FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(6):12	1975	ADD 28	127

℄ PIPE STA. 17+75
Construct: Inlet Struct. (For Detail See Sht. No. H6 of 28)
ESTIMATED QUANTITIES
*Ditch & Channel Exc. = 5,102 C.Y.
Class A Conc. = 49 C.Y.
CRM = 12 C.Y.
Reinf steel = 3,280 Lbs.
*Includes excavation quantities for Structural plate pipes.

℄ PIPE STA. 5+87.74 TO STA. 17+75
INSTALL: Double 132" ϕ Struc. Plate Pipe
5% Vertical Elongated (For Detail, See Sht. No. H6 of 28)
LEFT PIPE GAGE: Sta. 5+87.74 to Sta. 11+00 - 10 Ga.
Sta. 11+00 to Sta. 12+~~00~~24 - 7 Ga.
12+24 Sta. ~~12+00~~ to Sta. 14+25 - 10 Ga.
Sta. 14+25 to Sta. 17+~~25~~01 - 7 Ga.
17+01 Sta. ~~17+25~~ to Sta. 17+75 - 10 Ga.

ESTIMATED QUANTITIES
132" Struct. Plate, 10 Ga. = 1576 LF
132" Struct. Plate, 7 Ga. = 800 LF
Structural Backfill for Structural Plate Culverts = 4977 CY
Bed Course Material for Culvert = 2,563 CY

132" Struct. Plate Pipe - Right Pipe
Pipe Sta.
5+87.74 to 10+72 = 10 Ga.
10+72 to 12+20 = 7 Ga.
12+20 to 14+49 = 10 Ga.
14+49 to 17+01 = 7 Ga.
17+01 to 17+75 = 10 Ga.

℄ PIPE STA. 5+87.74
Construct: Outlet & GRP Lined Ditch
(For detail see sht. no. H3 of 28)
ESTIMATED QUANTITIES
GRP = 90 CY
Struc. Exc. = 15 CY
Ditch & Channel Exc. = 435 CY

℄ Pipe Sta. 12+05
℄ Pipe Sta. 13+05
Install: 36" CMP Sht. "t" = 0.108"
(For Detail, See Sht. No. H8 of 28)
ESTIMATED QUANTITIES
36" CMP, Sht. "t" = 0.108" = 40 LF

℄ Sta. 13+15
Install: 54" CMP, Sht. "t" = 0.138"
(For Detail, See Sht. No. H8 of 28)
ESTIMATED QUANTITIES
54" CMP, Sht. "t" = 0.138" = 56 LF
Struc. Exc. = 9 C.Y.

℄ Pipe Sta. 13+15
Inv. = 219.61

Existing 54" Pipe
Inv. = 222.6

Extend 54" Pipe

PIPE CURVE DATA Δ2
Δ2 = 55° 11' 30"
Δ2/4 = 18° 17' 52.5"
℄ R2 = 150'
LEFT PIPE
R2 = 157'
t2 = R2 tan 1/2 (Δ2/4)
t2 = 18.18'
2t2 = 36.36'
RIGHT PIPE
R2 = 143'
t2 = 16.56'
2t2 = 33.12'

PIPE CURVE DATA Δ3
Δ3 = 52° 14' 00"
Δ3/4 = 13° 03' 30"
℄ R3 = 75'
LEFT PIPE
R3 = 82'
t3 = R3 tan 1/2 (Δ3/4)
t3 = 9.31
2t3 = 18.62'
RIGHT PIPE
R3 = 68'
t3 = 7.72'
2t3 = 15.44'

DRAIN LINE "A"
℄ Sta. 50G+60 o/s 344.50' Lt. "H-3" to
℄ Sta. 50G+74.50 o/s 113' Rt. "H-3"
Install: 54" CMP, Sht. "t" = 0.138" connect to 132" Structural Plate Pipe (For Detail & Profile See Sht. No. H8 of 28 & H7 of 28)
ESTIMATED QUANTITIES
Struct. Exc. = 2,800 C.Y.
54" CMP, Sht. "t" = 0.138" = 458 L.F.

℄ Sta. 50G+74.50 o/s 113' Rt. H-3
DL "A" Sta. 4+58 (FUTURE)
Modified Type "B" C.D.1. #A-1
Inv. = 227.00 (54")

℄ Sta. 10+77.75 Ramp "F"
Pipe Sta. 11+08.42

℄ Sta. 5+12+12.25 H-3
Pipe Sta. 15+41.40

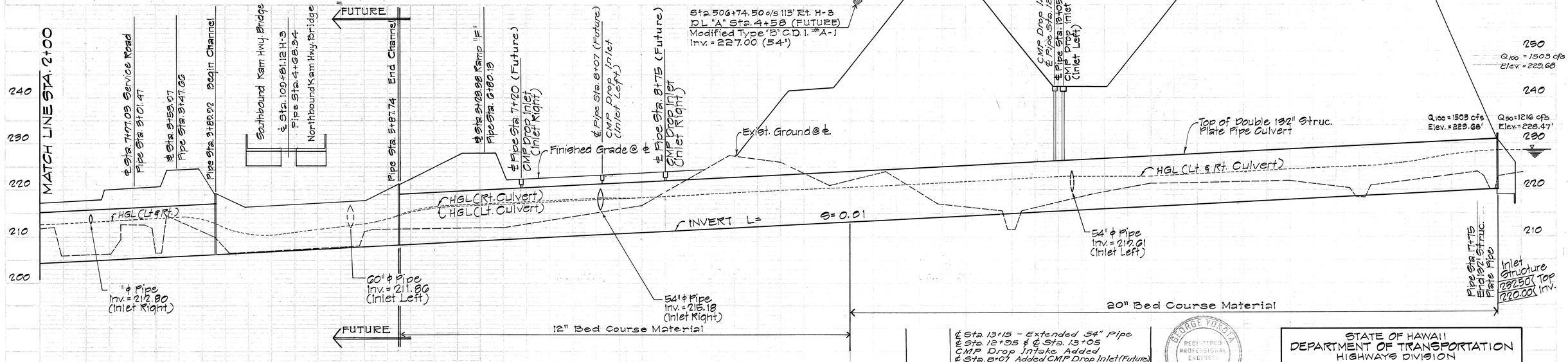
℄ Pipe Sta. 17+75
End 132" Pipe

For Detail, see Sht. No. H6 of 28

℄ Pipe Sta. 18+75

BORING NO. 57
BORING NO. 58
BORING NO. 60
BORING NO. 70
BORING NO. 77
BORING NO. 59

KAMOOALII BRANCH
NORTHBOUND
SOUTHBOUND
SERVICE ROAD
KAMEHAMEHA HIGHWAY
RAMP "E"
RAMP "F"
RAMP "G"
INTERSTATE ROUTE H3
EASTBOUND
WESTBOUND
KIONAOLE BRANCH
MATCH LINE STA. 2+00
True North
Scale: 1" = 50'



DATE	REVISION
	℄ Sta. 13+15 - Extended 54" Pipe ℄ Sta. 12+05 & ℄ Sta. 13+05 CMP Drop Intake Added ℄ Sta. 8+07 Added CMP Drop Inlet (Future) ℄ Sta. 5+87.74 - GRP Lined Ditch Replaces Earth Ditch 132" Struc. Plate Pipe, 10 Ga. Quantity changed to 1576 LF
1-14-75	

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

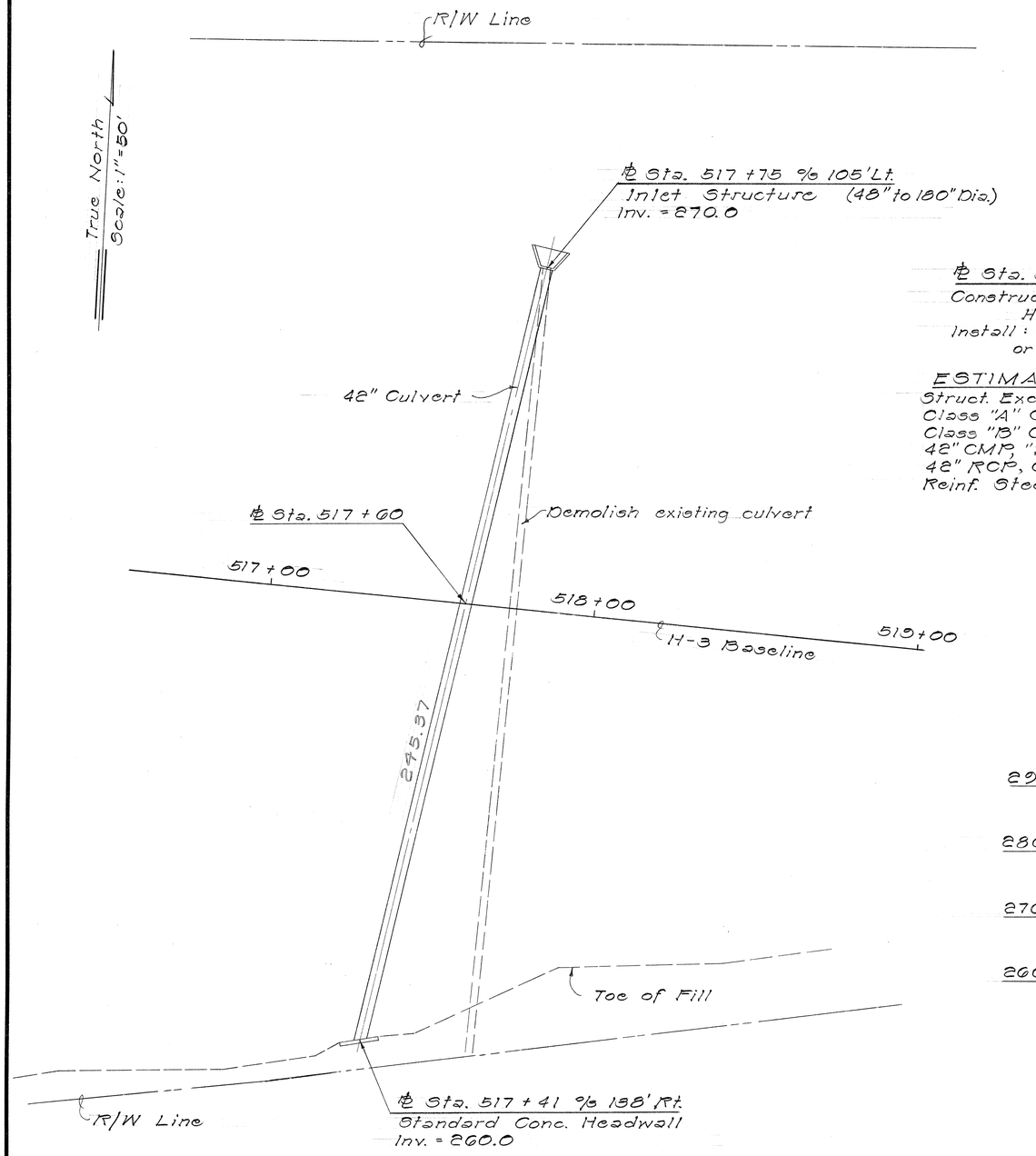
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KAMOOALII BRANCH DOUBLE 132" ϕ STRUCTURAL PLATE CULVERT

F.A.I. Project No. I-H3-1(G):12
Scale: As Shown Date: Jan. 1975
SHEET NO. H1 OF 28 SHEETS

ADD. 28

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(6):12	1975	29	127



PLAN

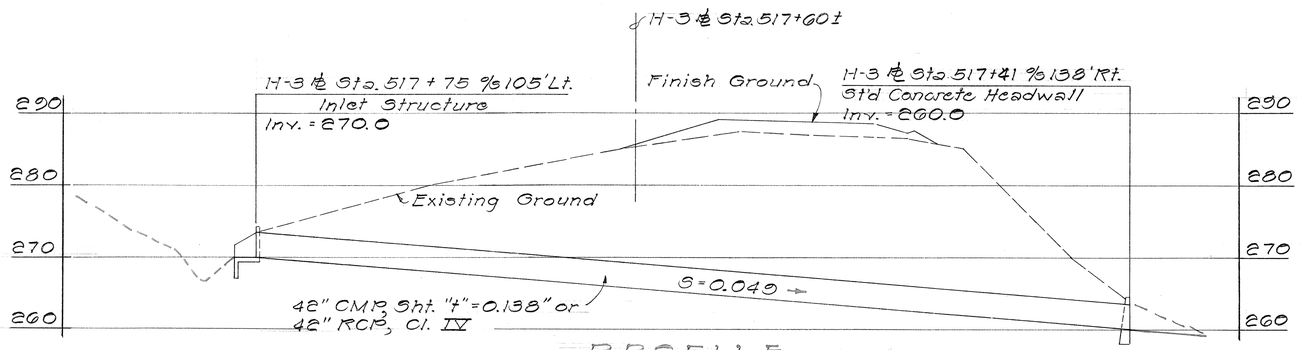
℄ Sta. 517 + 75 % 105' Lt.

Construct: Inlet Structure and Std Conc. Headwall (For Detail See Sht. No. H22 of 28)

Install: 42" CMP, Sht. "t"=0.138" or 42" RCP, Cl. IV

ESTIMATED QUANTITIES

Struct. Exc.	= ~~561.6~~ C.Y.	838.5
Class "A" Conc.	= ~~3.0~~ C.Y.	3.4
Class "B" Conc.	= ~~4.5~~ C.Y.	4.7
42" CMP, "t"=0.138" or 42" RCP, Cl. IV	= 240 L.F.	
Reinf. Steel	= ~~432~~ Lb.	546



PROFILE

~~H-3 ℄ STA. 517 + 60 ±~~

Scale: Horz. = 1" = 20'
Vert. = 1" = 10'

ORIGINAL PLAN

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

NOTE BOOK
No.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

42" CULVERT @ ℄ STA. 517+60

F.A.I. Proj. No. I-H3-1(6):12

Scale: 1" = 20' Date: Jan 1975

SHEET No. H2 OF 28 SHEETS

K+E ◎ TRACING PAPER

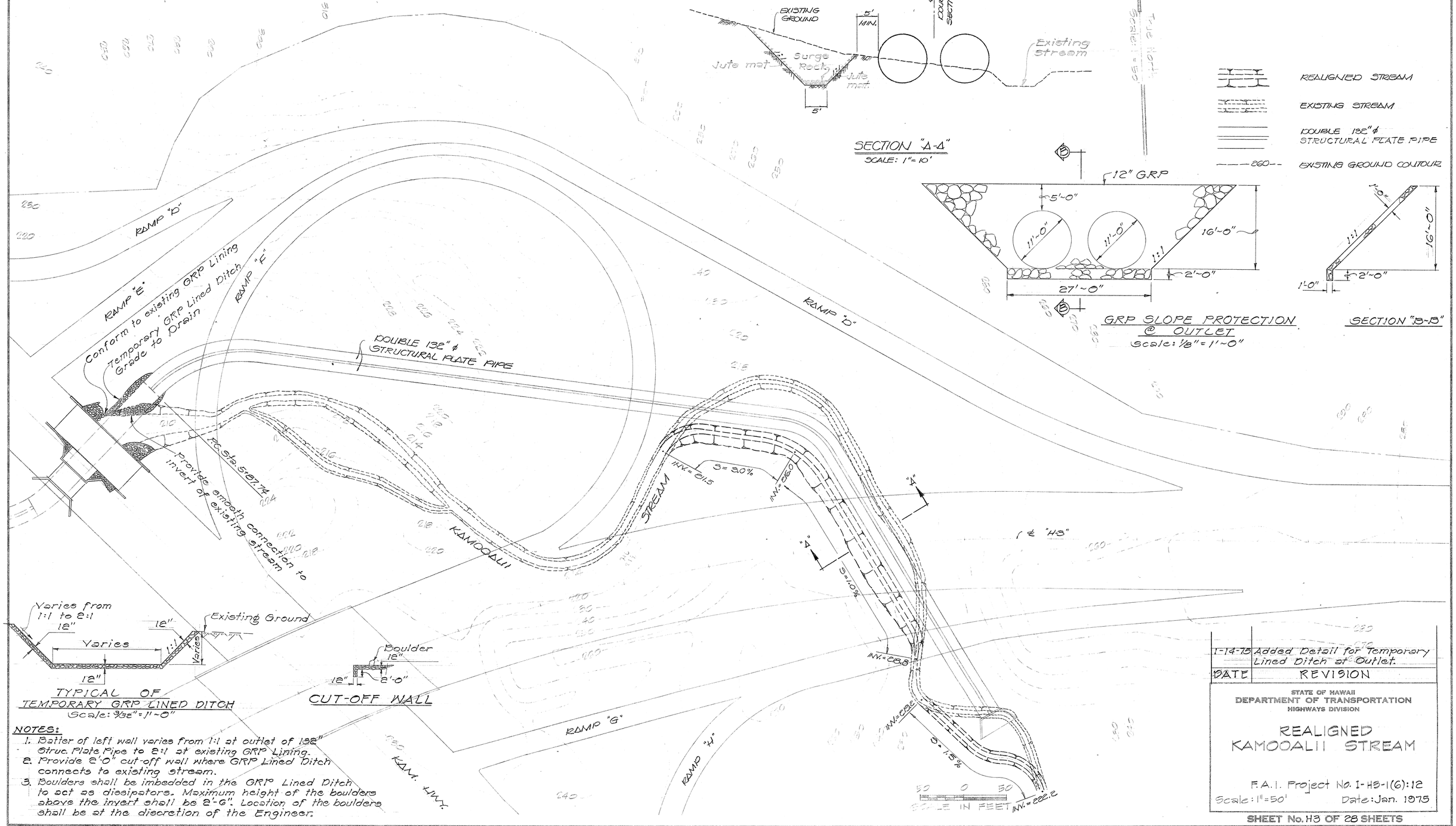
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(6):12	1975	ADD30	127

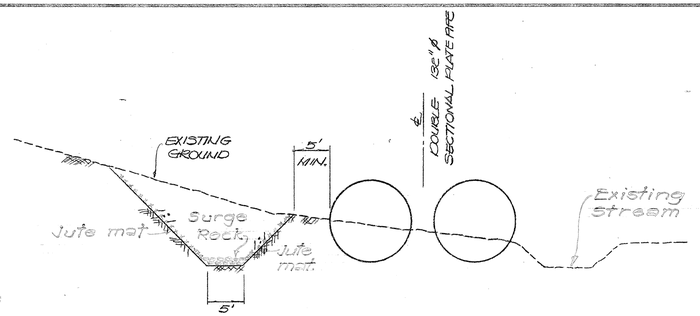
STREAM REALIGNMENT

Construct: Temporary Earth Ditch
(See This Sht. for Typical)

ESTIMATED QUANTITIES

Ditch & Channel Exc. 5,700 C.Y.





SECTION "A-A"
SCALE: 1"=10'

REALIGNED STREAM

EXISTING STREAM

DOUBLE 132" ϕ STRUCTURAL PLATE PIPE

260 EXISTING GROUND CONTOUR

GRP SLOPE PROTECTION @ OUTLET
Scale: 1/8"=1'-0"

SECTION "B-B"

TYPICAL OF TEMPORARY GRP LINED DITCH
Scale: 3/32"=1'-0"

CUT-OFF WALL

NOTES:

1. Batter of left wall varies from 1:1 at outlet of 132" Struc. Plate Pipe to 2:1 at existing GRP Lining.
2. Provide 2'-0" cut-off wall where GRP Lined Ditch connects to existing stream.
3. Boulders shall be imbedded in the GRP Lined Ditch to act as dissipators. Maximum height of the boulders above the invert shall be 2'-6". Location of the boulders shall be at the discretion of the Engineer.

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

DATE	REVISION
1-14-75	Added Detail for Temporary Lined Ditch at Outlet.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

REALIGNED KAMOOALII STREAM

F.A.I. Project No. I-H3-1(6):12
Scale: 1"=50' Date: Jan. 1975

SHEET No. H3 OF 28 SHEETS

ADD. 30

PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(6):12	1975	31	

2000N 500W 2500N 000 TRUE NORTH Scale: 1"=50'

ACCESS ROAD A-1 STA. 0+20 Lt.

Construct: Type "F" C.D.I
(For Details, See Sht. No. H13)
Install: 2-24" RCP, CL. III or
2-24" CMP, Sht. "t" = 0.079" or
2-24" ACP, CL. III.
(For Profile, See Sht. No. H11)

ESTIMATED QUANTITIES	
Struc. Exc.	= 102 C.Y.
CL. A Conc.	= 4.5 C.Y.
24" Culvert	= ~~112~~ L.F. 114
Reinf. Steel	= 190 LB.
GRP	= 0.5 C.Y.

STATIONS TO 562+00 UNDER CONSTRUCTION (BY OTHERS)

STATIONS 562+00 TO 580+00 UNDER THIS CONTRACT

Access Rd A-1 Sta. 1+75.23
Conc. Inlet & Outlet Struct.
3-84" Pipe Culverts

Access Rd. A-1 Sta. 0+20 Lt.
Type "F" C.D.I.
Inv. = 217.10

Access Rd. A-2 Sta. 0+78 Rt. & Lt.
Type A-9 Grated C.D.I.
Inv. = 205.00

Access Rd. A-2 Sta. 0+80.2
Type "G" S.D.M.H
Inv. = 199.25

℄ Sta. 562+95
Type G1214 Grated CDI
Inv. = 230

℄ Sta. 562+45
Type "B" Grated C.D.I
Inv. = 234.75

℄ Sta. 565+03 % 11' Lt.
Type "B" Grated C.D.I
Inv. = 214.07

℄ Sta. 565+13 % 72' Rt.
Conc. Inlet Struct.
Inv. = 223.50

Access Rd A-2
Sta. 1+94.80 Lt.
Type "G" S.D.M.H
Inv. = 203.75

Access Rd. A-2 Sta. 2+88 Lt.
Type "H" S.D.M.H
Inv. = ~~217.25~~ 218.00

ESTIMATED QUANTITIES

Struc. Exc.	= 2115 C.Y.
CL. A Conc.	= 91.5 C.Y.
84" Culvert	= ~~480~~ L.F. 486
Reinf. Steel	= 6712 LB.
Ditch & Channel Exc.	= 984 C.Y.
Bed Course Material	= 360 C.Y.
Filter Material	= 2 C.Y.
GRP	= 88 C.Y.

Remove Existing Culvert
2-24" Pipe Culverts
24" Pipe Culvert
24" RCP
Gutter Type 7ACF
48" Pipe Culvert
Gutter Type 7ACM-1
Gutter Type 7ACC
Existing Gutter
Existing 24" Pipe Culvert
Connection Detail See Sht. H16
CRM Wall See Sht. H16
84" Pipe Culvert
Remove Exist'g Culverts
Cleanout
6" Perforated Underdrain
Access Road A-1
Access Road A-2
Access Rd A-2 Cut-off Ditch
221°-30'
560+00
565+00
MATCH LINE STA. 10+00
MATCH LINE ℄ STA 572+00
500E
1500N
2500N

℄ STA. 570+00 to 572+00
Construct: Type "B" Grated C.P.I.
(For Details, See Sht. No. H14)
Install: 24" RCP, Class III or 24" C.M.P., 0.079 Inch, 24" ACP, Class III (For Profile, See Sht. No. H11)

ESTIMATED QUANTITIES	
Struc. Exc.	= 183 C.Y.
Class A Conc.	= 3.0 C.Y.
24" Culvert	= ~~200~~ 265 L.F.
24" "A" Grating	= 2 EA.
Type "B" Grating	= ~~1~~ 2 EA.
Type "B" Frame	= 1 EA.

℄ Sta. 563+50
Type G1214 Grated CDI
Inv. = 199.50
G1214 Grated CDI

℄ Sta. 570+00 % 10' Lt.
Type "B" Grated CDI
Inv. = 185.00

INBOUND
OUTBOUND
Cleanout

℄ STA. 564+00 to 572+00
Construct: Gutter Type 7ACM-1
(For Details, See Sht. No. 21)

ESTIMATED QUANTITIES	
Gutter	800 LF.

℄ STA. 563+90 to 572+00 (RT)
Construct: Gutter 7ACC
(For Details, Sht. No. 21)

ESTIMATED QUANTITIES	
Gutter	830 LF.

℄ STA. 564+00 to 572+00 (LT)
Construct: Gutter Type 7ACF Type G1214 CDI (For Details See Sht. No. H21)

ESTIMATED QUANTITIES	
Gutter	= 780 L.F.
Struc. Exc.	= 7 C.Y.
Class A Conc.	= 3.0 C.Y.
Type G1214 Frame & Grating	= 1 EA.
Reinf. Steel	= 33 LBS.

℄ STA. 562+00 to 562+45

Construct: Gutter Type 7ACM-1
(For Details, See Sht. No. H21)

ESTIMATED QUANTITIES	
Gutter	45 LF.

℄ STA. 562+00 to 562+45

Construct: Gutter Type 7ACC
(For Details, See Sht. No. H21)

ESTIMATED QUANTITIES	
Gutter	45 LF.

℄ STA. 562+45

Construct: Type "B" Grated C.D.I.
Type G1214 C.D.I., CRM Wall
(For Details, See Sht. No. H14 & H16)
Install: 24" RCP Class IV (No Option)
(For Profile, See Sht. No. H2)

ESTIMATED QUANTITIES	
Struc. Exc.	= 198 C.Y.
Class "A" Conc.	= 7.5 C.Y.
24" Culvert	= 182 LF.
Reinf. Steel	= 160 LBS.
Type "A" Grating	= 3 EA.
Type "B" Grating	= 2 EA.
Type "B" Frame	= 1 EA.
Type G1214 Frame & Grating	= 1 EA.
CRM	= 8 CY.

ACCESS ROAD A-2

Construct: 2-Type "G" S.D.M.H., Type "H" S.D.M.H. & 2-Type A-9 Grated C.D.I, Cut-off Ditch. (For Details, See Sht. No. H17, H18, H19)

Install: 84" RCP, CL. V (No Option)
24" RCP, CL. IV (No Option)
(For Profile, See Sht. No. H11)

ESTIMATED QUANTITIES	
Struc. Exc.	= 1448 C.Y.
CL. A Conc.	= 23.5 C.Y.
CRM	= 183 C.Y.
GRP	= 87 C.Y.
84" Culvert	= ~~350~~ L.F. 340.5
24" Culvert	= ~~30~~ L.F. 27
Type A-9 Steel Fr. & Grate	= 2 EA.
Reinf. Steel	= 2327 LBS.
Ditch & Channel Exc.	= 890 C.Y.
Type "A" C.I. Fr. & Cover	= 3 EA.
Bed Course Material	= 245 C.Y.
Filter Material	= 20 C.Y.

