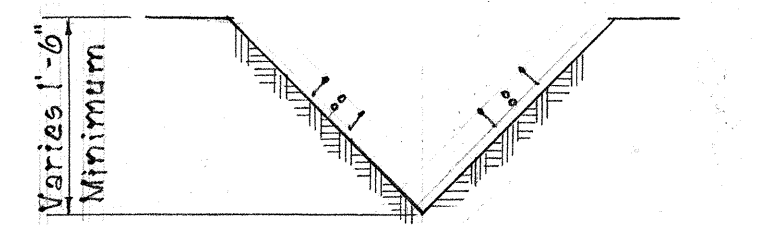
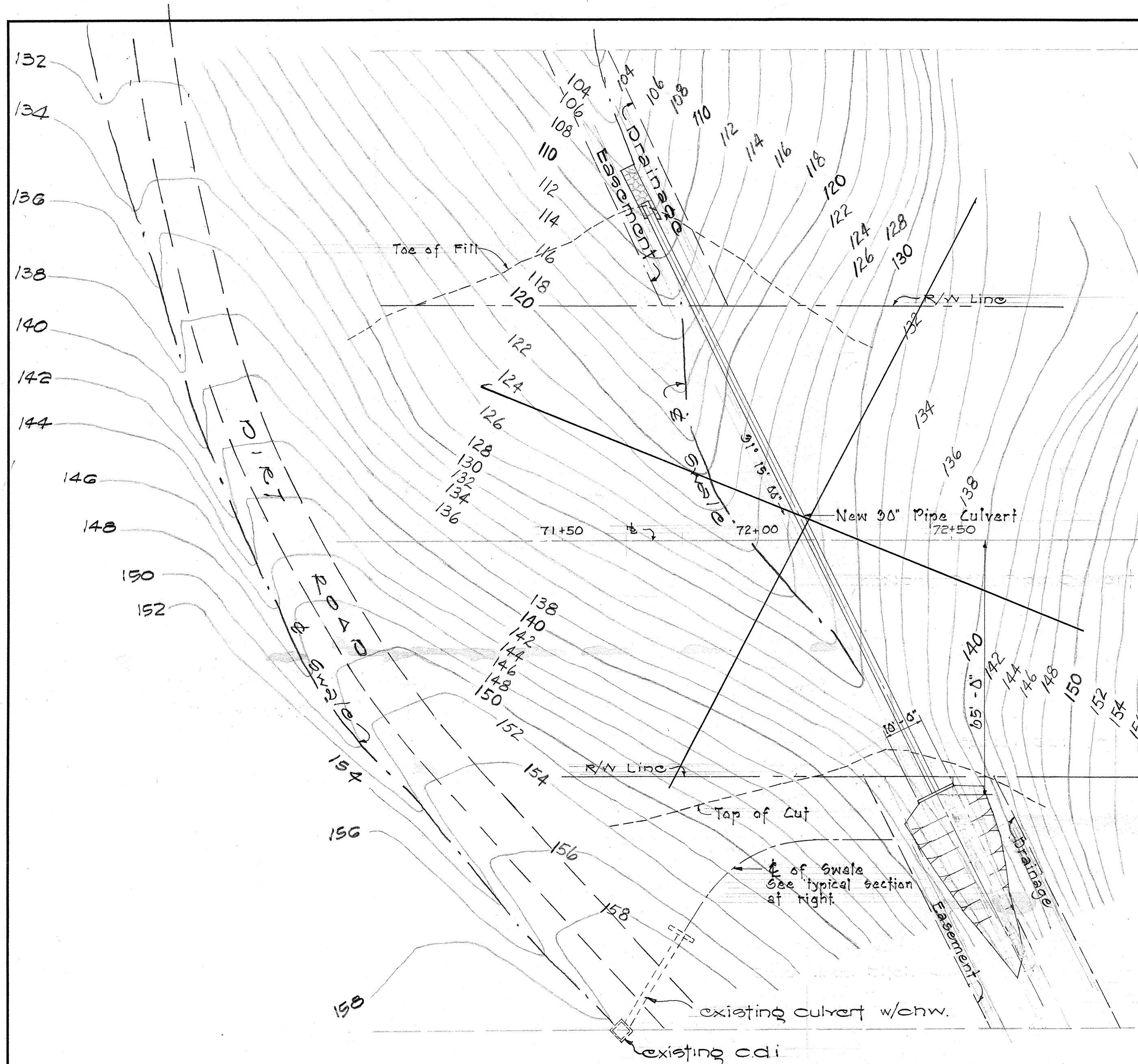
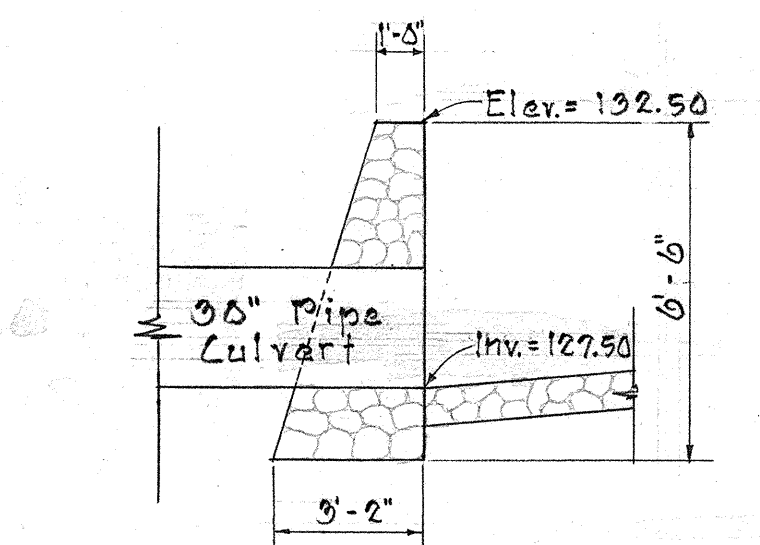


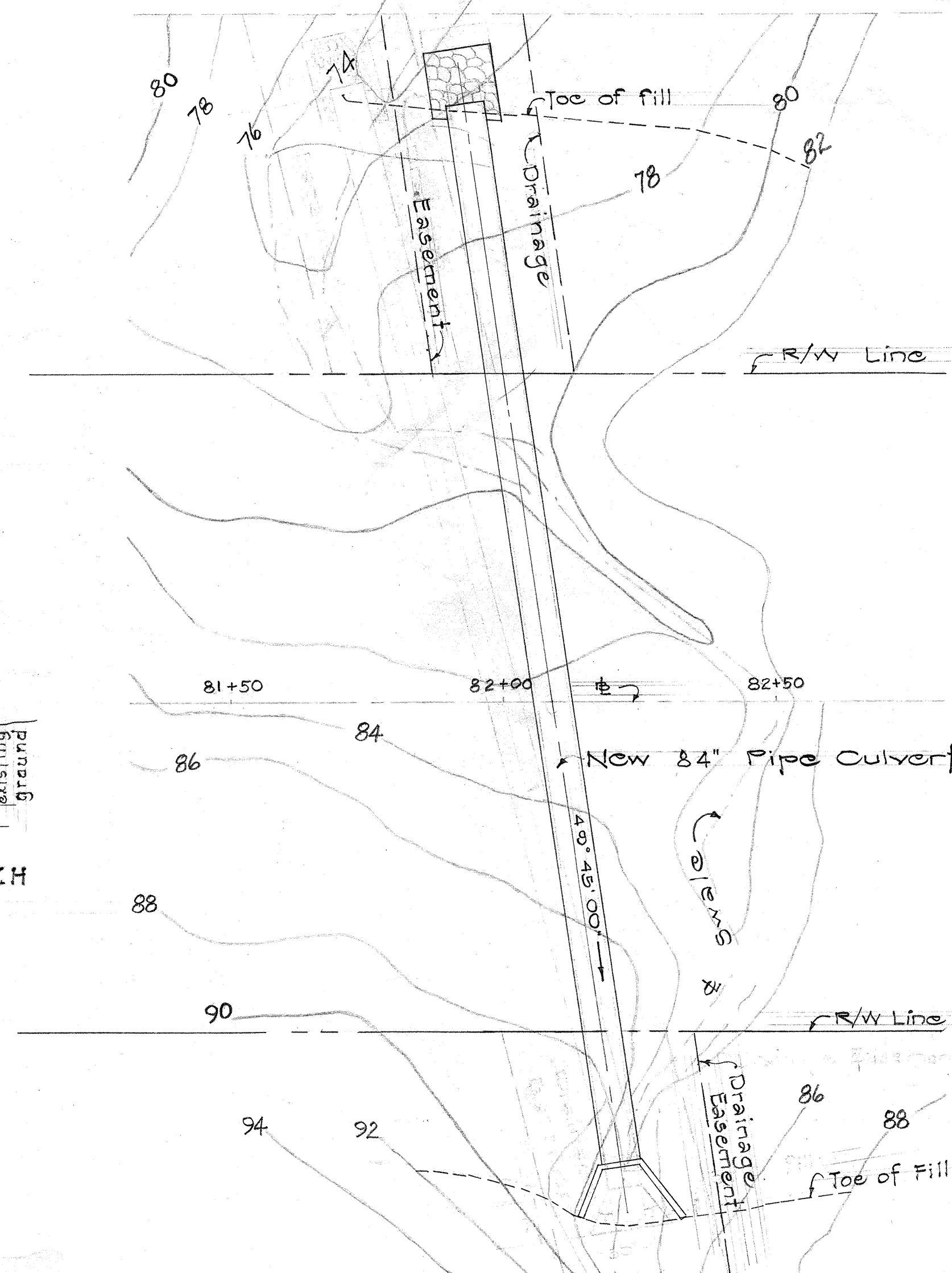
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(15)	1966	17	58



