FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(32)5 UNIT I	1966	16	73

Revised: Jan. 24, 1967

℄ Sta. 330+00 to 338+00±
Construct Earth Ditch along CHR "A".
For detail see sht. no. D-4
ESTIMATED QUANTITIES
Ditch & Channel Excavation 1041.0 c.y. ~~1340.0 c.y.~~

℄ Sta. 339+50± Lt. 87'±
Construct Type "B" CDI
Install 24" CGMP, 14 Ga.
For detail see sht. no. D-4
ESTIMATED QUANTITIES
Structure Excavation 24.33 ~~24.0~~ c.y.
Class B-1 Concrete 2.18 ~~2.1~~ c.y.
24" Pipe Culvert 16.0 ~~16.0~~ L.F.

Ramp KO Sta. 14+99± Lt.
Construct: Type "A" C.D.I.
Install: 24" CGMP 14 Ga.
For detail see sht. no. D-4
ESTIMATED QUANTITIES
Struct. Exc. 8.32 ~~2.0~~ c.y.
Class B-1 Conc. 1.79 ~~1.9~~ c.y.
24" Pipe Culvert 3.7 ~~4.0~~ L.F.

℄ Earth Ditch along CHR "A"
CANE HAUL ROAD "A"
RAMP (KO)
Grade to drain
5+00
10+00
Ramp KO Sta. 14+99± Lt.
Type A C.D.I.
Inv. = 173.0
(KO) P.C. Sta. 11+45.57
R = 80.00
(KO) P.T. Sta. 13+82.24
℄ Sta. 339+50
87' Lt.
Type "B" C.D.I.
Inv. = 174.5±
325+00
330+00
335+00
340+00
℄ Sta. 340+25
Match Line
15+00
84" Sectional Plate Pipe Culvert 12 Ga. or 84" CGMP 8 Ga.

(K1-A) Sta. 6+75
Type 'B' CDI (Future)
Inv. = 164.80
24" RCCP Cl. III or 24" CGMP, 14 Ga.
S = 0.0100
(K1-A) P.T. Sta. 8+14.47
Nose Ctr. ℄s = 17' Rt.
(K1-A) Sta. 9+75 & ℄s = 6' Lt.
Std. C.D.I. (Future)
Inv. = 172.5
(K1-A) P.C. Sta. 11+39.01
54" CGMP To Remain
(N.I.C.)
~~Abandon Existing 24" CGMP Plug Ends w/Brick & Mortar (Incidental to Struc. Exc.)~~
Existing C.B. To Remain
~~Demolish Existing C.D.I.~~
~~Demolish Existing C.B.~~
~~Salvage Existing C.I. Fr. & Cover (Incidental to Struc. Exc.)~~ (N.I.C.)
(K1-A) Sta. 6+75
Type 'D' C.B. (Future)
Inv. = 164.6
RAMP (K-1)
RAMP (K1-A) ℄
24" RCCP Cl. III or 24" CGMP, 14 Ga.
S = 0.0100
(K1) Sta. 9+75 & ℄s = 9' Rt.
Std. C.H.W. (Future)
Inv. = 172.0
℄ Normal Gutter Line
24" RCCP Cl. III or 24" CGMP, 14 Ga.
S = 0.0600
℄ Transition Ditch & ℄s 13' Rt. (Future)
(K1) Sta. 6+85 & ℄s = 11' Rt.
C.H.W. (Future)
Inv. 161.00
(K1) P.T. Sta. 8+14.18
Nose Ctr. ℄s = 17.0' Lt.
54" CGMP To Remain
5+00 RAMP (K-1)
℄ Lined Gutter (Future)
Construct 10' Transition

Ramp (K1) Sta. 3+95 ± to 6+00 ± Rt.
Construct: Lined Gutter
For detail see Sht. no. ____
ESTIMATED QUANTITIES
Structure Exc. 147.0 C.Y.
Class B-1 Conc. or Shotcrete 13.7 C.Y.
Reinf. Steel 215 lbs.

Ramp (K1-A) Sta. 6+75
Construct: Type "B" CDI & Type "D" C.B.
Install 24" RCCP, Cl. III or 24" CGMP, 14 Ga.
For detail see Sht. no. D-13 & D-18
ESTIMATED QUANTITIES
Struct. Exc. 65.0 c.y.
Class A-1 Conc. 3.7 c.y.
Class B-1 Conc. 3.6 c.y.
Reinf. Steel 77 lbs.
24" Pipe Culvert 76 L.F.
Salvaged C.I. Fr. & Cover 1 ea.

℄ Sta. 339+35
Construct: Inlet and Outlet Structure
Install: 84" Sectional Plate Pipe Culvert 8 Ga.
For details and estimated quantities see sht. no. D-5 & D-6

Ramp (K1) Sta. 6+00 to 6+85 ± Rt.
Construct: Conc. Transition Ditch and Conc. Headwall
For detail see Sht. no. D-4
ESTIMATED QUANTITIES
Struct. Exc. 9.0 c.y.
Ditch & Channel Exc. 50.0 c.y.
Class B-1 Conc. or Shotcrete 15.0 c.y.
Reinf. Steel 239 lbs.

Ramp (K1-A) Sta. 9+75
Construct: Std. CDI, Std. Conc. Headwall
Install 24" RCCP, Cl. III or 24" CGMP, 14 Ga.
For detail see Sht. no. D-17
ESTIMATED QUANTITIES
Struct. Exc. 22.0 c.y.
Class B-1 Conc. 3.4 c.y.
Reinf. Steel 42 lbs.
24" Pipe Culvert 42 L.F.

THIS SHEET SUPERSEDES SHEET NO 5

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE LAYOUT
℄ STA. 325+00 TO ℄ STA. 340+00

INTERSTATE ROUTE H-1
PROJ. No. I-H1-1 (32) : 5, UNIT I

Scale: As Shown Date: Sept. 1966

SHEET No. D-1 OF 10 SHEETS

DESIGN BY	TRACED BY	DATE
DRAWN BY		
TRACED BY		
CHECKED BY		
QUANTITIES BY		
CHECKED BY		

C. O. 16

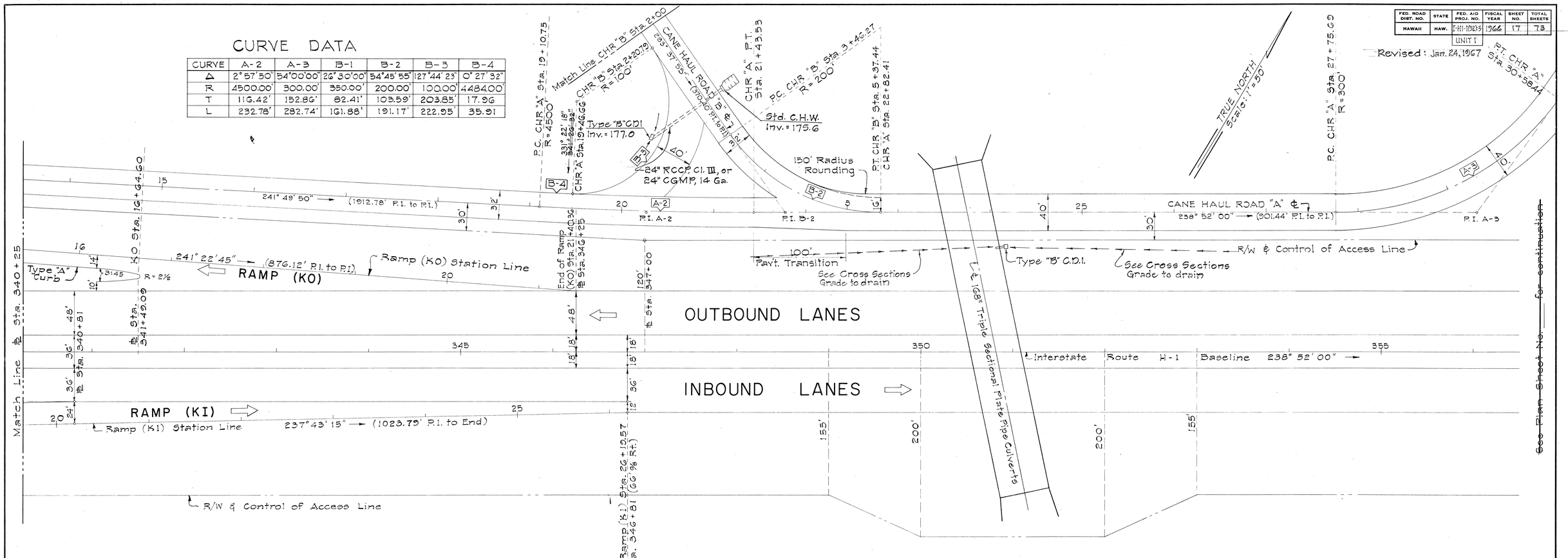
C. O. 51

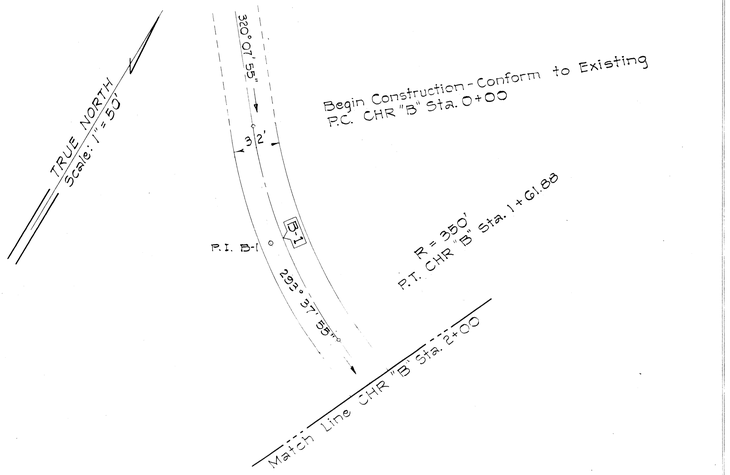
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(32)5 UNIT 1	1966	17	73

Revised: Jan. 24, 1967

CURVE DATA

CURVE	A-2	A-3	B-1	B-2	B-3	B-4
Δ	2°57'50"	54°00'00"	26°30'00"	54°45'55"	127°44'23"	0°27'32"
R	4500.00'	300.00'	350.00'	200.00'	100.00'	4484.00'
T	116.42'	152.86'	82.41'	103.59'	203.85'	17.96
L	232.78'	282.74'	161.88'	191.17'	222.55'	35.91





℄ Sta. 350+80
Construct: Inlet and Outlet Structures.
Install: Triple 168" Sectional Plate Pipe Culverts.
For details see sht. no. D-7, 8, 9

℄ Sta. 350+04 9'S 106'± Lt.
Construct: 1-Type "B" C.D.1.
Install: 24" CGMP, 14 Ga.
For details see sht. no. D-10

ESTIMATED QUANTITIES

Struc. Exc.	14.6	~~7.0~~ c.y.
Class B-1 Conc.	1.81	~~.80~~ c.y.
24" Pipe Culvert	14.2	~~16.0~~ L.F.

CHR "B" Sta. 3+00
Construct: Type "B" CD1, Std Conc. Headwall
Install: 24" RCCP, Cl. III, or 24" CGMP, 14 Ga.

ESTIMATED QUANTITIES

Struc. Exc.	56.41	= ~~.06~~ c.y.
Ditch & Channel Exc.	69.0	= ~~.80~~ c.y.
Class B-1 Concrete	3.12	= ~~.30~~ c.y.
Reinf. Steel		= 42 lbs.
24" Pipe Culvert		= 92 L.F.

50 100 150
SCALE IN FEET

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

THIS SHEET SUPERSEDES SHEET NO. 52

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE LAYOUT

℄ STA. 340+00 TO ℄ STA 355+00

INTERSTATE ROUTE H-1
PROJ. No. I-HI-1(32):5, UNIT 1

Scale: As Shown Date: Sept. 1966

SHEET No. D-8 OF 10 SHEETS

C. O. 17 C. O. 52

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(32):5 UNIT 1	1966	18	73

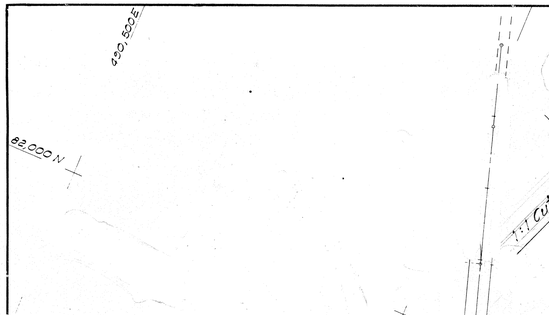
PLAN — SURVEYED, PLOTTED, ALIGNMENT CHECKED, RT. OF WAY CHECKED, NOTE BOOK, NO., BY, DATE

PROFILE — SURVEYED, PLOTTED, CHECKED, NOTE BOOK, B.M.'s NOTED, NO., STRUCTURE NOTATIONS CHKD., BY, DATE

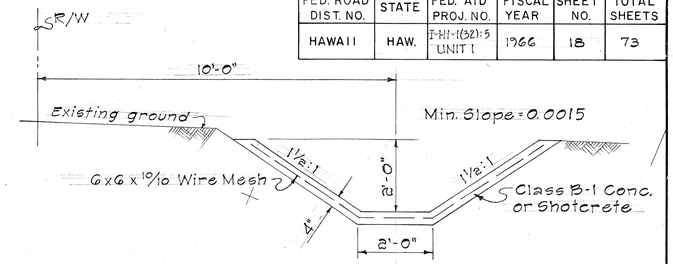
℄ Sta. 361+00± to 375+60±
Construct: 2x2 Cut-off ditch
For Typical: See this sheet

ESTIMATED QUANTITIES

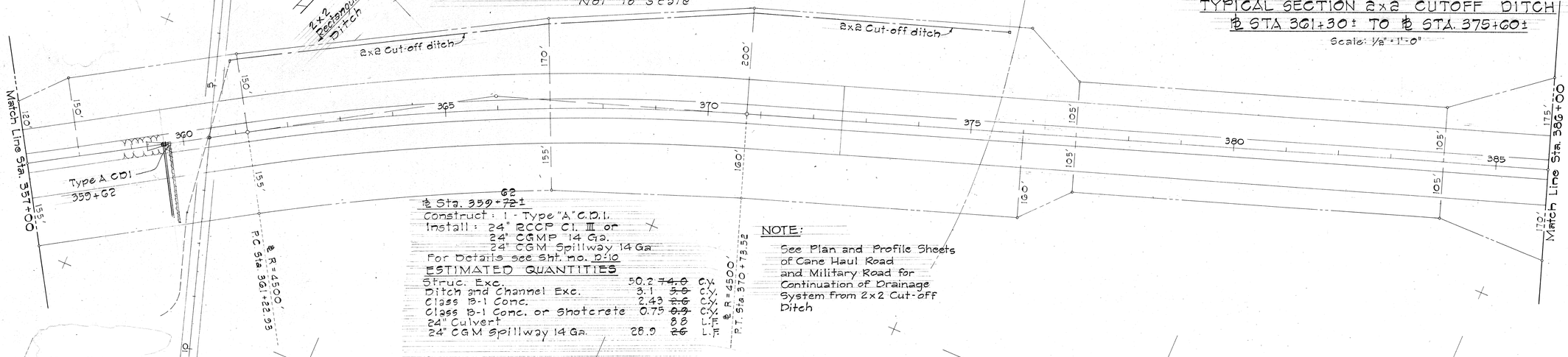
Struc. Exc.	624.0 ~~541.0~~	C.Y.
Class B-1 Conc. or Shotcrete	177.04 ~~80.0~~	C.Y.
Reinf. Steel	2860.01 ~~2920~~	lbs.



CUT-OFF DITCH TRANSITION
AT ℄ STA. 361+30± LT. AND ℄ STA. 375+60± LT.
Not to Scale



TYPICAL SECTION 2x2 CUTOFF DITCH
℄ STA 361+30± TO ℄ STA. 375+60±
Scale: 1/8" = 1'-0"

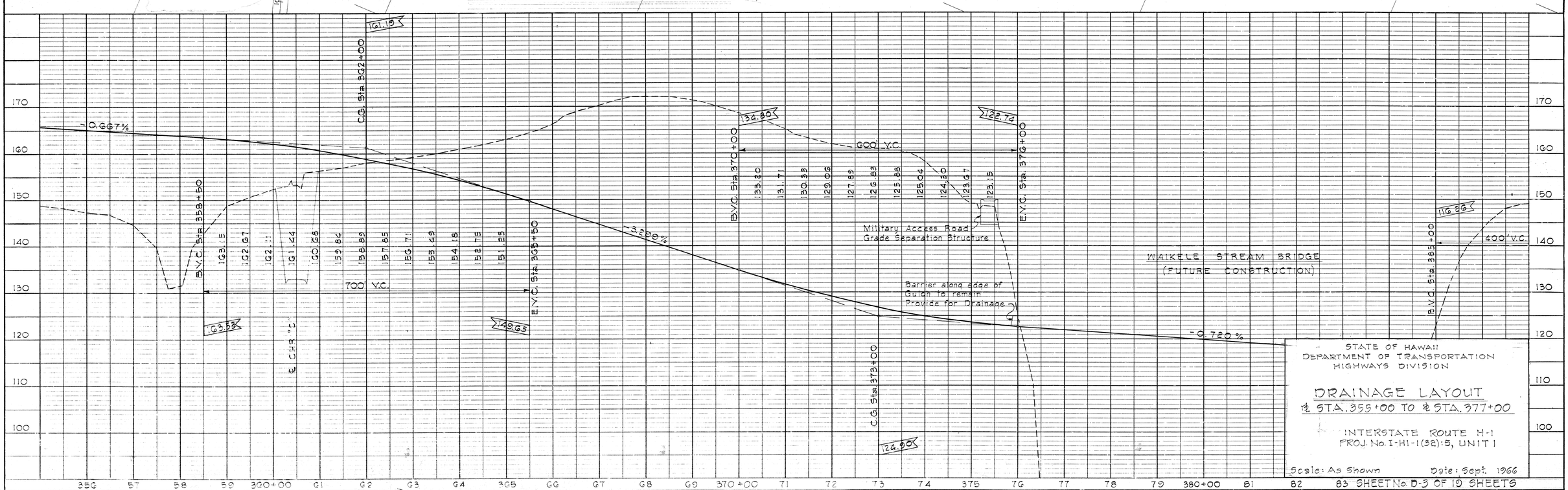


℄ Sta. 359+~~72~~ 62±
Construct: 1 - Type "A" C.D.I.
Install: 24" RCCP Cl. III or
24" CGMP 14 Ga.
24" CGM Spillway 14 Ga.
For Details see Sht. no. D-10

ESTIMATED QUANTITIES

Struc. Exc.	50.2 ~~74.0~~	C.Y.
Ditch and Channel Exc.	3.1 ~~5.0~~	C.Y.
Class B-1 Conc.	2.43 ~~3.6~~	C.Y.
Class B-1 Conc. or Shotcrete	0.75 ~~0.9~~	C.Y.
24" Culvert	~~80~~	L.F.
24" CGM Spillway 14 Ga.	28.9 ~~26~~	L.F.