℄ Sta. 565+13 % 72' Rt.

Construct: St'd. Conc. Inlet Structure, Type "B" Grated C.D.I. (For Details See Sht. No. H14, H22)
Install: 48" RCP, CL. III or
48" CMP, Sht. "t" = 0.109"
(For Profile, See Sht. No. H11)

ESTIMATED QUANTITIES	
Struc. Exc.	= 375 C.Y.
CL. A Conc.	= 10.0 C.Y.
48" Culvert	= ~~250~~ L.F. 248
Type "A" Grating	= 3 EA.
Type "B" Grating	= 2 EA.
Type "B" Frame	= 1 EA.
Reinf. Steel	= 804 LBS.
GRP	= 3 CY.

℄ STA. 564+00 to 572+00

Construct: 3 Cleanout (For Details See Sht. H20)
Install: Longitudinal Underdrain Pipe (For Details, See Sht. No. H20)

ESTIMATED QUANTITIES	
Struc. Exc.	= 118 C.Y.
Filter Material	= 112 C.Y.
Cleanouts	= 3 EA.
6" Perforated Underdrain Pipe	= ~~827~~ L.F.
6" Non-Perforated	= 18 L.F.

NOTE: Removal & disposal of existing culverts shall be incidental to the various items of work.

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PLAN

F.A.I. PROJ. No. I-H3-1(6):12

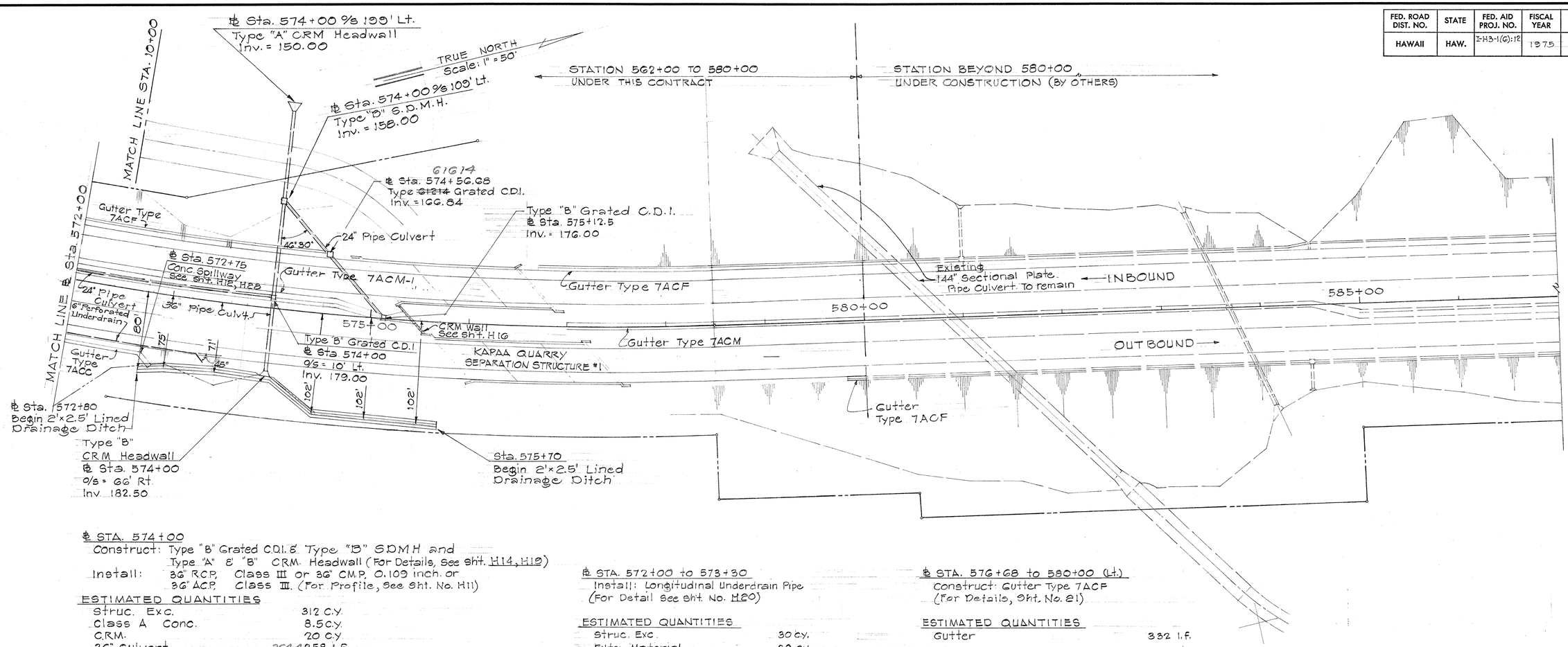
Scale: As Shown Date: Jan., 1975

SHEET No. H4 OF 28 SHEETS

000 1500N

K+E IMPERIAL™ LA 3207

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(6):12	1975	32	127



℄ STA. 574+00
Construct: Type "B" Grated C.D.I. & Type "B" S.D.M.H. and Type "A" & "B" C.R.M. Headwall (For Details, See sht. H14, H19)
Install: 36" R.C.P. Class III or 36" C.M.P. 0.109 inch. or 36" A.C.P. Class III. (For Profile, See Sht. No. H11)

ESTIMATED QUANTITIES

Struc. Exc.	312 C.Y.
Class A Conc.	8.5 C.Y.
C.R.M.	20 C.Y.
36" Culvert	~~264.4~~258 L.F.
Type "A" Grating	4 ea.
Type "B" Grating	2 ea.
Type "B" Frame	1 ea.
Type "A" C.I. Frame & Cover	1 ea.
Reinf. Steel	256 lbs

℄ STA. 572+80 to 575+70 (Rt.)
Construct: 2'x 2.5' Lined Drainage Ditch (For Details See Sht. H18)

ESTIMATED QUANTITIES

Ditch & Channel Exc.	125 C.Y.
2'x 2.5' Lined Drainage Ditch	290 L.F.

℄ STA. 572+00 to 572+75 (RT)
Construct: Gutter, Type 7ACC Conc. Spillway (For Details, See Sht. No. H18, H21, H28)

ESTIMATED QUANTITIES

Gutter	75 l.f.
Ditch & Channel Exc	3 C.Y.

℄ STA. 572+00 to 573+30
Install: Longitudinal Underdrain Pipe (For Detail See Sht. No. H20)

ESTIMATED QUANTITIES

Struc. Exc.	30 C.Y.
Filter Material	29 C.Y.
6" Perforated Underdrain Pipe	167 l.f.

℄ STA. 579+80 to 580+00 (Rt.)
Construct: Gutter Type 7ACF (For Details, See Sht. No H21)

ESTIMATED QUANTITIES

Gutter	20 l.f.

℄ STA. 572+00 to 575+12.5
Construct: Gutter Type 7ACM-1 (For Details, See Sht. No. H21)

ESTIMATED QUANTITIES

Gutter	313 l.f.

℄ STA. 577+00 to 580+00
Construct: Gutter Type 7ACM (For Details, See Sht. No. 21)

ESTIMATED QUANTITIES

Gutter	300 l.f.

℄ STA. 576+68 to 580+00 (Lt.)
Construct: Gutter Type 7ACF (For Details, Sht. No. 21)

ESTIMATED QUANTITIES

Gutter	332 l.f.

℄ STA. 572+00 to 574+00
Install: 24" R.C.P. Class III or 24" C.M.P. 0.079 inch or 24" A.C.P. Class III (For Profile, See Sht. No. 12)

ESTIMATED QUANTITIES

Struct. Exc	116 C.Y.
24" Pipe Culvert	198 l.f.

℄ STA. 572+00 to 574+56.68 (Lt.)
Construct: Gutter Type 7ACF (For Details, See Sht. No. 21)

ESTIMATED QUANTITIES

Gutter	248 l.f.

℄ STA. 574+56.68 61614
Construct: Type ~~G1214~~ Grated C.D.I.

ESTIMATED QUANTITIES

Struct Exc.	21 C.Y.
Class A Conc.	3.0 C.Y.
Reinf. Steel	33 lbs.
Type ~~G1214~~ 61614 Steel Frame & Grate	1 ea.

℄ STA. 575+12.5
Construct: Type "B" Grated CDI, CRM Wall (For Details See Sht. H14, H16)
Install: 24" R.C.P. Class III or 24" C.M.P. 0.079 inch or 24" A.C.P. Class III (For Profile, See Sht. H13)

ESTIMATED QUANTITIES

Struct. Exc.	29 C.Y.
Class A Conc.	1.5 C.Y.
24" Culvert	148 l.f.
CRM Wall	12 C.Y.
Type "A" Grating	4 ea.
Type "B" Grating	2 ea.
Type "B" Frame	1 ea.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PLAN

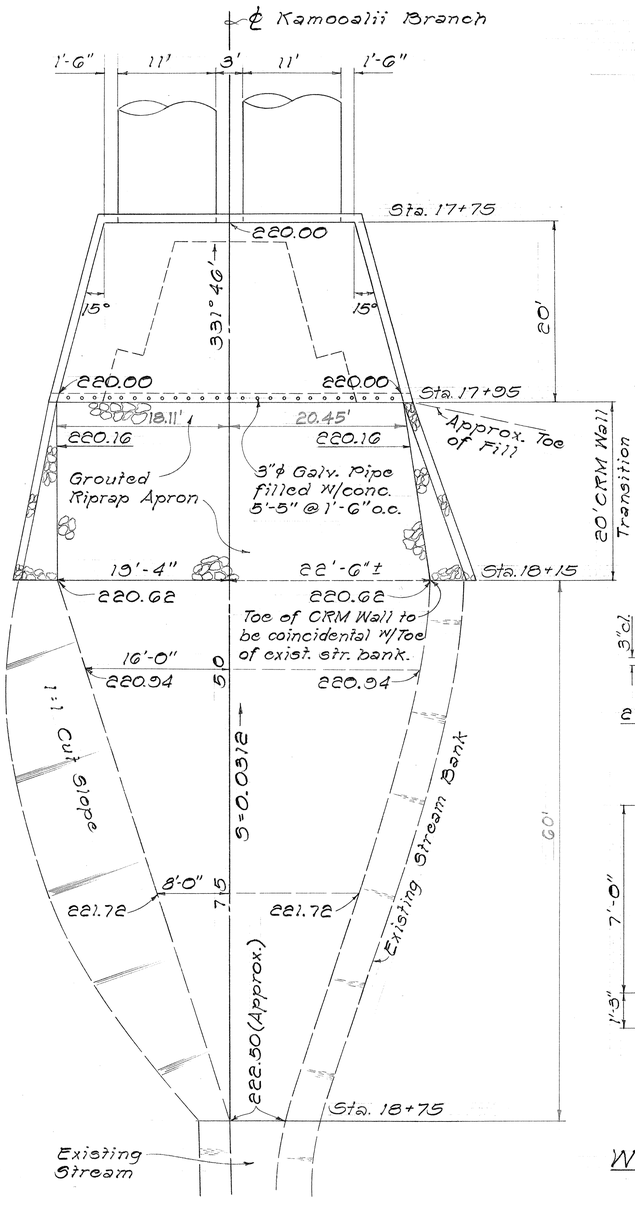
F.A.I. Proj. No. I-H3-1(6):12
Scale: As Shown Date: Jan. 1975

SHEET No. H5 OF 28 SHEETS

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

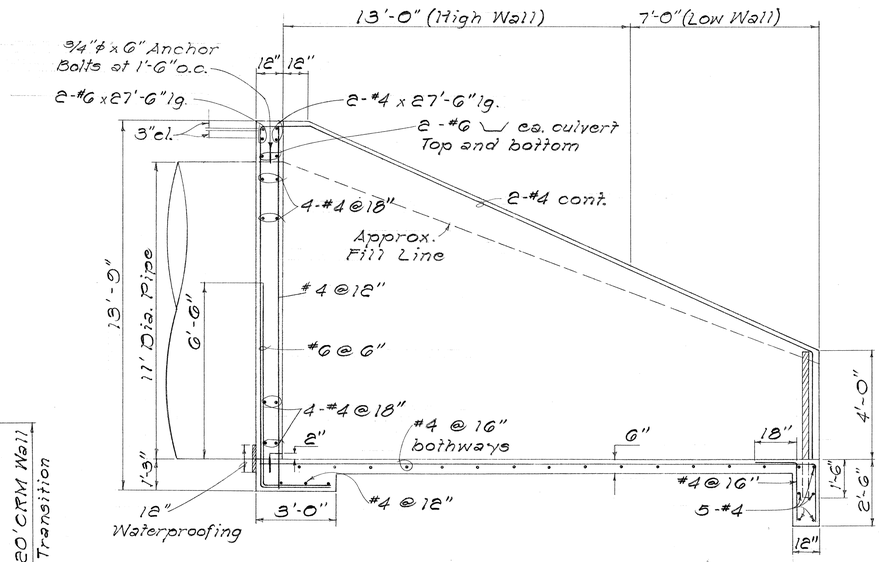
K&E CRYSTALENE® LA 2920 TRACING PAPER

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HS-1 (G):12	1975	33	127



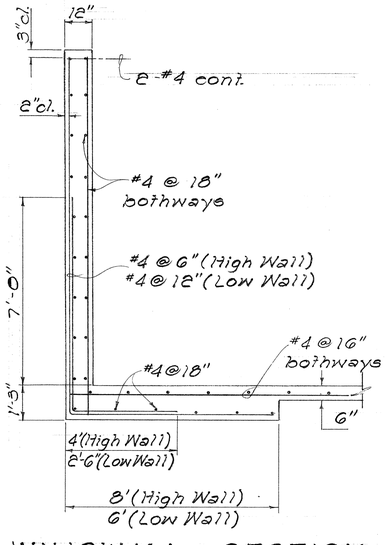
PLAN

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



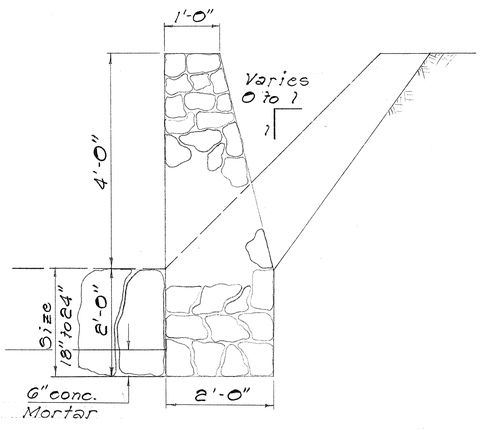
ELEVATION - WINGWALL SECTION

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



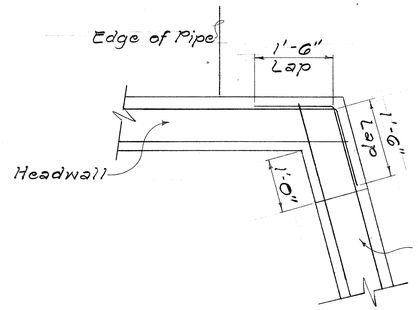
WINGWALL SECTION

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



TYPICAL CRM TRANSITION

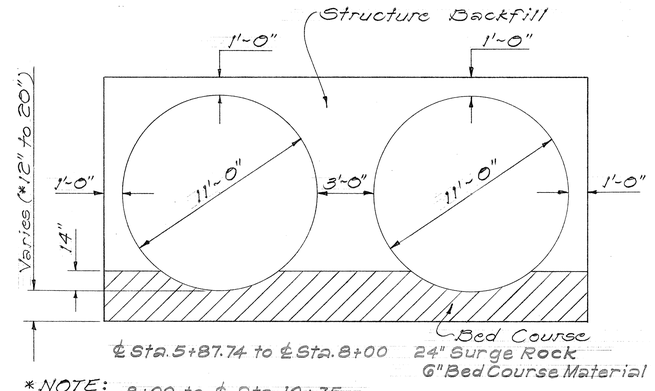
Scale: 3/4"=1'-0"



PLAN

HEADWALL CORNER

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



*NOTE: 8+00 to ℄ Sta. 10+75
~~℄ Sta. 5+87.74 to ℄ Sta. 10+75 - 12" Bed Course Material~~
℄ Sta. 10+75 to ℄ Sta. 17+75 - 20" Bed Course Material

TYPICAL FOR STRUCTURE BACKFILL AND BED COURSE MATERIAL

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

NOTES:
1. All concrete shall be Class "A".
2. Fill slope to be contoured to cover exposed portions of Wall and Pipe.
3. Area surrounding inlet shall be graded to drain.
4. Concrete Mortar (6") shall be considered incidental to Grouted Rip-rap Apron.

INLET STRUCTURE @ ℄ PIPE STA. 17+75

Scale: As Shown

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

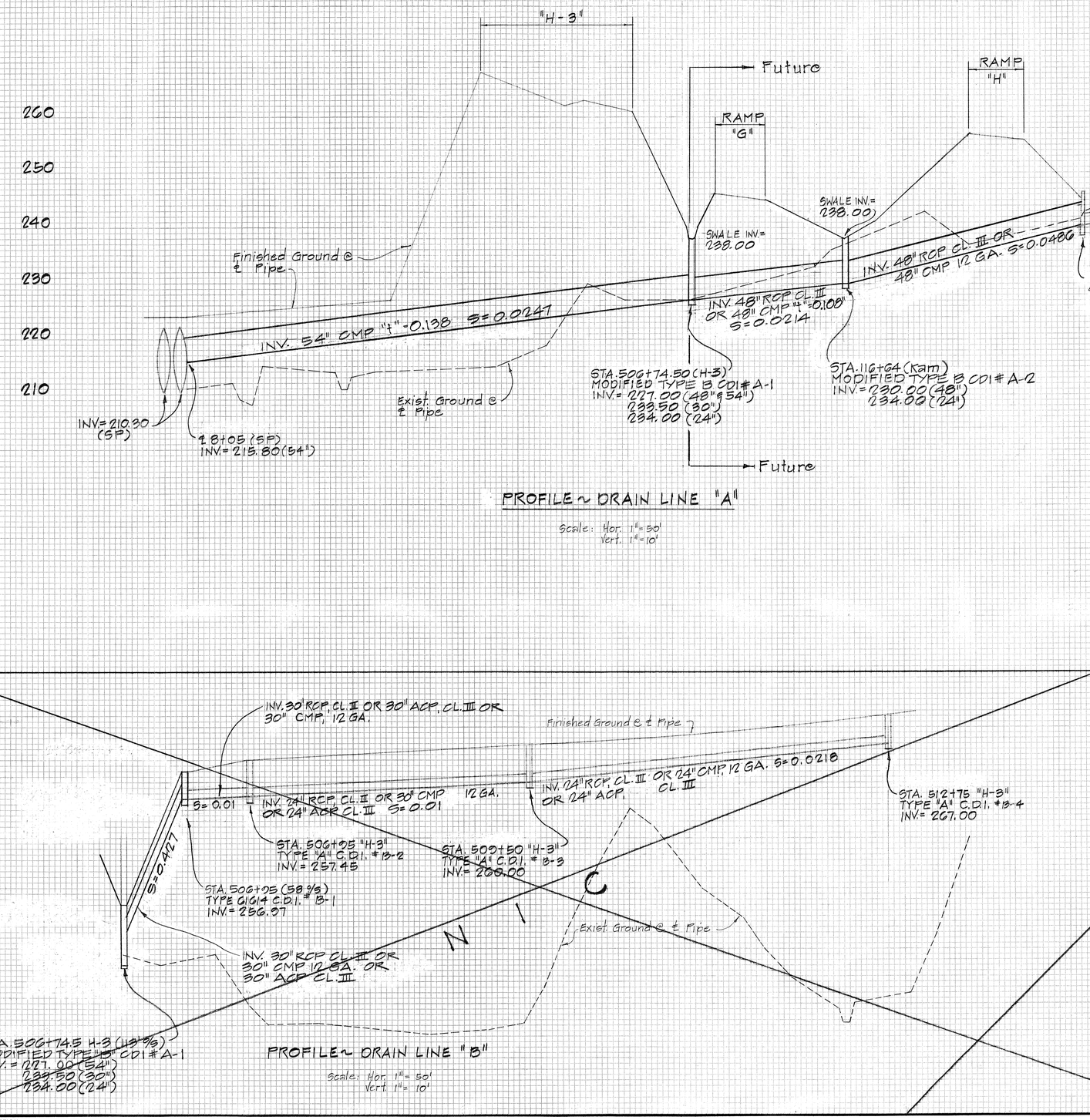
INTERSTATE ROUTE H-3
F.A.I. Proj. No. I-H3-1(6):12

Scale: As Noted Date: Jan. 1975

SHEET No. H6 OF 28 SHEETS

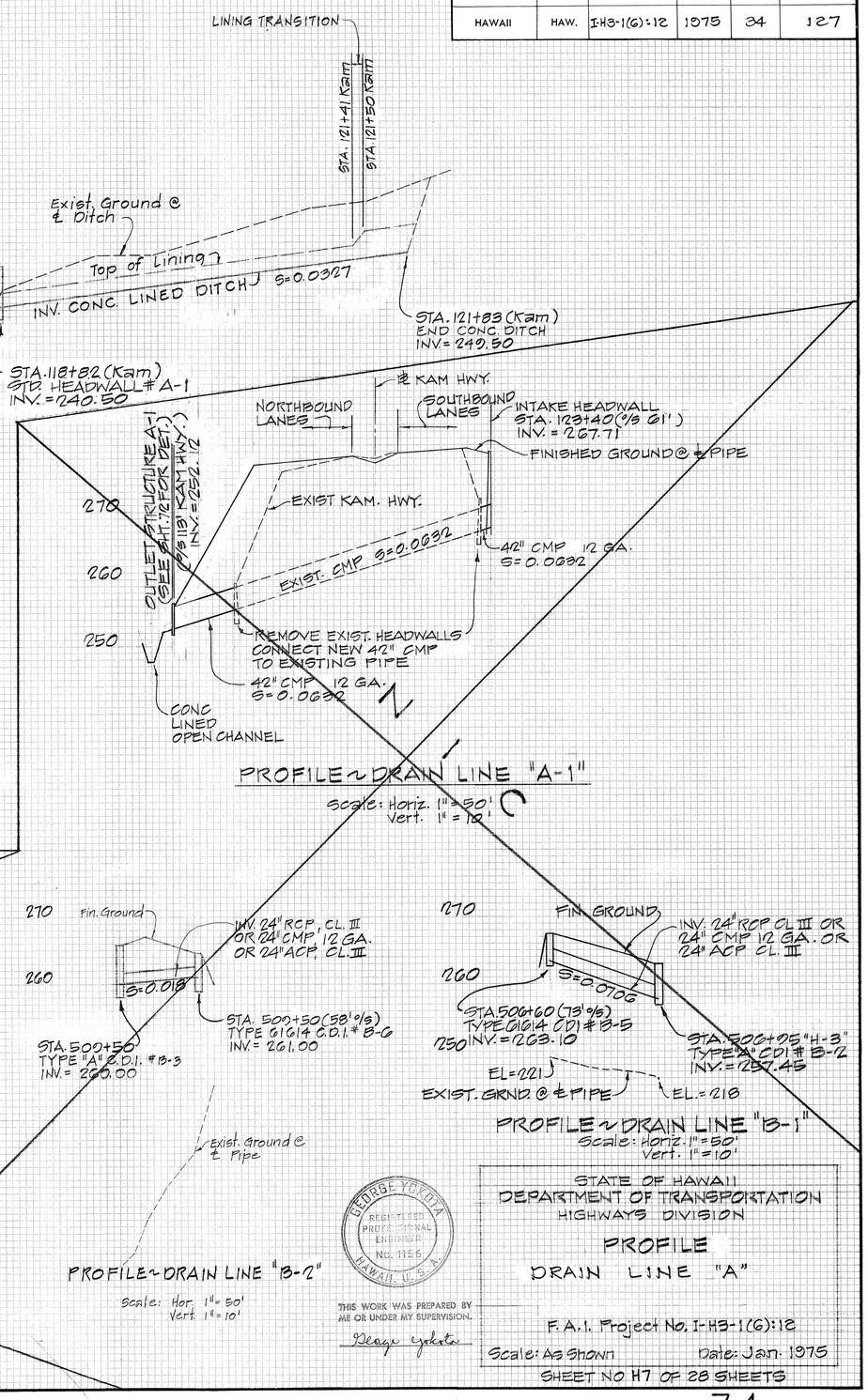
K+E CRYSTALENE TRACING PAPER

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(6)-12	1975	34	127



PROFILE ~ DRAIN LINE "A"

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



PROFILE ~ DRAIN LINE "A-1"

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

PROFILE ~ DRAIN LINE "B"

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

PROFILE ~ DRAIN LINE "B-1"

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

PROFILE ~ DRAIN LINE "B-2"

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

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

George Yokota

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PROFILE
DRAIN LINE "A"

F.A.I. Project No. I-H3-1(6):12

Scale: As Shown Date: Jan. 1975

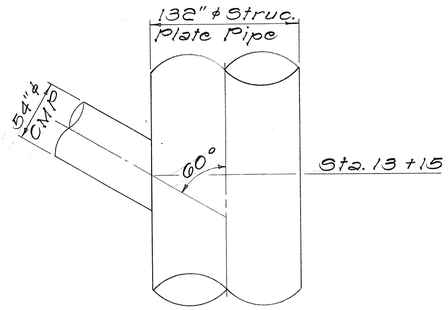
SHEET NO H7 OF 28 SHEETS

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

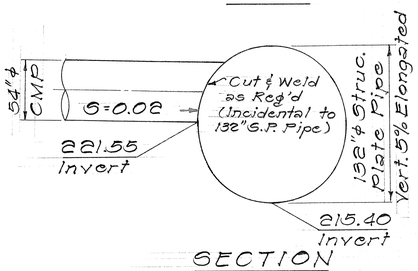
ORIGINAL SURVEY — DATE, BY, SURVEYED, PLOTTED, TEMPLATE, AREAS, NOTE BOOK, NO., AREAS CHECKED

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(6):12	1975	ADD 35	127

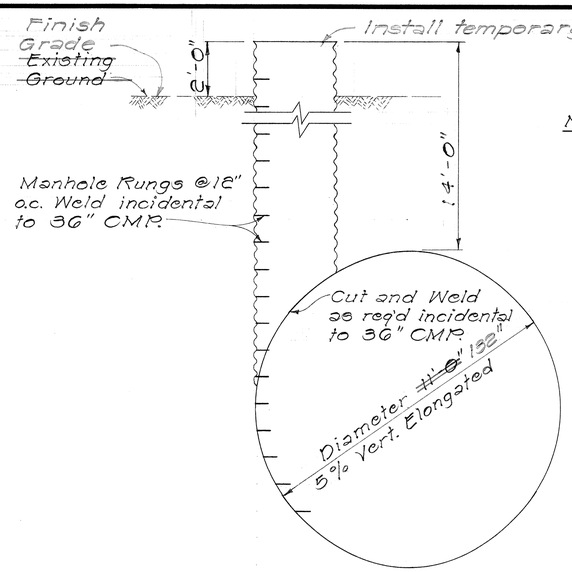


PLAN



SECTION

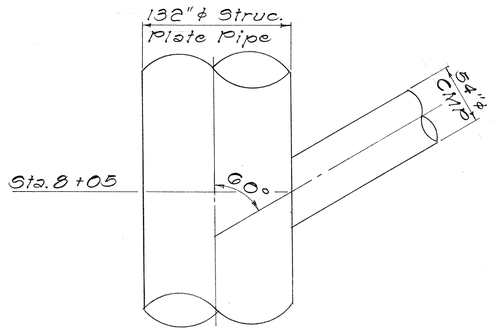
LEFT CULVERT - KAMOOALII BRANCH
STA. 13+15
Scale: 3/16" = 1'-0"



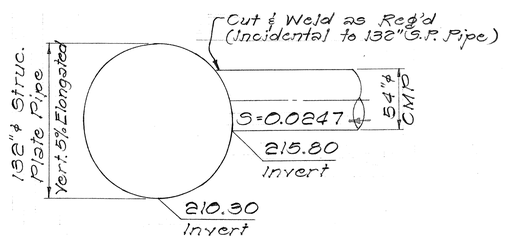
CMP DROP INLET
Scale: 3/8" = 1'-0"

NOTES:

1. Contractor shall weld a metal plate to cover the opening of the 36" CMP. (Incidental to 36" CMP.)
2. Manhole Rungs at 12" o.c. are required. (Incidental to 36" CMP.)
3. Standard Manhole Rungs to be cut off at wall line before welding.
4. All welding shall be incidental to 36" CMP.
5. Frame and Grate shall be installed in future job.