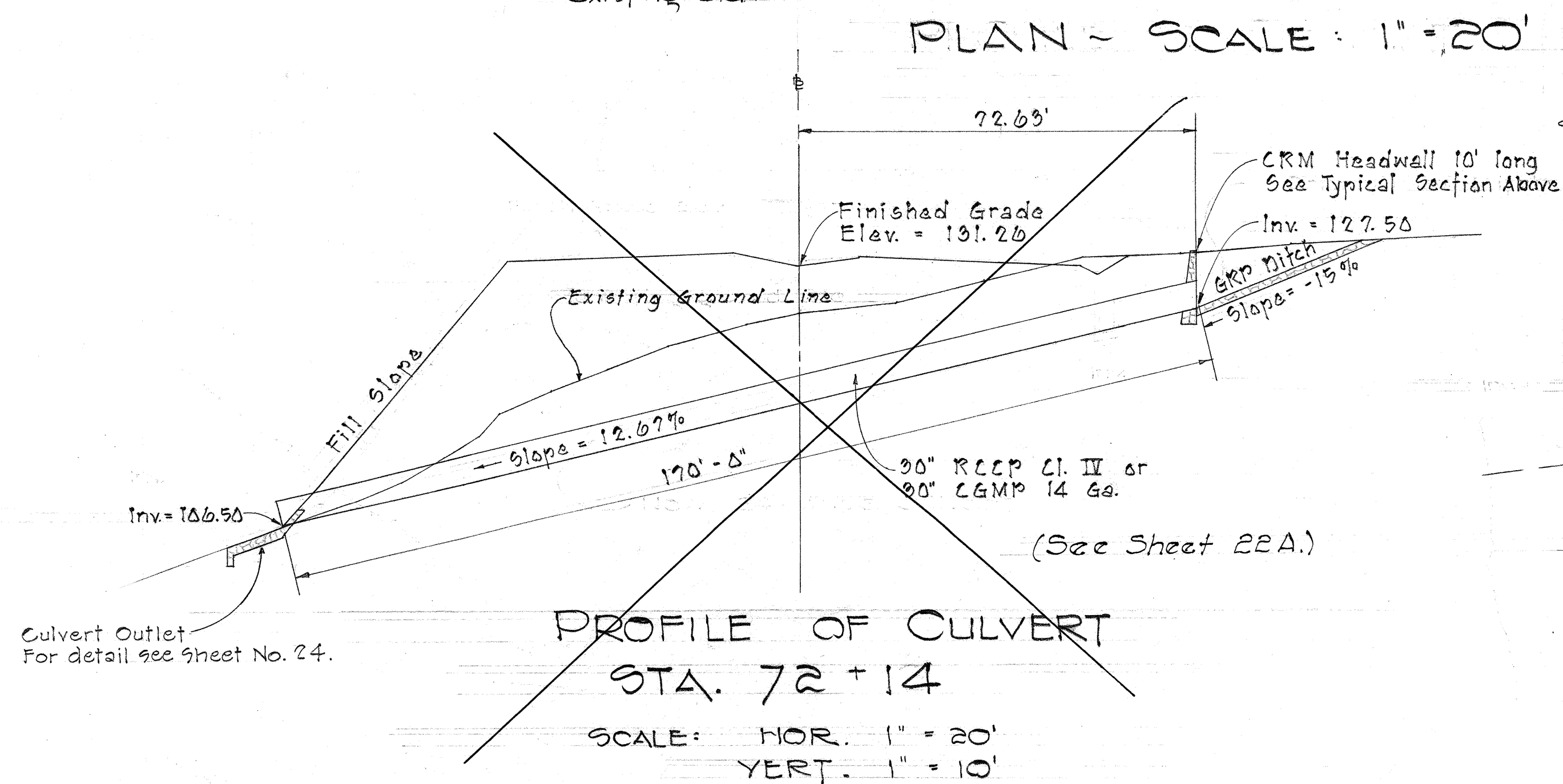
TYPICAL SECTION - GRP DITCH
Not to Scale



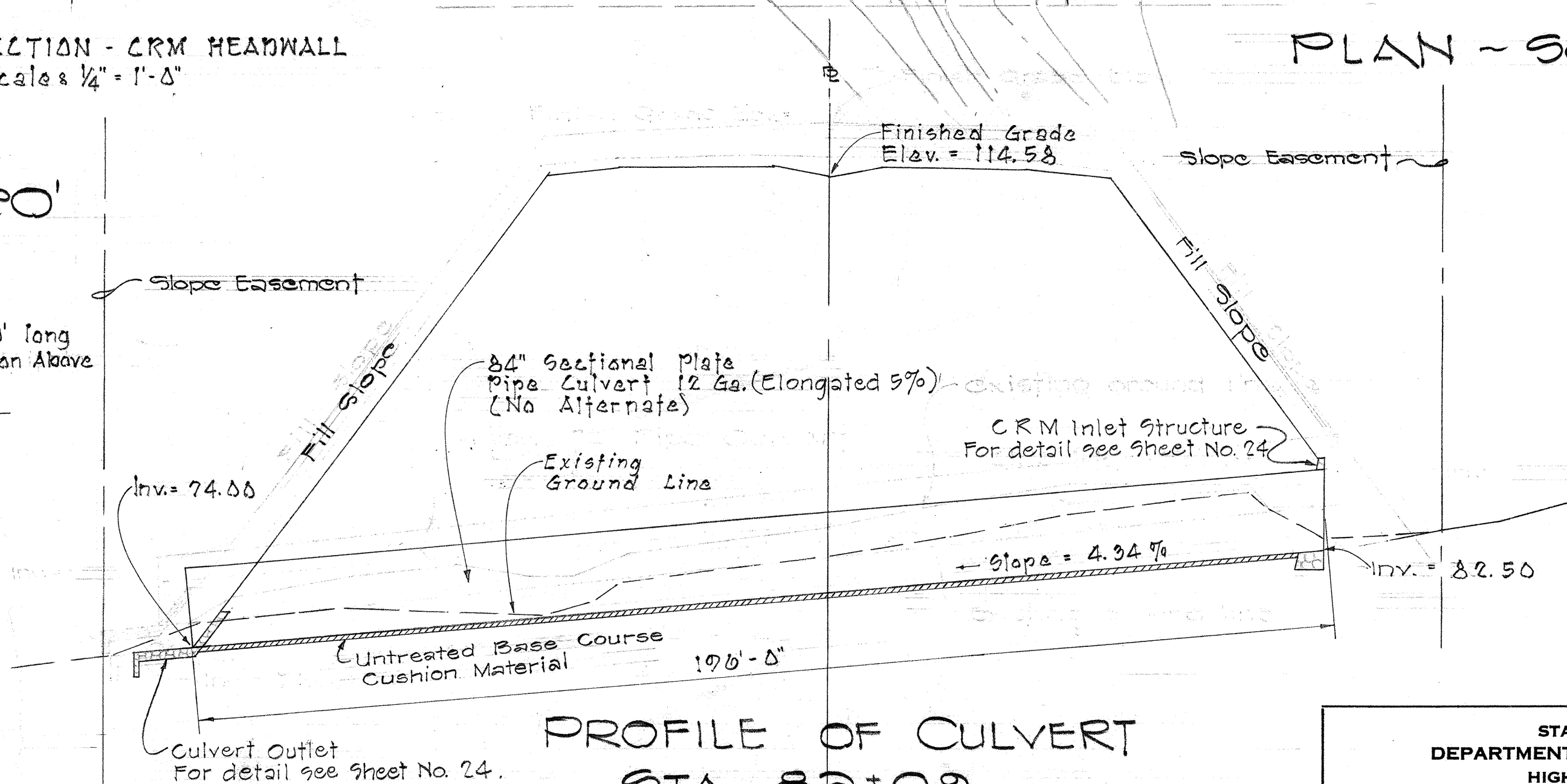
TYPICAL SECTION - CRM HEADWALL
Scale 1/4" = 1'-0"



PLAN - SCALE: 1" = 20'



PROFILE OF CULVERT
STA. 72+14
SCALE: HOR. 1" = 20'
VERT. 1" = 10'



PROFILE OF CULVERT
STA. 82+09
SCALE: HOR. 1" = 20'
VERT. 1" = 10'