NOTE:
See Plan and Profile Sheets of Cane Haul Road and Military Road for Continuation of Drainage System from 2x2 Cut-off Ditch



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE LAYOUT
℄ STA. 355+00 TO ℄ STA. 377+00

INTERSTATE ROUTE H-1
PROJ. No. I-H1-1(32):5, UNIT 1

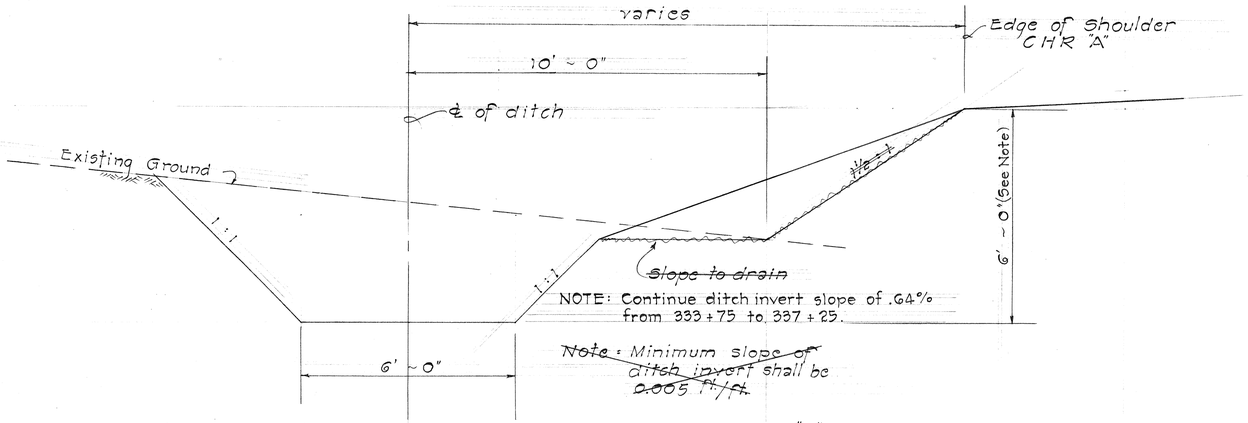
Scale: As Shown Date: Sept. 1966

SHEET No. D-3 OF 10 SHEETS

PLATE 1 PLAN PROFILE C.P.R.A.S.E. STANDARD
HELFFRICH & ESSER CO., NEW YORK
H & E Co. No. 348-1C

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(32):5 Unit 1	1966	19	73

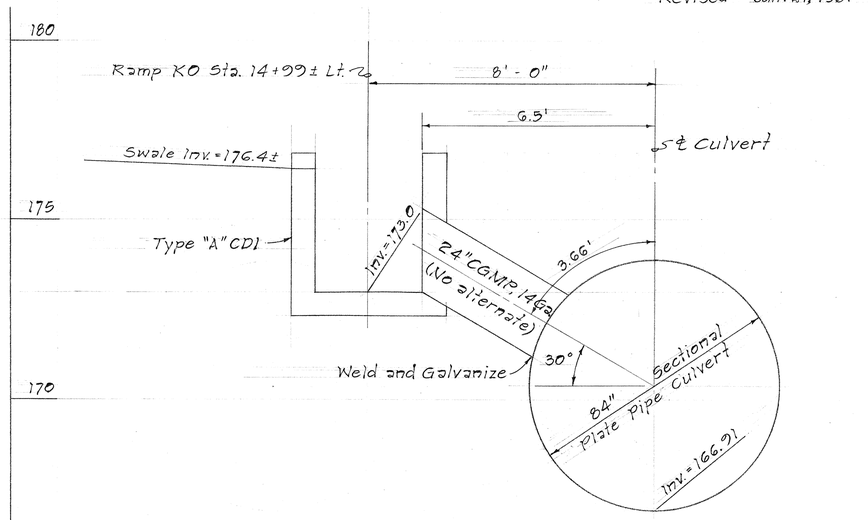
Revised : Jan. 24, 1967



NOTE: Continue ditch invert slope of .64% from 333+75 to 337+25.

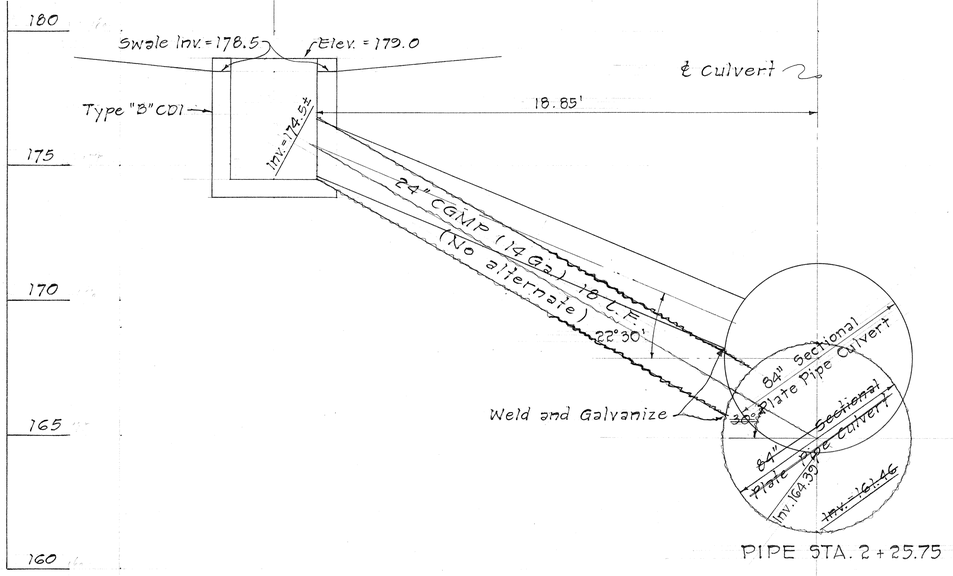
~~Note: Minimum slope of ditch invert shall be 0.005 Ft./Ft.~~

TYPICAL SECTION ~ EARTH DITCH ALONG C.H.R. "A"
℄ STA. 330+00 TO STA. ~~339+00~~ 337+25
Scale: ½" = 1'-0"



PIPE STA. 2+93.40

CONNECTION DETAIL - CDI @ RAMP KO STA. 14+99±
TO 84" SECTIONAL PLATE PIPE CULVERT
Scale: ½" = 1'-0"



PIPE STA. 2+25.75

CONNECTION DETAIL - CDI @ STA 339+50±
TO 84" SECTIONAL PLATE PIPE CULVERT
Scale: ⅜" = 1'-0"

THIS SHEET REPLACES SHEET NO. 54

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

INTERSTATE ROUTE H-1
PROJ. No. I-HI-1(32):5, UNIT 1

Scale: As Shown Date: Jan., 1967

SHEET No. D-4 OF 19 SHEETS

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

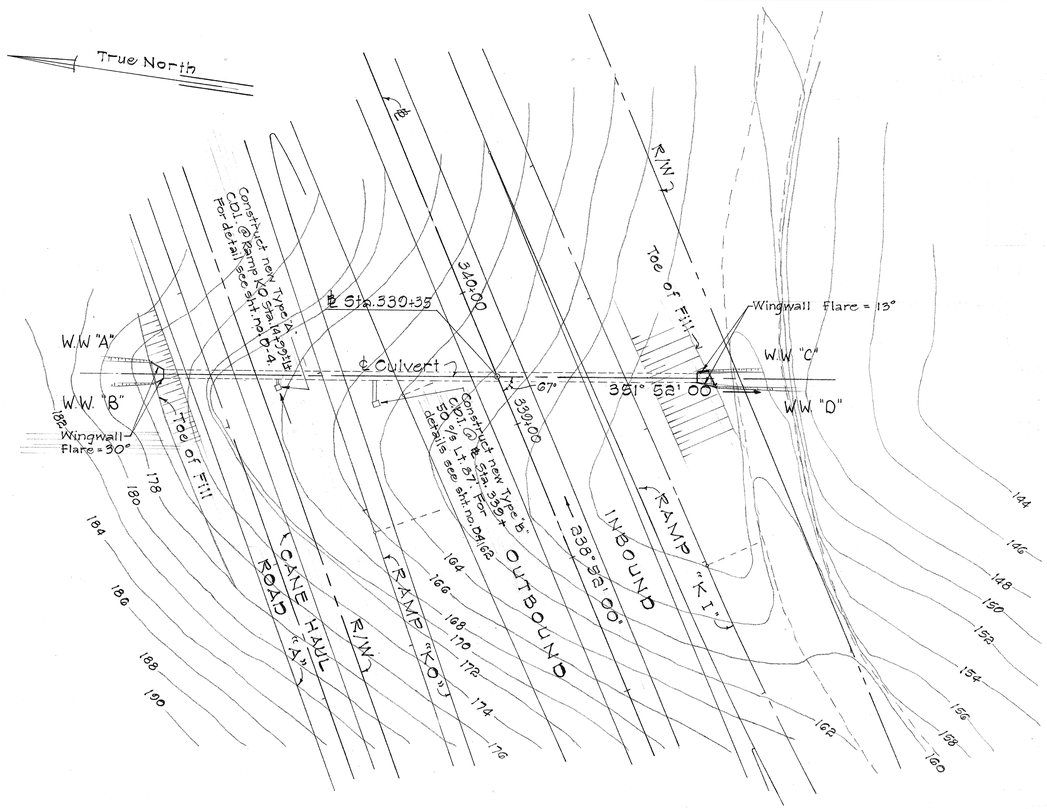
PRINTED ON NO. 1000H CLEARPRINT

C. O. 19

C. O. 54

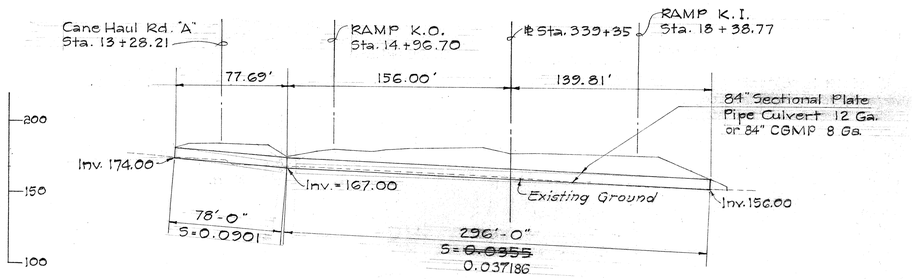
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(32)5 UNIT 1	1966	20	73

Revised : Jan. 24, 1967



PLAN

Scale: 1" = 50'



PROFILE ~ CULVERT AT STA. 330+35

Scale : 1" = 50'

℄ Sta. 339+35

ESTIMATED QUANTITIES

Struct. Exc.	69.34 ~~85~~ c.y.
Ditch and Channel Exc.	15 c.y.
Untreated Base	62 c.y.
Class A-1 Conc.	27 c.y.
Reinf. Steel	1863 lbs.
84" Sectional Plate Pipe Culvert 12 Ga.	374 L.F.

GENERAL NOTES

1. The 84" Sectional Plate Pipe Culvert shall have its vertical diameter factory elongated 5%.
2. For detail connection of C.D.I.'s to 84" Sectional Plate Pipe Culvert see sht. no. D-4

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE Nov. 66
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	M. M.
	QUANTITIES BY	
	CHECKED BY	R. K.

THIS SHEET SUPERSEDES SHEET NO. 55

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
FOR 84" CULVERT AT
℄ STA. 339+35

INTERSTATE ROUTE H-1
PROJ. No. I-H1-1(32)5, UNIT 1

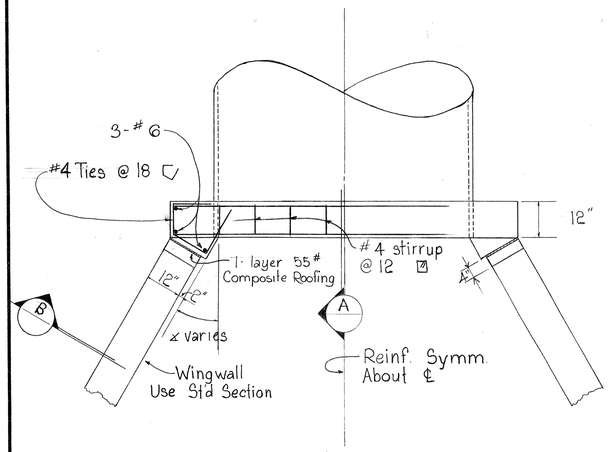
Scale: As Shown Date: Sept. 1966

SHEET No. D-5 OF 19 SHEETS

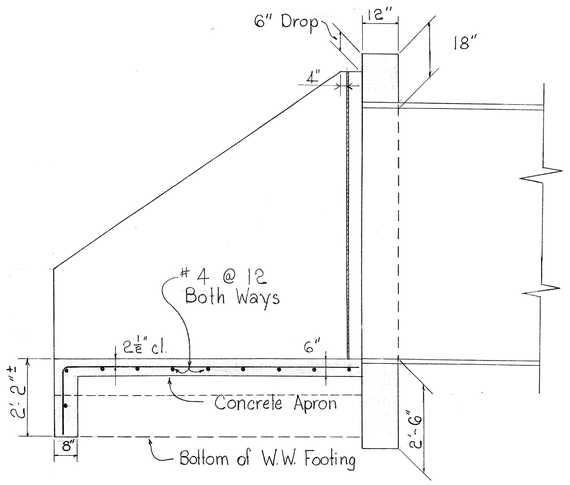
PRINTED ON NO. 1000H CLEARPRINT

C. O. 20 C. O. 55

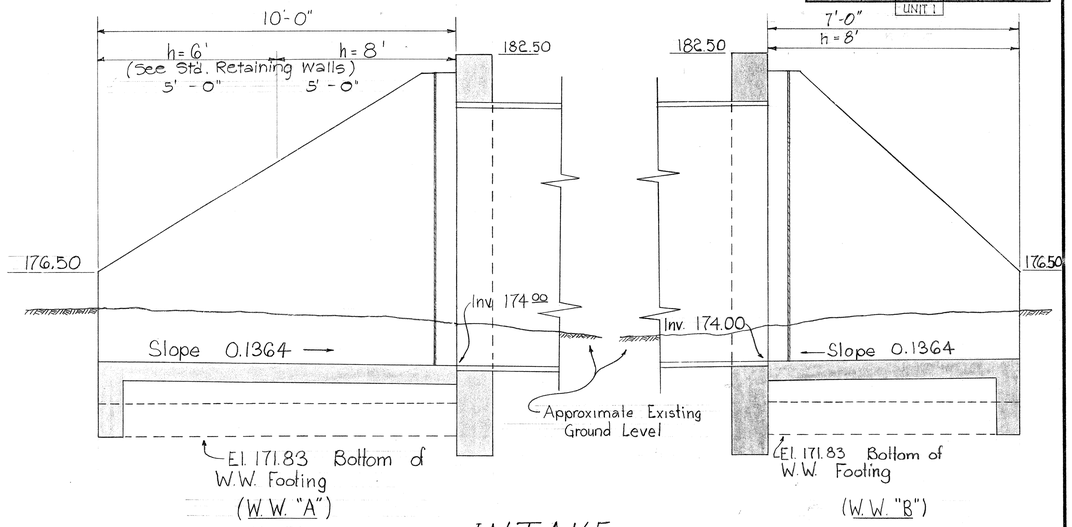
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(32)5 UNIT 1	1966	21	73

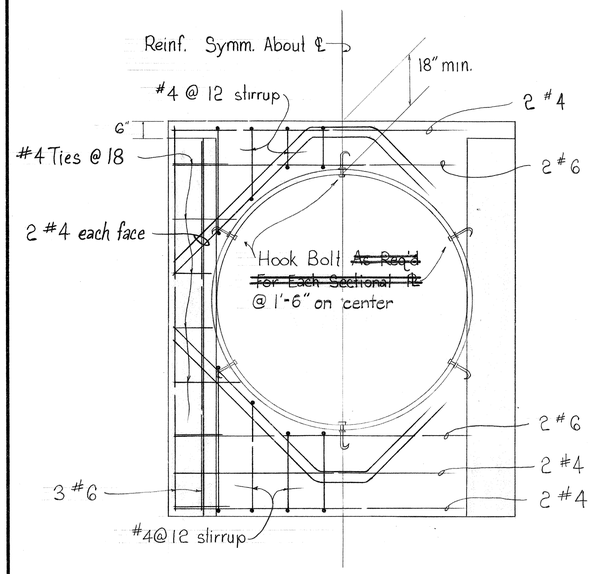


TYPICAL HEAD WALL - PLAN
Scale ½"= 1'-0"