PLAN



SECTION

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

DATE	REVISION
	Added Note "Cut & Weld as Req'd" to Detail of Right Culv't. Kamooali Branch @ Sta. 8+05
1-14-75	Added CMP Drop Inlet & Connection Detail of Left Culvert - Kamoolii Branch @ Sta. 13+15

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

F.A.I. Proj. No. I-H3-1(6):12

Scale: As Noted Date: Jan., 1975

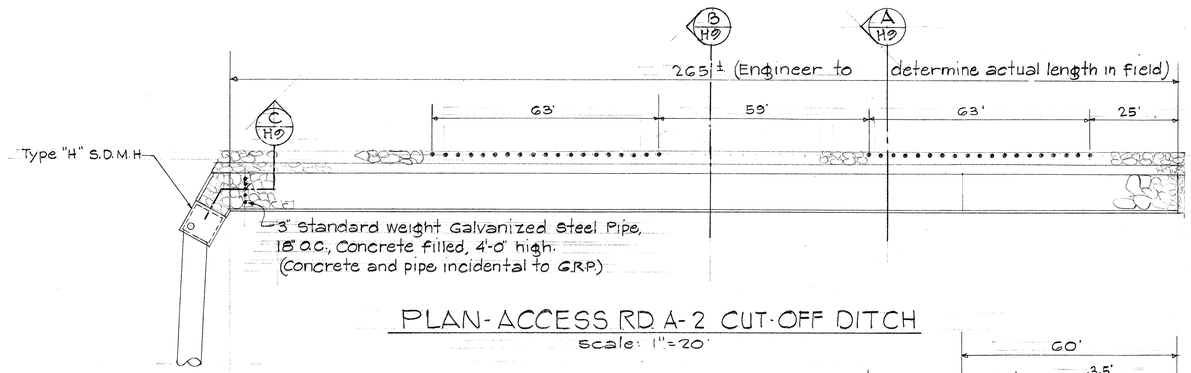
SHEET No. H8 OF 28 SHEETS

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

K+E ® TRACING PAPER

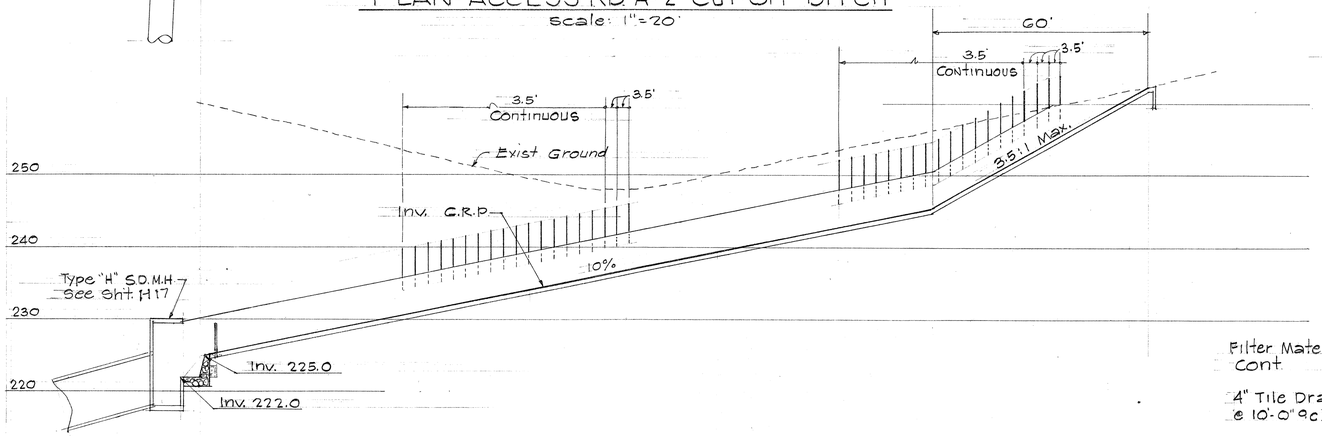
ADD. 35

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(6):12	1975	36	127



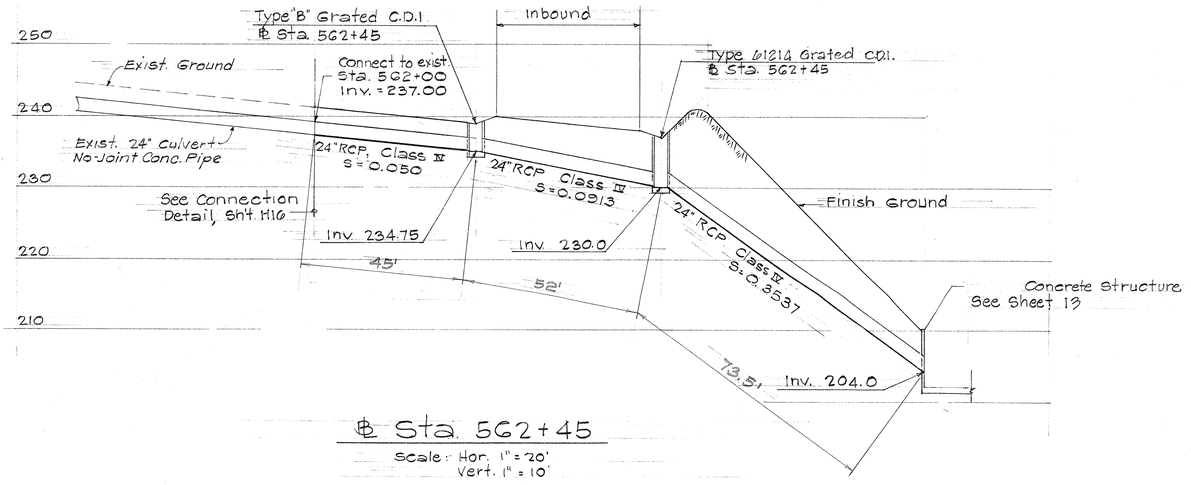
PLAN-ACCESS RD. A-2 CUT-OFF DITCH

Scale: 1"=20'



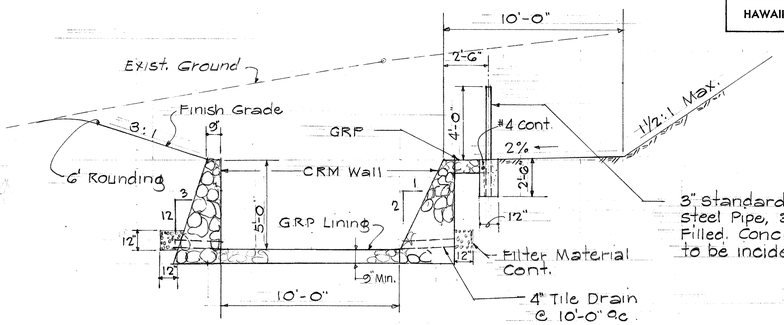
PROFILE

Scale: Hor. 1"= 20'
Vert. 1" = 10'



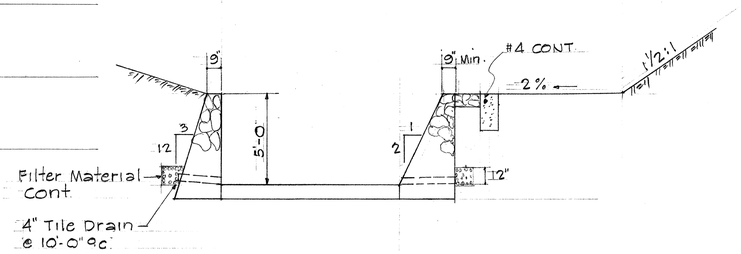
℄ Sta. 562+45

Scale: Hor. 1" = 20'
Vert. 1" = 10'



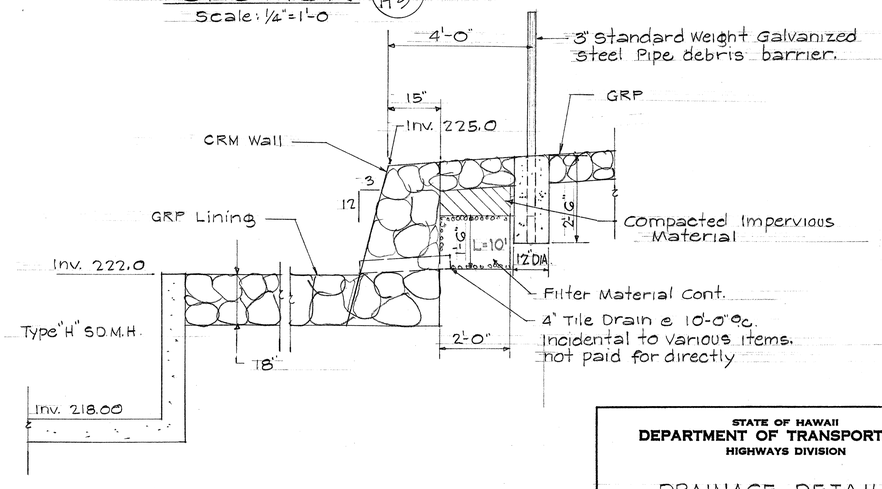
SECTION A H9

Scale: ¼"= 1'-0"



SECTION B H9

Scale: ½"=1'-0"



SECTION C H9

Scale: ½"=1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

ACCESS RD. A-2 CUT-OFF DITCH & 24" PIPE CULVERT PROFILE

F.A.I. Proj. No. I-H3-1(6):12

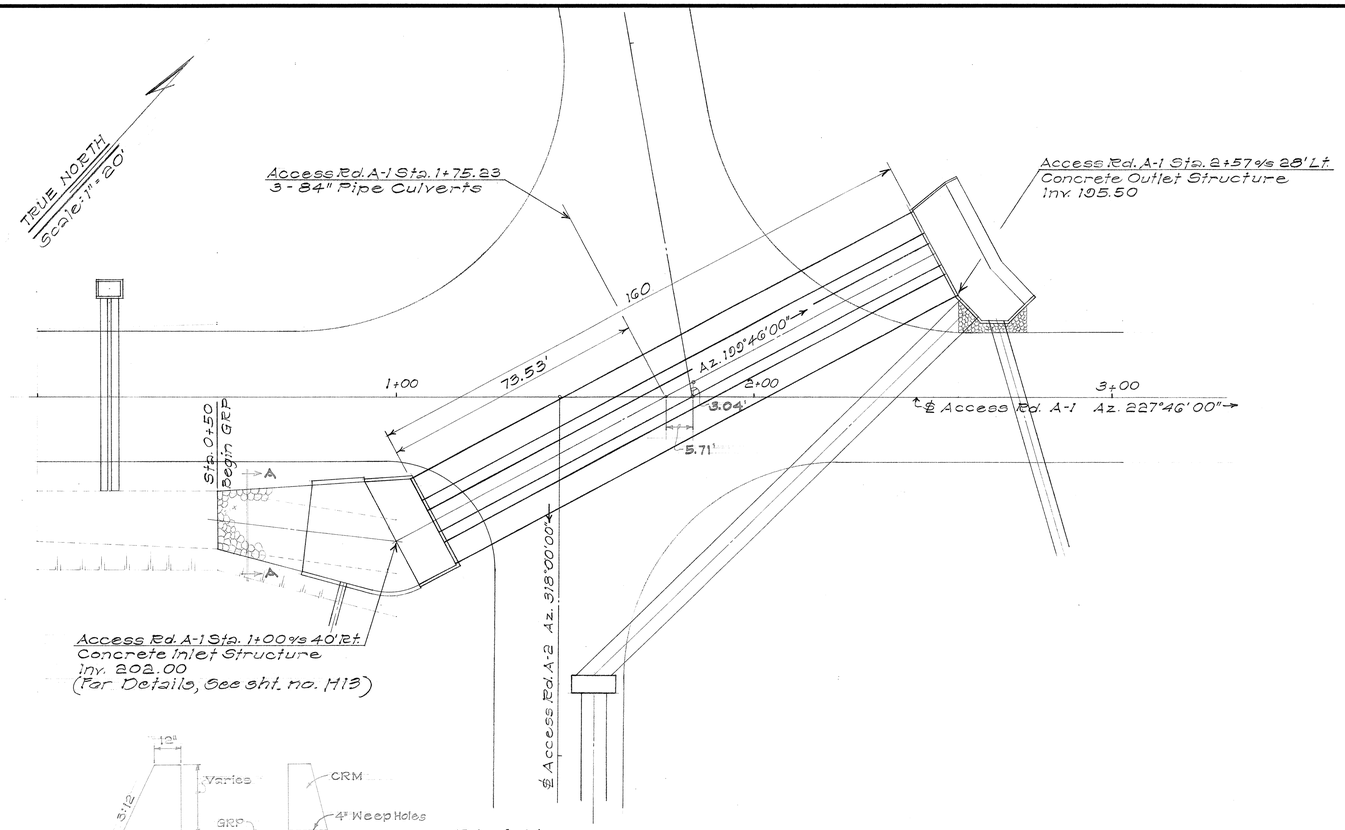
Scale As Shown Date: Jan 1975

SHEET No. H.9 OF 28 SHEETS

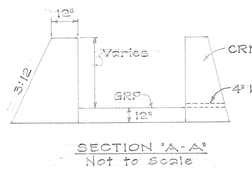
ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE
NOTE BOOK
No.

K+E CRYSTALENE® LA 3888

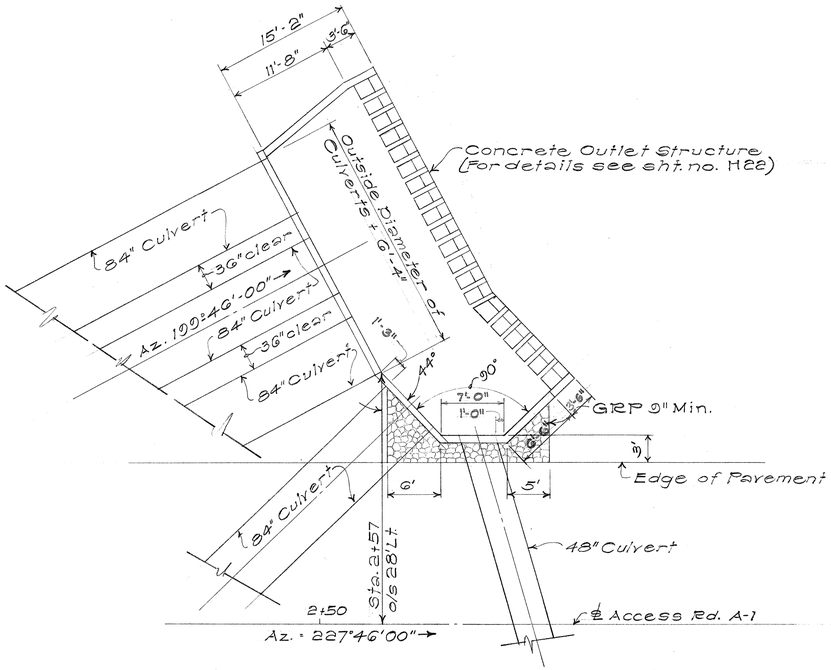
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HB-1(6):12	1975	37	127



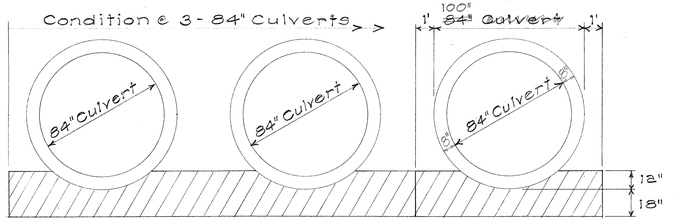
PLAN
Scale: 1" = 20'



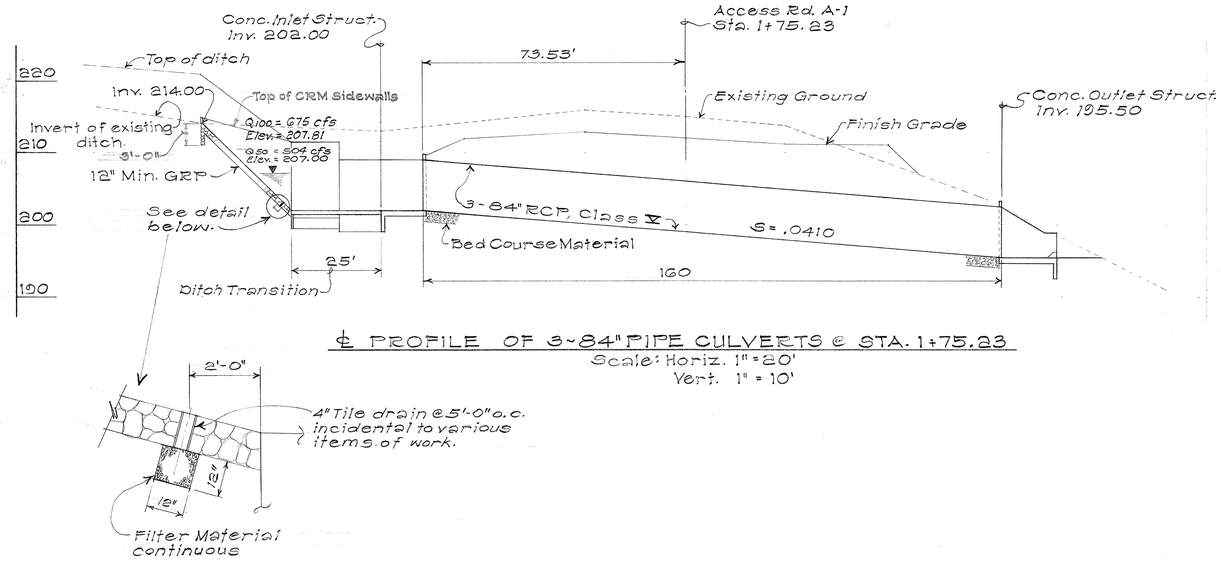
SECTION "A-A"
Not to Scale



PLAN VIEW - CONCRETE OUTLET STRUCTURE
Scale: 1/8" = 1'-0"



DETAIL OF BED COURSE MATERIAL FOR 84" CULVERT
Scale: 1/4" = 1'-0"



℄ PROFILE OF 3-84" PIPE CULVERTS @ STA. 1+75.23
Scale: Horiz. 1" = 20'
Vert. 1" = 10'

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

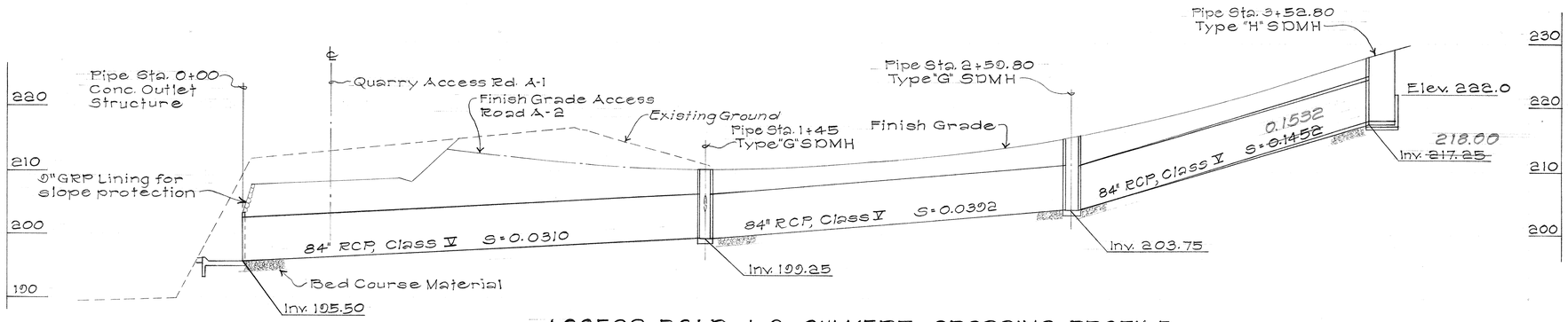
3-84" PIPE CULVERT CROSSING AND OUTLET STRUCTURE

F.A.I. PROJ. No. I-HB-1(6):12

Scale: As Shown Date: Jan. 1975

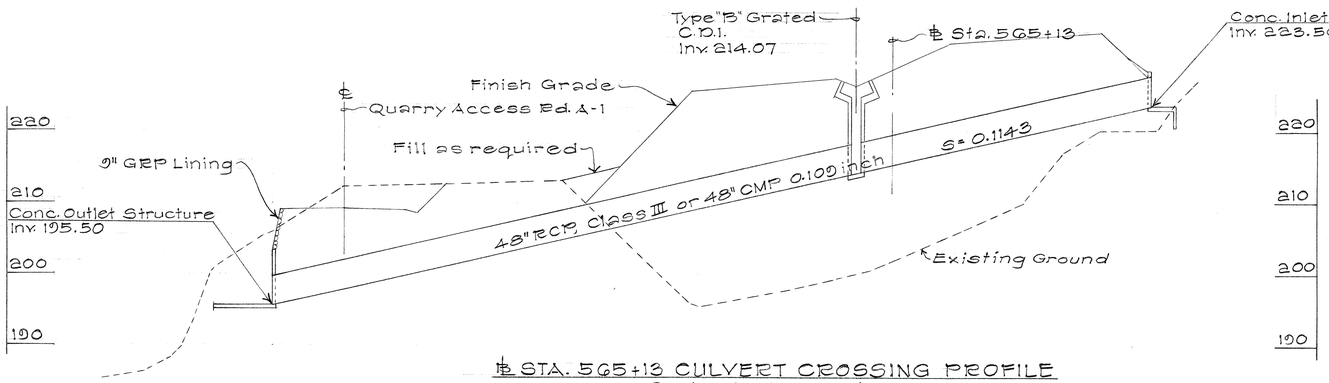
SHEET No. H10 OF 28 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(6):12	1975	38	127



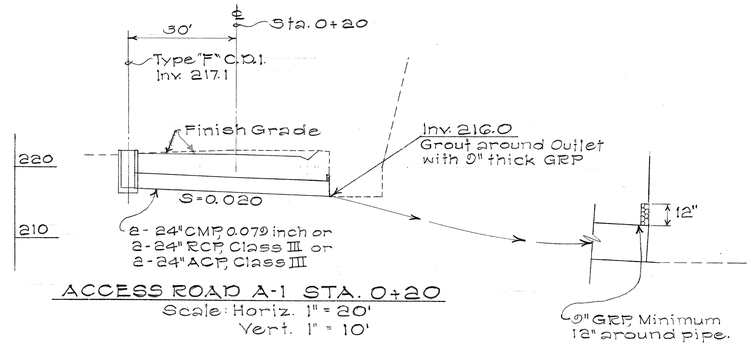
ACCESS ROAD A-2 CULVERT CROSSING PROFILE

Scale: Horiz. 1" = 20'
Vert. 1" = 10'



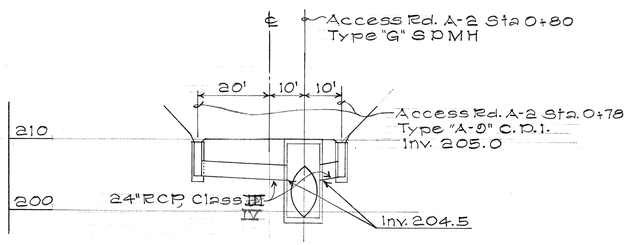
℄ STA. 5G5+13 CULVERT CROSSING PROFILE

Scale: Horiz 1" = 20'
Vert. 1" = 10'