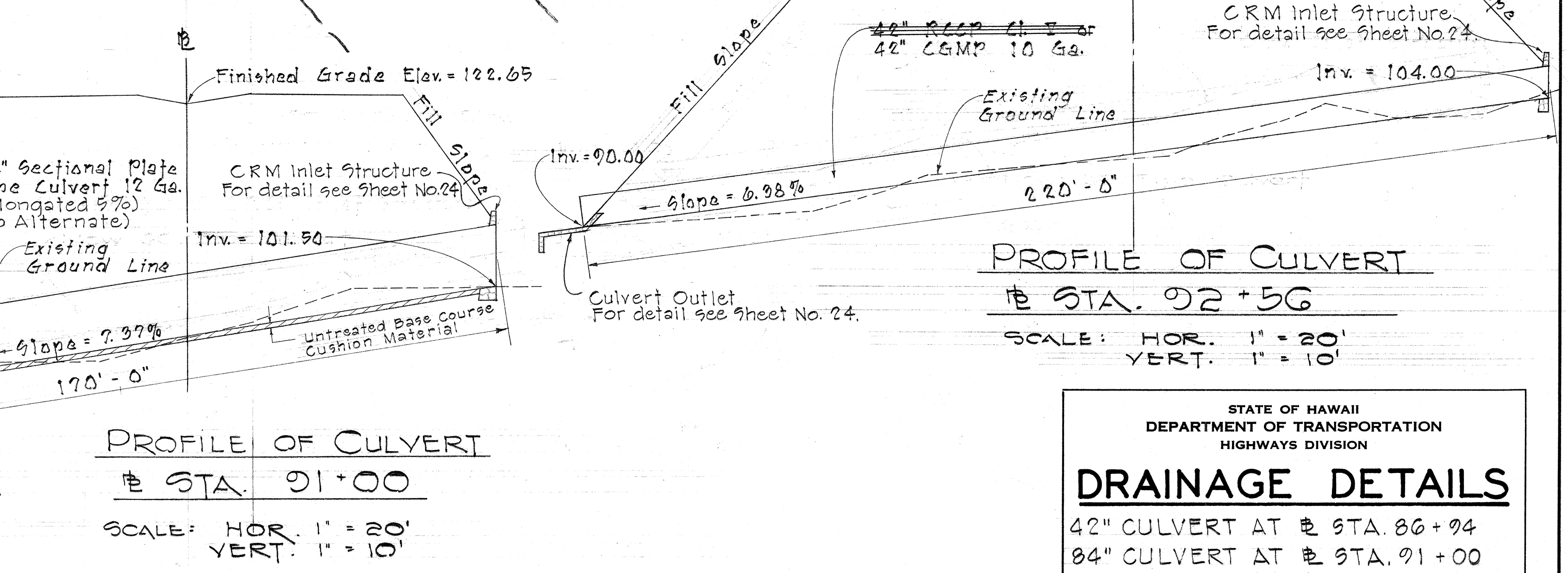
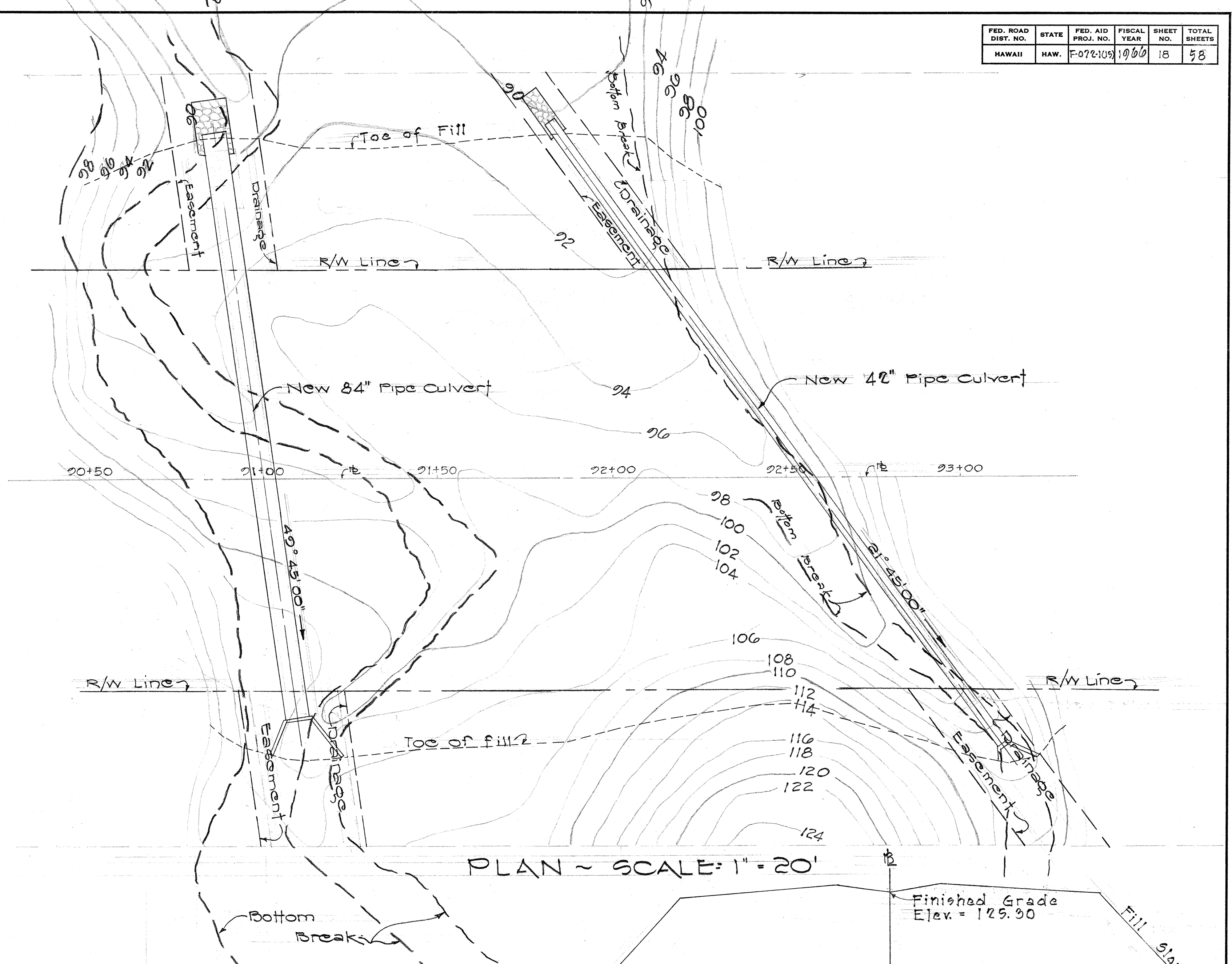
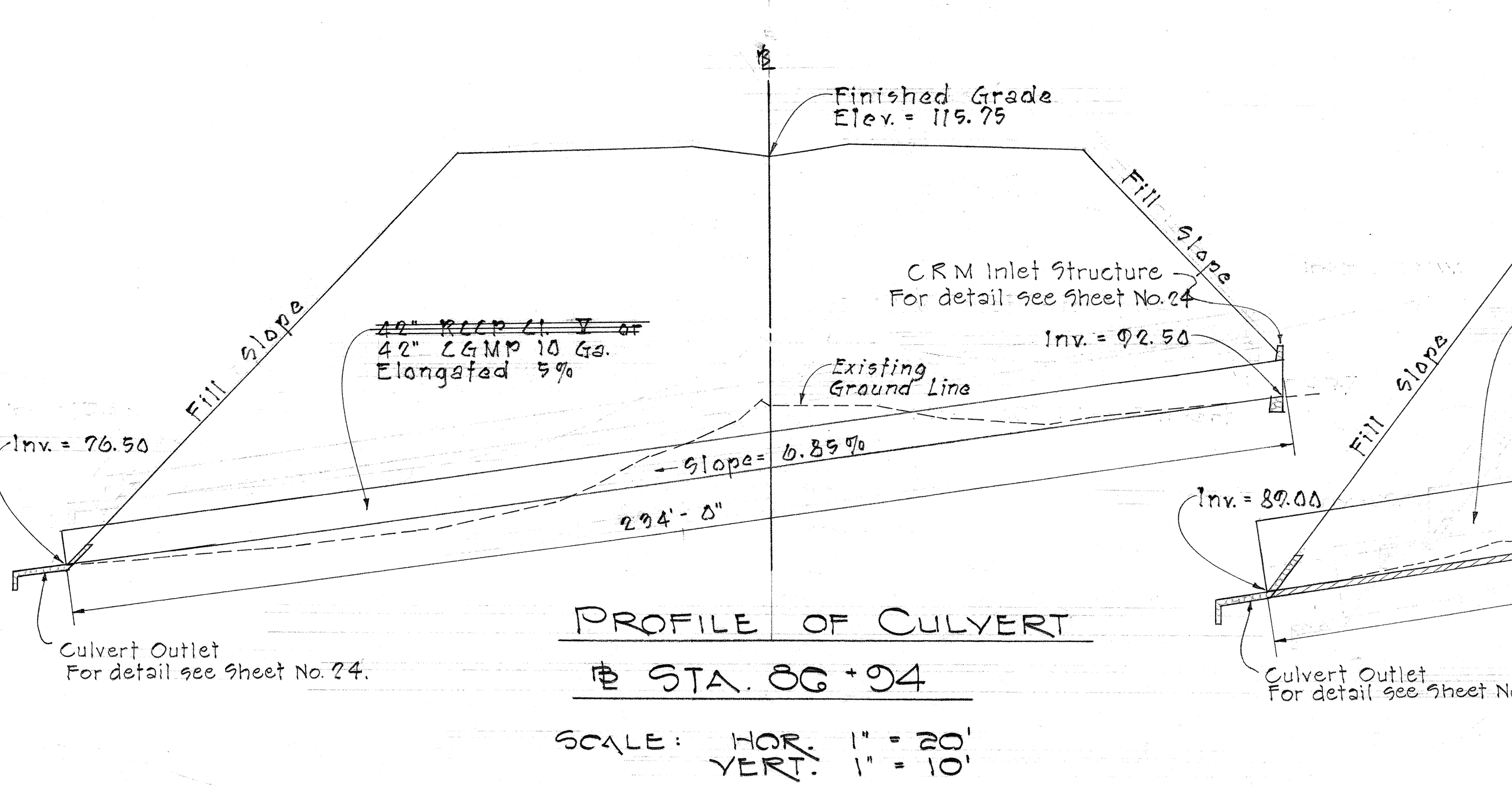
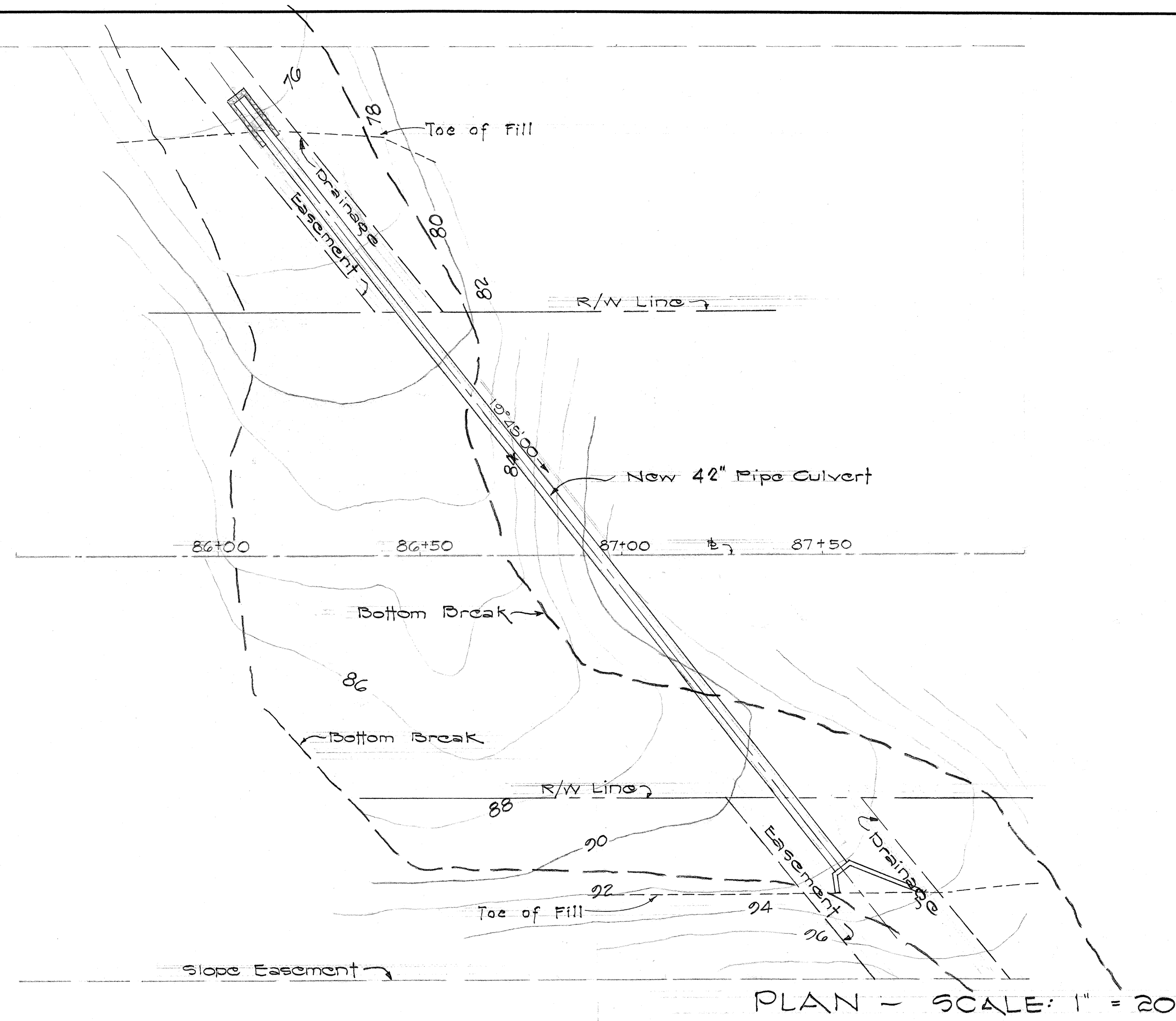
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