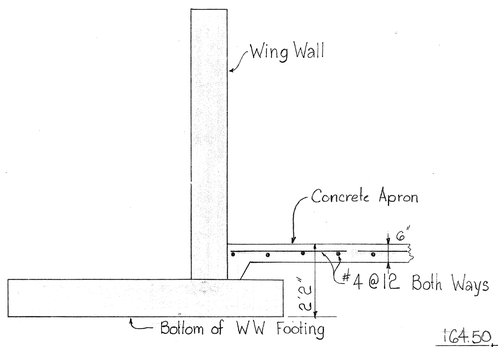


TYPICAL SECTION A
Scale ½"= 1'-0"

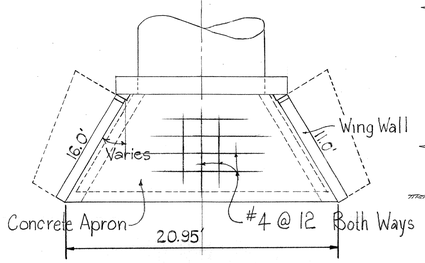




ELEVATION

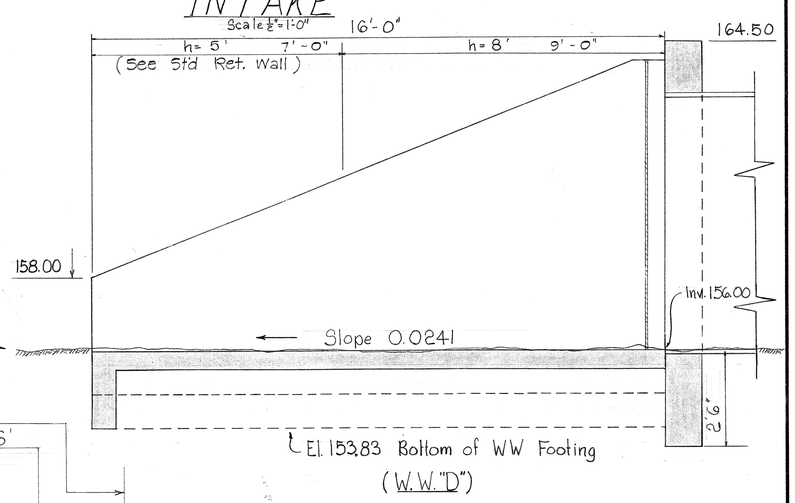


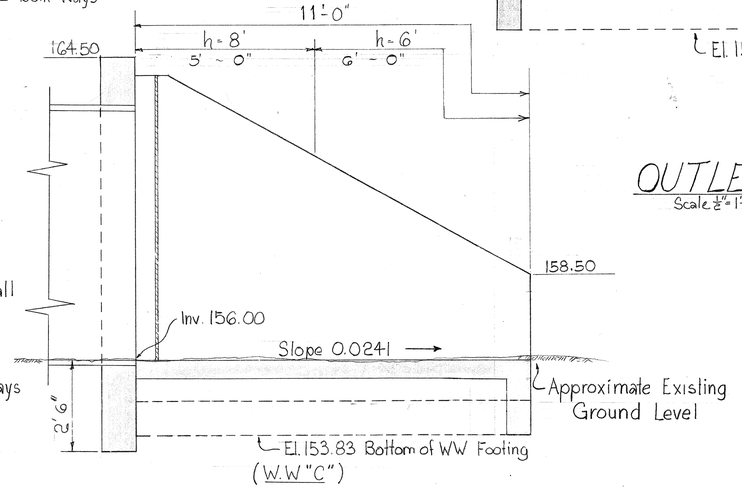
TYPICAL SECTION B
Scale ½"= 1'-0"



TYPICAL OUTLET PLAN
Scale ¼"= 1'

INTAKE
Scale ½"= 1'-0"





OUTLET
Scale ½"= 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS FOR 84" CULVERT @ ℄ STA. 339+35

INTERSTATE ROUTE H-1
PROJ. No. I-H1-1(32):5, UNIT 1

Scale: As Shown Date: Sept. 1966

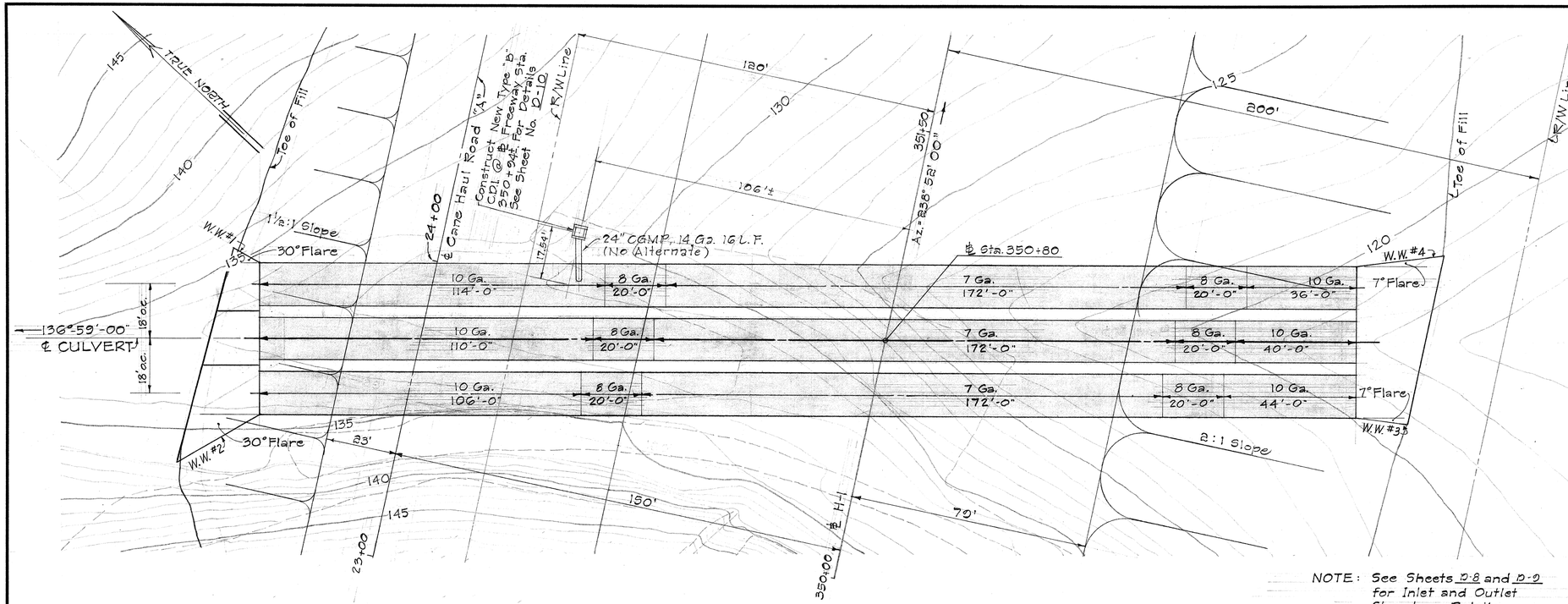
SHEET No. D-6 OF 10 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE Aug. '66
	DRAWN BY " "	
NOTE BOOK	TRACED BY " "	
No.	DESIGNED BY H.H.	
	QUANTITIES BY " "	
	CHECKED BY R.K.C.	

PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(32):5 UNIT 1	1966	22	73

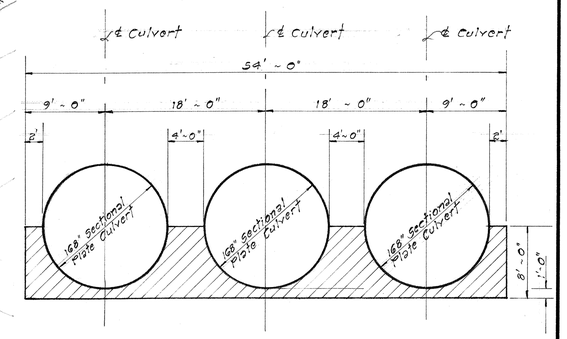
Revised: Jan. 24, 1967



PLAN

Scale: 1" = 20'

NOTE: See Sheets D-8 and D-9 for Inlet and Outlet Structure Details.

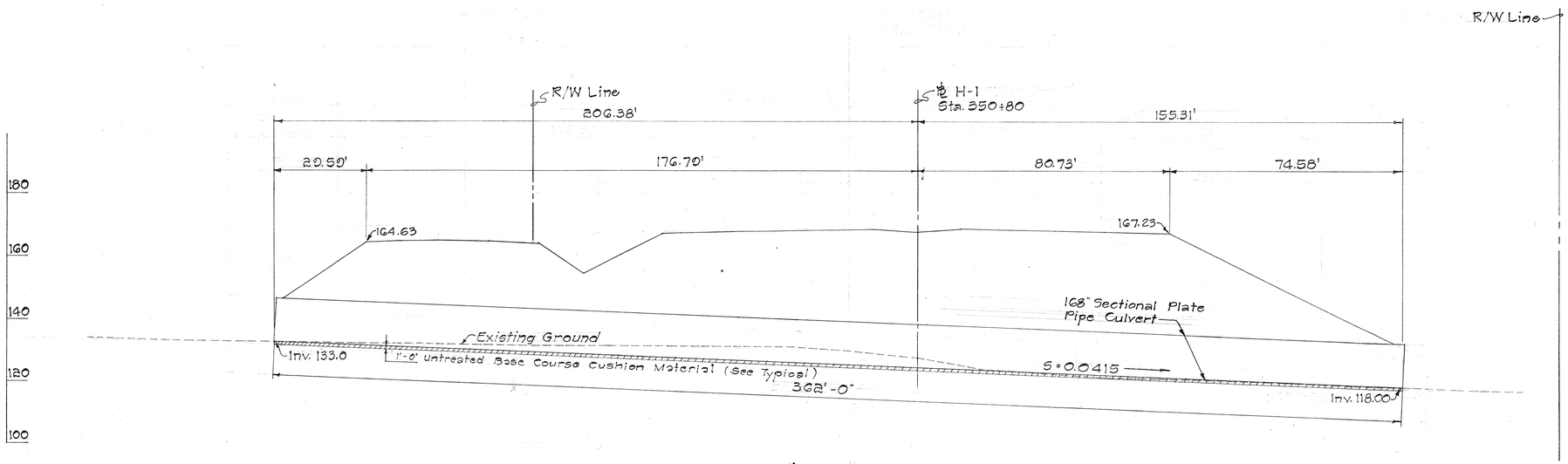


TYPICAL SECTION OF UNTREATED BASE COURSE FOUNDATION MATERIAL

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

ESTIMATED QUANTITIES

Structure Excavation	3432.18	~~2520~~ c.y.
Ditch & Channel Excavation		90 c.y.
Untreated Base Course for Pipe Foundation	3010.11	~~2700~~ c.y.
Class A-1 Concrete		188 c.y.
Reinforcing Steel		17,283 lb.
Filter Material	18.2	~~82~~ c.y.
168" Sectional Plate Pipe Culvert		1,086 l.f.



PROFILE @ ℄ OF TRIPLE 168" SECTIONAL PLATE PIPE CULVERTS

Scale: 1" = 20'

GENERAL NOTES

1-The Triple 168" Sectional Plate Culvert shall have its vertical diameter factory elongated 5 %.

THIS SHEET SUPERSEDES SHEET NO. 57

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE STRUCTURE DETAILS
TRIPLE 168" SECTIONAL PLATE PIPE CULVERTS @ ℄ STA. 350+80

INTERSTATE ROUTE H-1
PROJ. No. I-HI-1(32):5, UNIT 1

Scale: As Shown Date: Sept. 1966

SHEET No. D-7 OF 19 SHEETS

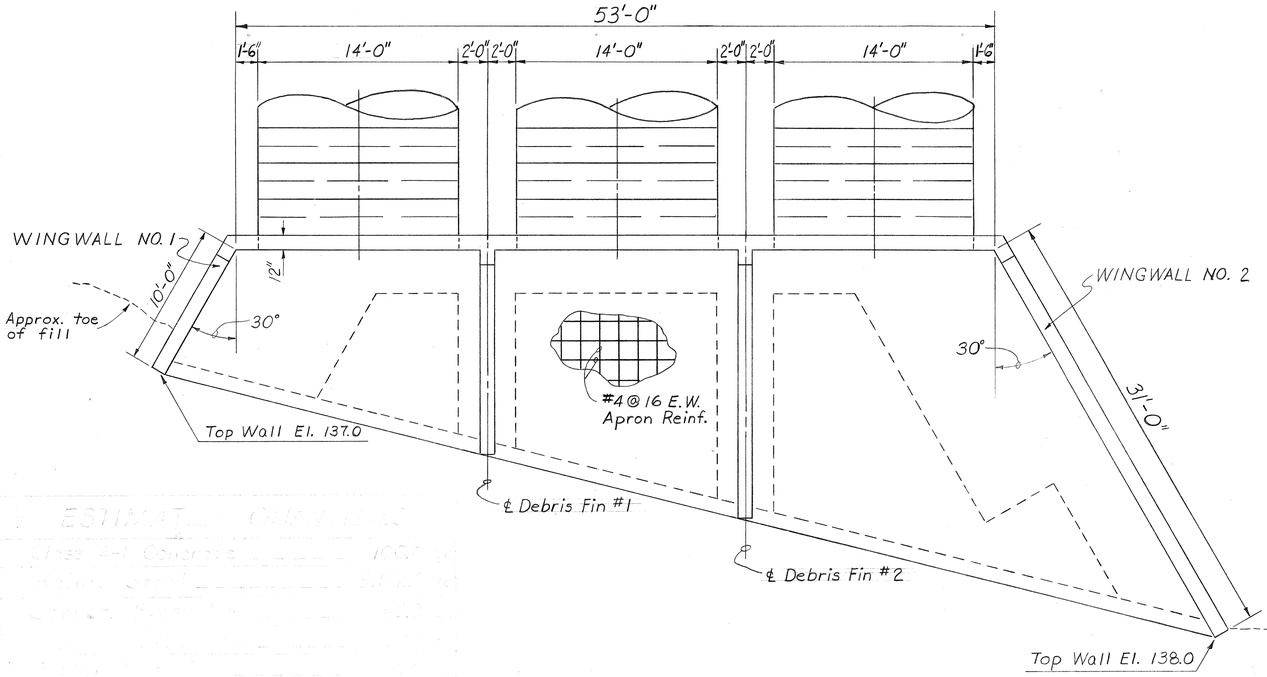
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

PRINTED ON NO. 1000H CLEARPRINT

C.O. 22

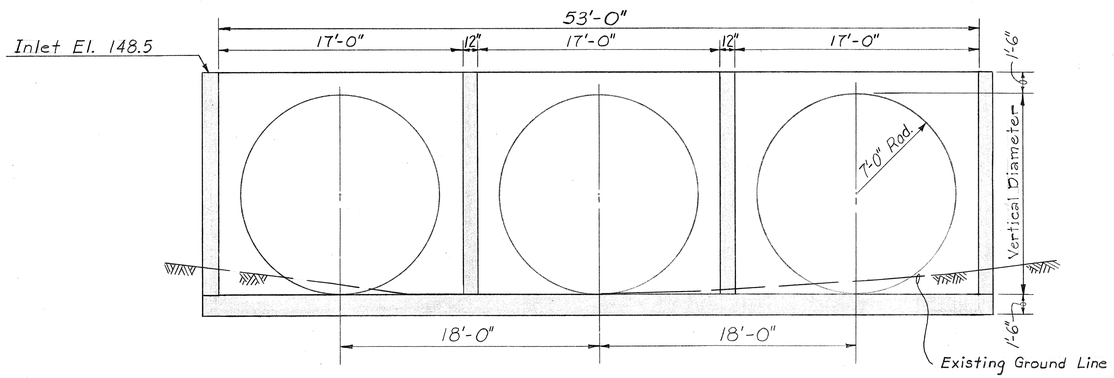
C.O. 57

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(32)5 UNIT 1	1966	23	73



INLET PLAN

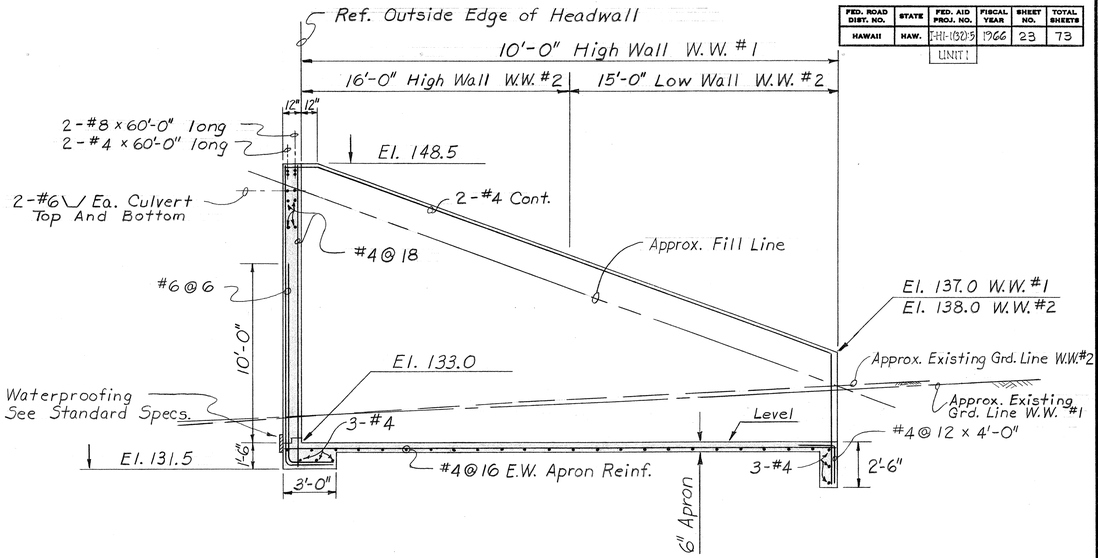
Scale 1" = 5'-0"



Note:
For reinforcing layout, see Outlet Headwall Elevation.