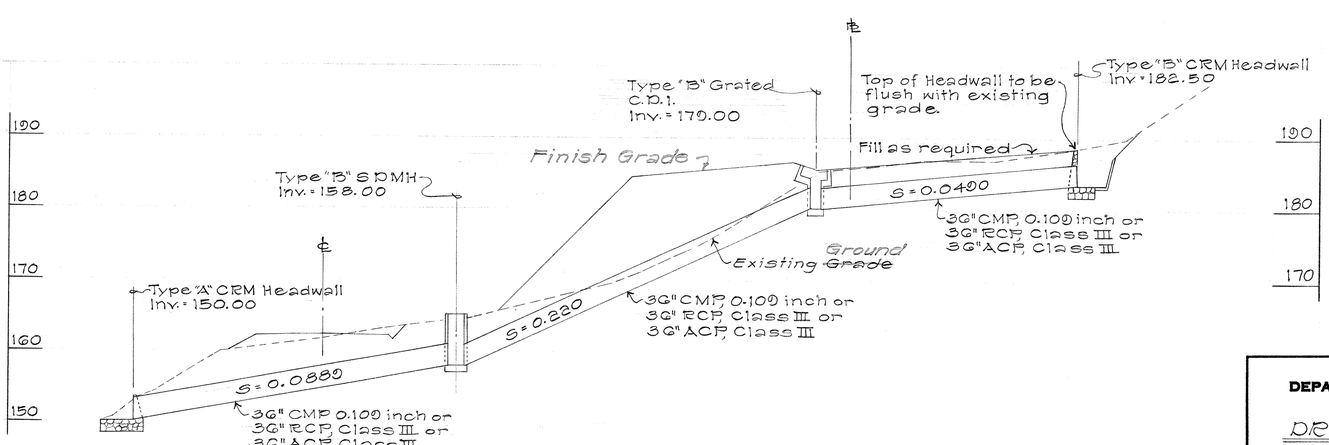
ACCESS ROAD A-1 STA. 0+20

Scale: Horiz. 1" = 20'
Vert. 1" = 10'



℄ ACCESS RD. A-2 STA. 0+78

Scale: Horiz. 1" = 20'
Vert. 1" = 10'



℄ STA. 574+00 CULVERT CROSSING PROFILE

Scale: Horiz. 1" = 20'
Vert. 1" = 10'

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

PIPE CULVERT CROSSINGS

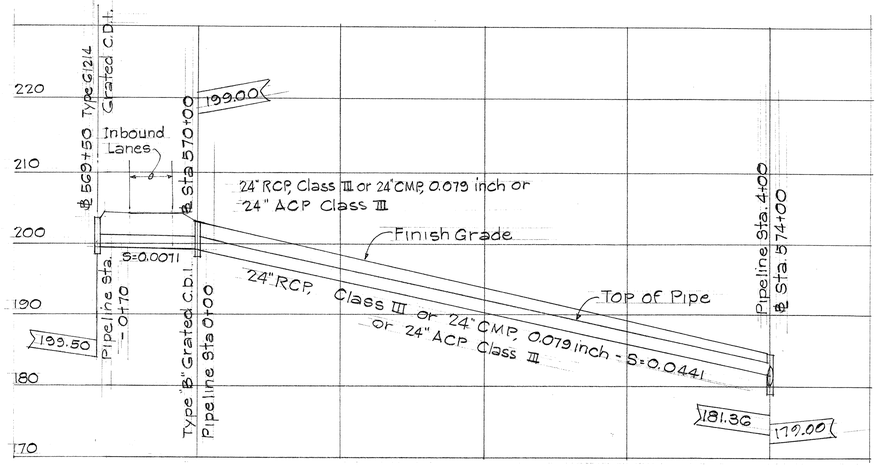
F.A.I. PROJ. No. I-H3-1(6):12

Scale: As Shown Date: Jan. 1975

SHEET No. H11 OF 28 SHEETS

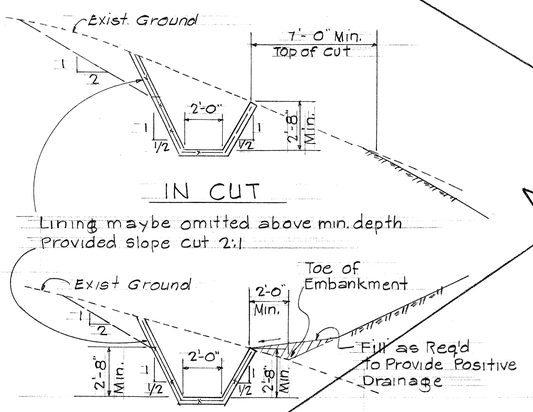
K&E CRYSTALENE® TRACING PAPER

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(6):12	1975	39	127



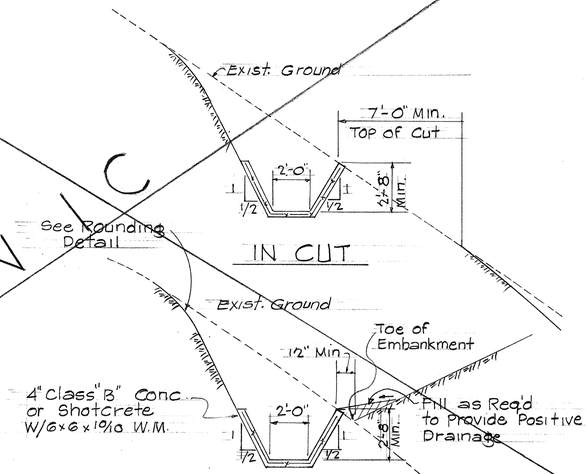
PROFILE

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



TYPE "A" DITCH SECTIONS

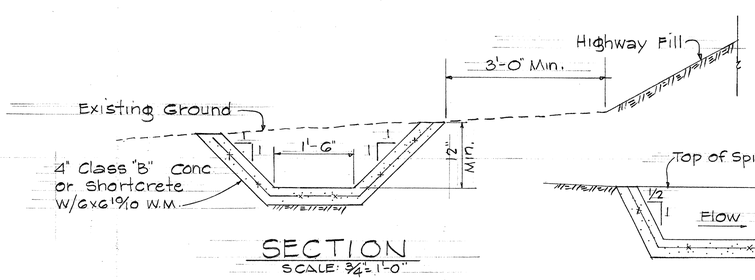
Scale: 1/4" = 1'-0"



TYPE "B" DITCH SECTIONS

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

CONC.- LINED CUTOFF DITCHES



SECTION

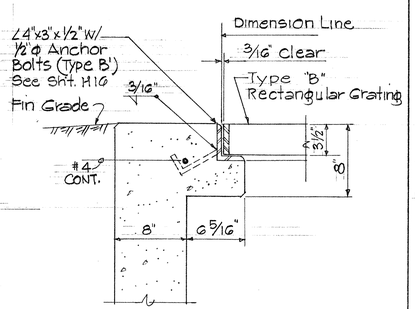
SCALE: 3/4" = 1'-0"

BEG OF SPILLWAY

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

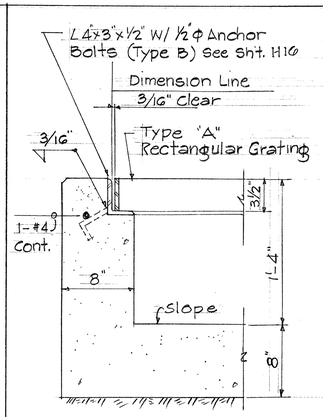
CONCRETE SPILLWAY

NOTE:
Concrete Spillway including transition length shall not be paid directly but shall be considered incidental to unit price bid for "Asphalt Concrete Gutter, Type 7ACC"



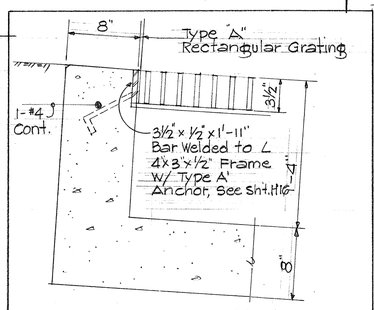
DETAIL (A / H12)

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



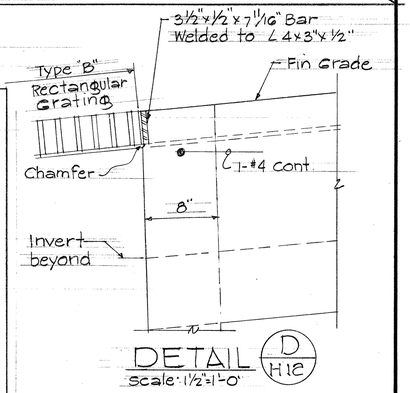
DETAIL (B / H12)

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



DETAIL (C / H12)

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



DETAIL (D / H12)

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

F.A.I. Proj No I-H3-1(6):12

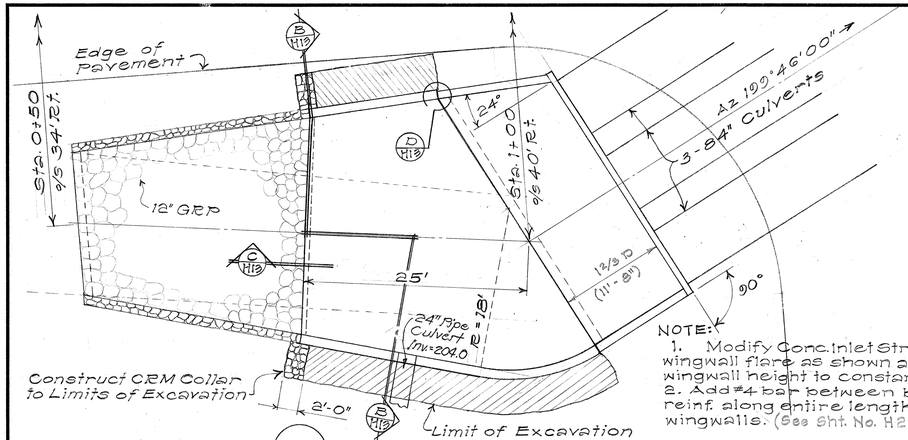
Scale: As shown Date: Jan. 1975

SHEET No. H12 OF 20 SHEETS

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

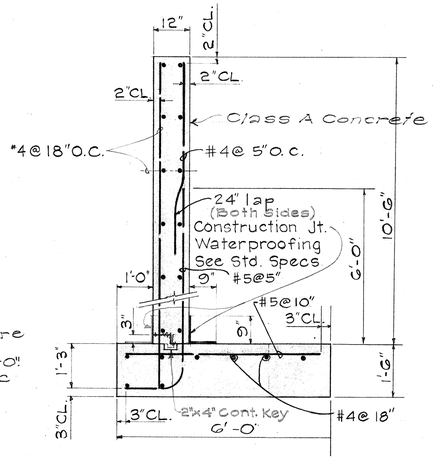
K&E CRYSTALENE LA 3888

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(G):12	1975	40	127

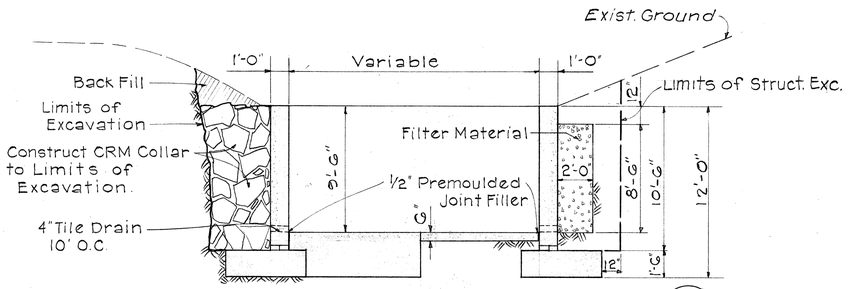


NOTE:
1. Modify Conc. Inlet Structure wingwall flare as shown and wingwall height to constant 7'-0".
2. Add #4 bar between basic reinf. along entire length of wingwalls. (See Sht. No. H22)

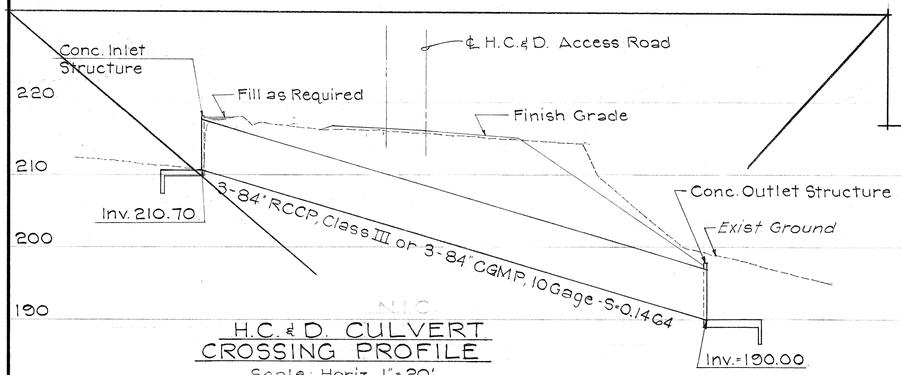
PLAN (A) DITCH TRANSITION
Scale: 1/8" = 1'-0"



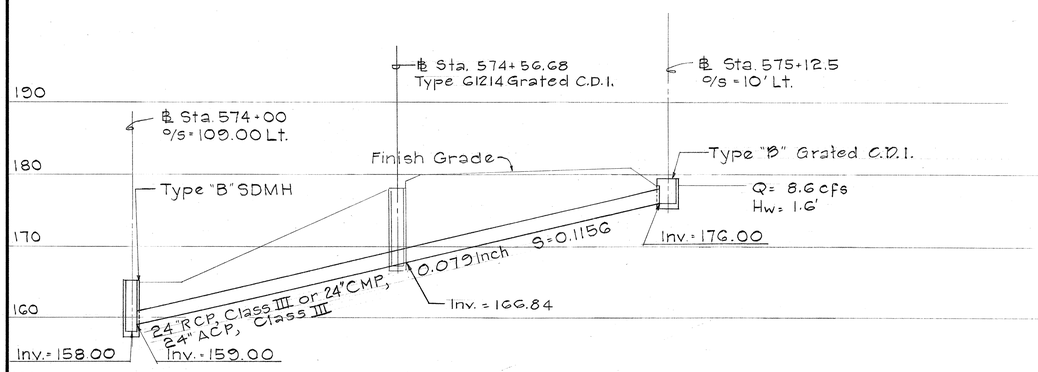
TYPICAL WALL SECTION
Scale: 1/2" = 1'-0"



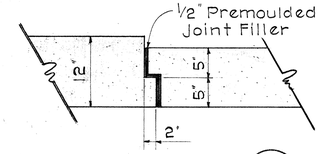
TYPICAL DITCH SECTION (B-B / H13)
Not to Scale



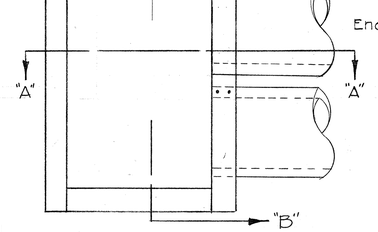
H.C.&D. CULVERT CROSSING PROFILE
Scale: Horiz. 1" = 20'
Vert. 1" = 10'



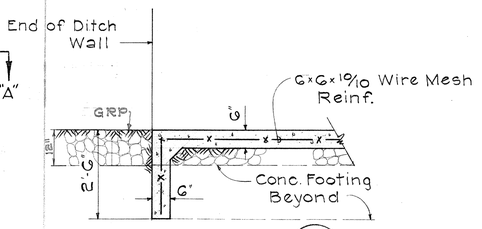
℄ Sta. 575+12.5
Scale: Horiz. 1" = 20'
Vert. 1" = 10'



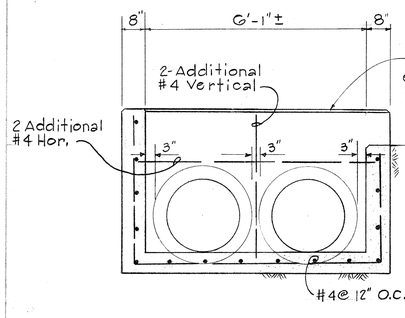
DETAIL (D / H13)
Scale: 1" = 1'-0"



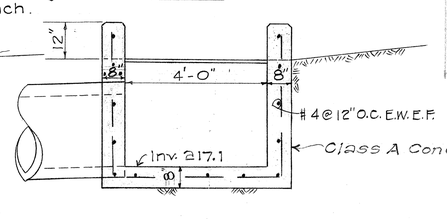
PLAN



DETAIL (C / H13)
Scale: 1/2" = 1'-0"



SECTION "B-B"



SECTION "A-A"

TYPE "F" CONCRETE DROP INTAKE
Scale: 1/2" = 1'-0"

WALLACE S. MIYAHIRA REGISTERED PROFESSIONAL ENGINEER No. 1513 HAWAII, U.S.A.

This work was prepared by me or under my supervision.

Wallace Miyahira

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

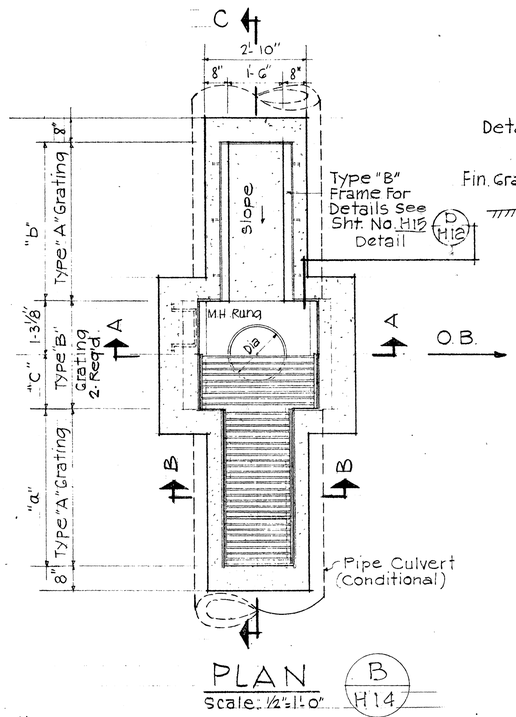
F.A.I. Proj. No. I-H3-1(G):12
Scale: As Shown Date: Jan., 1975

SHEET No. H13 OF 23 SHEETS

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | NOTE BOOK | QUANTITIES BY | CHECKED BY | DATE

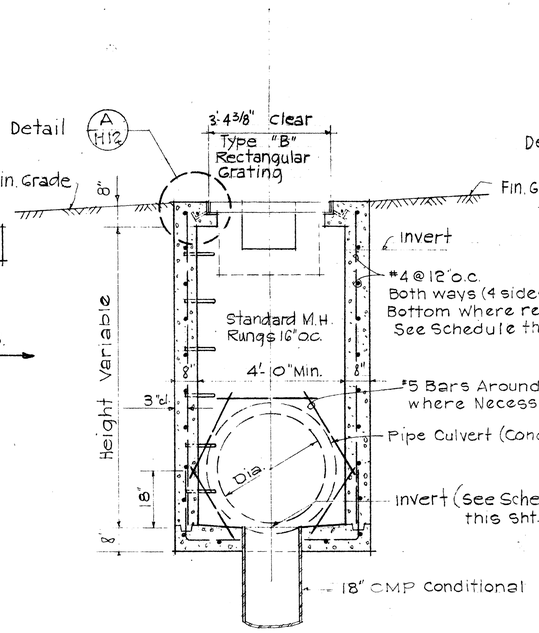
PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(6)12	1975	41	127

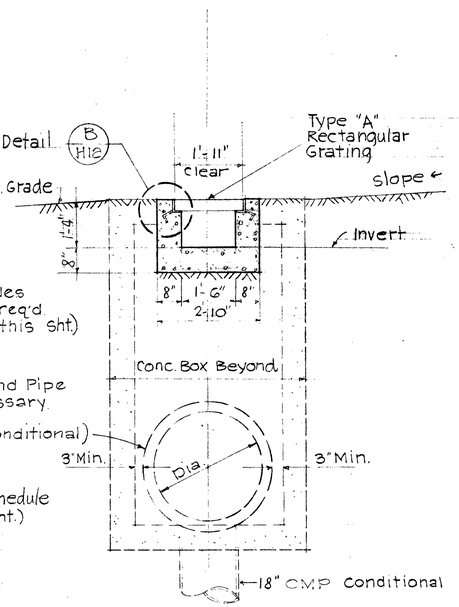


PLAN (B / H14)
Scale: ½"=1'-0"

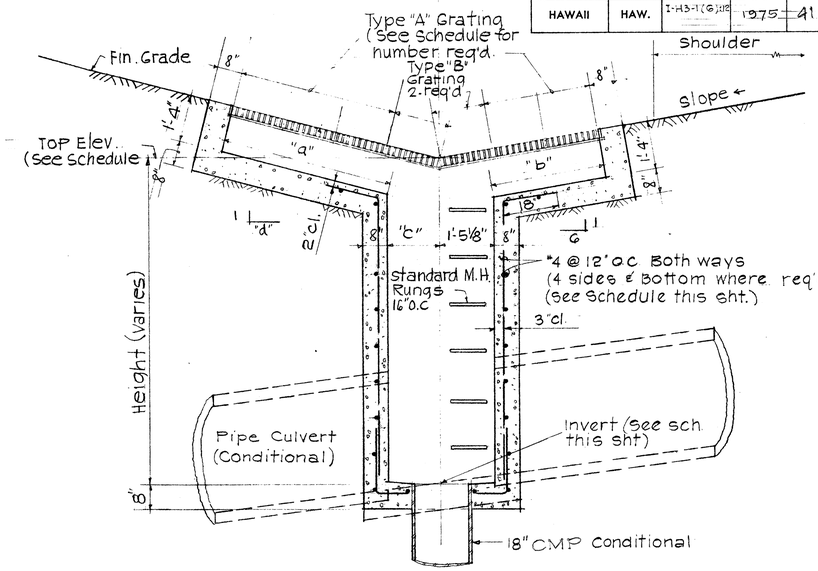
NOTE.
See Sht. No. H15 for frame & Grating Details.



SECTION "A-A"
Scale: ½"=1'-0"

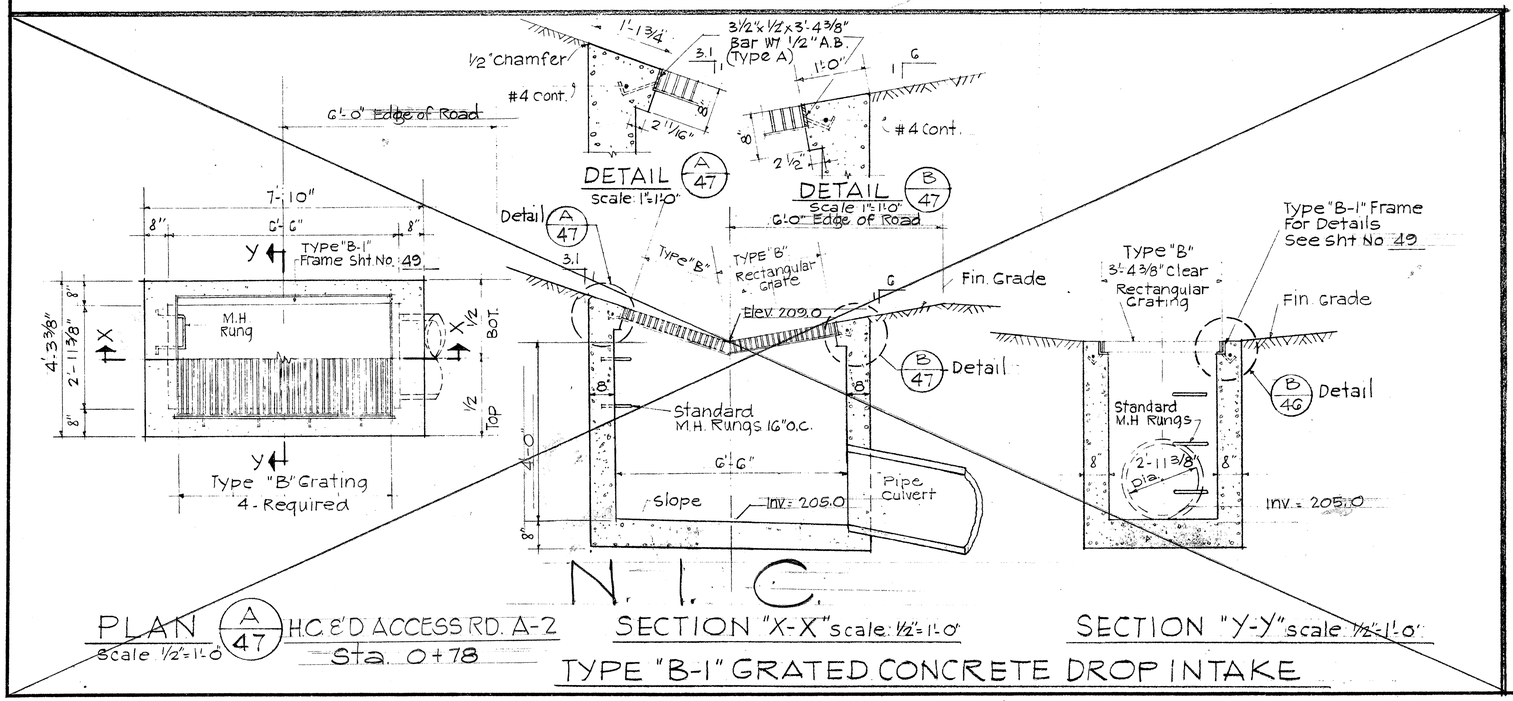


SECTION "B-B"
Scale: ½"=1'-0"



SECTION "C-C" (Inbound)
Scale: ½"=1'-0"

TYPE "B" GRATED CONCRETE DROP INTAKE



N. I. C.

PLAN (A / 47) H.C. & D. ACCESS RD. A-2 Sta. 0+78
Scale 1½"=1'-0"

SECTION "X-X" scale: ½"=1'-0"

SECTION "Y-Y" scale: ½"=1'-0"

TYPE "B-1" GRATED CONCRETE DROP INTAKE

TYPE "B" GRATED CONC. DROP INTAKE SCHEDULE

℄ Station	Top Elev.	Invert	"a"	"b"	"c"	d"	Type "A" Grating	Reinf. Steel Req'd.
~~530+50 I.B~~	~~354.76~~	~~345.74~~	~~3'-0 5/8"~~	~~1'-8 7/8"~~	~~1'-6 1/4"~~	11.1	~~3 ea.~~	~~No~~
562+45 I.B	338.86	234.75	1'-9¾"	3'-2½"	1'-6¼"	3.2	3 ea.	No
565+13 I.B	225.61	214.07	1'-9½"	3'-2½"	1'-6⅜"	3.4	3 ea.	Yes
574+00 IB	185.36	179.00	3'-0⅜"	3'-2½"	1'-6¼"	14.6	4 ea.	No
~~559+00 IB~~	~~256.00~~	~~252.00~~	~~1'-9½"~~	~~3'-2½"~~	~~1'-6⅜"~~	~~3.4~~	~~3 ea.~~	~~No~~
570+00 IB	203.00	199.00	1'-8⅜"	3'-2½"	1'-6⅜"	5.2	3 ea.	No
~~545+50 IB~~	~~323.41~~	~~320.30~~	~~1'-9½"~~	~~3'-2½"~~	~~1'-6⅜"~~	~~3.4~~	~~3 ea.~~	~~No.~~
~~562+00 I.B.~~	~~241.00~~	~~237.00~~	~~1'-9½"~~	~~3'-2½"~~	~~1'-6⅜"~~	~~3.4~~	~~3 ea.~~	~~No.~~
575+12.5	179.20	176.00	3'-0⅜"	3'-2½"	1'-6¼"	14.6	4	NO

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE STRUCTURE DETAILS
GRATED CONCRETE DROP INTAKE
TYPE "B"

F.A.I. Proj. No. I-H3-1(6):12
Scale: ½"=1'-0" Date: Jan 1975

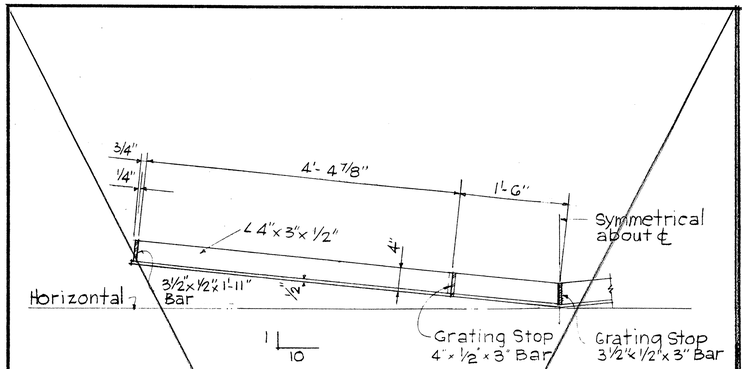
SHEET No. H14 OF 28 SHEETS

WALLACE S. MIYASHIRO REGISTERED PROFESSIONAL ENGINEER No. 1513 HAWAII, U.S.A.