30" CULVERT AT STA. 72+14
84" CULVERT AT STA. 82+09
KALANIANA'OLE HIGHWAY
PROJ. NO. F-072-1(15)

SCALE: AS NOTED FEB. 1966
SHEET No. 1 OF 10 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-105	1966	18	58



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

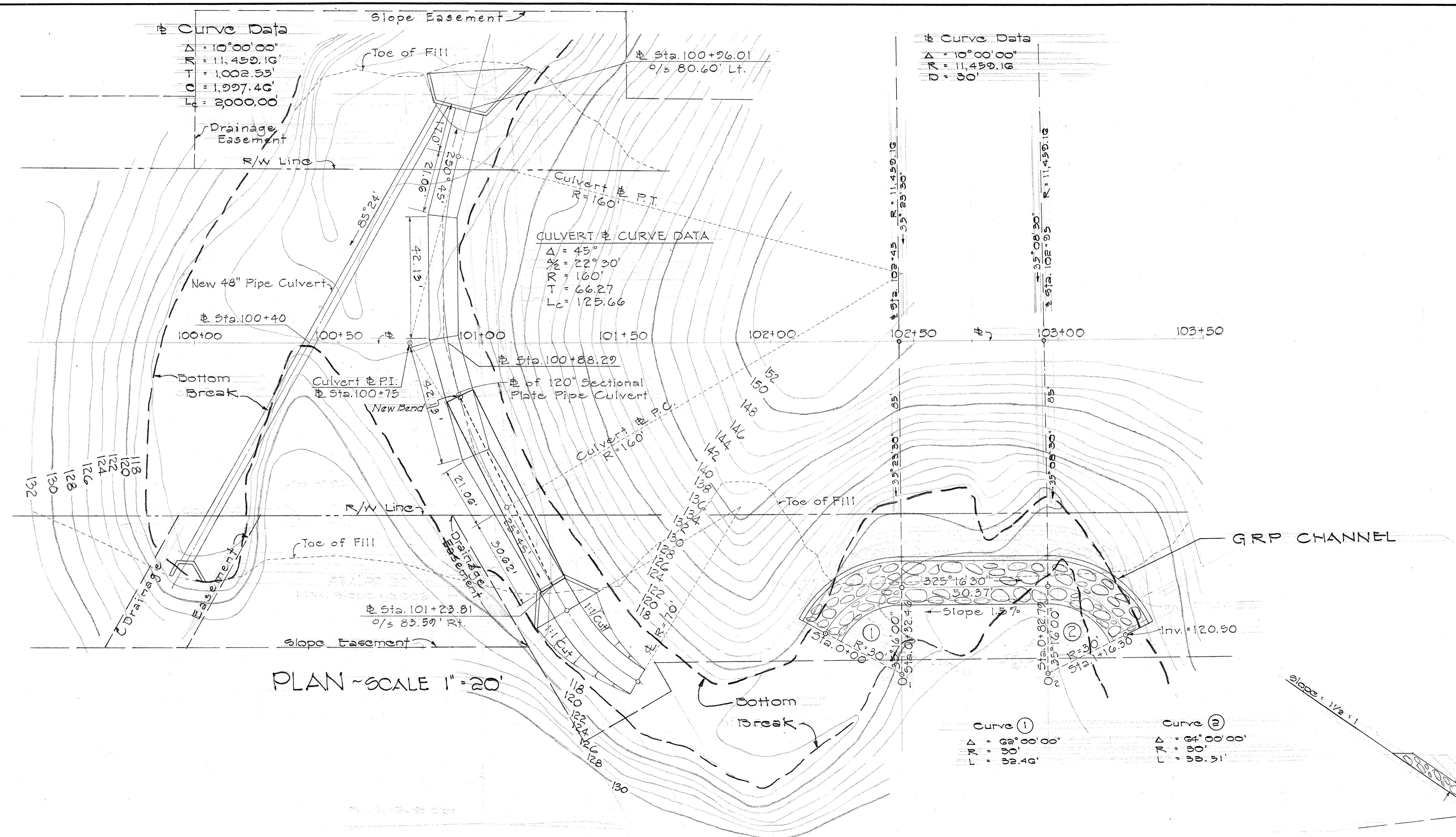
DRAINAGE DETAILS

42" CULVERT AT STA. 86+04
84" CULVERT AT STA. 91+00
42" CULVERT AT STA. 92+56
KALANIANA'OLE HIGHWAY PROJ. NO. F-072-1(15)
SCALE: AS NOTED FEB. 1966

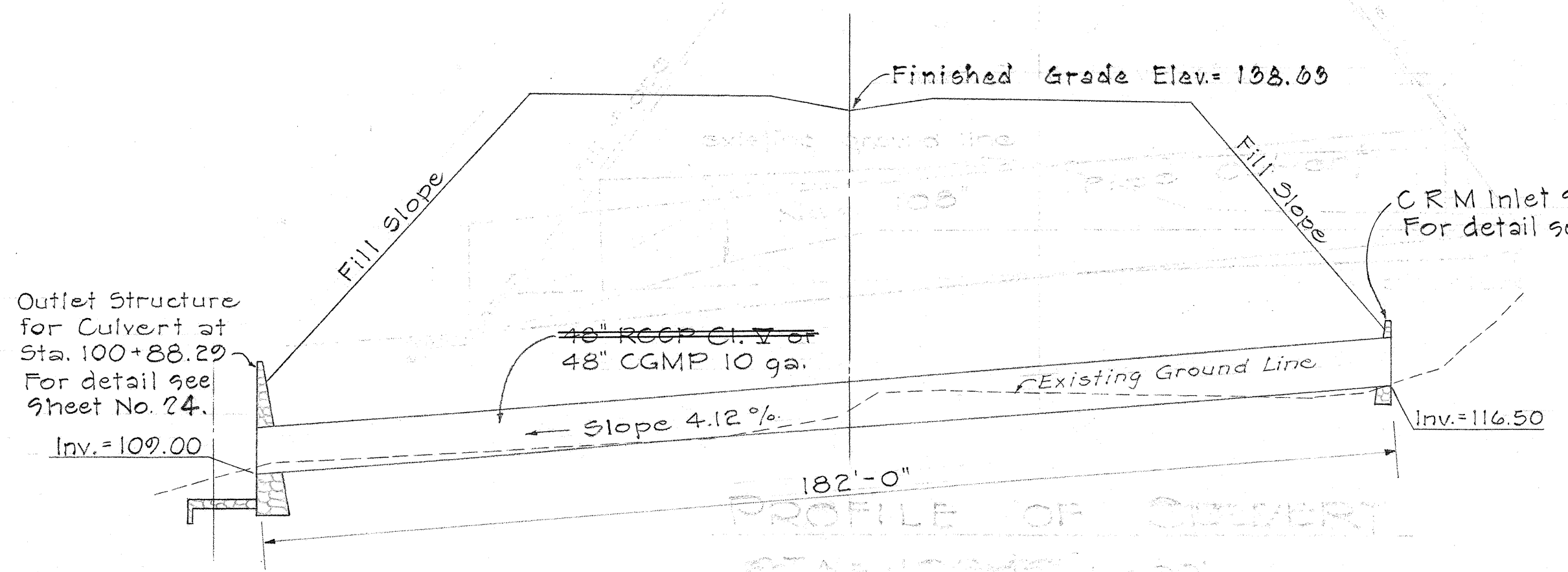
SHEET No. 2 OF 10 SHEETS

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

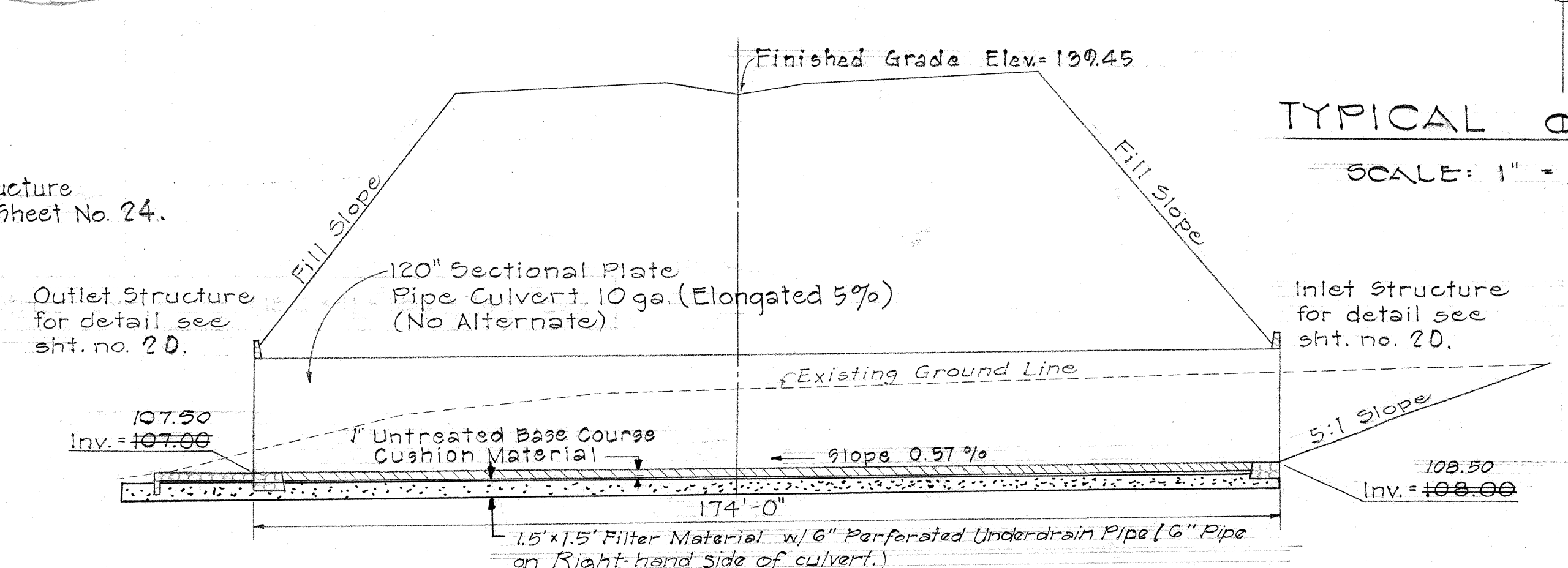
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-105	1966	19	58