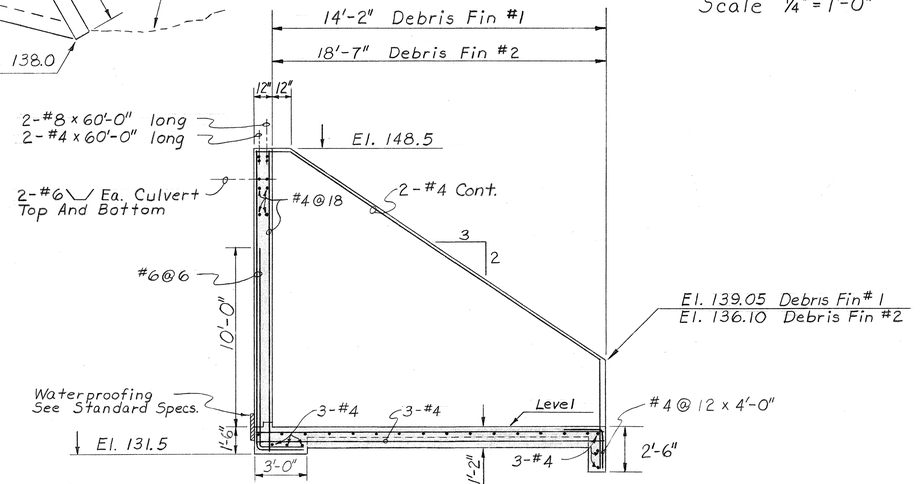
INLET HEADWALL ELEVATION

Scale 1" = 5'-0"



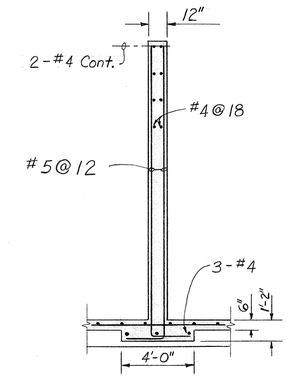
ELEVATION ~ WINGWALL NO. 1 & 2

Scale 1/4" = 1'-0"



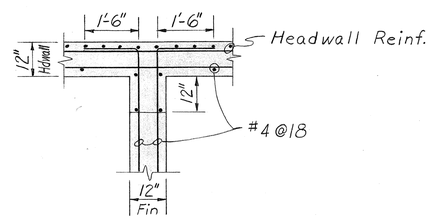
DEBRIS FIN ELEVATION

Scale 1/4" = 1'-0"



TYP. SECTION THRU FIN

Scale 1/4" = 1'-0"



TYPICAL SECTIONAL PLAN AT DEBRIS FIN CONNECTION

Scale 1/2" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE STRUCTURE DETAILS

TRIPLE 168" SECTIONAL PLATE PIPE CULVERTS @ ℄ STA. 350+80

INTERSTATE ROUTE H-1
PROJ. No. I-HI-1(32)5, UNIT 1

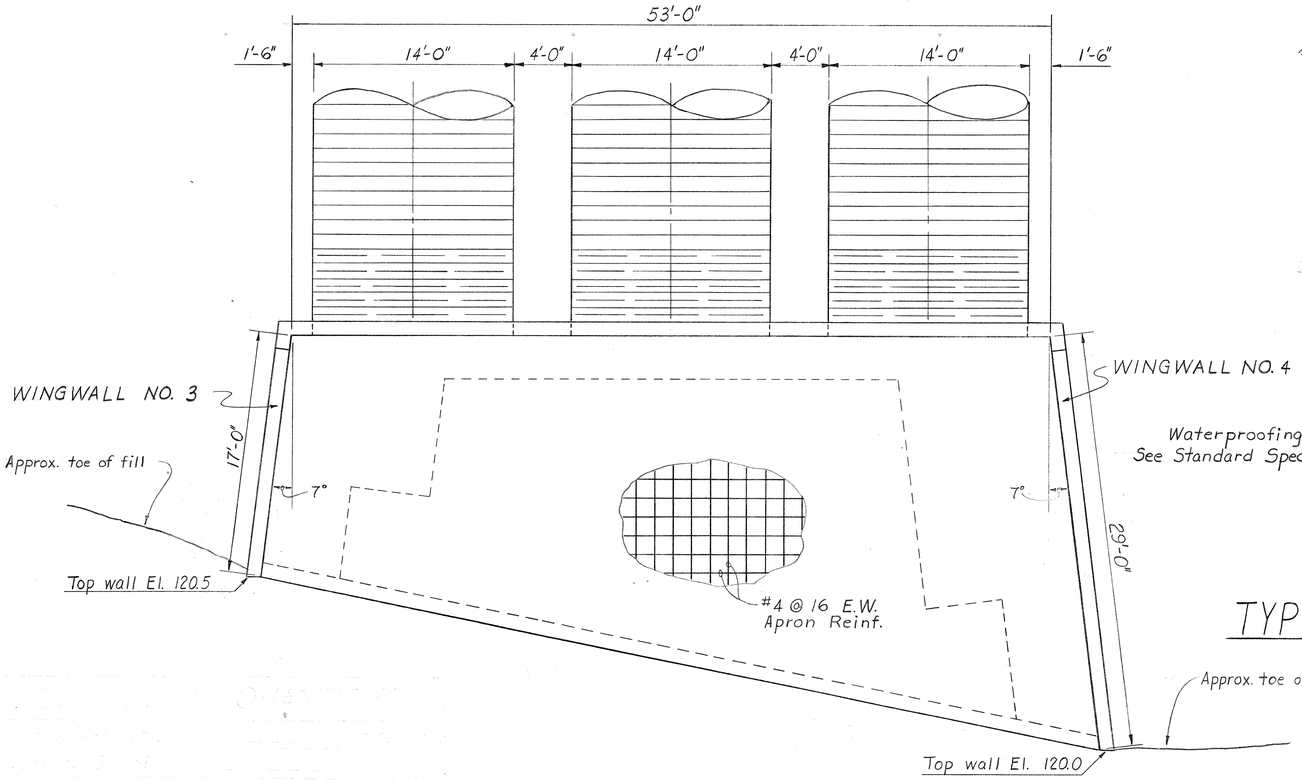
Scale: As Shown Date: Sept., 1966

SHEET No. D-8 OF 10 SHEETS

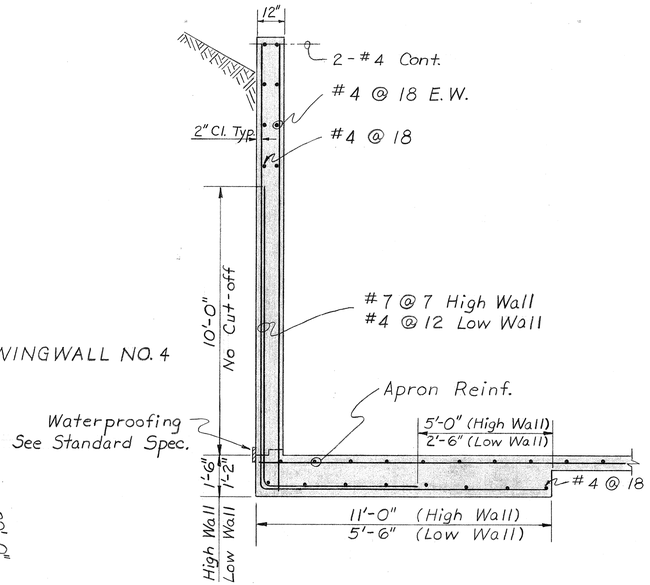
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	"
	TRACED BY	"
NOTE BOOK	DESIGNED BY	"
No.	QUANTITIES BY	"
	CHECKED BY	"

PRINTED ON NO. 1000H CLEARPRINT

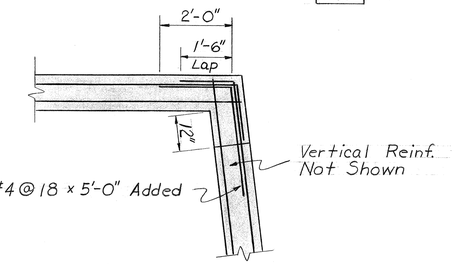
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(32)5 UNIT 1	1966	24	73



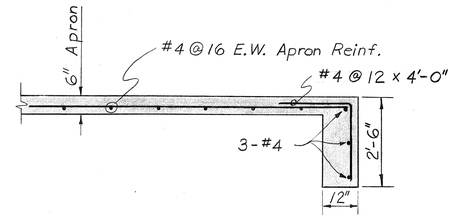
OUTLET PLAN
Scale 1" = 5'-0"



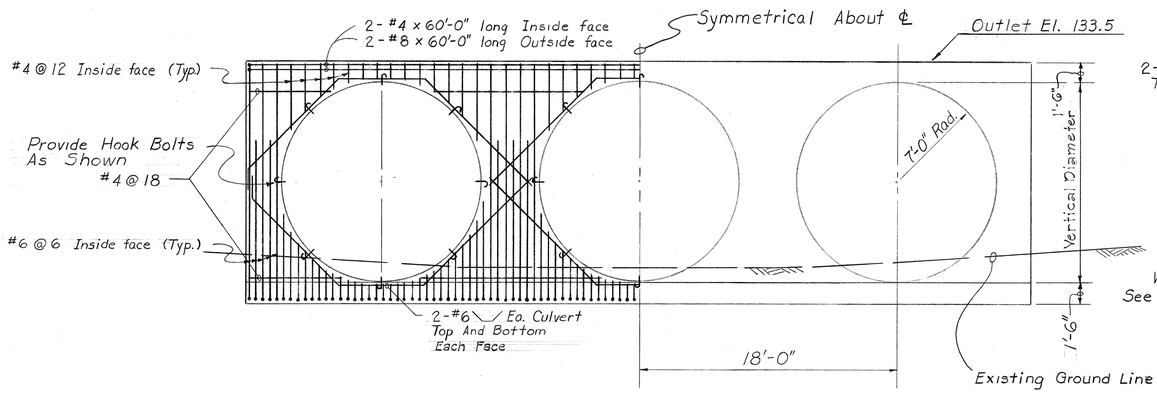
TYPICAL WINGWALL SECTION
No Scale



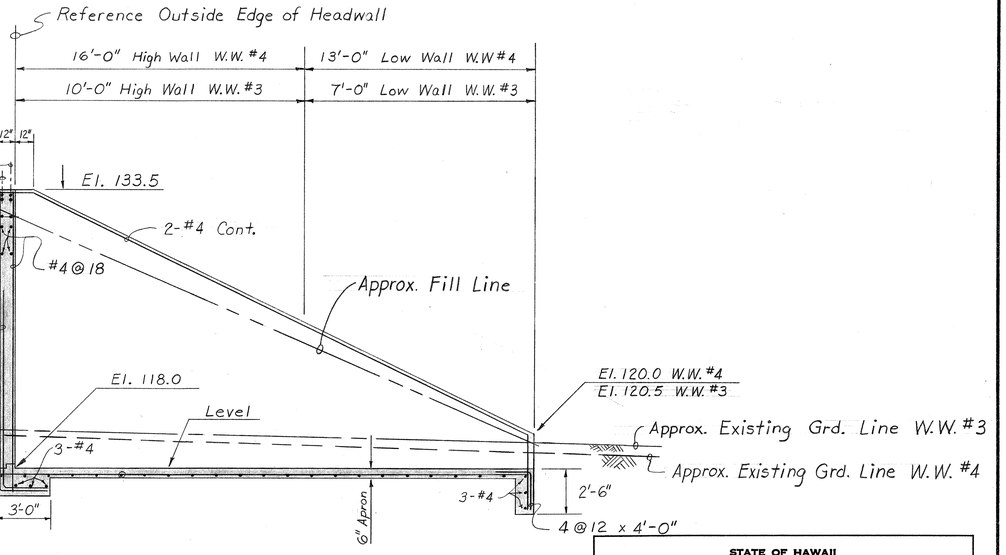
TYPICAL CORNER REINF. DETAIL AT HEADWALL
Scale ½" = 1'-0"



TYPICAL APRON CUT-OFF SECT.
Scale ½" = 1'-0"



OUTLET HEADWALL ELEVATION
Scale 1" = 5'-0"



ELEVATION ~ WINGWALL NO. 3 & 4
Scale ¼" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE STRUCTURE DETAILS
TRIPLE 168" SECTIONAL PLATE PIPE CULVERTS @ ℄ STA. 350+80

INTERSTATE ROUTE H-1
PROJ. No. I-HI-1(32):5, UNIT 1

Scale: As Shown Date: Sept. 1966

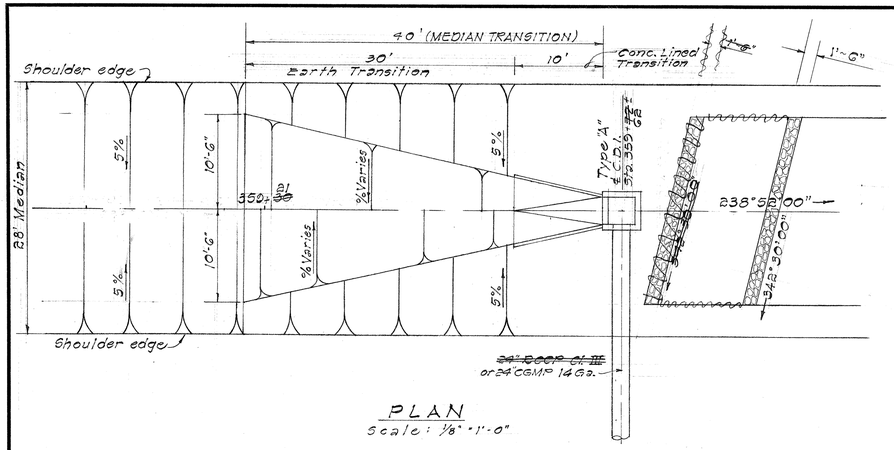
SHEET No. D-9 OF 10 SHEETS

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

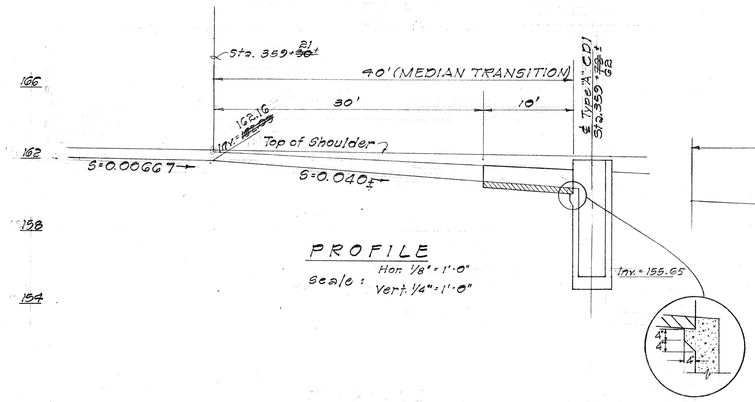
PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(32):5 UNIT 1	1966	25	73

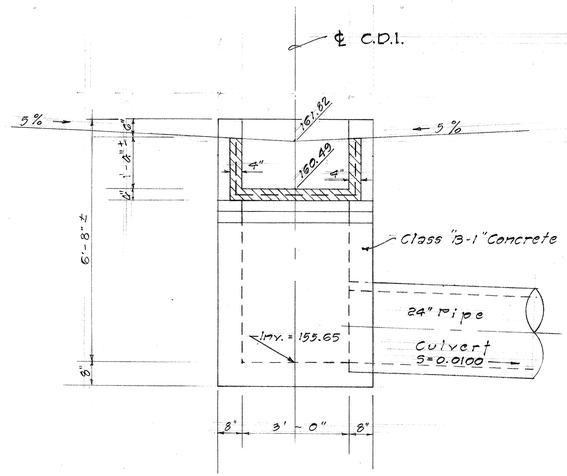
Revised: Jan. 24, 1967



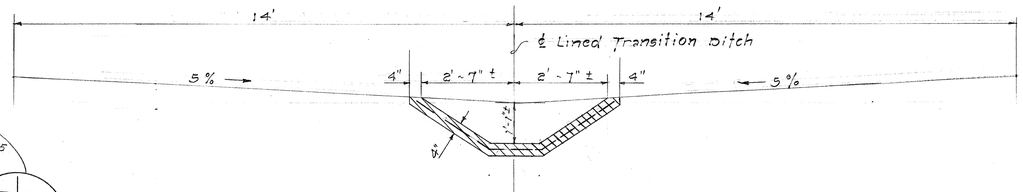
PLAN
Scale: 1/8" = 1'-0"