This work was prepared by me or under my supervision.
Wallace Miyashiro

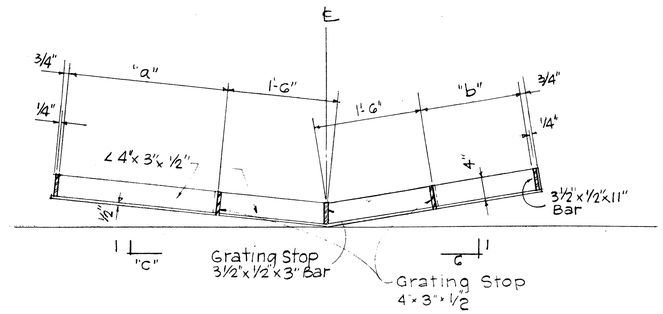
ORIGINAL PLAN | NOTE BOOK No. | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

PRINTED ON NO. 1000H CLEARPRINT



SECTION "X-X"

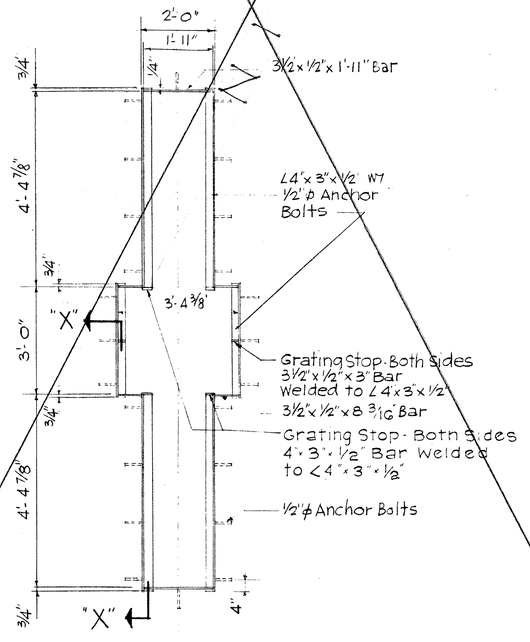
Scale: 1"=1'-0"



SECTION "Y-Y"

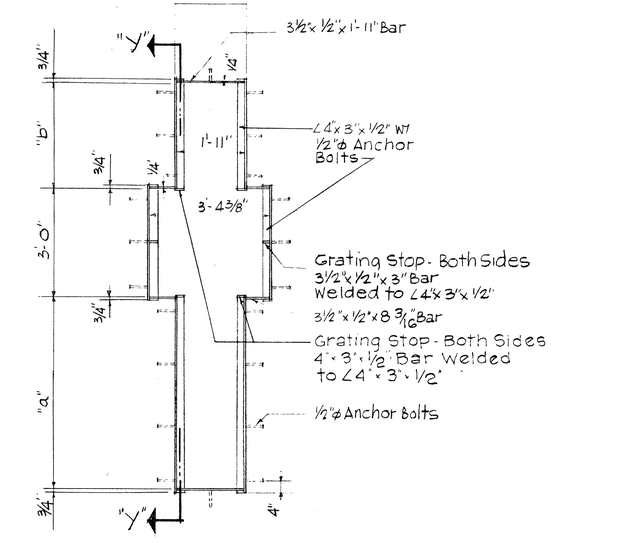
Scale: 1"=1'-0"

TYPE "B" GRATING FRAME SCHEDULE				
℄ Station	"a"	"b"	"c"	Remarks
~~530+50 IB~~	~~2'-11¼"~~	~~1'-5⅝"~~	~~11.4~~	
562+45 IB	1'-5⅝"	2'-11¼"	3.4	
565+13 IB	1'-5⅝"	2'-11¼"	3.4	
574+00 IB	2'-11¼"	2'-11¼"	14.6	
~~559+00 IB~~	~~1'-5⅝"~~	~~2'-11¼"~~	~~3.4~~	
570+00 IB	1'-5⅝"	2'-11¼"	5.2	
~~545+50 IB~~	~~1'-5⅝"~~	~~2'-11¼"~~	~~3.4~~	
575+12.5 IB	2'-11¼"	2'-11¼"	14.6	



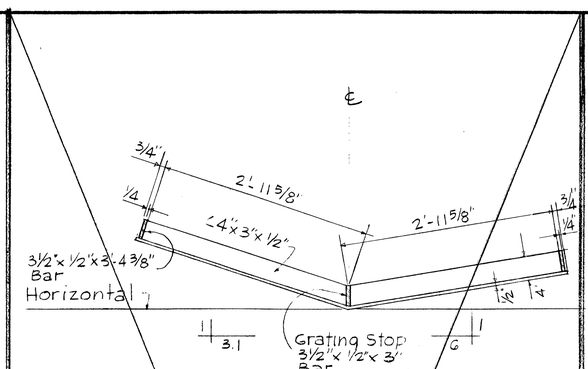
TYPE "A"

Scale: ½"=1'-0"



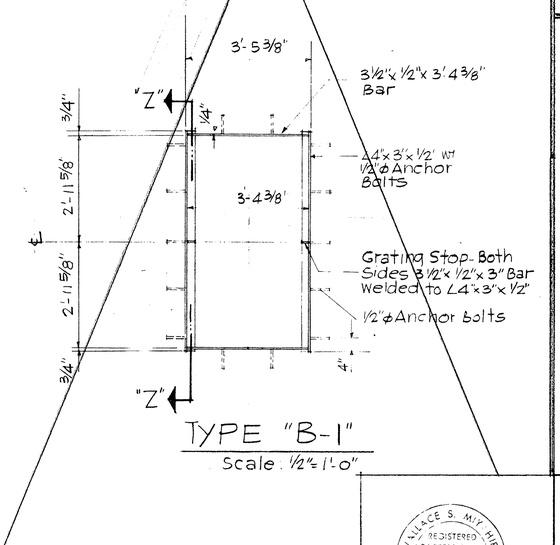
TYPE "B" FRAME

scale ½"=1'-0"



SECTION "Z-Z"

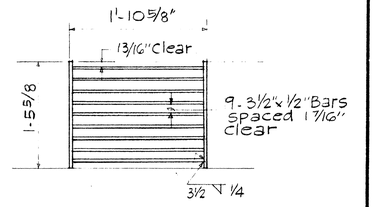
Scale: 1"=1'-0"



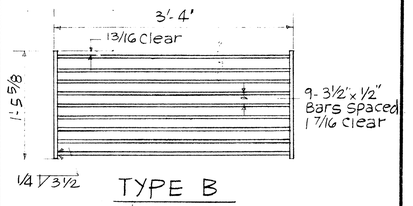
TYPE "B-1"

Scale: ½"=1'-0"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(6):12	1975	42	127



TYPE A



TYPE B

RECTANGULAR GRATE DETAILS scale 1"=1'-0"

NOTES:

1. Grates & Frames shall have edges ground smooth after fabrication.
2. Grates and frames may be galvanized or asphalt dipped. See Standard Specifications or Special Provisions.
3. Full penetration butt welds may be substituted for the fillet welds on all anchors.
4. Standard square, hexagon, round or equivalent headed anchors may be substituted for the right angle hook on the anchors shown on this plan.

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

WALLACE S. MIYASHIRA REGISTERED PROFESSIONAL ENGINEER No. 1513 HAWAII, U.S.A.

This work was prepared by me or under my supervision.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

TYPE "B" FRAME AND TYPE "A" & "B" GRATES

F.A.I. Proj. No. I-H3-1(6):12
Scale 1"=1'-0" Date: Jan, 1975

SHEET No. 115 OF 28 SHEETS

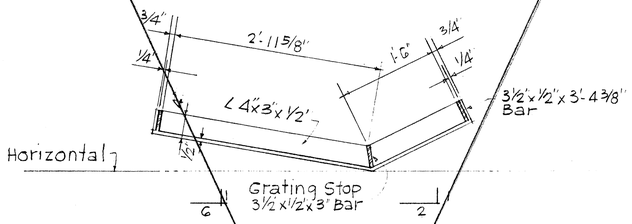
PRINTED ON NO. 1000H CLEARPRINT

42

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HB-1(6)12	1975	43	127

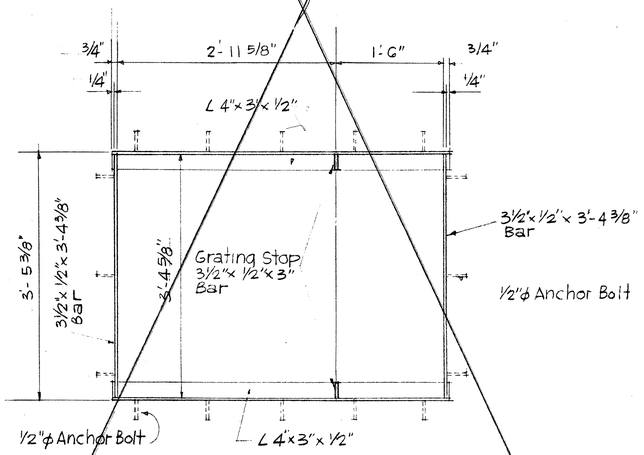
TYPE "C" GRATED CONC. DROP INTAKE SCHEDULE

Stations	Top Elevation I.B.	Top Elevation O.B.	Invert I.B.	Invert O.B.	Reinf. Steel Req'd I.B.	Reinf. Steel Req'd O.B.
~~521+50~~	~~310.53~~	~~312.12~~	~~303.00~~	~~302.50~~	~~No~~	~~No~~
~~526+00~~	~~330.20~~	~~333.65~~	~~330.00~~	~~329.40~~	~~No~~	~~Yes~~
~~530+50~~	~~352.97~~	~~357.72~~	~~346.00~~	~~345.50~~	~~No~~	~~Yes~~
~~535+20~~	~~357.19~~	—	~~353.50~~	—	~~No~~	—
~~537+32~~	~~354.67~~	—	~~349.00~~	—	~~No~~	—
~~545+50~~	—	~~328.15~~	—	~~321.50~~	—	~~No~~
~~555+43~~	—	~~279.35~~	—	~~275.50~~	—	~~No~~
562+45	237.22	—	230.00	—	YES	—



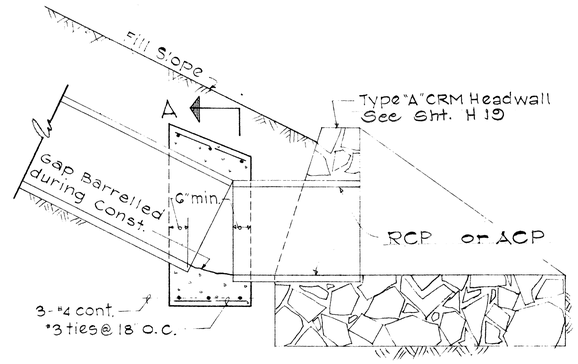
SECTION "A-A"
Scale: 1"=1'-0"

N.I.C.



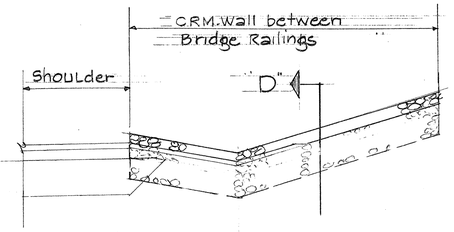
TYPE "C"
Scale: 1"=1'-0"

GRATING FRAME TYPE "C"

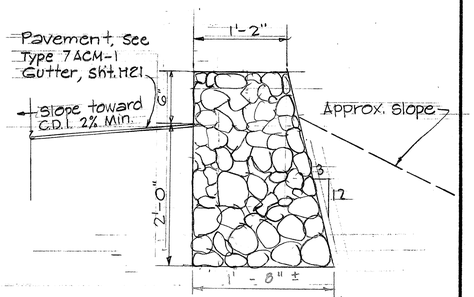


SECTION

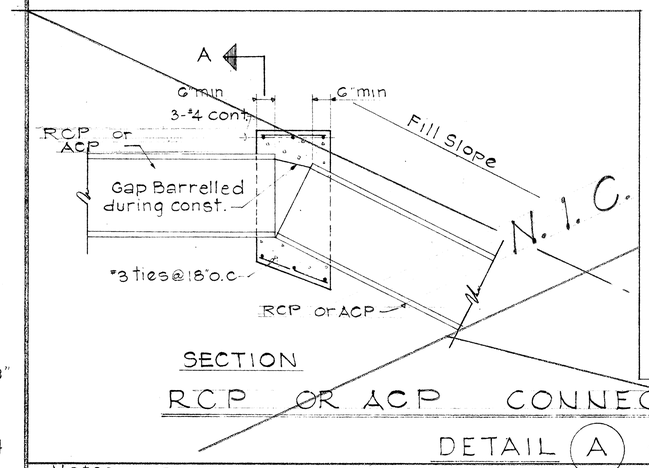
DETAIL (B) RCP or ACP CONNECTION COLLAR
Scale: ½"=1'-0"



C.R.M. WALL
Scale: ¼"=1'-0"



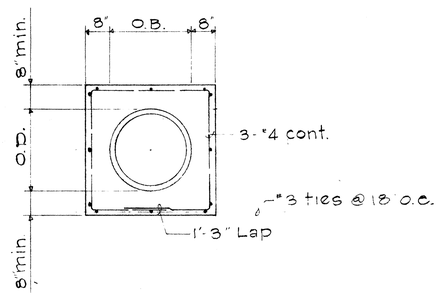
SECTION "D"
Scale: 1"=1'-0"



SECTION

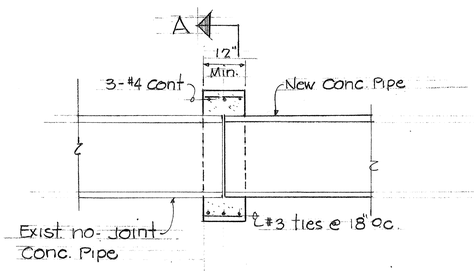
RCP OR ACP CONNECTION COLLAR

DETAIL (A) scale: ½"=1'-0"

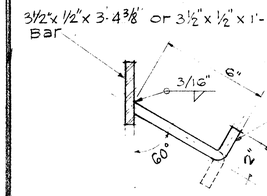


SECTION "A"

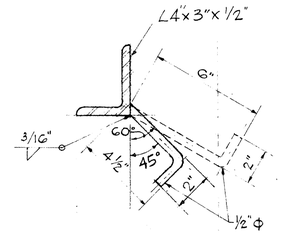
Notes:
1. Concrete shall be Class B.
2. Connection Collars shall be Incidental to RCP or ACP



DETAIL (C) CONNECTION COLLAR
SCALE: ½"=1'-0" @ sta. 562+00



TYPE "A" & "A'" (DASHED)



TYPE "B" & "B'" (DASHED)

TYPICAL ANCHOR BOLT DETAILS scale: 3"=1'-0"

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 DETAILS

F.A.I. Proj. No. I-H3-1(6):12
Scale: 1"=1'-0" Date: Jan. 1975

SHEET No. H16 OF 28 SHEETS

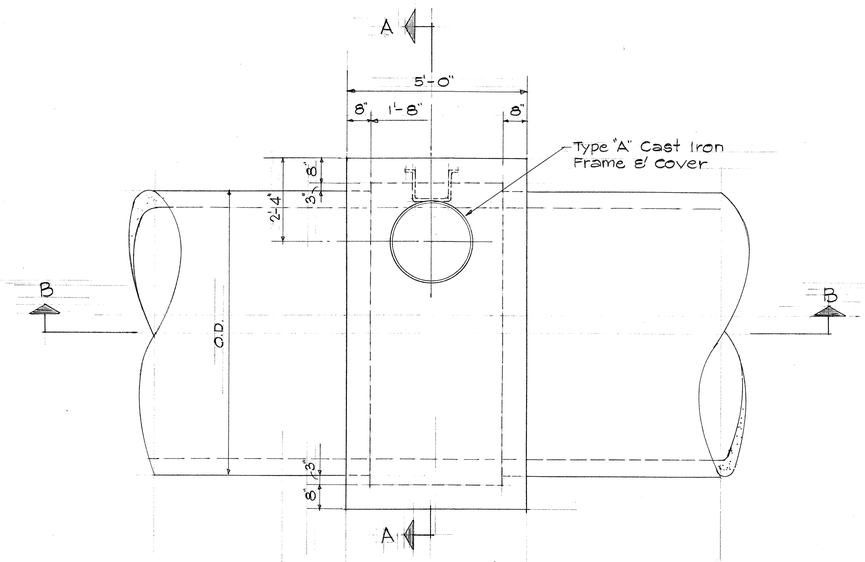
WALLACE S. MYKURA
REGISTERED PROFESSIONAL ENGINEER
No. 1313
HAWAII, U.S.A.

This work was prepared by me or under my supervision.

Wallace Mykura

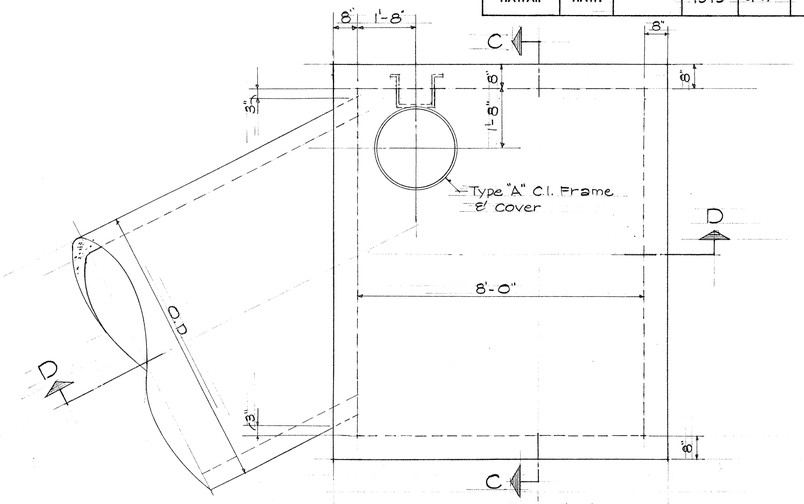
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(G)12	1975	44	127



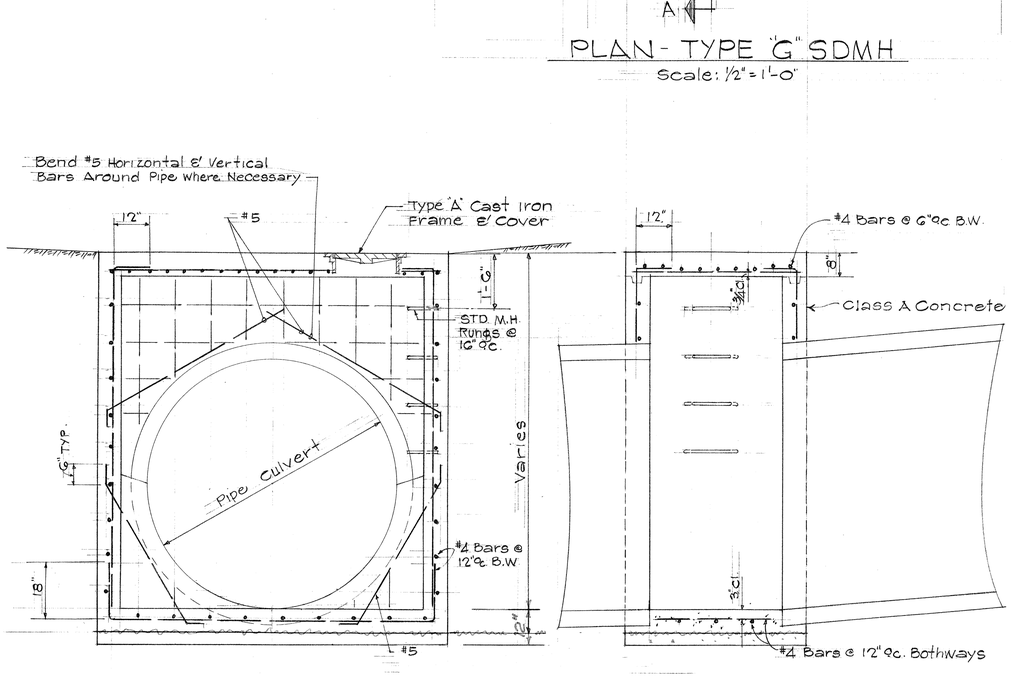
PLAN - TYPE "G" SDMH

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



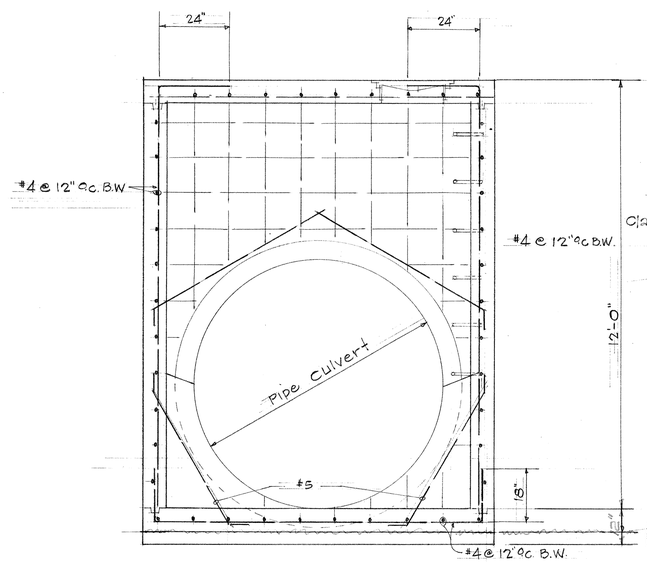
PLAN - TYPE "H" S.D.M.H.

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

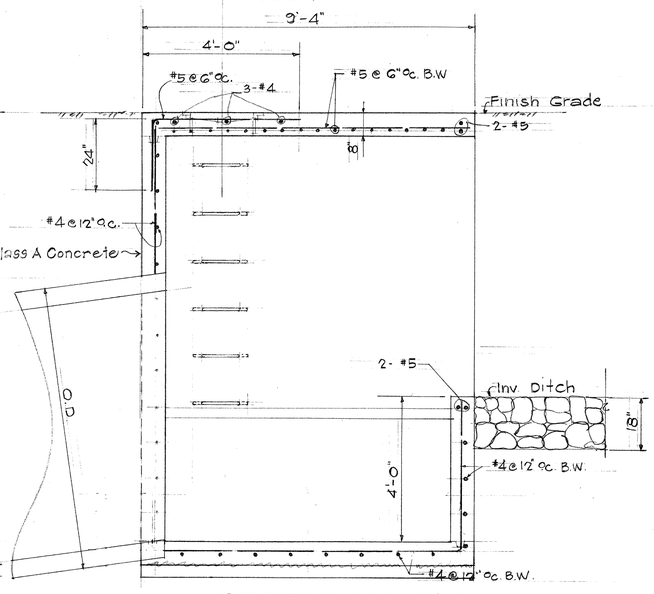


SECTION "A-A"

SECTION "B-B"



SECTION "C-C"



SECTION "D-D"

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
TYPE "G" AND "H" S.D.M.H.