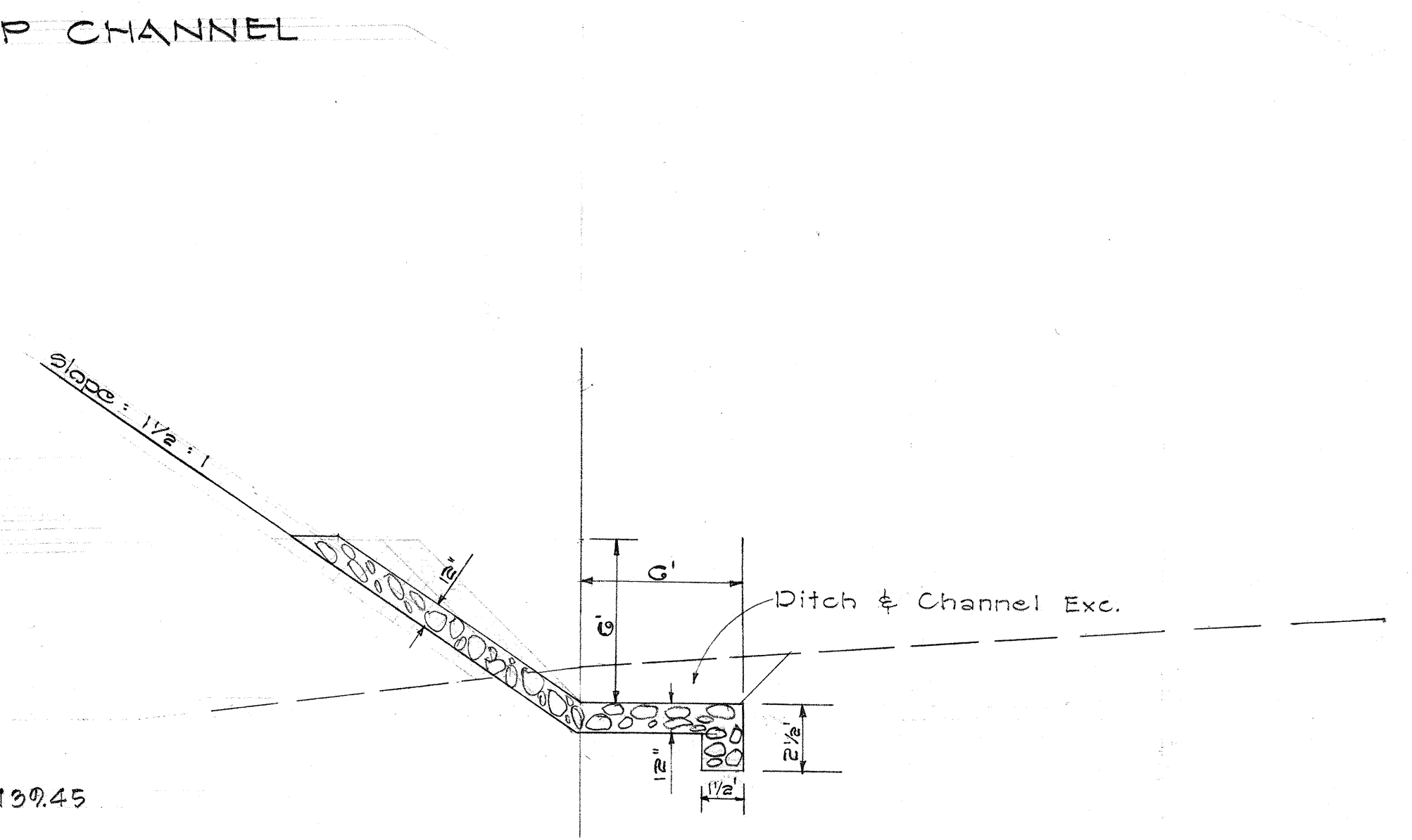
PLAN - SCALE 1" = 20'



PROFILE OF CULVERT
STA. 100+40
Scale: Horiz. 1" = 20'
Vert. 1" = 10'



PROFILE OF CULVERT
STA. 100+88.29
Scale: Horiz. 1" = 20'
Vert. 1" = 10'



TYPICAL OF GRP CHANNEL
SCALE: 1" = 5'

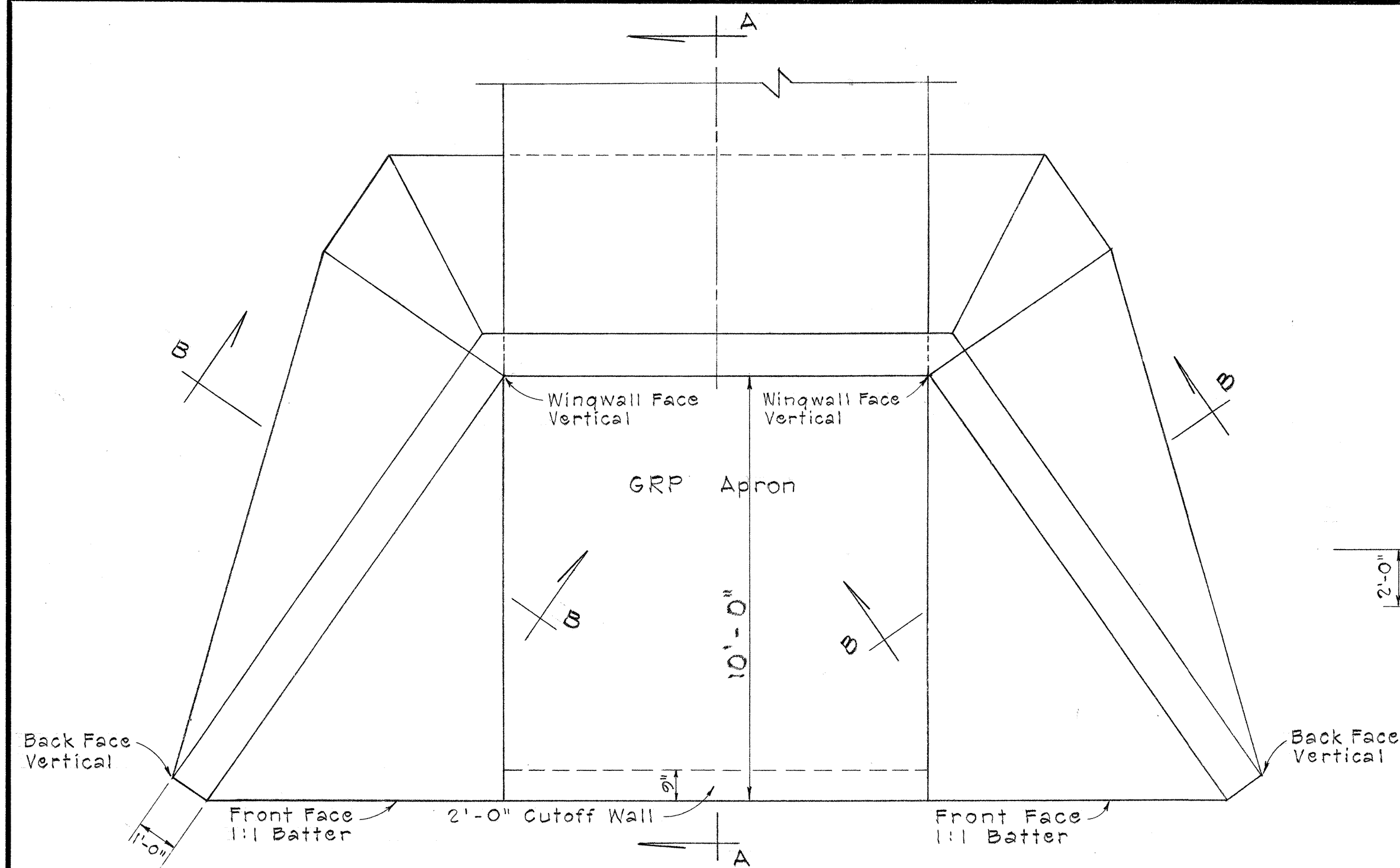
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