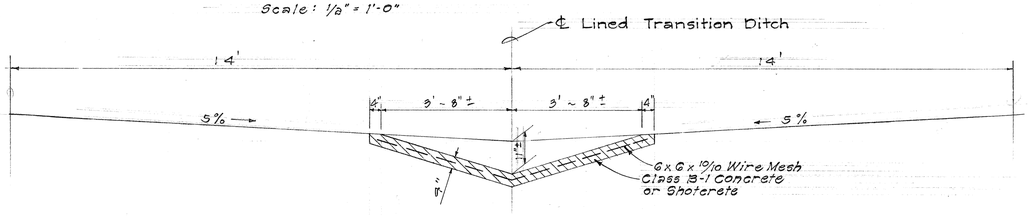
PROFILE
Scale: Hor. 1/8" = 1'-0"
Vert. 1/4" = 1'-0"



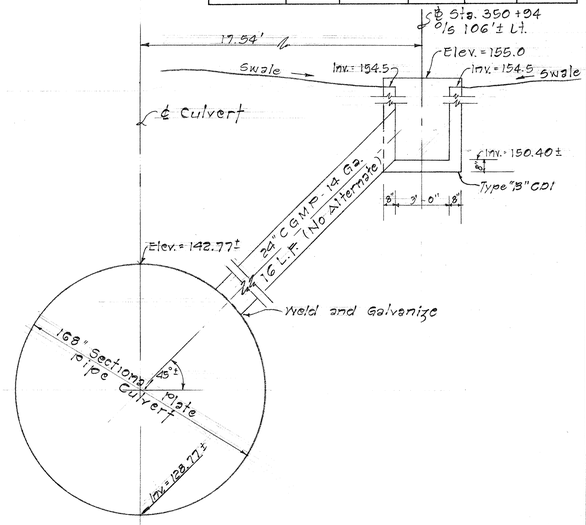
SECTION A-A
Scale: 1/2" = 1'-0"



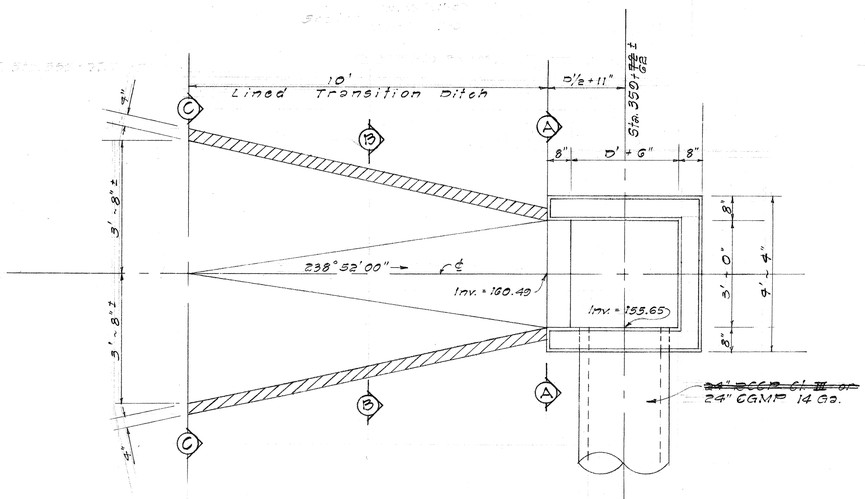
SECTION B-B
Scale: 1/2" = 1'-0"



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



CONNECTION DETAIL OF C.D.I. @ STA. 350+94± TO 168" SECTIONAL PLATE PIPE CULVERT
Not to Scale



DETAILED PLAN VIEW CONCRETE LINED TRANSITION
Scale: 1/2" = 1'-0"

MEDIAN DRAIN AT ℄ STA 350+~~72~~ 62 ±

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

THIS SHEET SUPERSEDES SHEET NO. 60

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
CDI @ STA. 350+94± & STA. 359+~~72~~ 62 ±

INTERSTATE ROUTE H-1
PROJ. No. I-HI-1(32):5, UNIT 1

Scale: As Shown Date: Sept., 1966

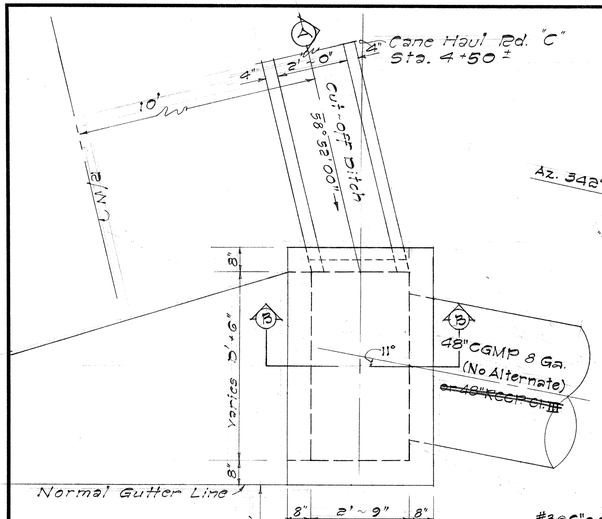
SHEET No. D-10 OF 10 SHEETS

PRINTED ON NO. 1000H CLEARPRINT

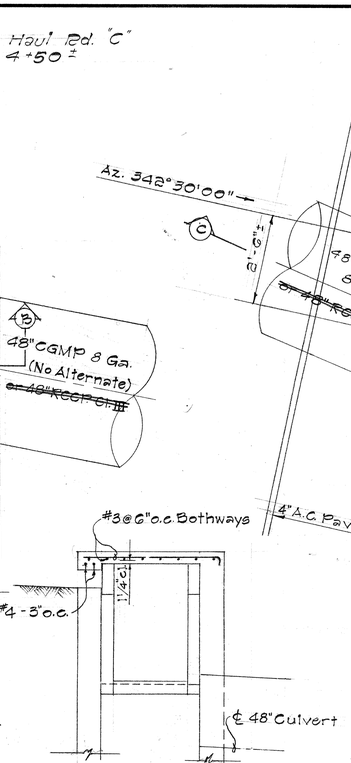
C. O. 25

C. O. 60

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(32):5 UNIT 1	1966	26	73

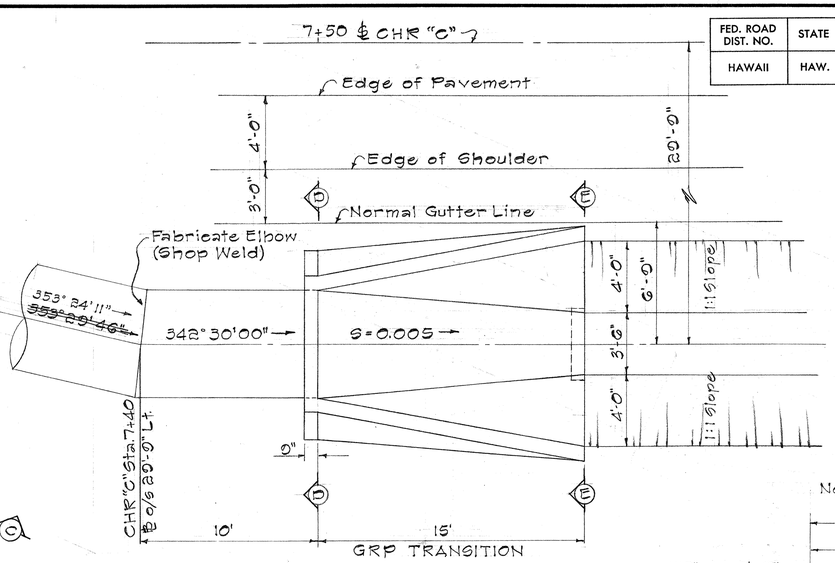


PLAN
Scale: ½"=1'-0"

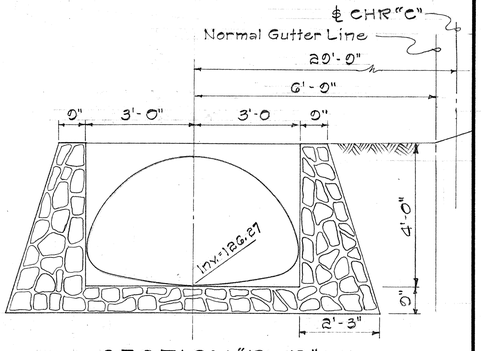


SECTION "B-B"
Scale: ½"=1'-0"

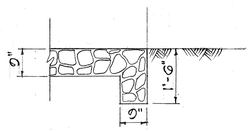
PLAN
Scale: ½"=1'-0"



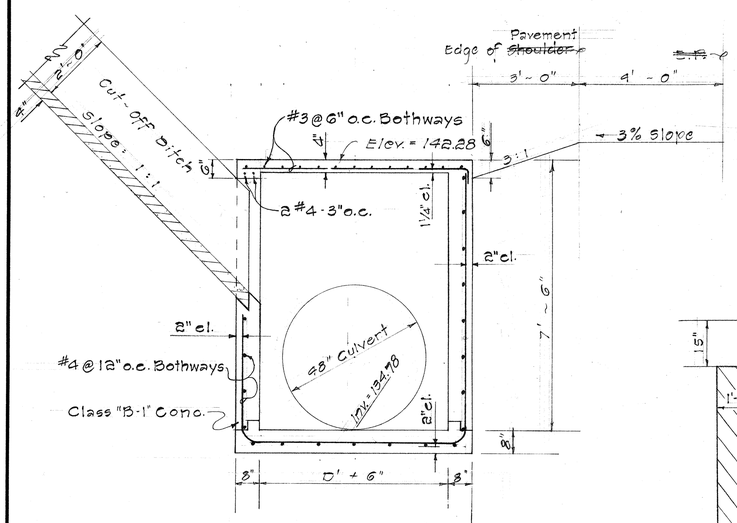
PLAN
Scale: ¼"=1'-0"



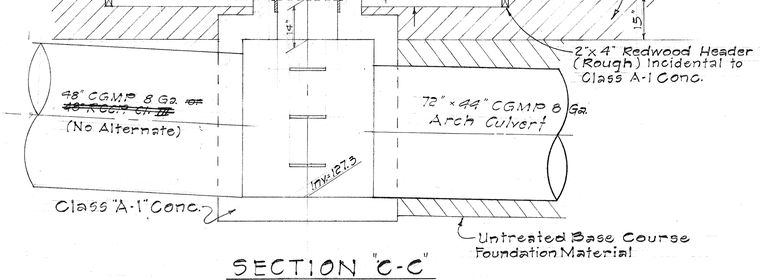
SECTION "D-D"
Scale: ½"=1'-0"



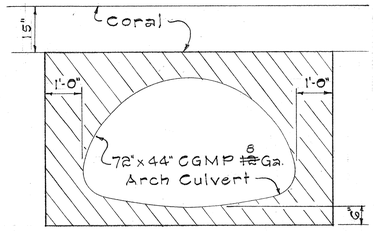
SECTION "F-F"
Scale: ½"=1'-0"



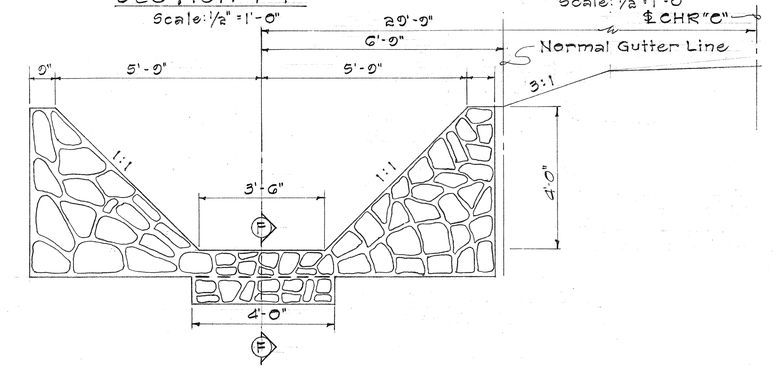
SECTION "A-A"
Scale: ½"=1'-0"



SECTION "C-C"
Scale: ½"=1'-0"



TYPICAL SECTION UNTREATED BASE COURSE FOUNDATION MATERIAL
Scale: ½"=1'-0"



SECTION "E-E"
Scale: ½"=1'-0"

DETAIL of CDI @ CHR "C" Sta. 4+50 ± Lt.

DETAIL OF GRP TRANSITION DITCH @ CHR "C" STA 7+50 ±

DETAIL OF SDMH @ CHR "C" STA. 6+00 ±

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 STRUCTURES
DETAILS CANE HAUL RD. "C"

INTERSTATE ROUTE H-1
PROJ. No. I-HI-1(32):5, UNIT 1

Scale: As Shown Sept. 1966

SHEET No. 10-11 OF 10 SHEETS

PRINTED ON NO. 1000H CLEARPRINT

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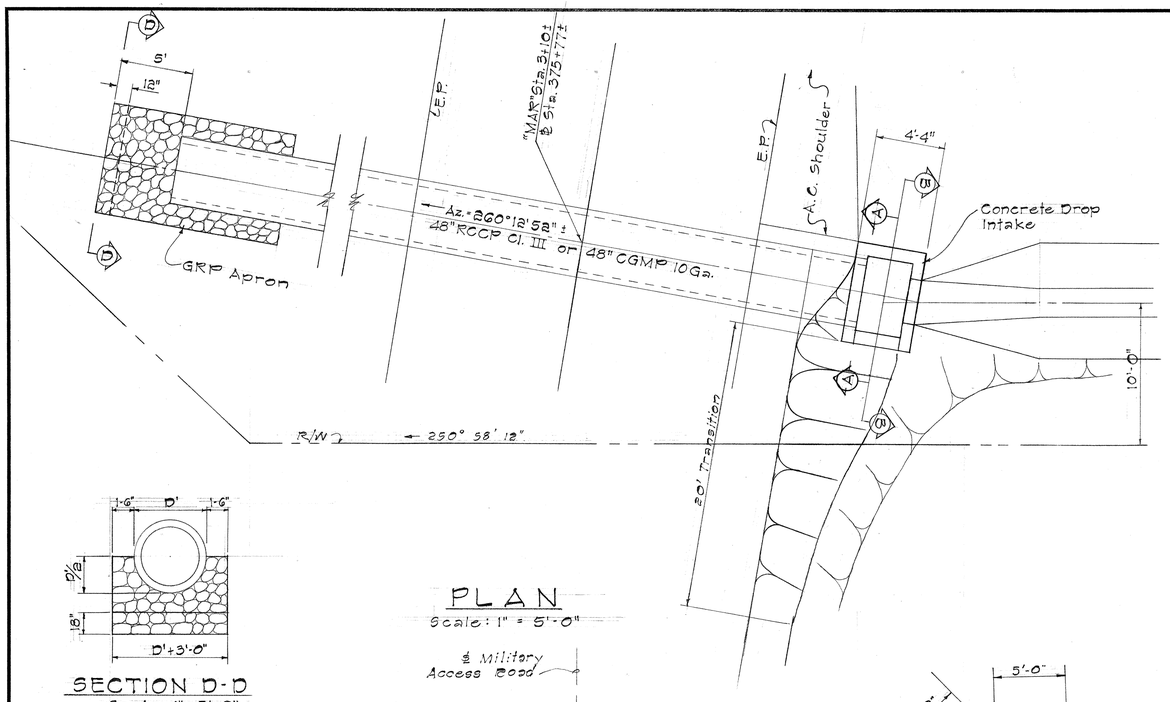
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(32):5 UNIT 1	1966	27	73

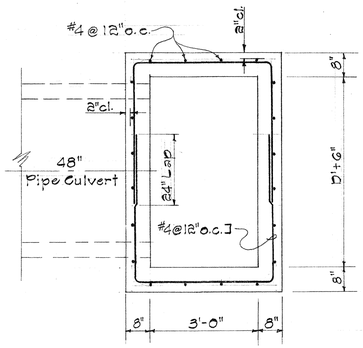


PLAN

Scale: 1" = 5'-0"

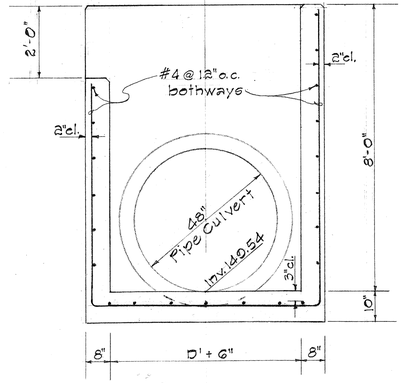
SECTION D-D

Scale: 1" = 5'-0"



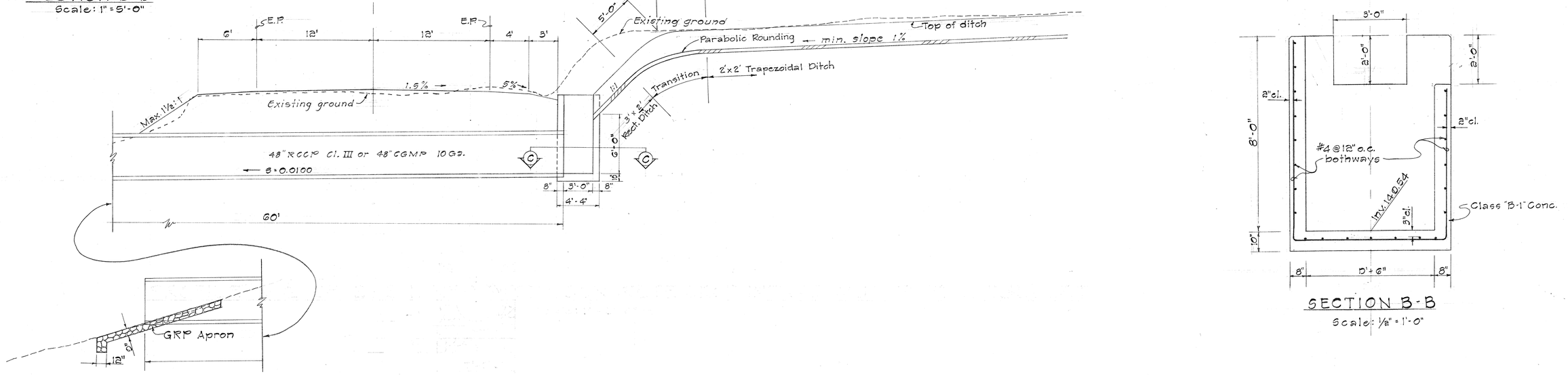
SECTION C-C

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



SECTION A-A

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



PROFILE AT ℄ OF 2x2 LINED DITCH, CONCRETE DROP INTAKE AND 48" PIPE CULVERT

Scale: 1" = 5'-0"