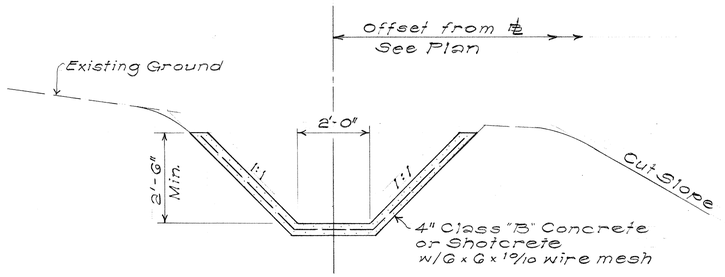
F.A.I. Proj. No I-H3-1(G):12

Scale: 1/2" = 1'-0" Date: Jan. 1975

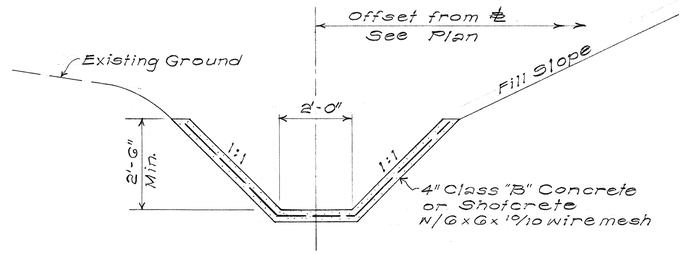
SHEET No. H17 OF 28 SHEETS

K+E CRYSTALGRID LA 3888 TRACING PAPER

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HS-1(6):12	1975	45	127

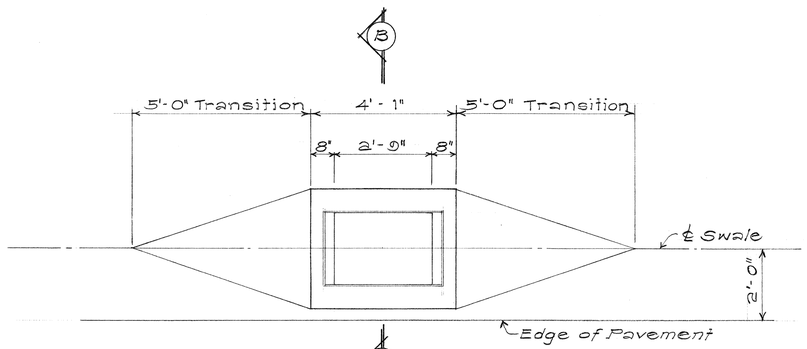


IN CUT

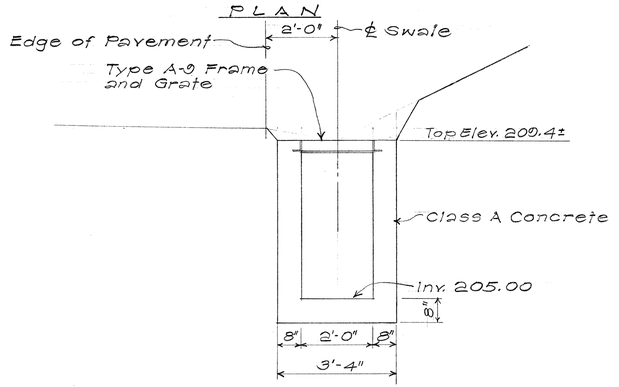


IN FILL

2' x 2'-6" LINED DRAINAGE DITCH
Scale: 1/2" = 1'-0"

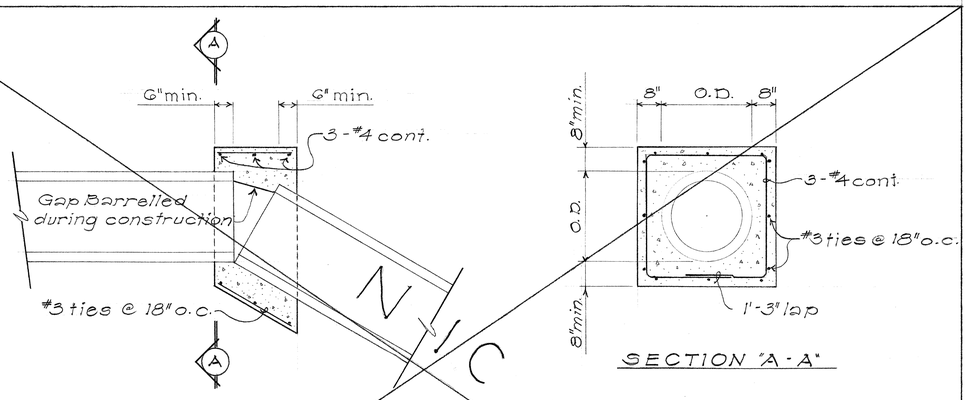


PLAN



SECTION "B-B"

TYPE "A-9" GRATED CONCRETE DROP INTAKE
Scale: 1/2" = 1'-0"



SECTION "A-A"

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

Notes:
1. Concrete shall be class B.
2. Connection collars shall be incidental to culverts.

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
GRATED
TYPE "A-9" CONC. DROP INTAKE &
2' x 2'-6" LINED DRAINAGE DITCH

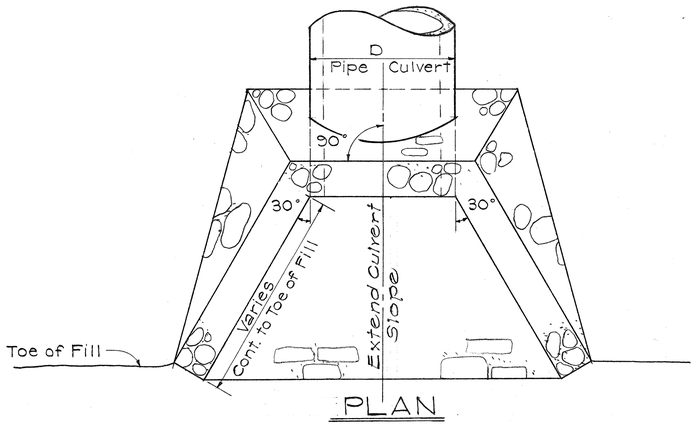
F.A.I. PROJ. No. I-HS-1(6):12

Scale: As Shown Date: Jan. 1975

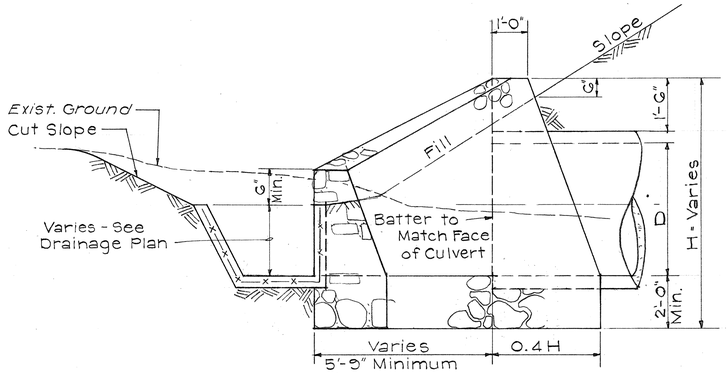
SHEET No. H18 OF 28 SHEETS

K&E CRYSTALENE TRACING PAPER

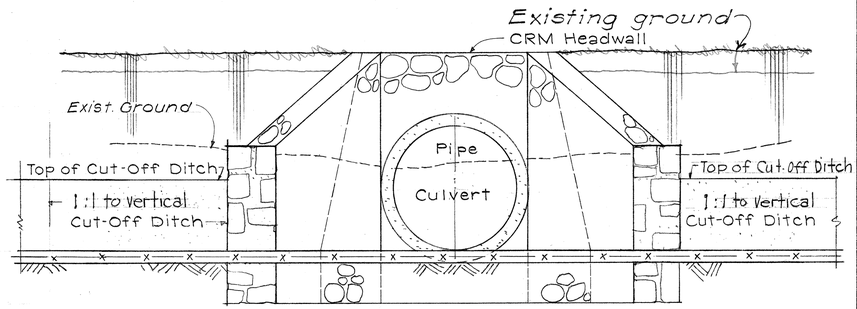
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(6):12	1975	46	127



PLAN



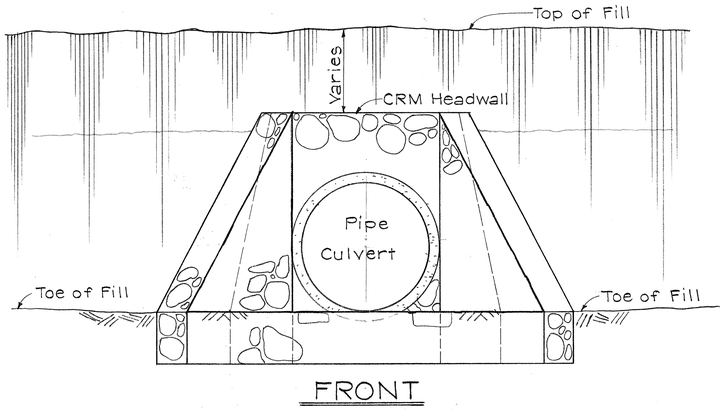
SIDE ELEVATION



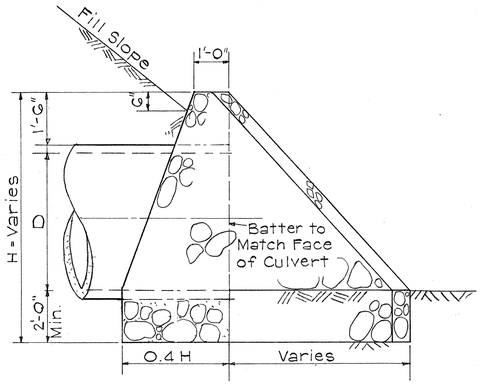
FRONT

TYPE "B" CRM HEADWALL

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



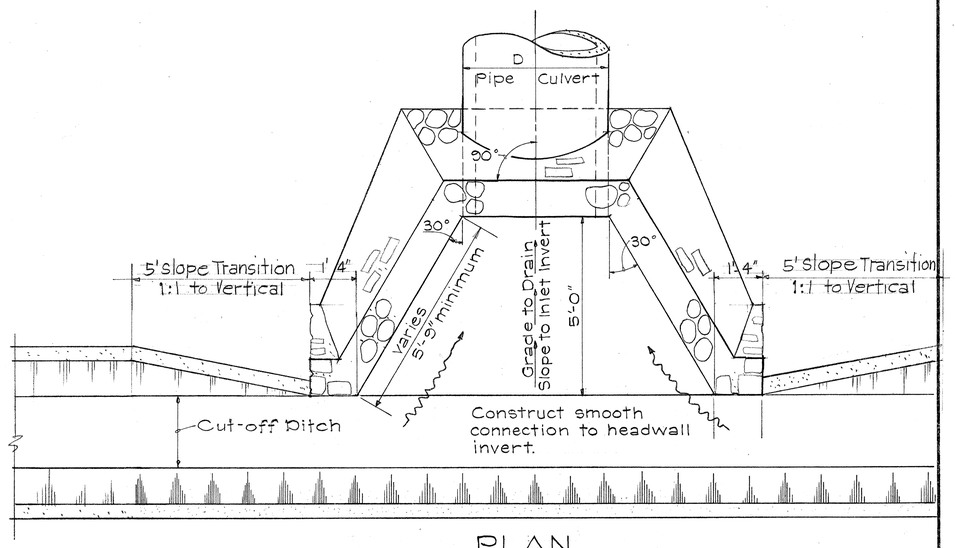
FRONT



SIDE ELEVATION

TYPE "A" CRM HEADWALL

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



PLAN

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

WALLACE S. MIYAHIRA
REGISTERED PROFESSIONAL ENGINEER
No. 1513
HAWAII, U.S.A.

This work was prepared by me or under my supervision.

Wallace Miyahira

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

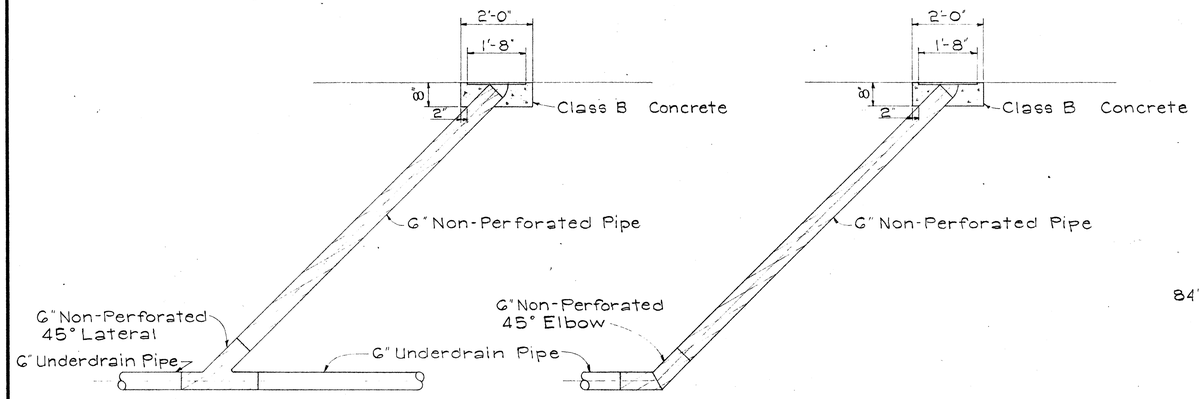
DRAINAGE DETAILS
CRM HEADWALL
TYPE "A" & "B"

F.A.I. Proj. No. I-H 3-1(6):12
Scale: 1/2" = 1'-0" Date: Jan. 1975

SHEET No. H19 OF 28 SHEETS

PRINTED ON NO. 1000H CLEARPRINT

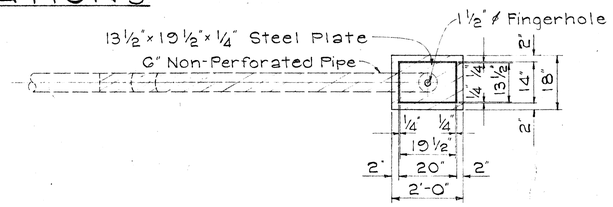
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(6):12	1975	47	127



CLEANOUT AT INTERMEDIATE POINTS CLEANOUT AT END OF PIPE

ELEVATIONS

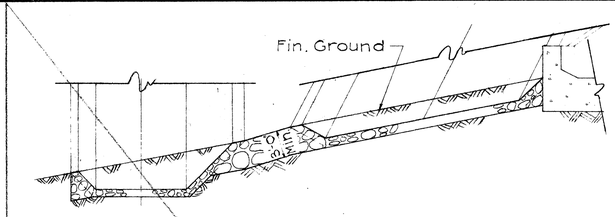
NOTE:
1. Steel plate shall be thoroughly cleaned and painted with one coat of high grade asphaltum.
2. Class B Concrete shall be incidental to Cleanout.



PLAN

DETAILS OF CLEANOUT AND CONCRETE BLOCKS FOR UNDERDRAIN

Scale: ½" = 1'-0"

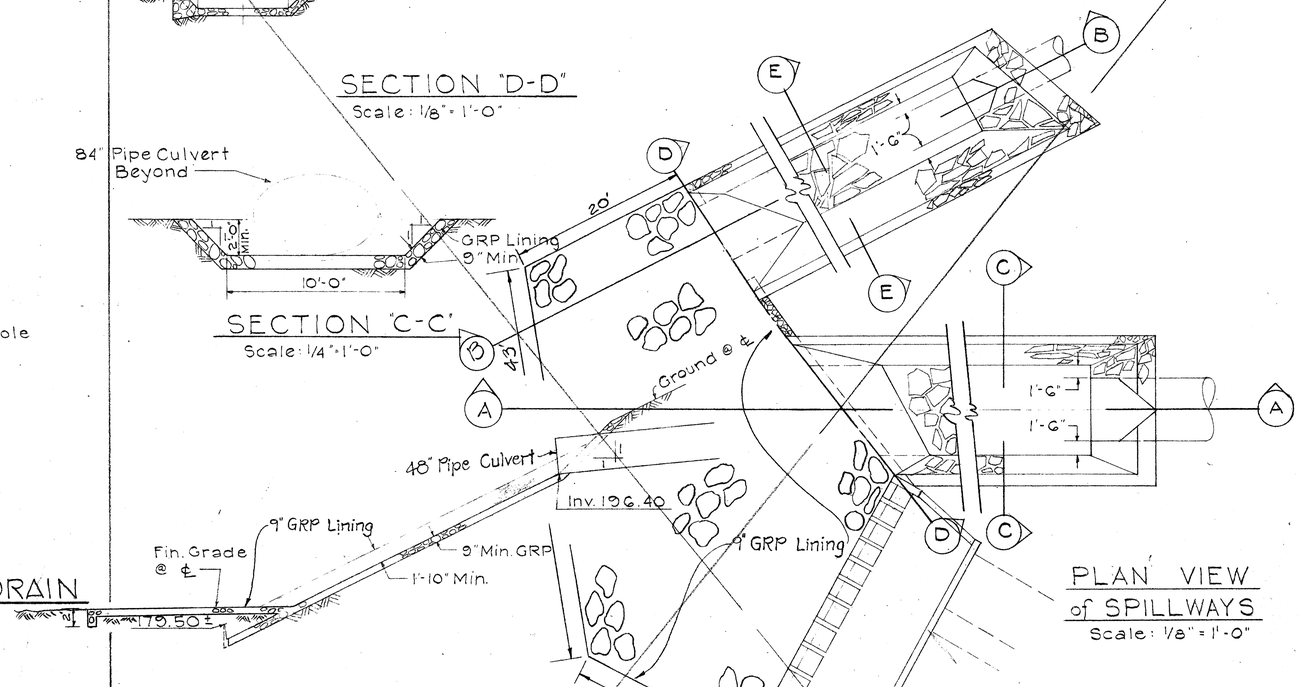


SECTION "D-D"

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

SECTION "C-C"

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



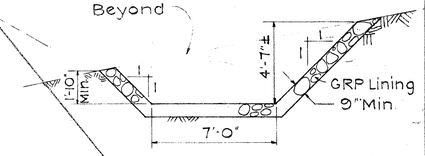
PLAN VIEW of SPILLWAYS

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

SECTION "B-B"

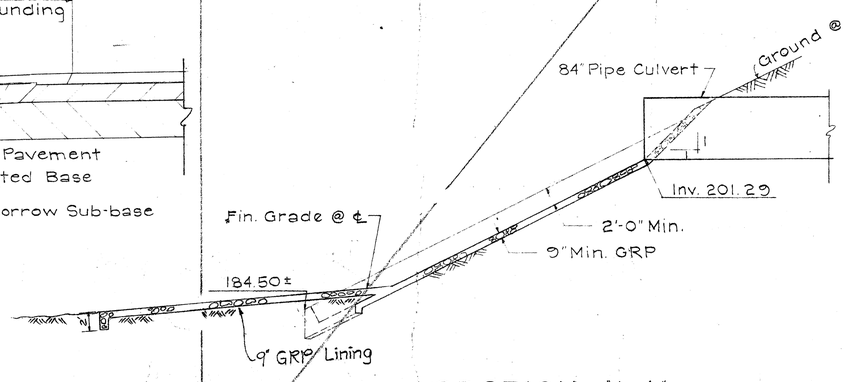
Scale: 1/8" = 1'-0"

N.I.C.



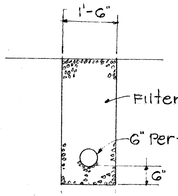
SECTION "E-E"

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

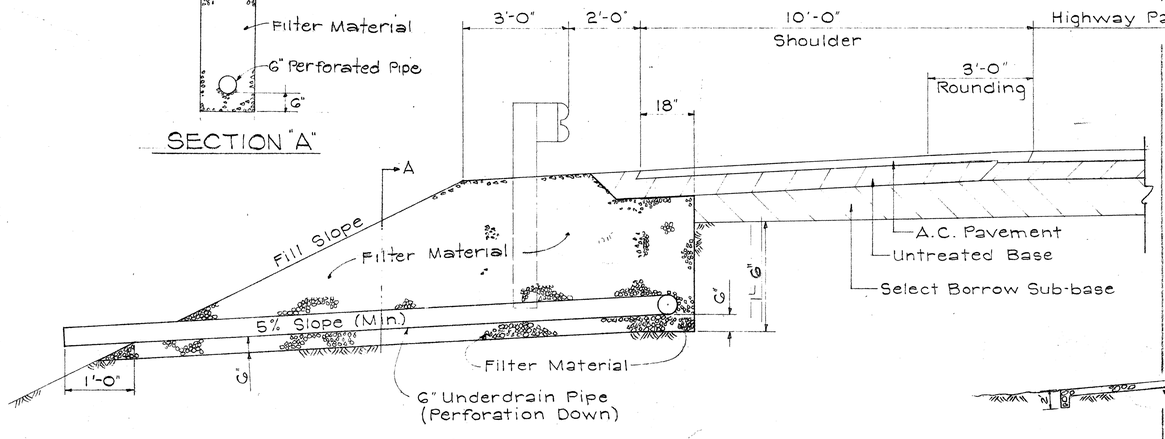


SECTION "A-A"

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



SECTION "A"



TYPICAL UNDERDRAIN OUTLET SECTION

Not to Scale

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
TYPICAL UNDERDRAIN

F.A.I. Proj. No. I-H3-1(6):12
Scale: As Shown Date: Jan., 1975

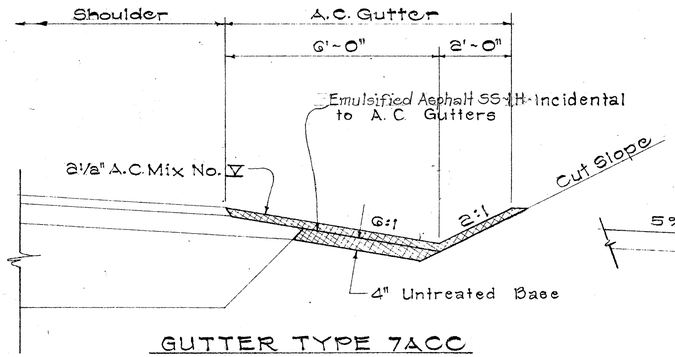
SHEET No. H20 OF 28 SHEETS

WALLACE S. MIYASHIRO REGISTERED PROFESSIONAL ENGINEER No. 1312 HAWAII, U.S.A.

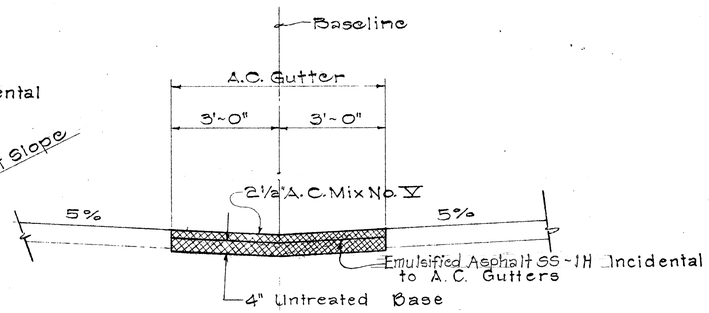
This work was prepared by me or under my supervision.

Printed on No. 1000H Clearprint

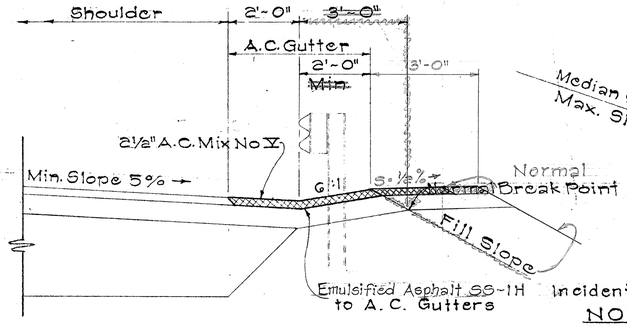
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(6):12	1975	48	127



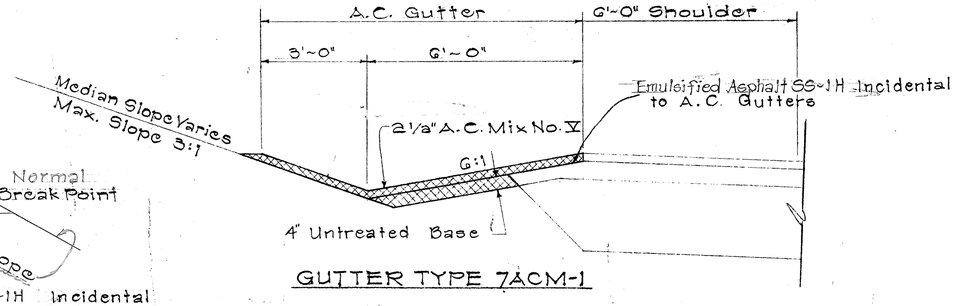
GUTTER TYPE 7ACC



GUTTER TYPE 7ACM



GUTTER TYPE 7ACF

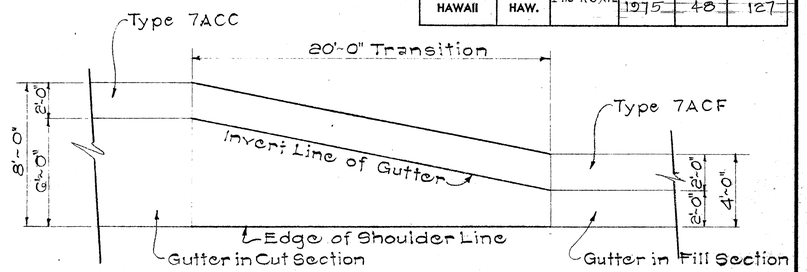


GUTTER TYPE 7ACM-1

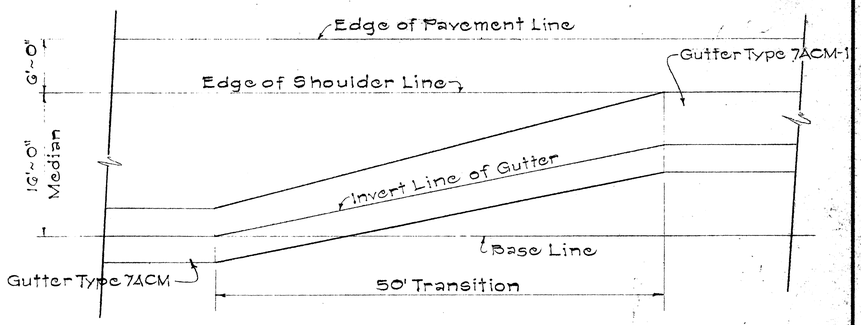
NOTE:
Cross Hatched Area indicates items to be covered under pay item for Type 7A A.C. Gutter per lin. ft.