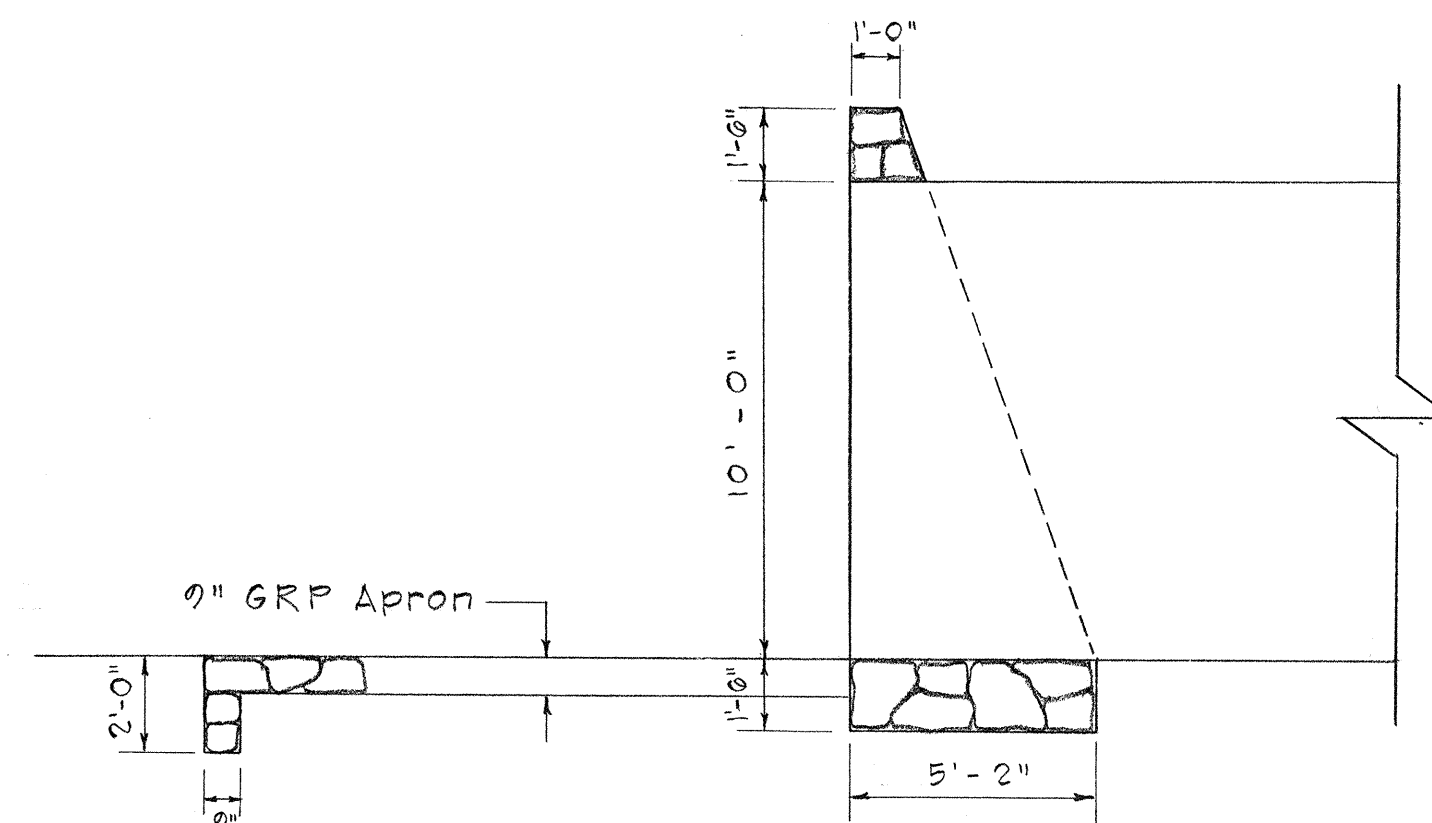
48" CULVERT AT STA. 100+40
120" CULVERT AT STA. 100+88.29
KALANIANA'OLE HIGHWAY PROJ. NO. F-072-1(15)
SCALE: AS NOTED
FEB. 1966

SHEET No. 3 OF 10 SHEETS

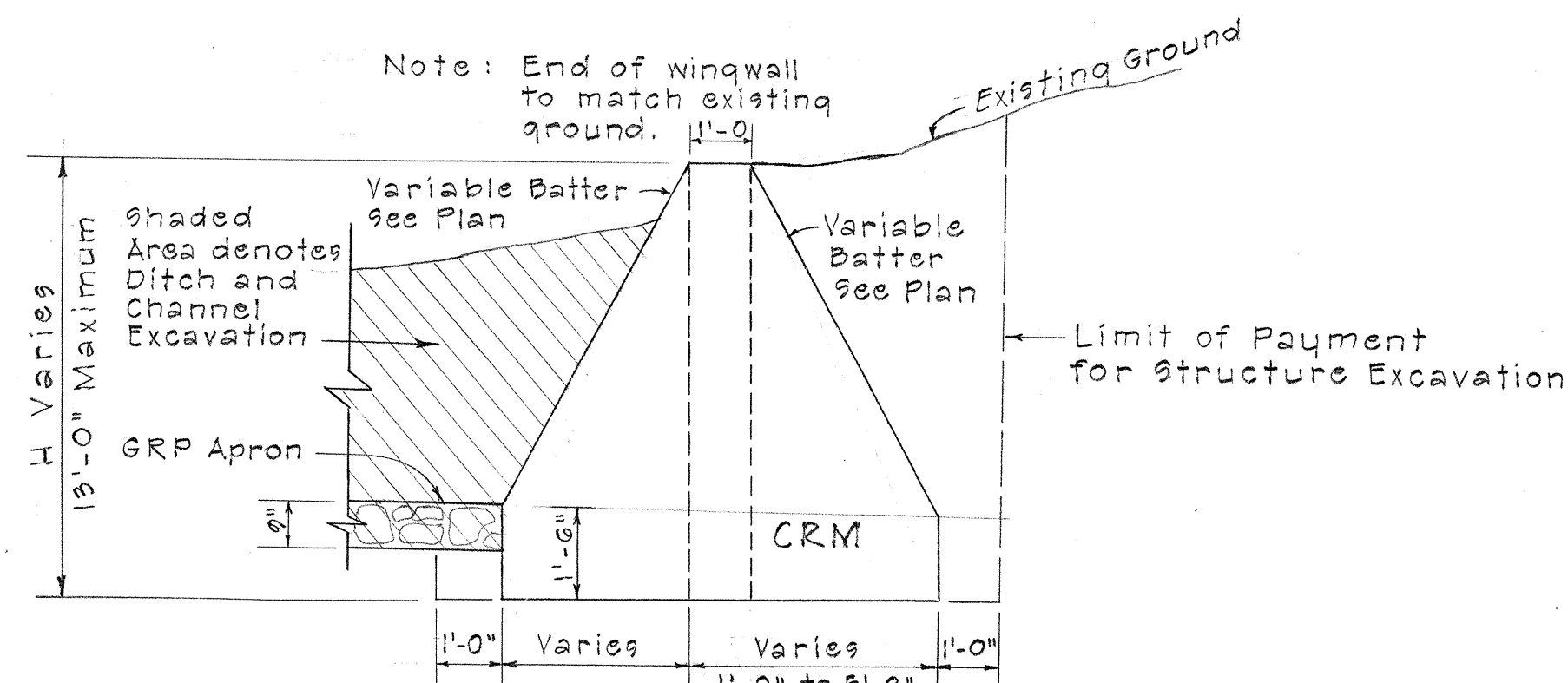
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-105	1966	20	58