SECTION B-B

Scale: 1/2" = 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

CULVERT CROSSING @ MAR STA. 3+10 ±

INTERSTATE ROUTE H-1
PROJ. No. I-HI-1(32):5, UNIT 1

Scale: As Shown Date: Sept. 1966

SHEET No. D-12 OF 19 SHEETS

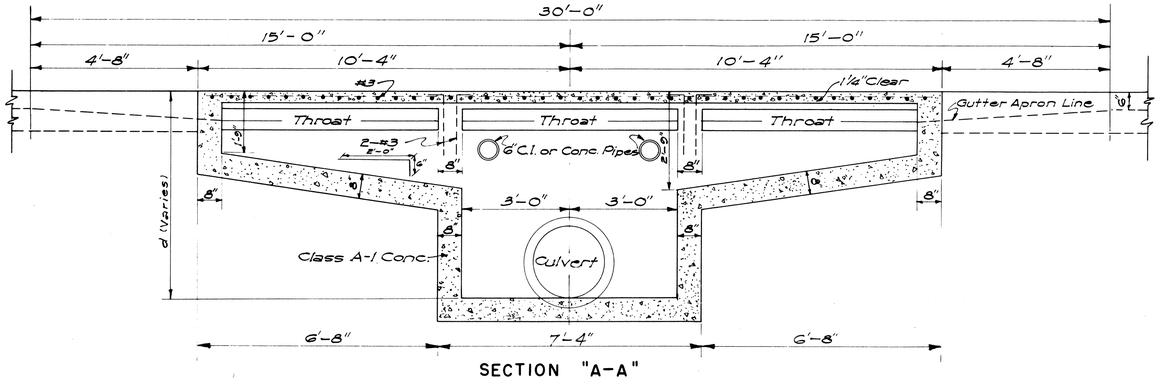
27

62

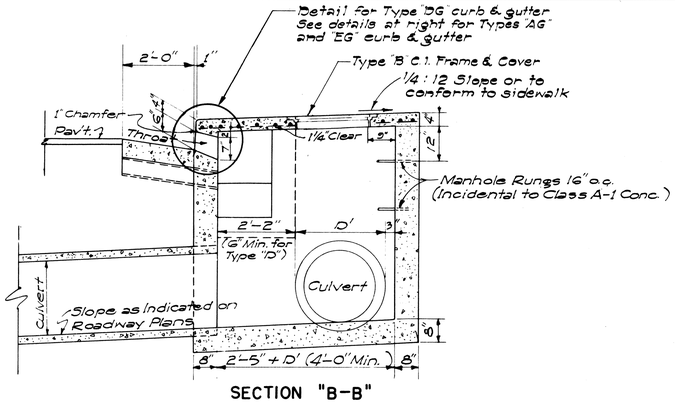
2/17/59

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(32)5	1966	28	73

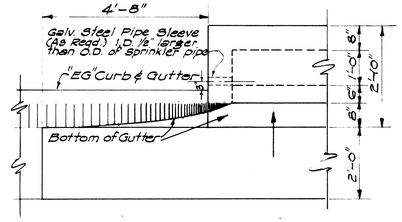
UNIT 1



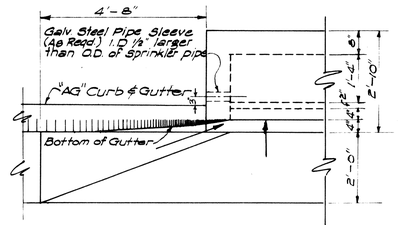
SECTION "A-A"



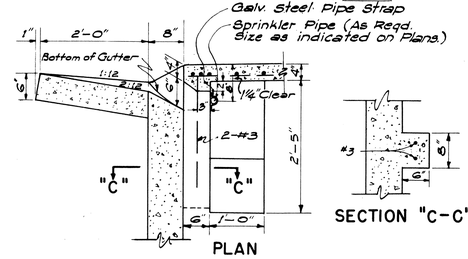
SECTION "B-B"



DETAIL OF CATCH BASIN
WITH TYPE "EG" CURB & GUTTER



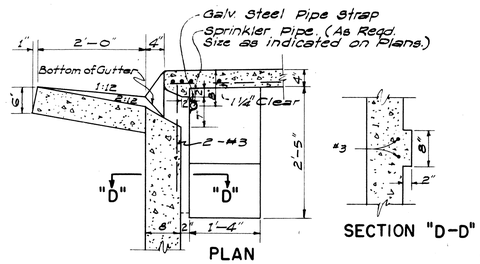
DETAIL OF CATCH BASIN
WITH TYPE "AG" CURB & GUTTER
SCALE: 1/2" = 1'-0"



PLAN

SECTION "C-C"

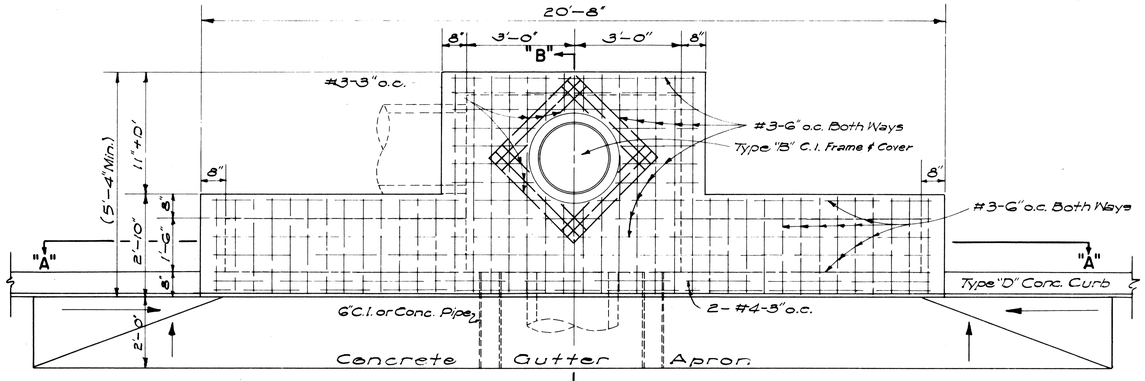
THROAT DETAIL FOR
TYPE "EG" CURB & GUTTER
SCALE: 3/4" = 1'-0"



PLAN

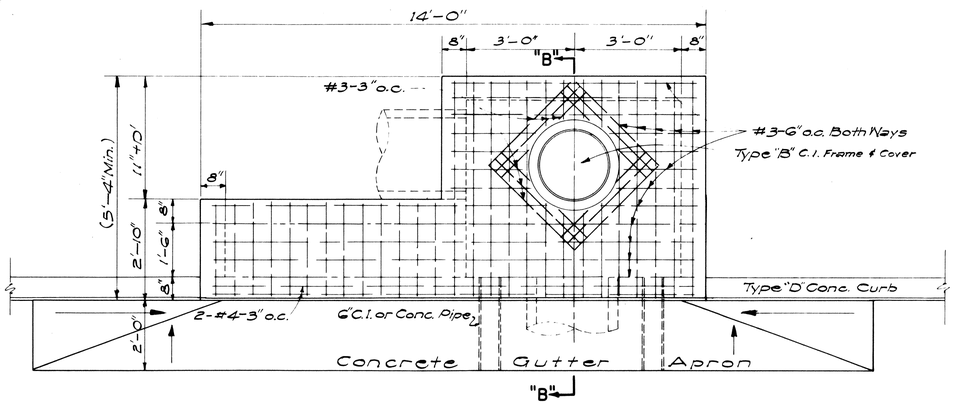
SECTION "D-D"

THROAT DETAIL FOR
TYPE "AG" CURB & GUTTER
SCALE: 3/4" = 1'-0"

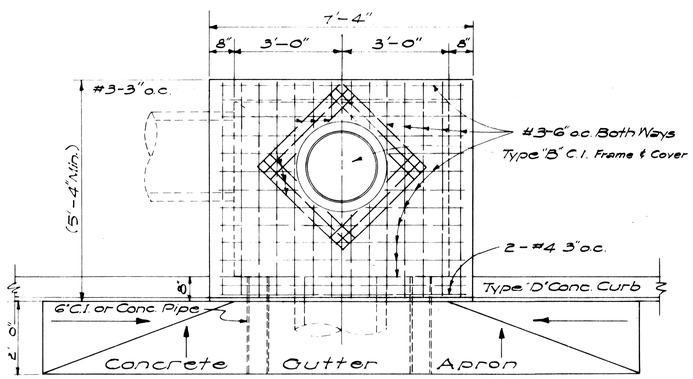


PLAN

DETAIL OF TYPE "A" CATCH BASIN
SCALE: 1/2" = 1'-0"



DETAIL OF TYPE "B" CATCH BASIN
SCALE: 1/2" = 1'-0"
NOTE: TYPE "C" C.B. SIMILAR BUT OPPOSITE HAND



DETAIL OF TYPE "D" CATCH BASIN
SCALE: 1/2" = 1'-0"

ESTIMATED QUANTITIES

Type	Class A-1 Conc.	Struct. Exc.	Reinf. Steel	Gutter Length
"A"	7.5 c.y.	24.7 c.y.	145 lb.	30'-0"
"B"	6.0 c.y.	21.5 c.y.	108 lb.	23'-4"
"C"	6.0 c.y.	21.5 c.y.	108 lb.	23'-4"
"D"	4.9 c.y.	16.5 c.y.	77 lb.	16'-8"

NOTES:

1. Quantities based on d = 5.75' and D' = 30"
2. Quantities do not include concrete for Gutter Apron.
3. The Contractor shall install two 6" Cast Iron or Concrete Pipes as incidental to Class A-1 Concrete for Construction Drainage.
4. Culvert shall leave C.B from any position and any direction indicated by plans or ordered by the Engineer. Culvert may both enter and leave C.B. so that C.B. will also act as Manhole.
5. The Contractor shall install Galvanized Steel Pipe Sleeves and Straps as incidental to Sprinkler System.

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

APPROVED: ..... DATE Aug. 20, 1959
STATE HIGHWAY ENGINEER

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
CATCH BASINS

SCALES AS NOTED

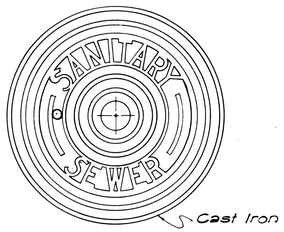
SHEET NO D-13 OF 19 SHEETS

25 63

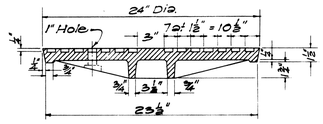
2/17/59
8/12/59

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1021(9)	1966	29	73

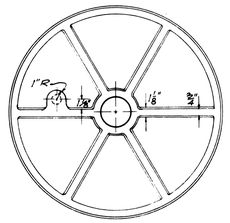
August 1957 UNIT 1



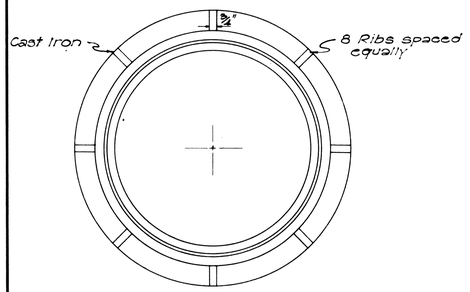
TOP VIEW OF COVER



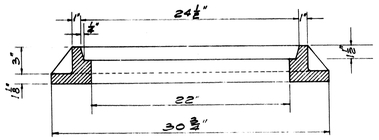
SECTION



BOTTOM VIEW OF COVER



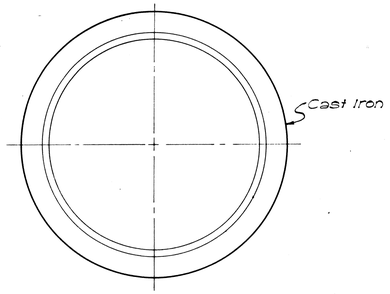
PLAN OF RIM



SECTION OF RIM

DETAILS OF TYPE "S" CAST IRON FRAME AND COVER

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



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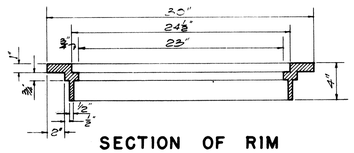
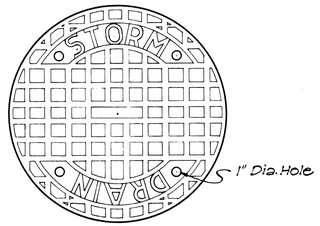
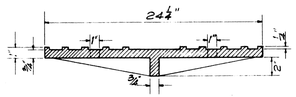


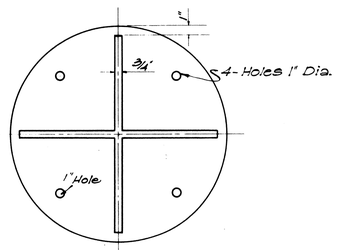
SECTION OF RIM



TOP VIEW OF COVER



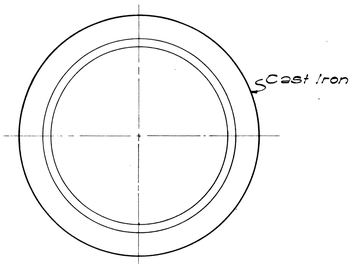
SECTION



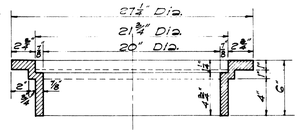
BOTTOM VIEW OF COVER

DETAILS OF TYPE "B" CAST IRON FRAME AND COVER

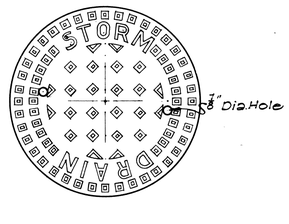
SCALE: 1-1/2" = 1'-0"



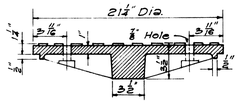
PLAN OF RIM



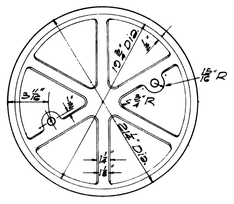
SECTION OF RIM



TOP VIEW OF COVER



SECTION

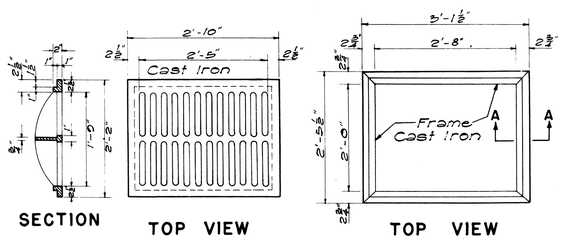


BOTTOM VIEW OF COVER

DETAILS OF TYPE "A" CAST IRON FRAME AND COVER

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

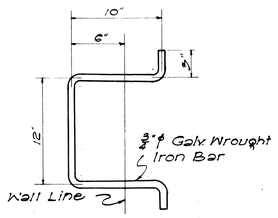
NOTE: Stock Pattern From Novelty Foundry ~ Honolulu



SECTION TOP VIEW TOP VIEW

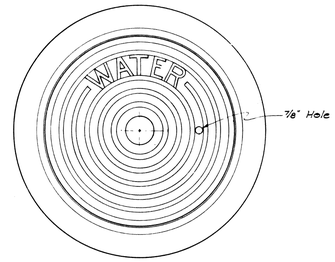
TYPE C C.I. FRAME AND GRATING

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

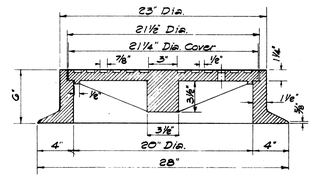


MANHOLE RUNG

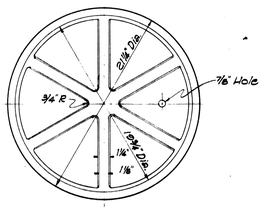
SCALE: 1-1/2" = 1'-0"



PLAN OF FRAME AND COVER



SECTION OF FRAME AND COVER



BOTTOM VIEW OF COVER

DETAILS OF TYPE "W" CAST IRON FRAME AND COVER

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

NOTE:

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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