DETAILS OF TYPE 7 ASPHALTIC CONCRETE GUTTERS

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

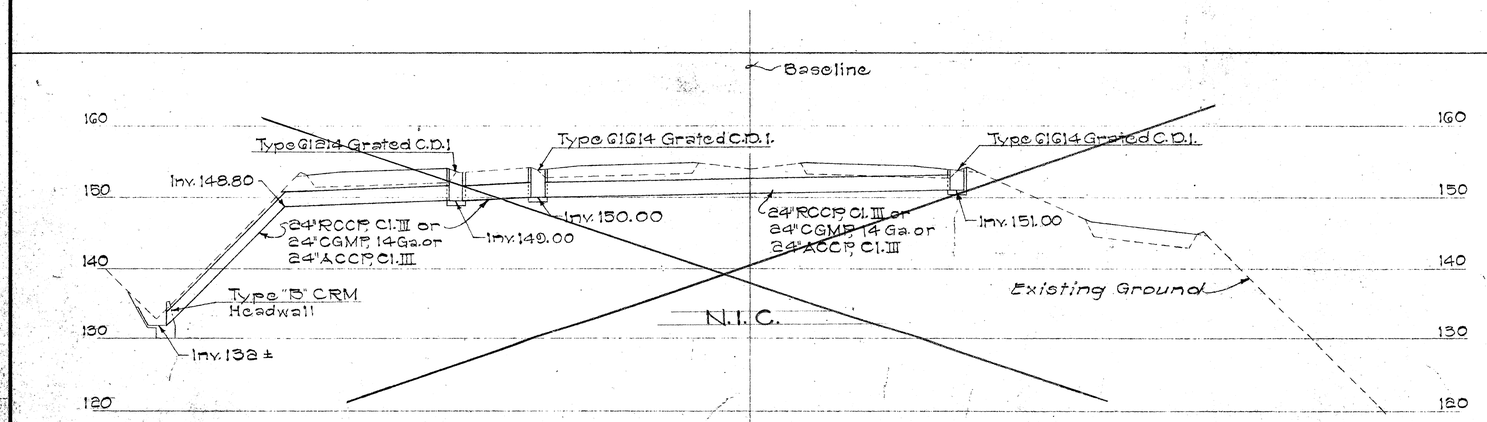


TRANSITION ALONG SHOULDER
Scale: 1/4" = 1'-0"



TRANSITION ALONG MEDIAN
Scale: 1/8" = 1'-0"

DETAIL OF GUTTER TRANSITIONS



℄ STA. 628+45
Scale: Horiz. 1" = 20'
Vert. 1" = 10'

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
TYPE 7 GUTTERS & GUTTER TRANSITIONS

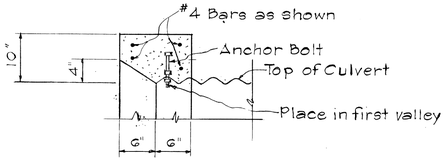
F.A.I. Proj. No. I-H3-1(6):12

Scale: As Shown Date: Jan. 1975

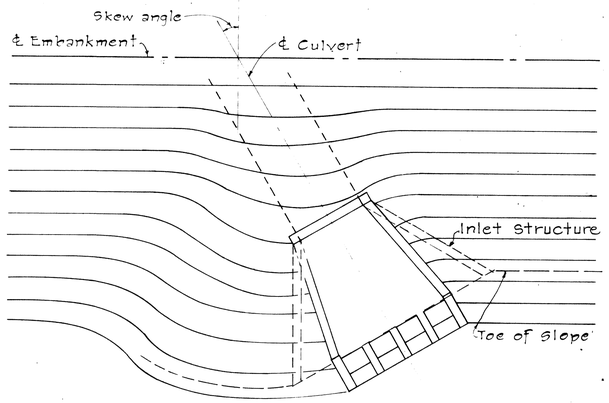
SHEET No. 121 OF 28 SHEETS

K&E CRYSTALENE® LA 2920

FED. ROAD DIST. NO.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-H3-1(6):12	1975	49	127



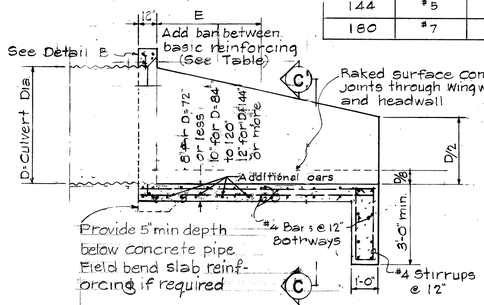
DETAIL "B"
Scale: 1"=1'-0"



EMBANKMENT CONTOURS FOR SKEWED OUTLET & (INLET)

When outlet is skewed to embankment slope, the embankment may be contoured to cover the exposed section of wall and pipe.

Culvert Dia (inches)	Add bar Size	E (feet)
108	#4	3
120	#4	5
144	#5	8
180	#7	11



SECTION D-D

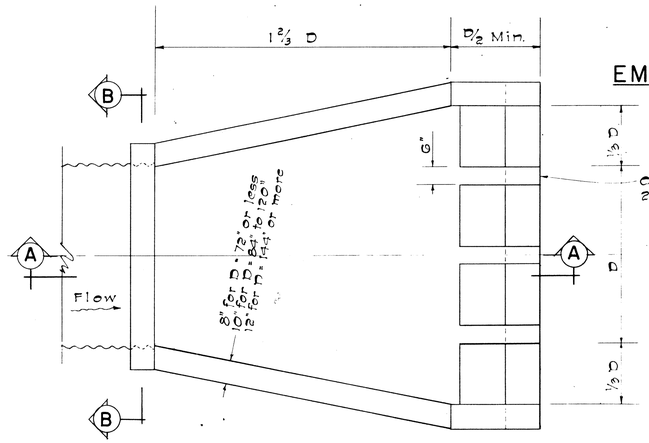
GENERAL NOTES

Concrete: All concrete shall be Class A.

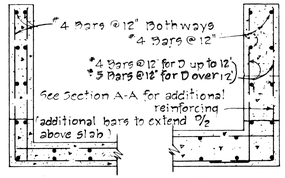
Cutoff Wall: The depth of wall shown on the plan may be reduced if rock is encountered at a higher elevation.

Multiple Pipe Installations: To permit careful placing and tamping of back fill material, clear spacing for multiple pipe installations shall be not less than one-half the diameter of the larger pipe between sides of adjacent pipes, but not required to exceed three feet.

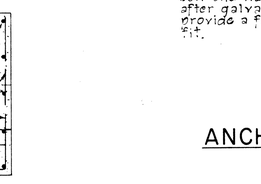
Anchor Bolts: Anchor bolts are not required for concrete pipe.



PLAN

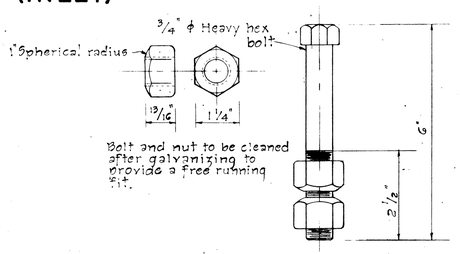


8" WING WALL

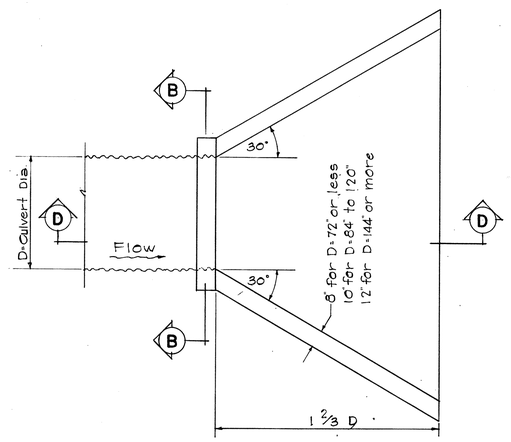


10" TO 12" WING WALLS

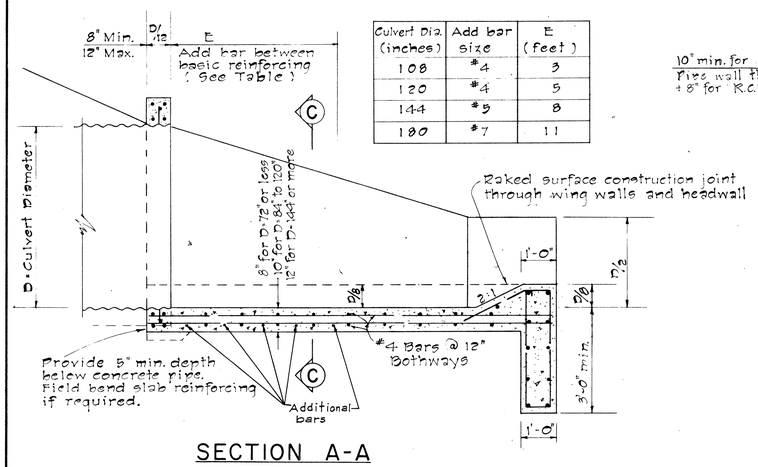
SECTION C-C



ANCHOR BOLT DETAIL

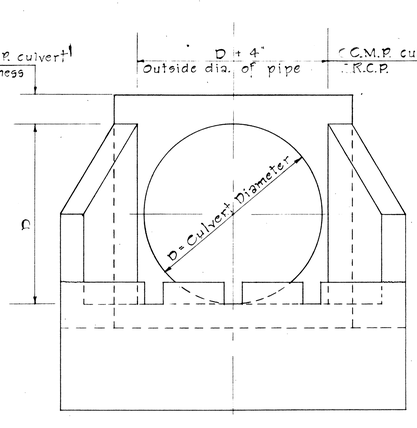


PLAN

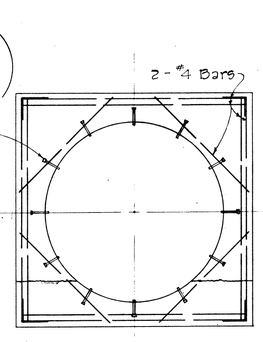


Culvert Dia. (inches)	Add bar size	E (feet)
108	#4	3
120	#4	5
144	#5	8
180	#7	11

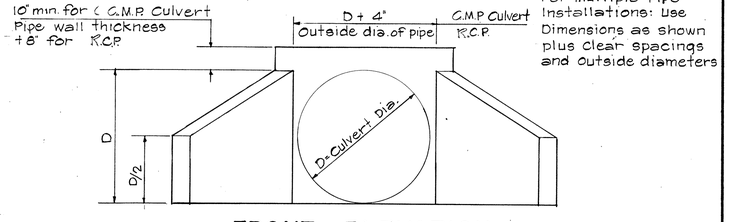
SECTION A-A



FRONT ELEVATION



SECTION B-B



FRONT ELEVATION

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

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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

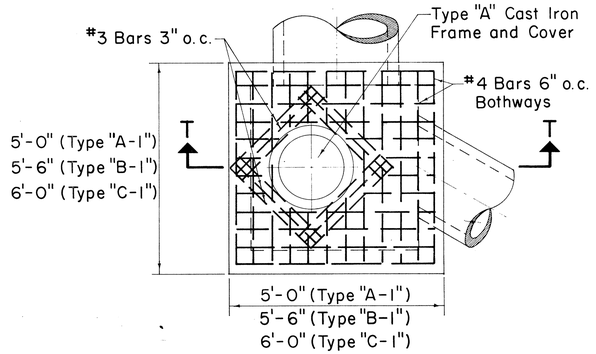
DRAINAGE DETAILS

CONCRETE INLET & OUTLET STRUCTURES

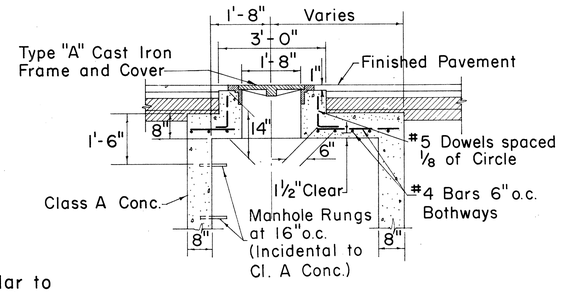
F.A.I. Proj. No. I-H-3-1(6):12
Scale: As Shown Date: Jan. 1975

SHEET No. 122 OF 88 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID. PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HS-1(4)-12	1975	50	127



PLAN

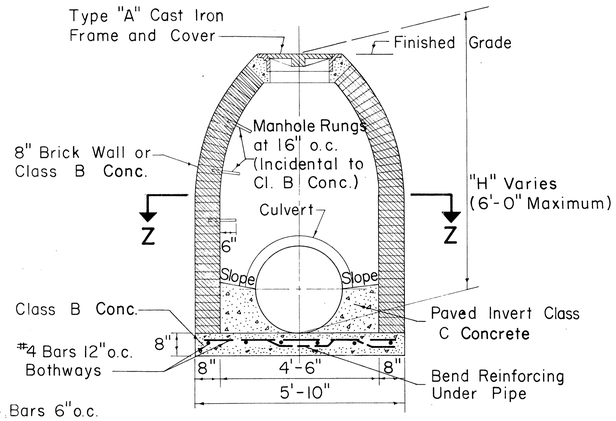


Note:
Bottom detail similar to Type "A", "B", & "C".

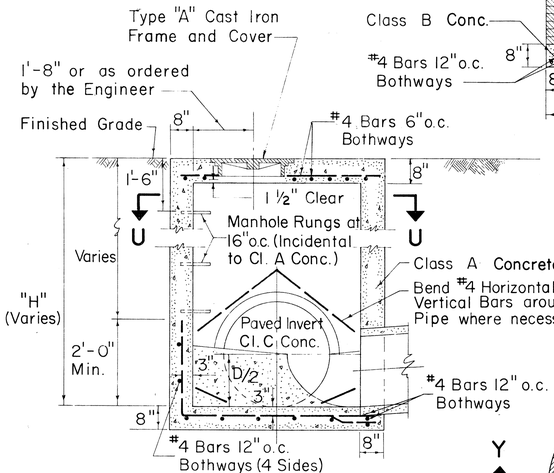
SECTION T-T

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

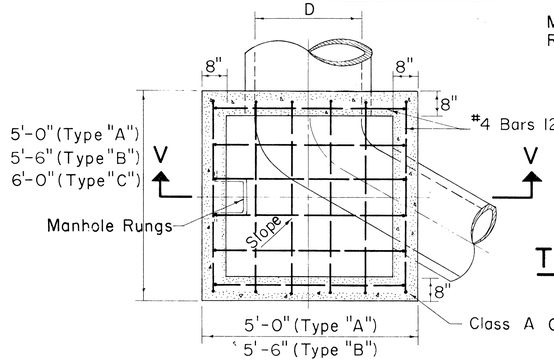
Scale: ½" = 1'-0"



SECTION Y-Y



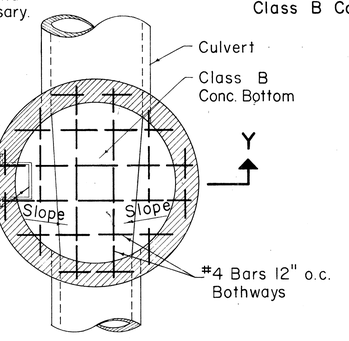
SECTION V-V



SECTION U-U

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

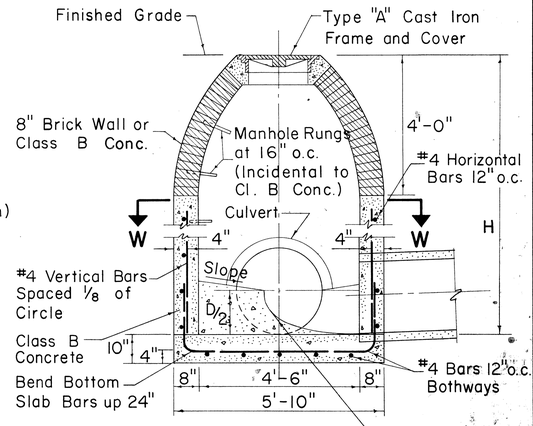
Scale: ½" = 1'-0"



SECTION Z-Z

TYPE "D" STORM DRAIN MANHOLE

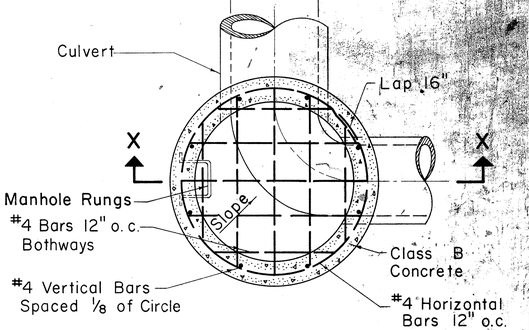
Scale: ½" = 1'-0"



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 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 X-X



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 (16" o.c.) are required when "H" is greater than 4'-6". Only one rung (12" 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:
HYDRAULIC DESIGN ENGINEER — DATE: 12-17-69

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

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

STORM DRAIN MANHOLES

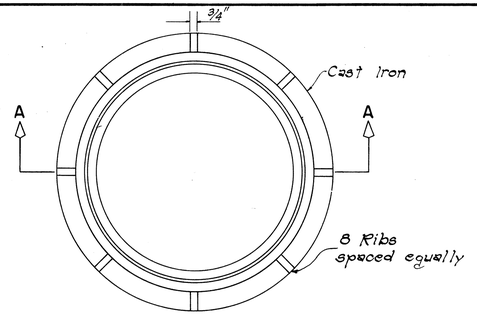
Scales: As Noted — Date: July, 1969

SHEET NO. H-23 OF 28 SHEETS — DH 5.

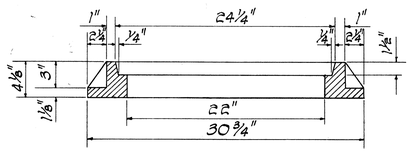
50

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

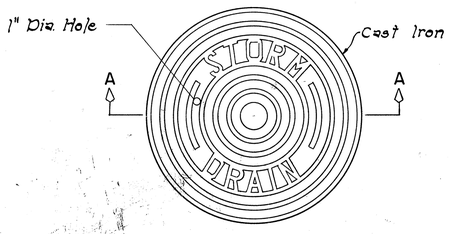
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HB-1(6)-12	1975	51	127



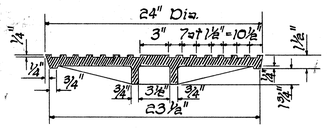
PLAN



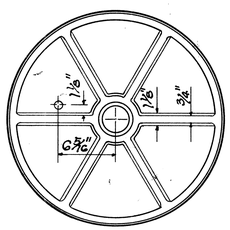
SECTION A-A



PLAN



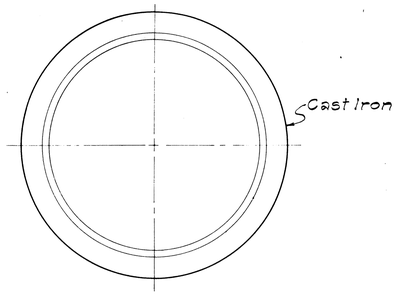
SECTION A-A



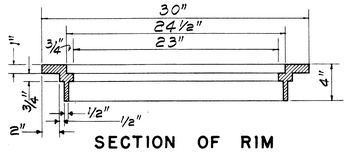
BOTTOM VIEW OF COVER

DETAILS OF TYPE "P" CAST IRON FRAME AND COVER

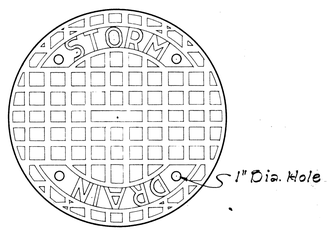
SCALE: 1-1/2" = 1'-0"



PLAN OF RIM

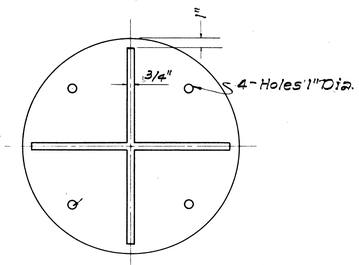


SECTION OF RIM



TOP VIEW OF COVER

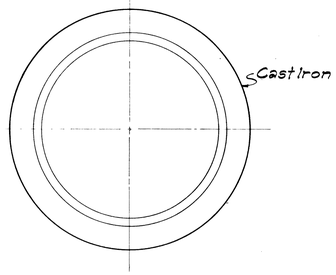
SECTION



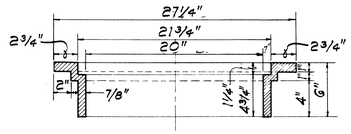
BOTTOM VIEW OF COVER

DETAILS OF TYPE "B" CAST IRON FRAME AND COVER

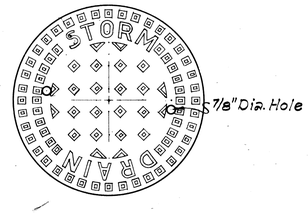
SCALE: 1-1/2" = 1'-0"



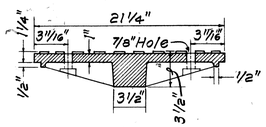
PLAN OF RIM



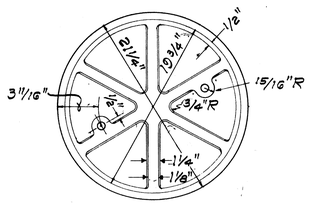
SECTION OF RIM



TOP VIEW OF COVER



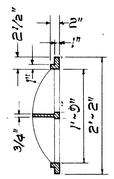
SECTION



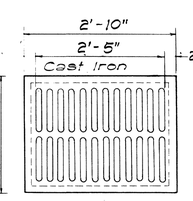
BOTTOM VIEW OF COVER

DETAILS OF TYPE "A" CAST IRON FRAME AND COVER

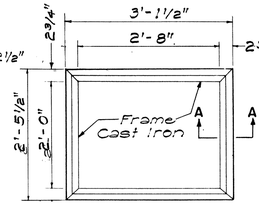
SCALE: 1-1/2" = 1'-0"



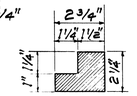
SECTION



TOP VIEW



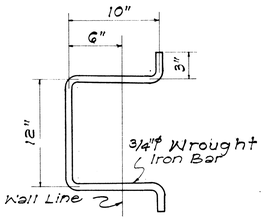
TOP VIEW



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

TYPE C C.I. FRAME AND GRATE

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



MANHOLE RUNG

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

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

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

NO.	REVISION	APPROVED BY	DATE
1.	Detail of Type "P" Cast Iron Frame and Cover	H.T.	1-6-71

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
CATCH BASIN AND MANHOLE CASTINGS

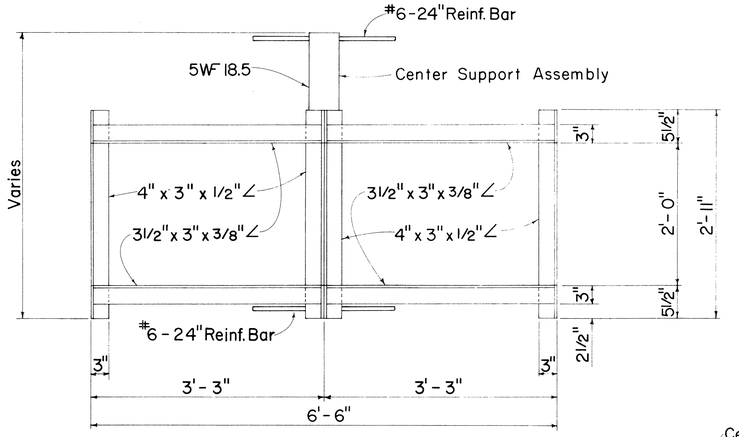
Scale: As Noted — Date: July, 1969

SHEET NO. H 24 OF 28 SHEETS DH 6

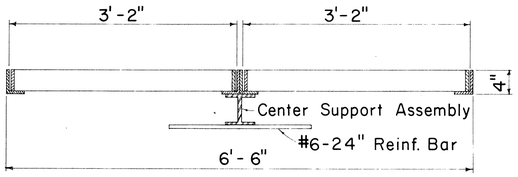
51

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

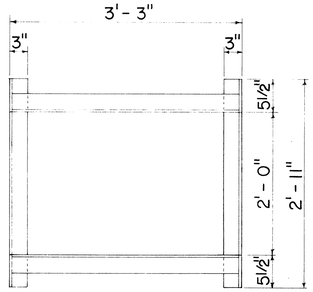
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HB-1(6):12	1975	52	127



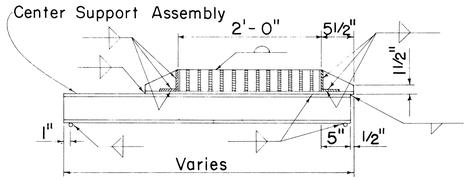
PLAN
(Two or More Grates)



LONGITUDINAL SECTION
(Thru Frame & Grate)



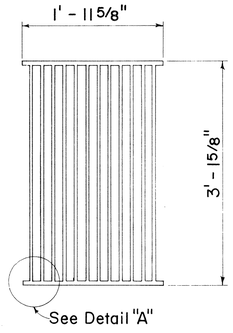
PLAN
(Single Grate)



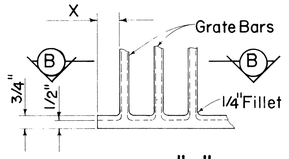
CROSS SECTION
(Thru Frame & Grate)

FRAME DETAILS

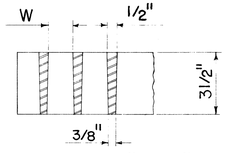
Scale: 1"= 1'-0"



PLAN
Scale: 1"= 1'-0"

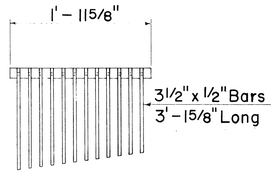


DETAIL "A"
Scale: 3"= 1'-0"

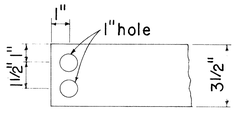


SECTION "B-B"
Scale: 3"= 1'-0"

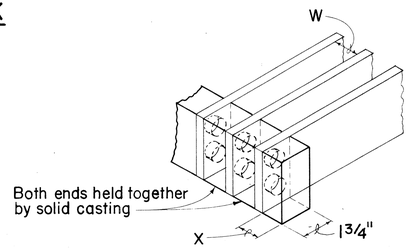
ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL GRATE



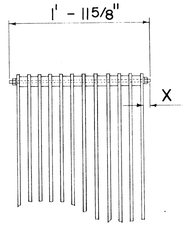
CAST END BLOCK
Scale: 1"= 1'-0"



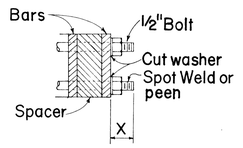
END OF BAR
Scale: 3"= 1'-0"



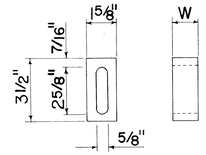
ALTERNATIVE CAST MALLEABLE IRON OR CAST STEEL END BLOCK GRATE



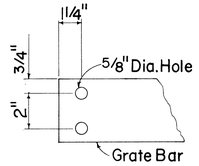
BOLTED END BLOCK
Scale: 1"= 1'-0"



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

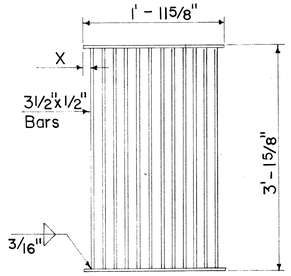


BAR SPACER
Scale: 3"= 1'-0"

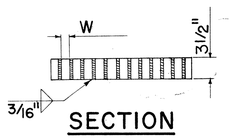


END OF BAR
Scale: 3"= 1'-0"