PLAN
Scale: $\frac{3}{8}'' = 1'-0''$

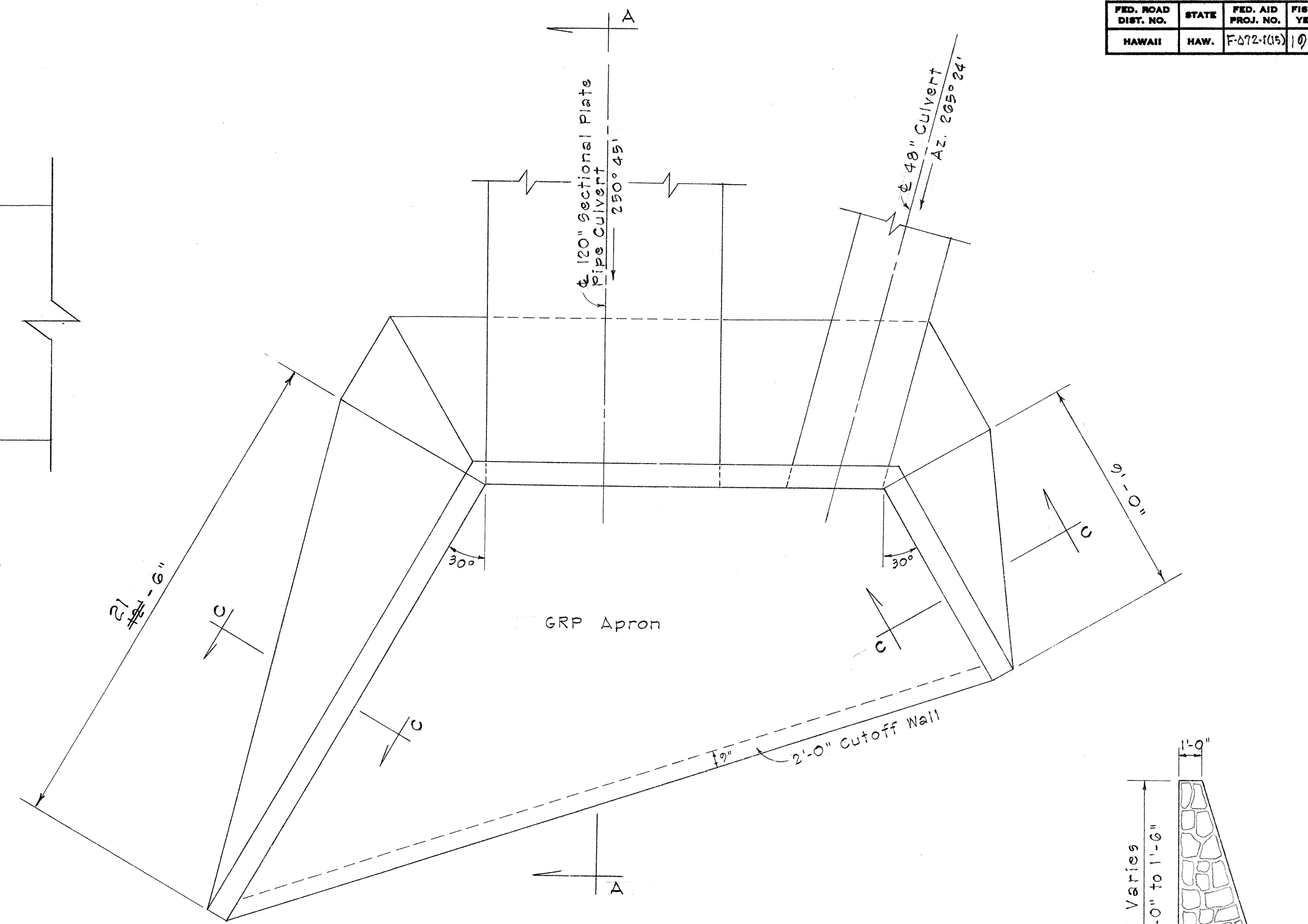


SECTION A-A
Scale: $\frac{1}{4}'' = 1'-0''$

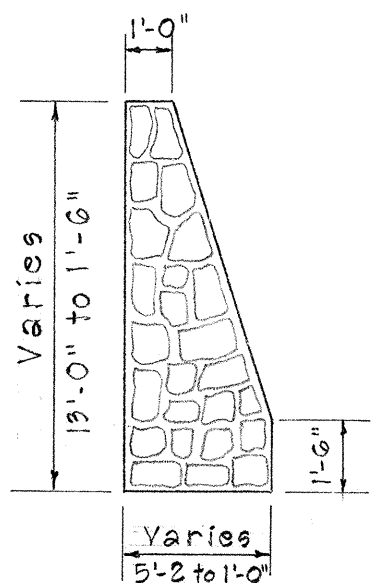


WINGWALL SECTION B-B
Scale: $\frac{3}{8}'' = 1'-0''$

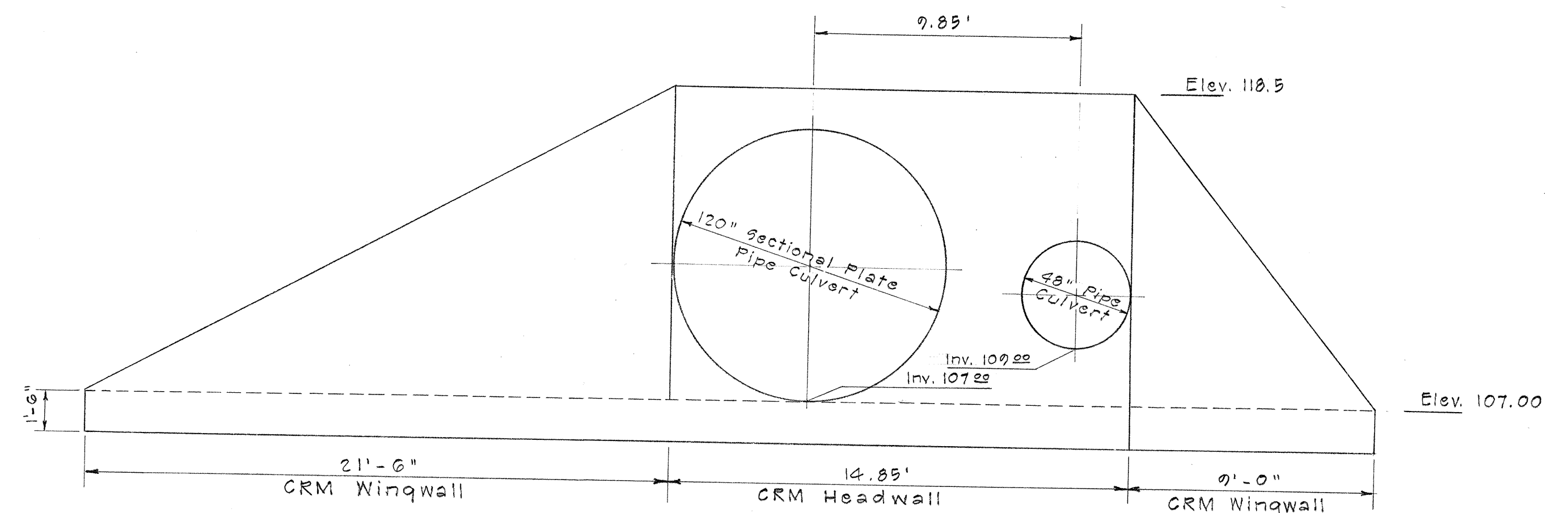
DETAIL - INLET STRUCTURE CULVERT AT STA. 100+88.27 SCALE: AS NOTED



PLAN
Scale: $\frac{1}{4}'' = 1'-0''$



WINGWALL SECTION C-C
Not to Scale



DEVELOPED OUTLET ELEVATION
Scale: $\frac{1}{4}'' = 1'-0''$

DETAIL - OUTLET STRUCTURE CULVERT AT STA. 100+88.27 SCALE: AS NOTED

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

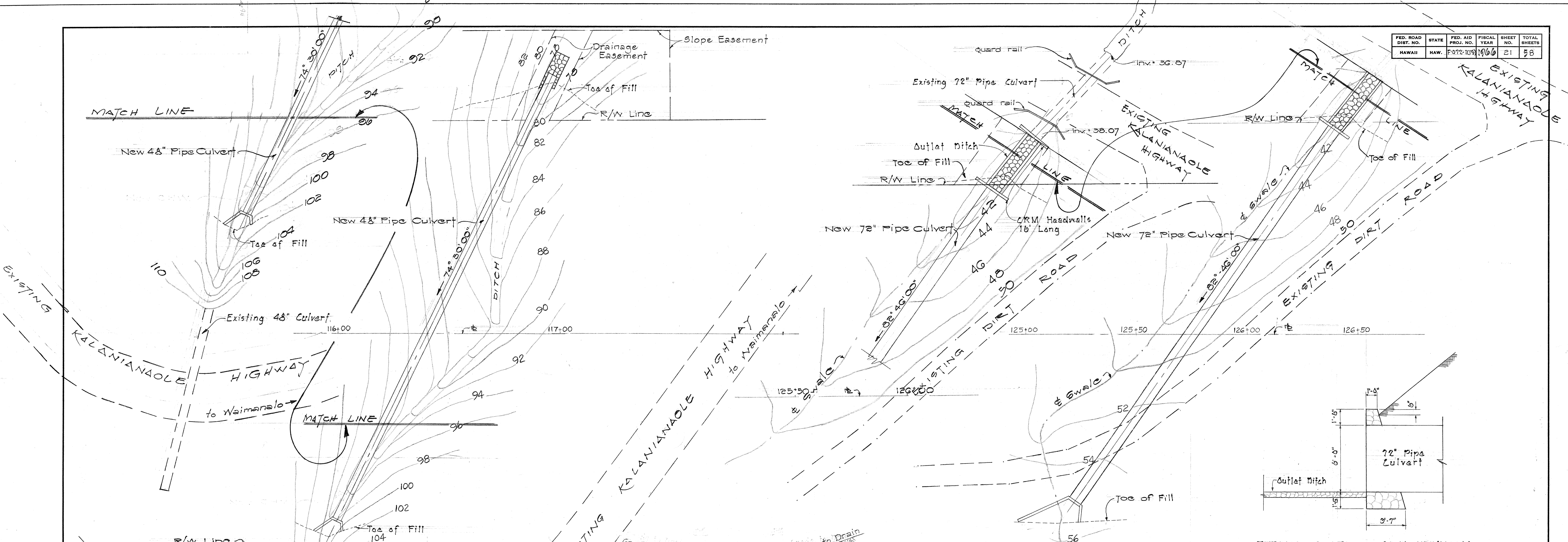
INLET AND OUTLET STRUCTURES
FOR CULVERT AT STA. 100+88.27

KALANIANA'OLE HIGHWAY
PROJ. NO. F-072-1(15)
SCALE: AS NOTED
FEB. 1966

SHEET No. 4 OF 10 SHEETS

DATE	BY
DESIGNED BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
ORIGINAL PLAN	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(15)	1966	21	58

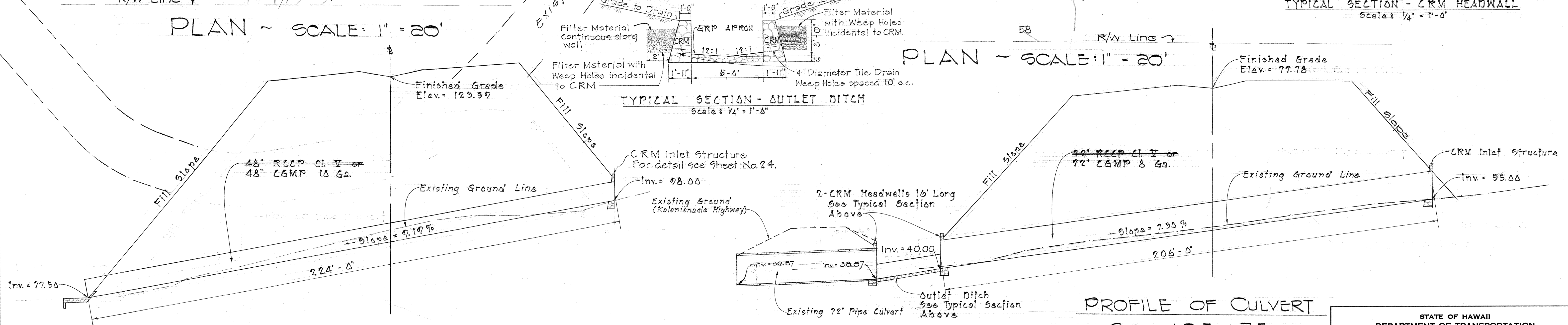


PLAN ~ SCALE: 1" = 20'

PLAN ~ SCALE: 1" = 20'

TYPICAL SECTION - CRM HEADWALL
Scale: 1/4" = 1'-0"

TYPICAL SECTION - OUTLET DITCH
Scale: 1/4" = 1'-0"



PROFILE OF CULVERT

STA. 116+40

SCALE: HOR. 1" = 20'
VERT. 1" = 10'

PROFILE OF CULVERT

STA. 125+75

SCALE: HOR. 1" = 20'
VERT. 1" = 10'