CATCH BASIN AND MANHOLE CASTINGS

SCALES AS NOTED

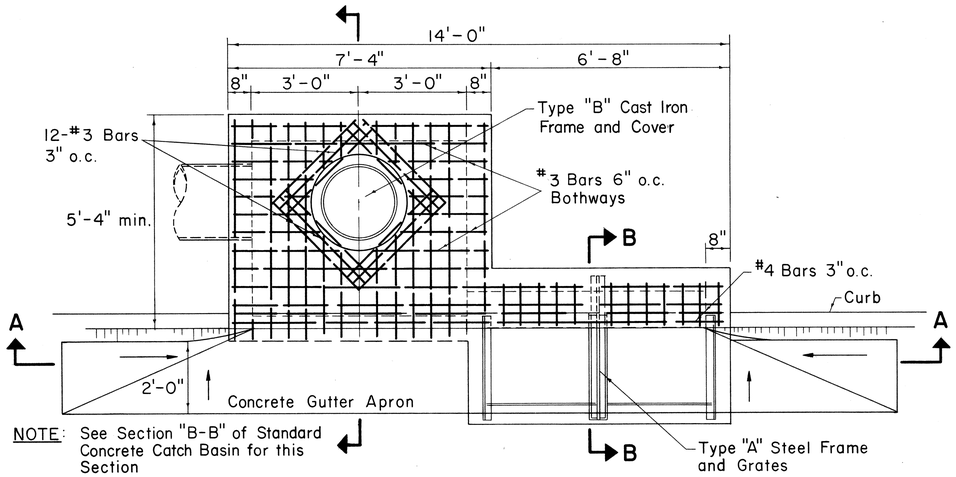
SHEET Nº 10-14 OF 10 SHEETS

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

29

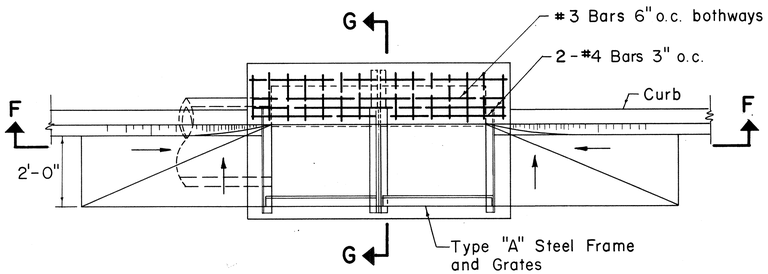
64

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(32)5 UNIT 1	1966	30	73

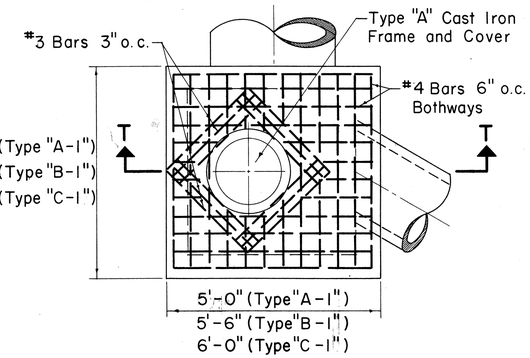


NOTE: See Section "B-B" of Standard Concrete Catch Basin for this Section

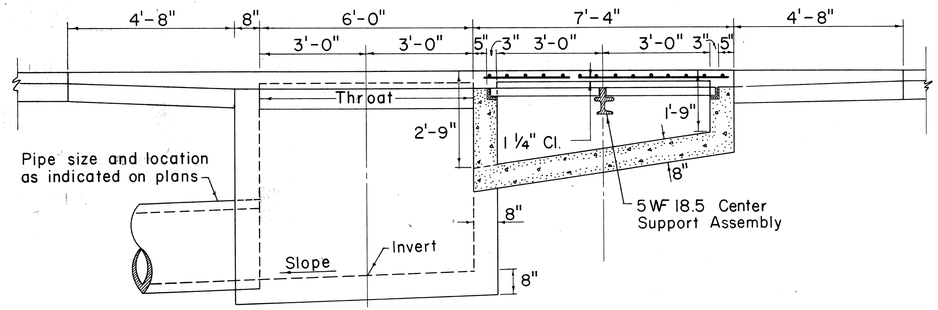
PLAN



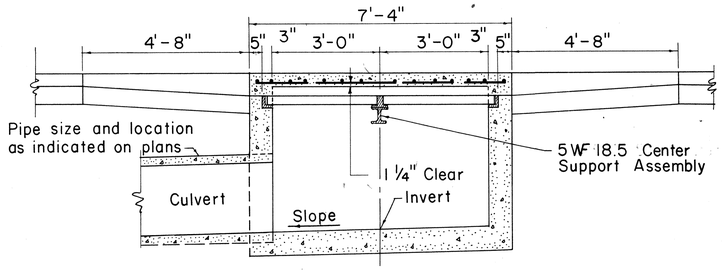
PLAN



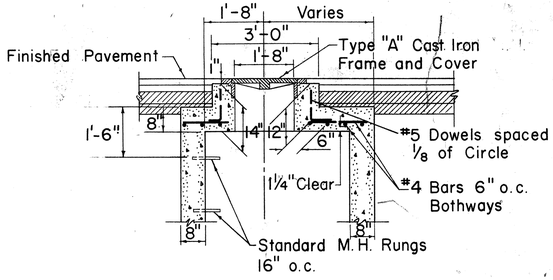
PLAN



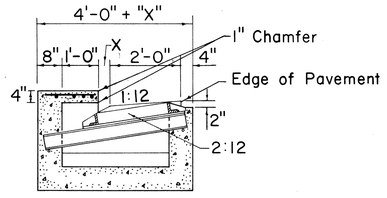
SECTION A-A



SECTION F-F

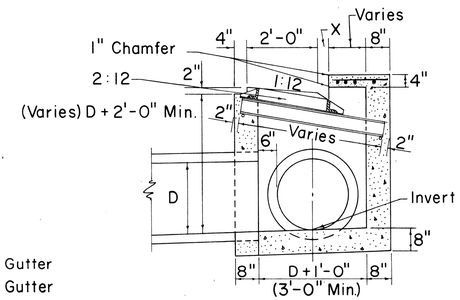


SECTION T-T



SECTION B-B

NOTE:
X = 4" For Type "AG" Curb and Gutter
X = 9" For Type "EG" Curb and Gutter
X = 1" For Type "DG" Curb and Gutter



SECTION G-G

TYPE "A-1", "B-1", & "C-1" STORM DRAIN MANHOLE

TOP DETAIL UNDER PAVEMENT

(BOTTOM DETAIL SIMILAR TO TYPE "A", "B", & "C")

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

DETAIL OF TYPE "CG" CATCH BASIN

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

DETAIL OF TYPE "DG" CATCH BASIN

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

APPROVED:

DIRECTOR OF TRANSPORTATION DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

CATCH BASINS AND STORM DRAIN MANHOLES

Scales: As Noted Date

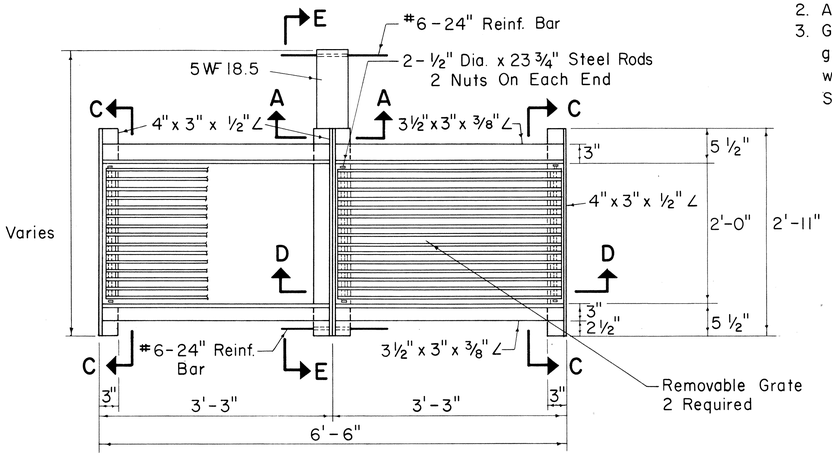
SHEET NO. D-15 OF 10 SHEETS

30

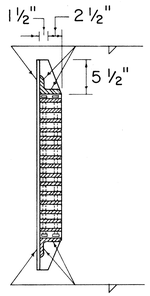
65

FED. AID DIST. NO.	STATE	FED. AID. PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(32)5 UNIT 1	1966	31	73

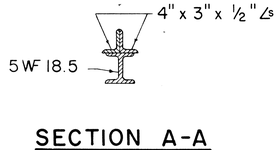
NOTE:
1. All welds 3/8" unless otherwise noted.
2. All steel shall be structural grade.
3. Grates and Frame shall be hot dip galvanized after fabrication in accordance with Section 44(H) of the Standard Specifications.



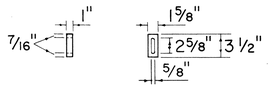
PLAN



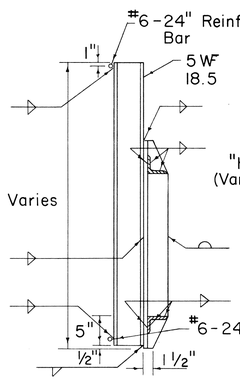
SECTION C-C



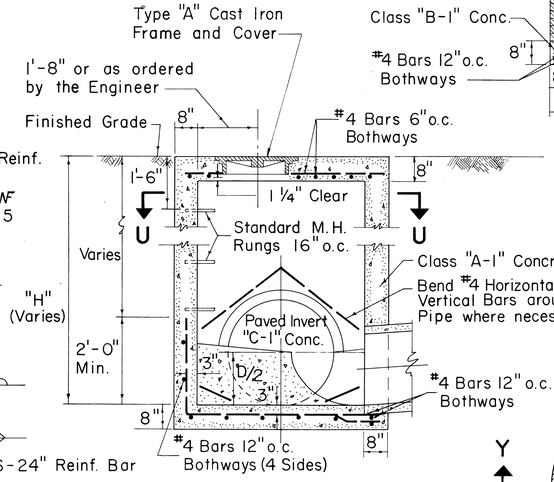
SECTION A-A



END SPACER



SECTION E-E



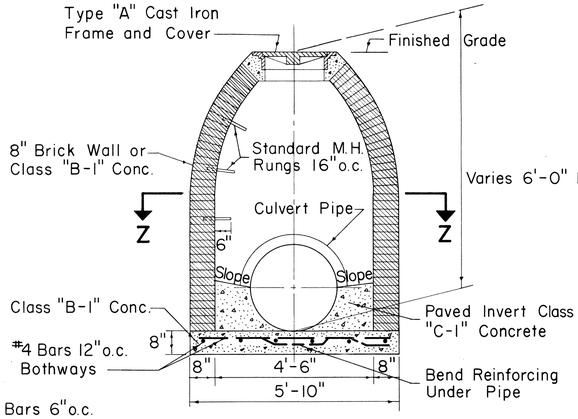
SECTION V-V

SECTION U-U

TYPE "A", "B", & "C"

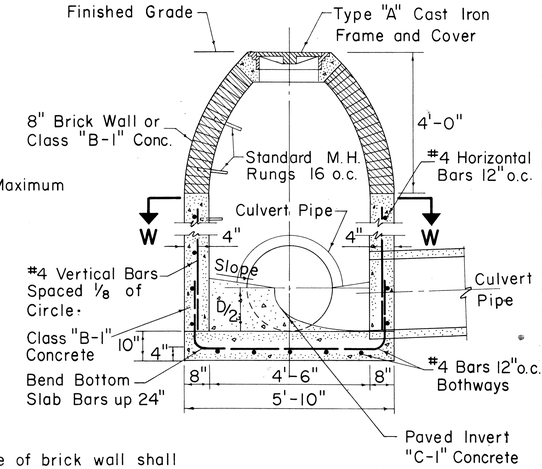
S.D.M.H.

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

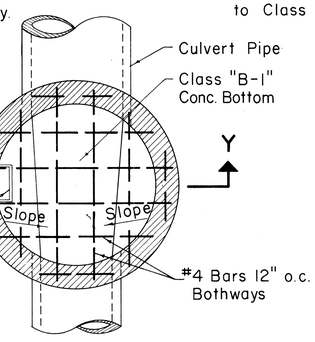


SECTION Y-Y

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



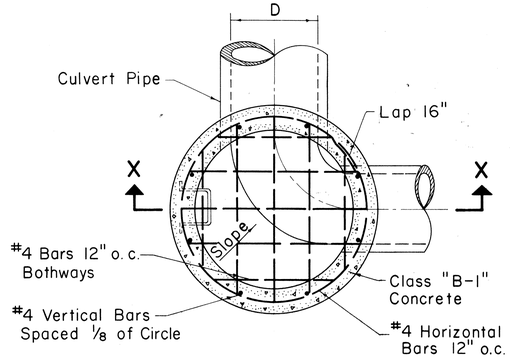
SECTION X-X



SECTION Z-Z

TYPE "D" STORM DRAIN MANHOLE

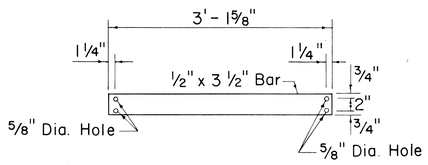
Scale: 1/2"= 1'-0"



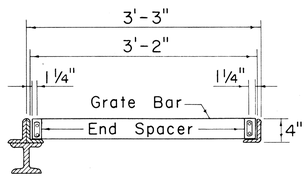
SECTION W-W

TYPE "E" STORM DRAIN MANHOLE

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



GRATE BARS



SECTION D-D

DETAIL OF TYPE "A" STEEL FRAME AND GRATES

Scale: 1"= 1'-0"

APPROVED:

DIRECTOR OF TRANSPORTATION DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

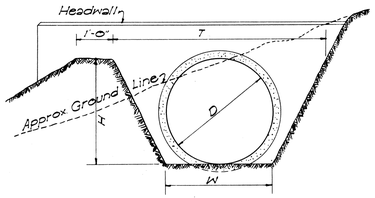
STEEL FRAME AND GRATES AND STORM DRAIN MANHOLES

Scales: As Noted Date

SHEET NO. D-16 OF 19 SHEETS

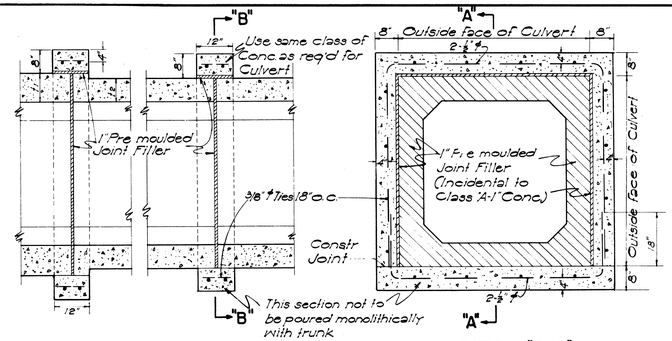
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(32)5	1966	32	73
Revised June, 1965		UNIT 1			

DATA FOR OUTLET DITCH			
D	W	H	T=W+H
18"	24"	2'-0"	4'-0"
24"	30"	2'-0"	4'-6"
30"	30"	2'-6"	5'-0"
36"	36"	3'-0"	6'-0"



DETAIL OF OUTLET DITCH

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



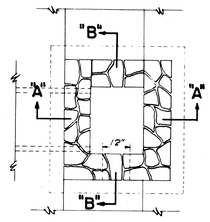
SECTION "A-A" SECTION "B-B"

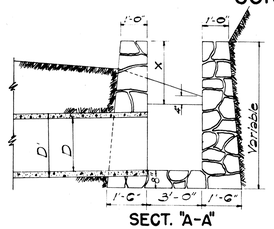
CONC. COLLAR FOR CONC. BOX CULVERT

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

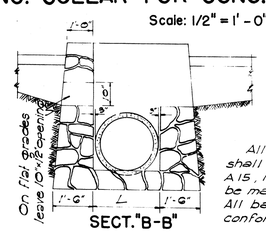
DATA FOR MASONRY DROP INTAKE				Where Variables Equal
D'	D	L=D'+6"	Cu Yds.	
23"	18"	2'-5"	3.02	4'-6"
30"	24"	3'-0"	3.61	5'-0"
37"	30"	3'-7"	4.21	5'-6"
44"	36"	4'-2"	4.85	6'-0"

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





SECT. "A-A"



SECT. "B-B"

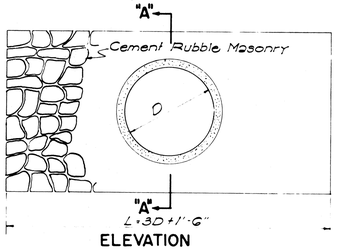
REINFORCING BARS

All reinforcing bars for concrete shall be Billet Steel bars, ASTM A15, intermediate grade. Steel shall be made by the open-hearth process. All bars shall be deformed type conforming to ASTM A-305.

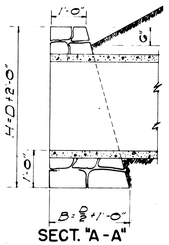
DETAIL OF MASONRY DROP INTAKE

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

DATA-MASONRY HEADWALL				Cast-in-Place Conc. Culv't	Conc. Pipe Culvert	Corrugated Pipe Culv't
D	H	B	L	Cu Yds.	Cu Yds.	Cu Yds.
18"	3'-6"	1'-0"	6'-0"	0.85	0.95	0.93
24"	4'-0"	2'-0"	7'-6"	1.28	1.45	1.41
30"	4'-6"	2'-3"	9'-0"	1.83	2.06	2.00
36"	5'-0"	2'-6"	10'-6"	2.40	2.84	2.72



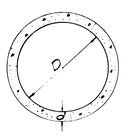
ELEVATION



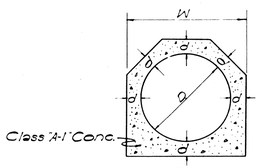
SECT. "A-A"

DETAIL OF MASONRY HEADWALL

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



SECTION



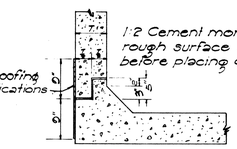
SECTION

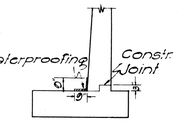
CONC. PIPE CULVERT

NOTE:
Thickness 'd', reinforcing and Concrete used are to conform with the approved design as provided by the Specifications.