ALTERNATIVE BOLTED GRATE



PLAN



SECTION

ALTERNATIVE WELDED GRATE

Scale: 1"= 1'-0"

GENERAL NOTES

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

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

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

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

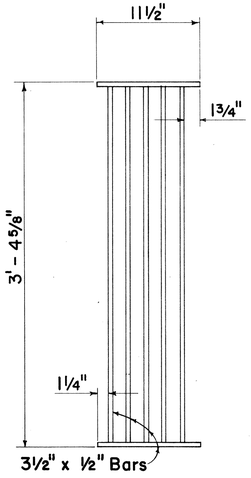
TYPE A-9 AND A-12 FRAMES AND GRATES

Scales: As Noted — Date: Aug. 1968

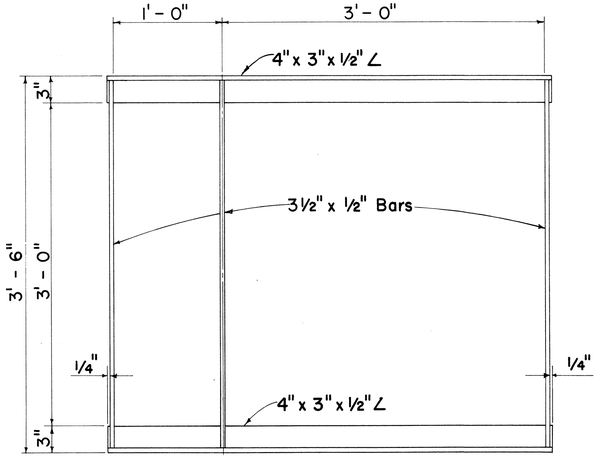
SHEET No. H25 OF 28 SHEETS DH 7

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

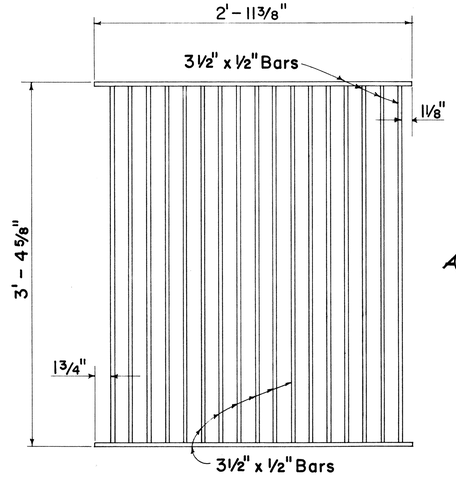
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(6);12	1975	53	127



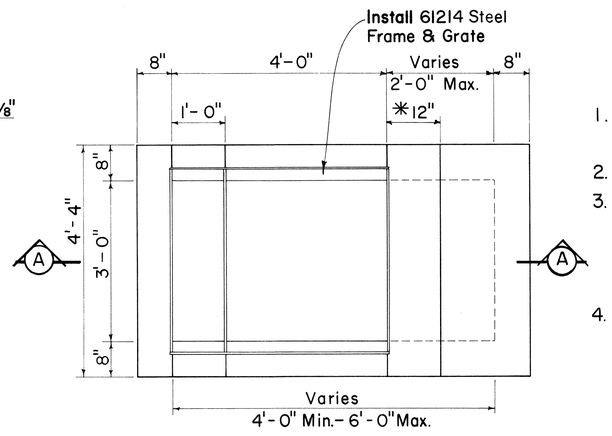
PLAN
Scale: 1½" = 1' - 0"



PLAN
Scale: 1½" = 1' - 0"



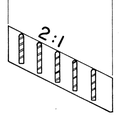
PLAN
Scale: 1½" = 1' - 0"



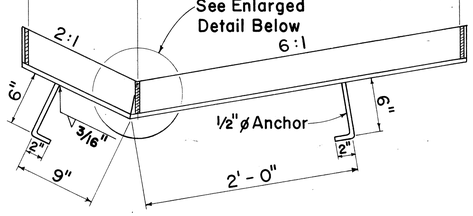
PLAN

GENERAL NOTES

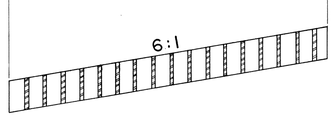
1. Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
2. All welds ⅜" unless otherwise noted.
3. The Frame & Grate materials shall conform to the specifications of ASTM Designation Structural Steel A283, Grade D and the Standard Specifications.
4. Culvert shall leave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



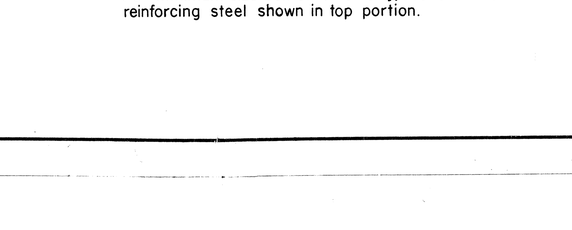
SECTION
Scale: 1½" = 1' - 0"



SECTION
Scale: 1½" = 1' - 0"



SECTION
Scale: 1½" = 1' - 0"

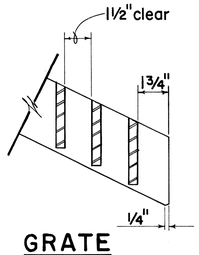


SECTION A - A

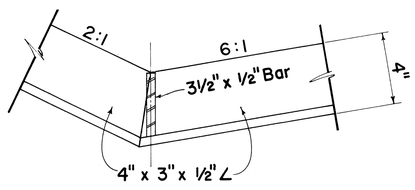
DETAIL OF 61214 DROP INTAKE

Scale: ¾" = 1' - 0"

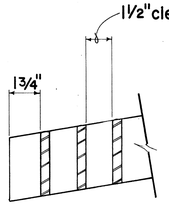
*For Minimum size box of 4'-0" only, use 8" and eliminate reinforcing steel shown in top portion.



GRATE
Scale: 3" = 1' - 0"



FRAME
Scale: 3" = 1' - 0"



GRATE
Scale: 3" = 1' - 0"

NO.	REVISION	APPROVED BY	DATE

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

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

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

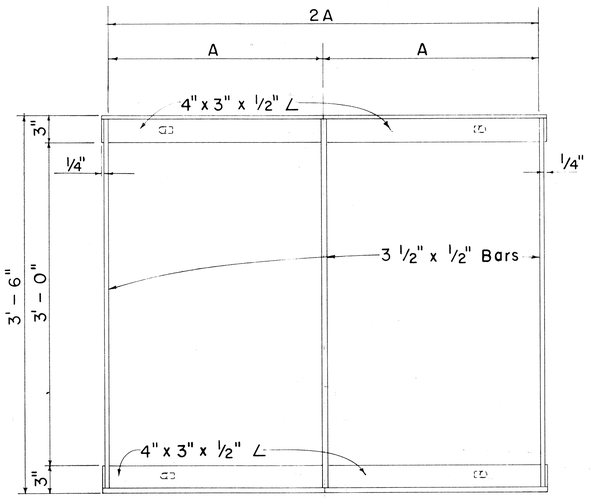
F.A. Proj. No. I-H-3-1(6);12
Scales: As Noted
Date: Feb. 1972

SHEET No. H 26 OF 28 SHEETS DH 9

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

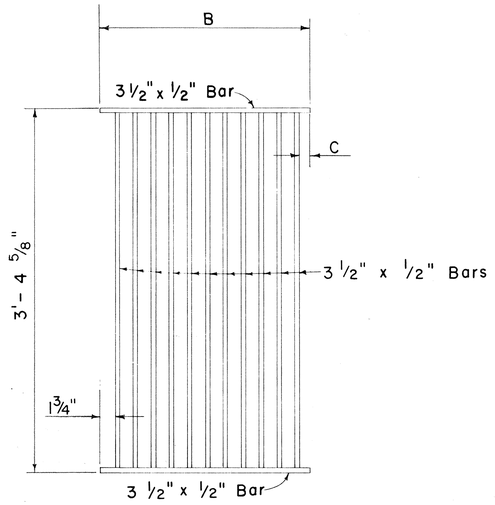
DETAILS OF TYPE 61214 STEEL FRAME AND GRATES

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(6)12	1975	C053S-1	127



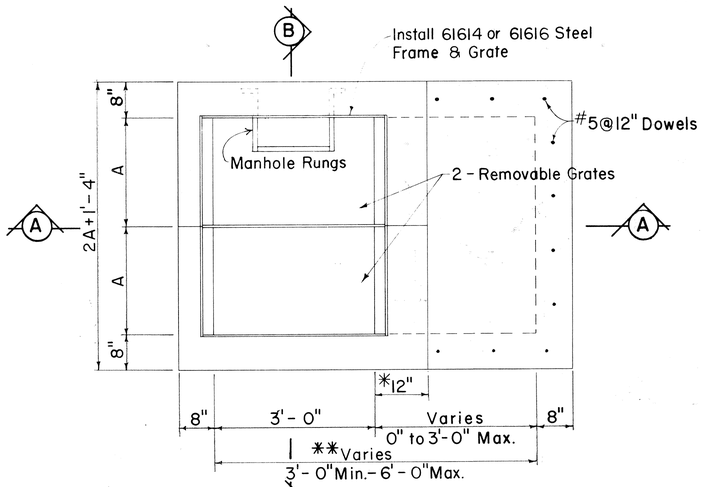
PLAN

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

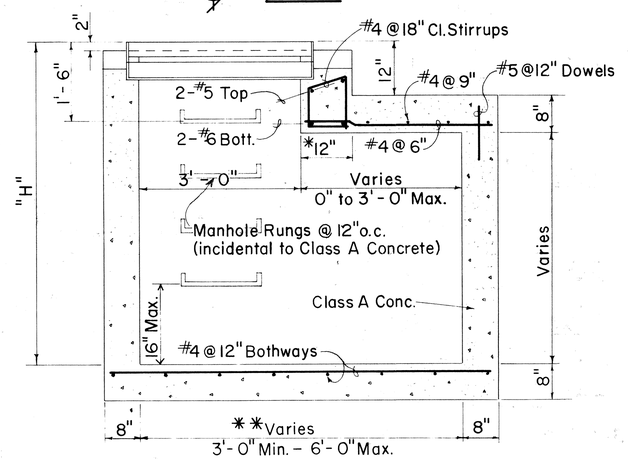


PLAN

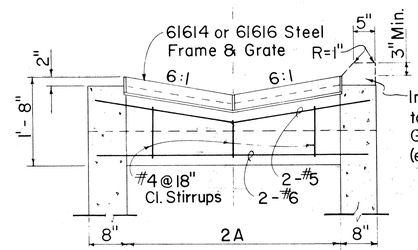
Scale: 1 1/2" = 1'-0"



PLAN



SECTION A-A



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

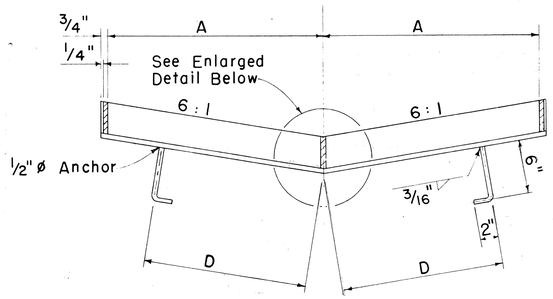
SECTION B-B

DETAILS OF 61614 OR 61616 DROP INTAKE

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

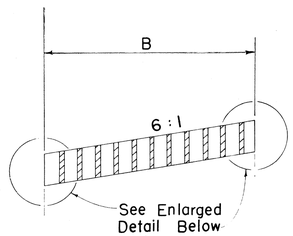
*For Minimum size box of 3'-0", use 8" and eliminate reinforcing steel shown in the top portion.

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



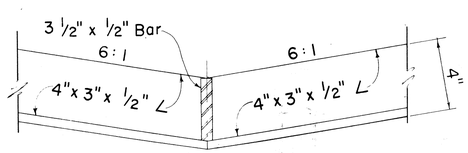
SECTION

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



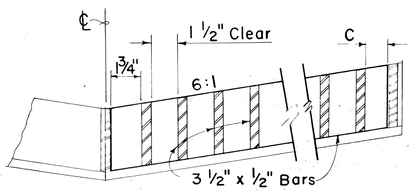
SECTION

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



FRAME

Scale: 3" = 1'-0"



GRATE

Scale: 3" = 1'-0"

DETAILS OF TYPE 61614 OR 61616 STEEL FRAME AND GRATE

GENERAL NOTES

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

SPACING TABLE

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

NO.	REVISION	APPROVED BY	DATE
1	Curb for Top of Fill Gutters Spacing on manhole rungs to conform to OSHA.	H.T.	6-5-71
2		H.T.	1-21-75

APPROVAL RECOMMENDED:

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

APPROVED:

ASSISTANT CHIEF, ENGINEERING — 12-11-69 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

TYPE 61614 & 61616 GRATED DROP INTAKES

Scales: As Noted — Date: Feb. 1969

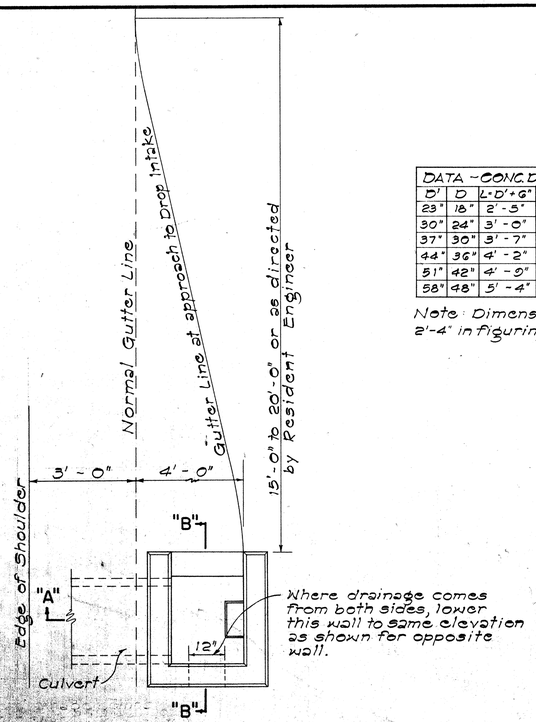
SHEET No. H2GA OF 28 SHEETS DH 8

(CCO #8)

C053 S-1

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

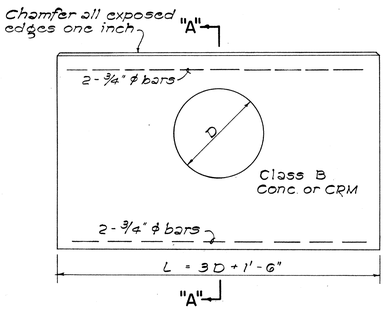
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HB-1(6)112	1975	54	127



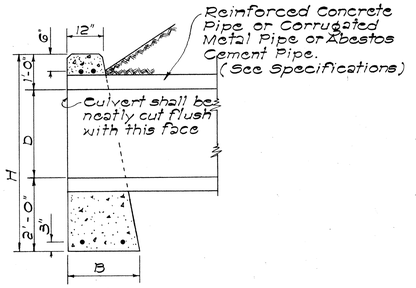
PLAN

DATA - CONC. DROP INTAKE					Where Variable Equals
D'	D	L=D'+6"	S	Cu. Yds.	
23"	18"	2'-5"	8"	1.41	4'-0"
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"

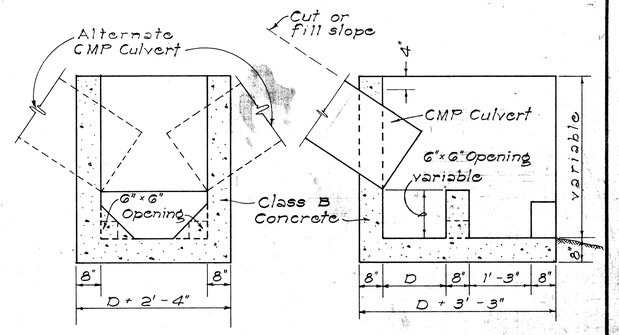
Note: Dimension "X" is assumed as 2'-4" in figuring the above quantities.



ELEVATION



SECTION "A-A"



SECTION "C-C"

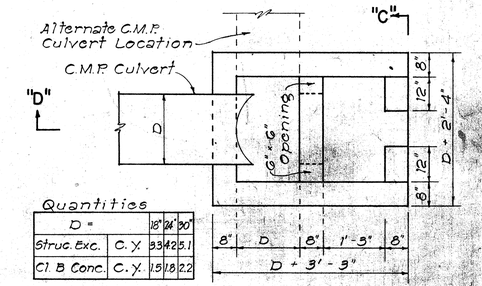
SECTION "D-D"

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"	2.36	2.49	4	3/4" ϕ	8'-6"	51
36"	2'-0"	10'-6"	6'-0"	2.94	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

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

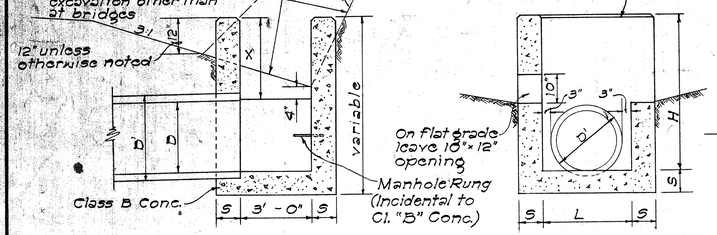
DETAIL OF HEADWALL

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



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

PLAN



SECTION "A-A"

SECTION "B-B"

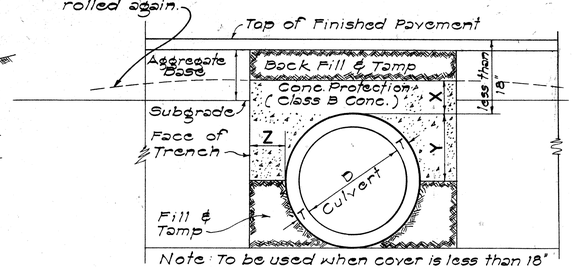
DETAIL OF CONCRETE DROP INTAKE

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 (16" o.c.) are required when "H" is greater than 4 feet 6 inches. Only one rung (12 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:

T. Takami — HYDRAULIC DESIGN ENGINEER — 12-17-69 DATE

APPROVED:

ASSISTANT CHIEF, ENGINEERING — 12-17-69 DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

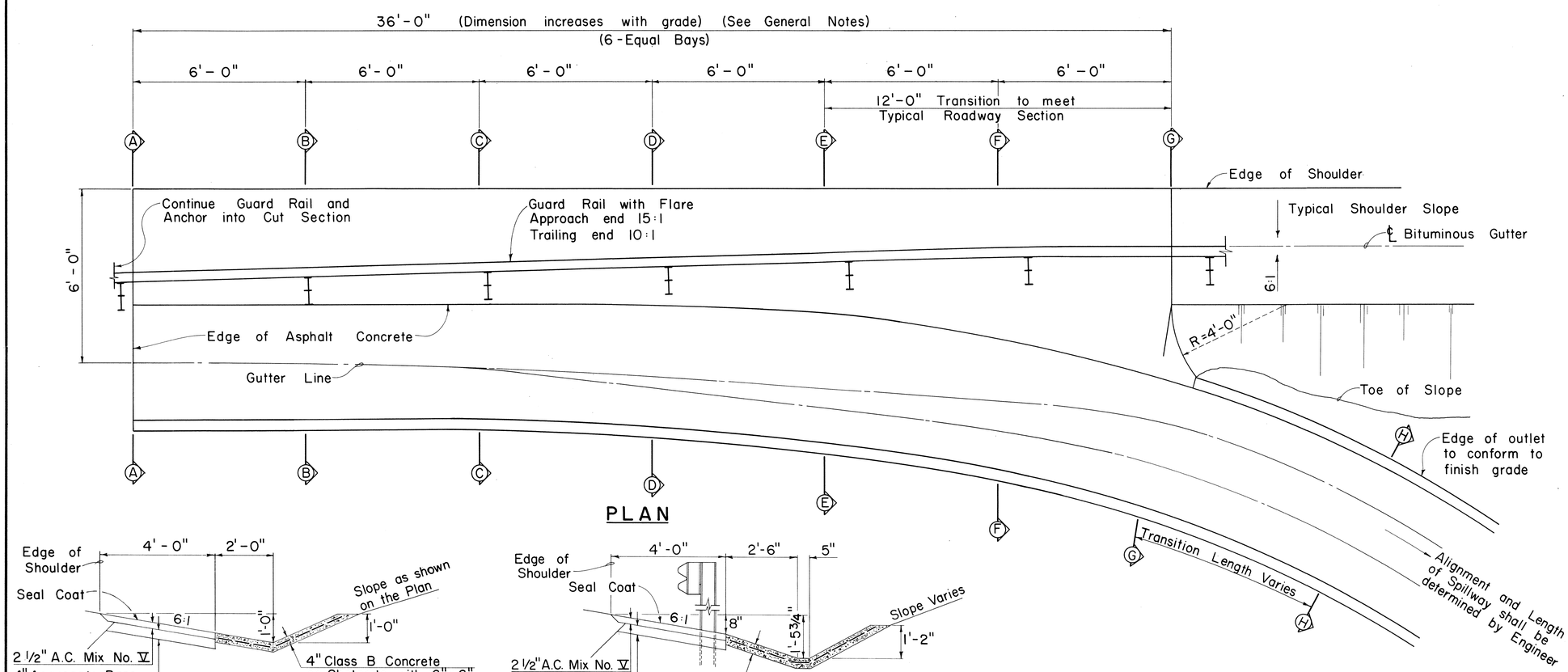
DROP INTAKE, HEADWALL & CONCRETE PROTECTION

Scale: As Noted. Date: Aug. 1967

SHEET No. H27 OF 28 SHEETS DH 10

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

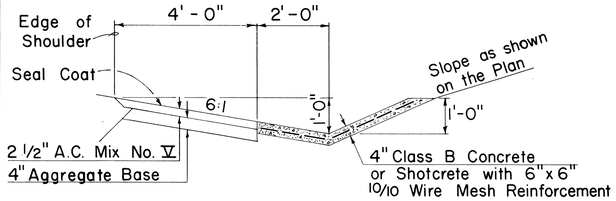
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(Q):12	1975	55	127



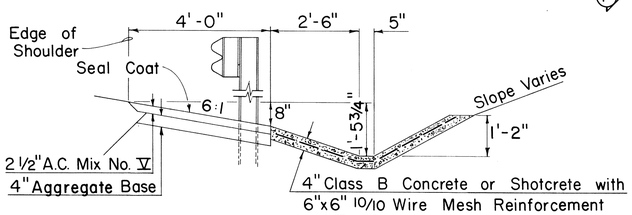
PLAN

GENERAL NOTES

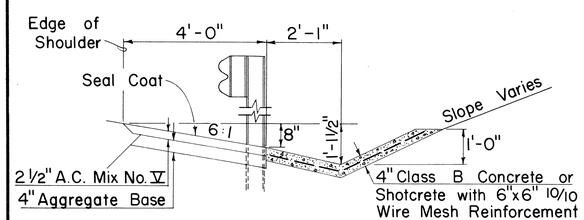
1. If the average grade of pavement for the distance from Section A-A to Section G-G exceeds 2% this distance shall be increased 6' for each 1% increase in grade.
2. Wire Mesh Reinforcement to be incidental to Class B Concrete or Shotcrete.
3. The gutter will be paid for at the contract unit price per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



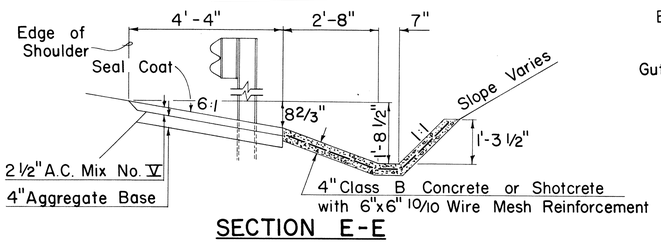
SECTION A-A



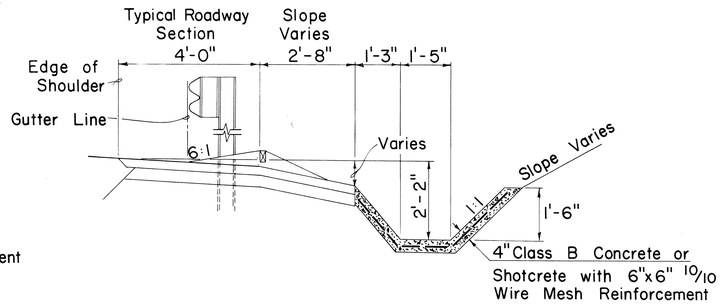
SECTION D-D



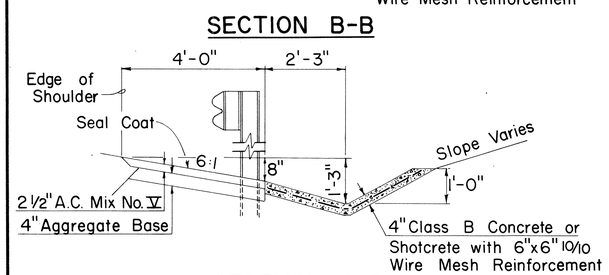
SECTION B-B



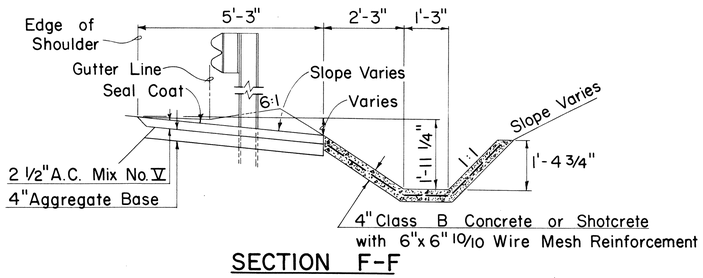
SECTION E-E



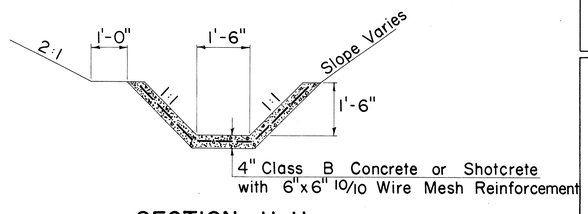
SECTION G-G



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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
CONCRETE SPILLWAY INLET

Scale: 1/2" = 1'-0" Date: Feb. 1972

SHEET No. H 28 OF 28 SHEETS DH 20

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