DATA- CAST-IN-PLACE CONC. CULV'T			
D	d	W	Cu Yd per Ft.
18"	4"	2'-2"	0.11
24"	4½"	2'-9"	0.14
30"	5"	3'-4"	0.19
36"	5½"	3'-11"	0.26

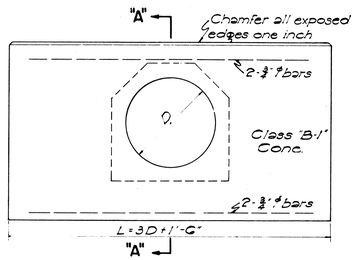
CAST-IN-PLACE CONC. CULVERT



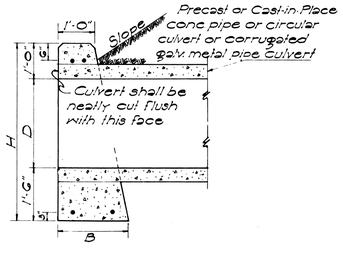


NOTE: Construction joints may only be used where indicated by the plans or permitted in writing by the Engineer

CONSTR. JOINT DETAILS



ELEVATION

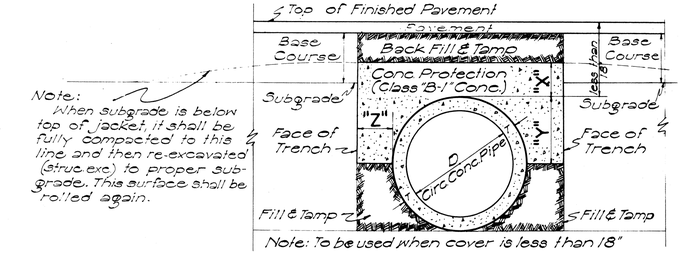


SECTION "A-A"

DATA FOR CONC. HEADWALL				Cast-in-Place Conc. Culvert	Conc. Pipe Culvert	Steel For One Headwall			
D	B	L	H	Cu Yd.	Cu Yd.	No of Bars	Size	Length	Lbs.
18"	1'-6"	6'-0"	4'-0"	0.92	1.00	4	¾" ϕ	5'-6"	33
24"	1'-6"	7'-6"	4'-6"	1.23	1.38	4	¾" ϕ	7'-0"	42
30"	2'-0"	9'-0"	5'-0"	1.65	2.17	4	¾" ϕ	8'-6"	51
36"	2'-0"	10'-6"	5'-6"	2.45	2.74	4	¾" ϕ	10'-0"	60
42"	2'-6"	12'-0"	6'-0"		3.87	4	¾" ϕ	11'-6"	69
48"	2'-6"	13'-6"	6'-6"		4.66	4	¾" ϕ	13'-0"	78

DETAIL OF CONCRETE HEADWALL

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



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"

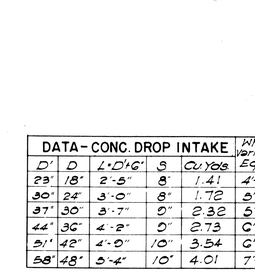
DATA FOR CONCRETE PROTECTION OVER CULVERTS		
X	Y	Z
6" for 18" D	D/2 + T	Z must be from pipe to face of trench
7" " 24" D		
8" " 30" D		Minimum = X
9" " 36" D		
10" " 42" D		Maximum pay quantity will be Z = 12"
11" " 48" D		
12" " 54" D		

SECT. OF CULVERT WITH CONC. PROTECTION

Scale: 1" = 1'-0"

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

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

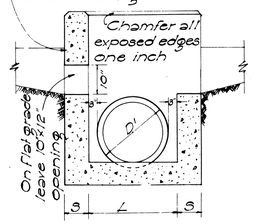


Where drainage comes from both sides lower this wall to same elevation as shown for opposite wall.

PLAN

Note: This type of structure shall also be used for the Drop Intakes of Syphons connected with Irrigation Ditches or Flumes with appropriate changes to dimensions.

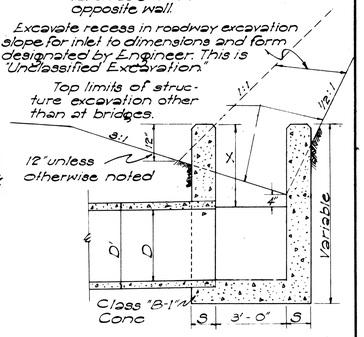
In this case all joints must be made water tight.



SECTION "B-B"

Excavate recess in roadway excavation slope for inlet to dimensions and form designated by Engineer. This is "Unclassified Excavation"

Top limits of structure excavation other than at bridges.



SECTION "A-A"

DETAIL OF CONCRETE DROP INTAKE

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

DROP INTAKES, RETAINING WALLS, HEADWALLS, CONSTRUCTION JOINTS

SCALES AS NOTED

SHEET Nº 047 OF 10 SHEETS

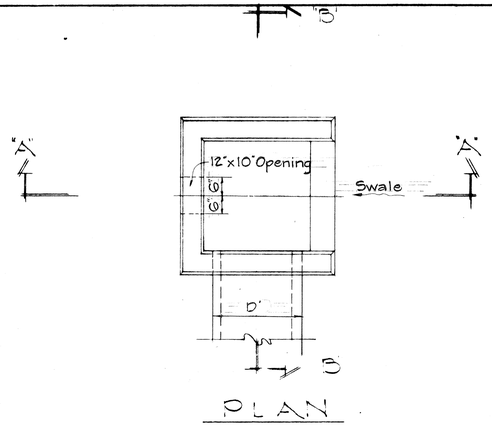
32

67

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(32)5	1966	33	73

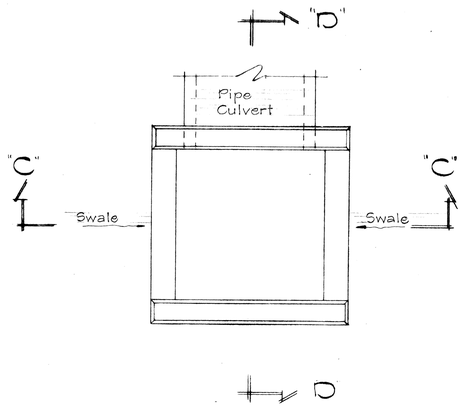
UNIT 1

Revised: Jan. 24, 1967

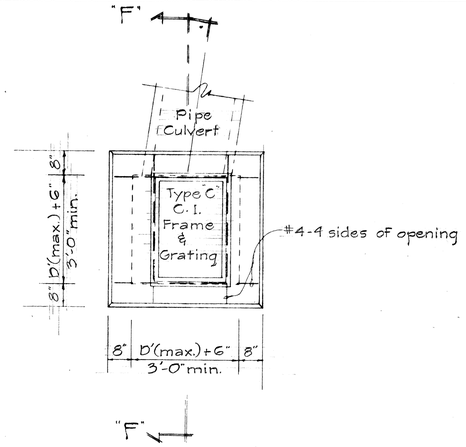


PLAN

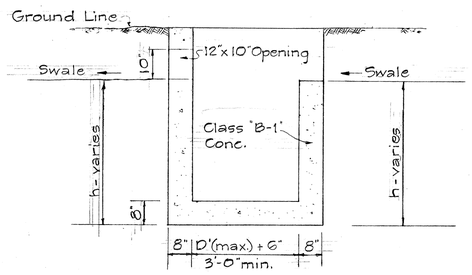
NOTE: 12"x10" opening not required when C.D.I. is located at termination of swale.



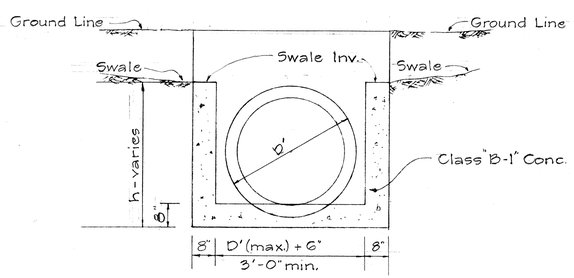
PLAN



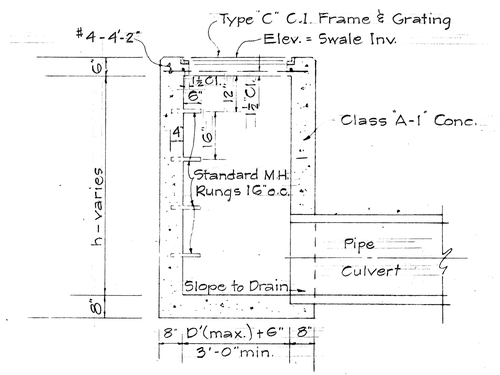
PLAN



SECTION "A-A"



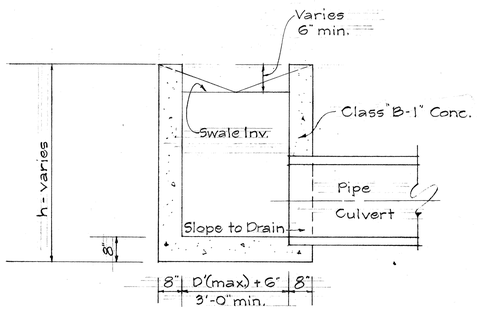
SECTION "C-C"



SECTION "F-F"

TYPE "C" GRATED CONCRETE DROP INTAKE

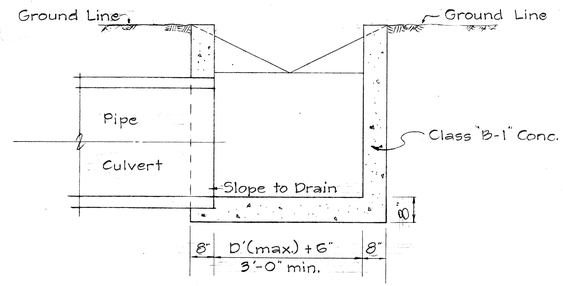
SCALE: ½" = 1'-0"



SECTION "B-B"

TYPE "A" CONCRETE DROP INTAKE

SCALE: ½" = 1'-0"



SECTION "D-D"

TYPE "B" CONCRETE DROP INTAKE

SCALE: ½" = 1'-0"

NOTES:

1. See Plans for alignment & inverts of all culverts, ditches and swales entering C.D.I.
2. Exposed edges above the ground line of Concrete Drop Intakes shall be chamfered one (1) inch.
3. Swales and Ditches shall have a ten (10) feet transition into C.D.I.
4. Standard Manhole Rungs @ 16" o.c. shall be provided for structures having "h" greater than 3'-0" and shall be incidental to class A-1 or B-1 Concrete.
5. Location of Standard Manhole Rungs to be determined by the Engineer.

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAILS OF
CONCRETE DROP INTAKE TYPE "A", "B", & "C"

INTERSTATE ROUTE H-1
PROJ. No. I-HI-1(32):5, UNIT 1

Scale: As Shown Date: Sept. 1965

SHEET No. 0-8 OF 19 SHEETS

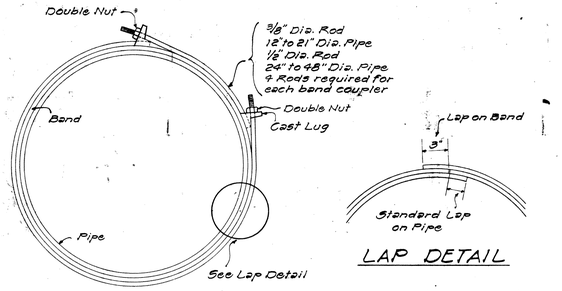
THIS SHEET SUPERSEDES SHEET NO. 68

C. O. 33

C. O. 65

PRINTED ON CLEARPRINT 1000-H

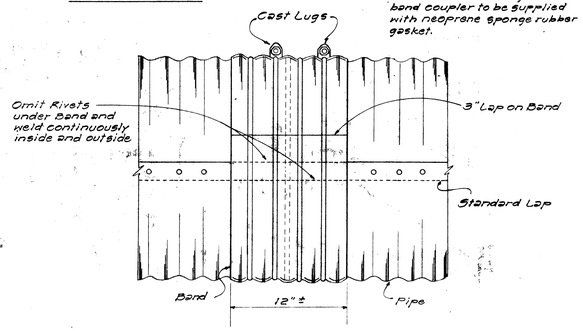
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(32)5 UNIT 1	1966	34	73



END VIEW

LAP DETAIL

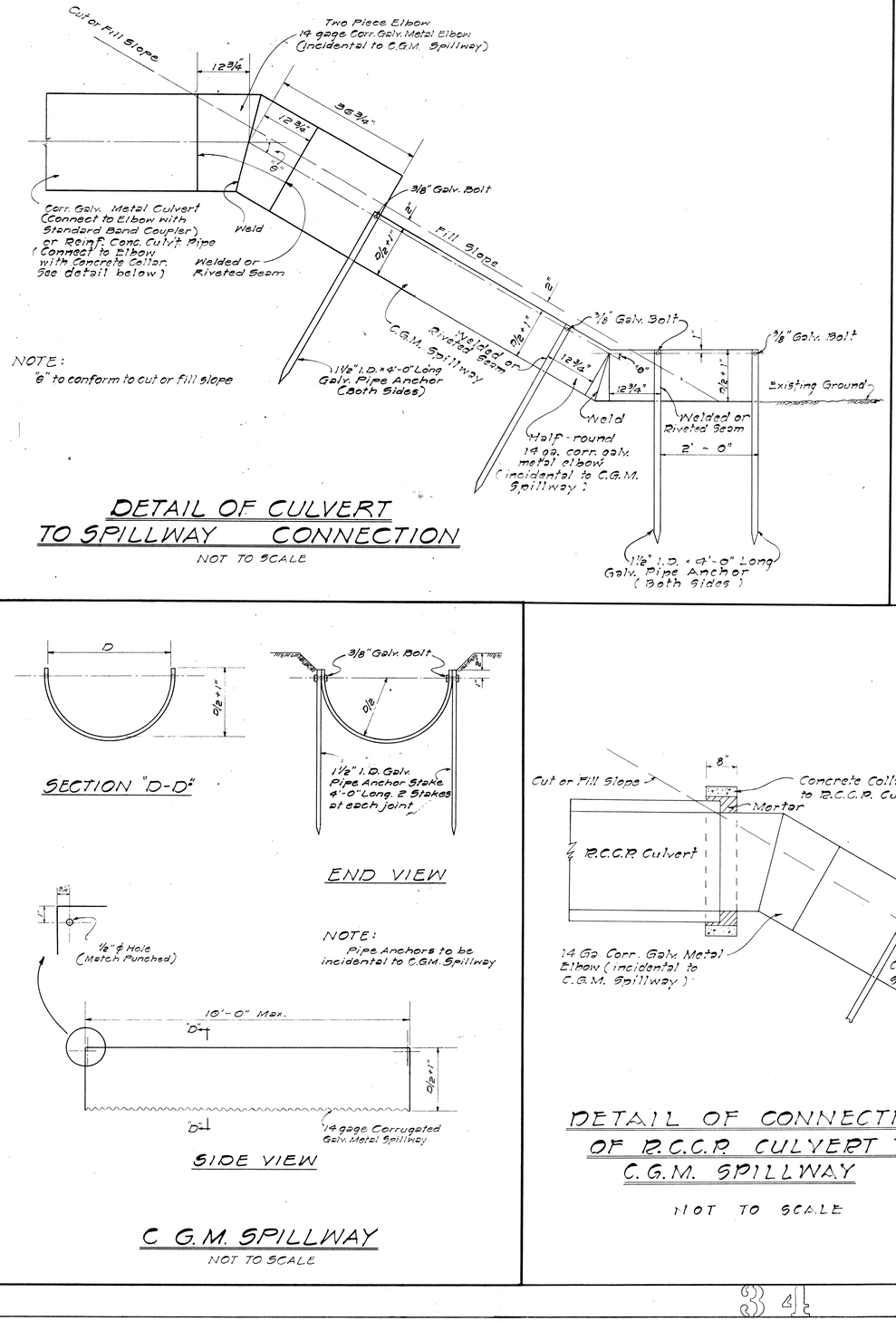
NOTE:
Each watertight band coupler to be supplied with neoprene sponge rubber gasket.



SIDE VIEW

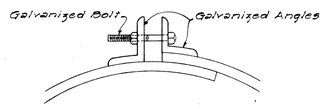
DETAIL OF WATERTIGHT BAND COUPLER

NOT TO SCALE

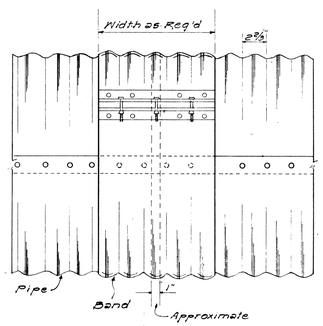


DETAIL OF CULVERT TO SPILLWAY CONNECTION

NOT TO SCALE



BAND DETAIL



SIDE VIEW

DETAIL OF STANDARD BAND COUPLER

NOT TO SCALE

SECTION "D-D"

END VIEW

SIDE VIEW

C.G.M. SPILLWAY

NOT TO SCALE

DETAIL OF CONNECTION OF R.C.C.P. CULVERT TO C.G.M. SPILLWAY

NOT TO SCALE

ORIGINAL PLANS	SURVEY PLOTTED BY	DATE
	DRAWN BY R.Y.	5-24-66
NOTE BOOK	TRACED BY	
	DESIGNED BY C.M.	
No.	QUANTITIES BY	5-24-66
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAILS OF C.G.M. COUPLERS, AND C.G.M. SPILLWAY

INTERSTATE ROUTE H-1
PROJ. No. I-HI-1(32)5, UNIT 1

Scale: As Shown Date: Sept. 1966

SHEET No. D-10 OF 10 SHEETS