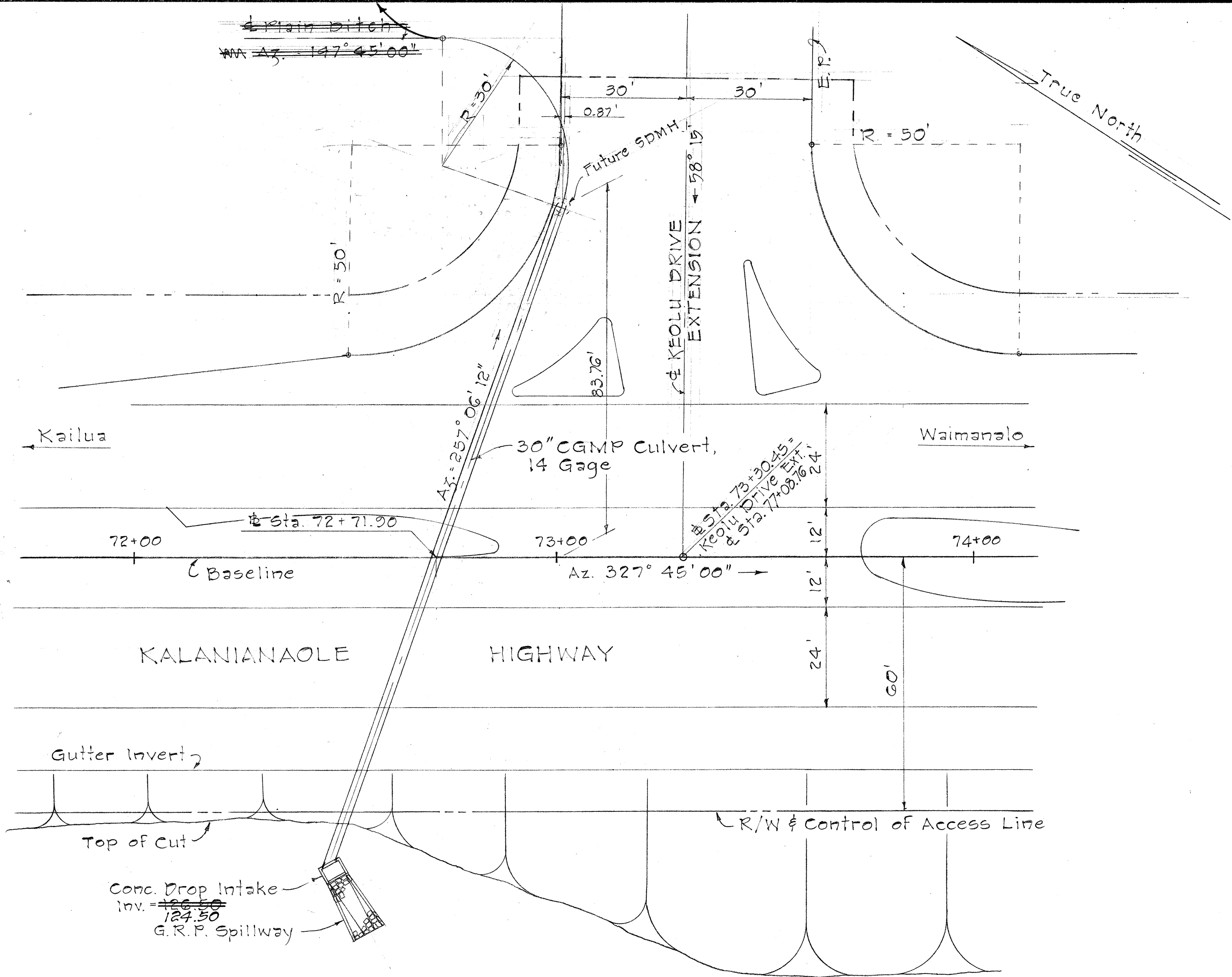
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

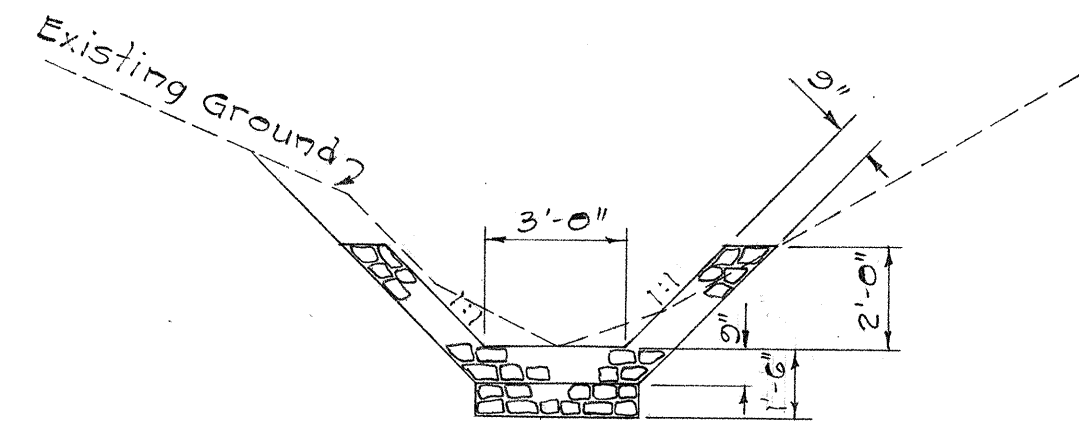
48" CULVERT AT STA. 116+40
72" CULVERT AT STA. 125+75
KALANIANA'OLE HIGHWAY
PROJ. NO. F-072-1(15)
SCALE: AS NOTED
FEB. 1966

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

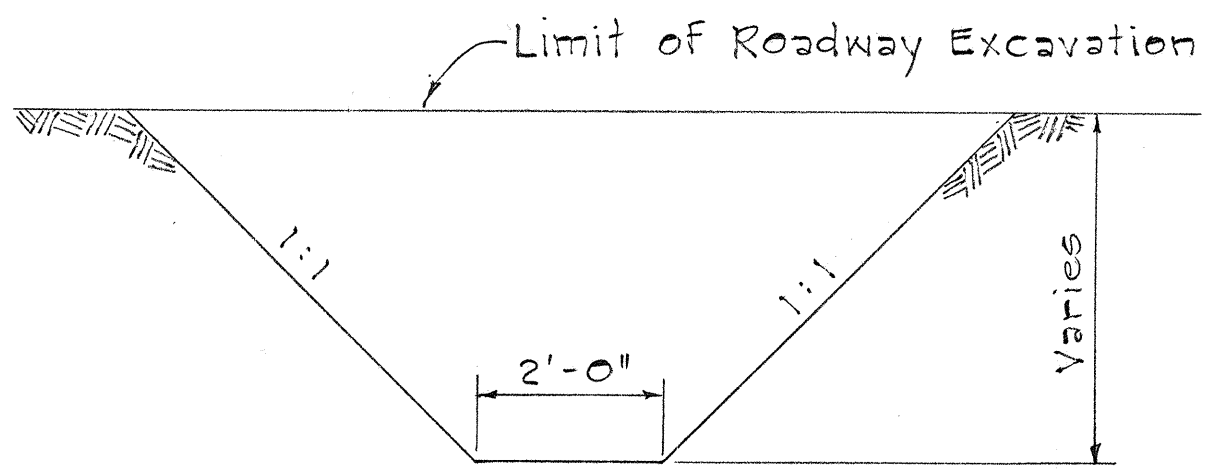
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(15)	1966	22A	



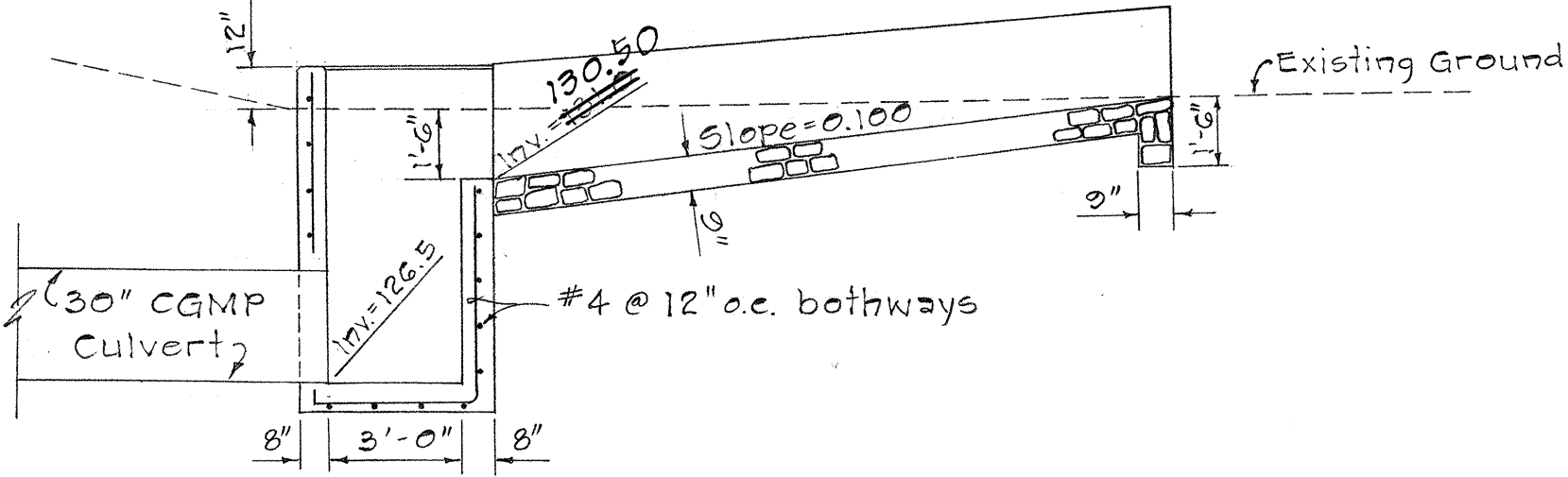
PLAN
Scale 1" = 20'



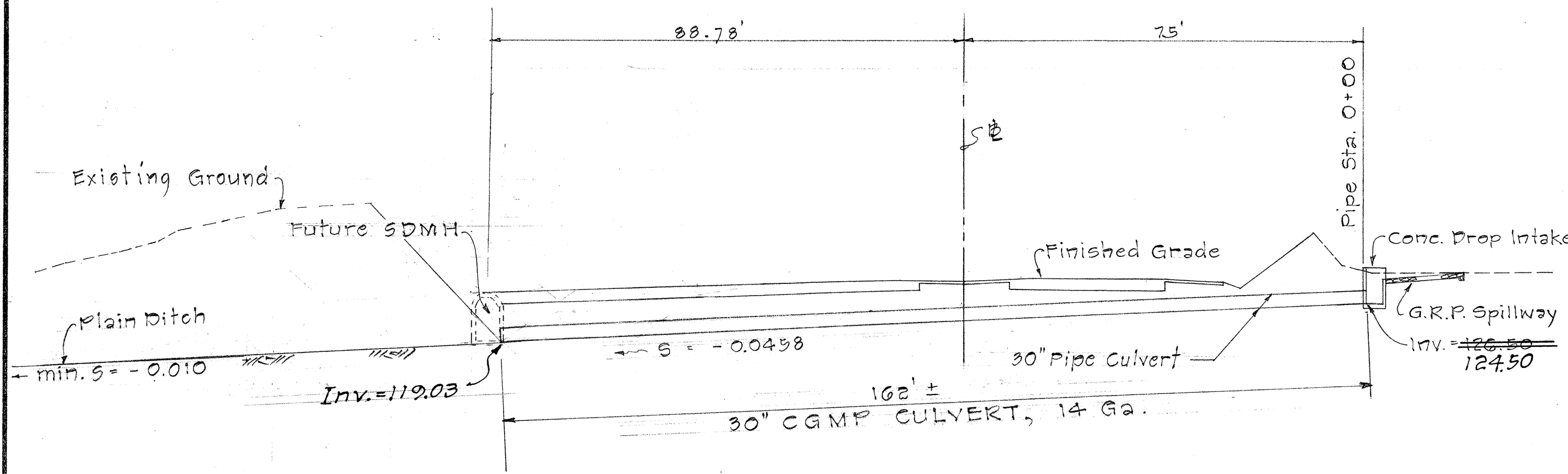
INLET DETAIL



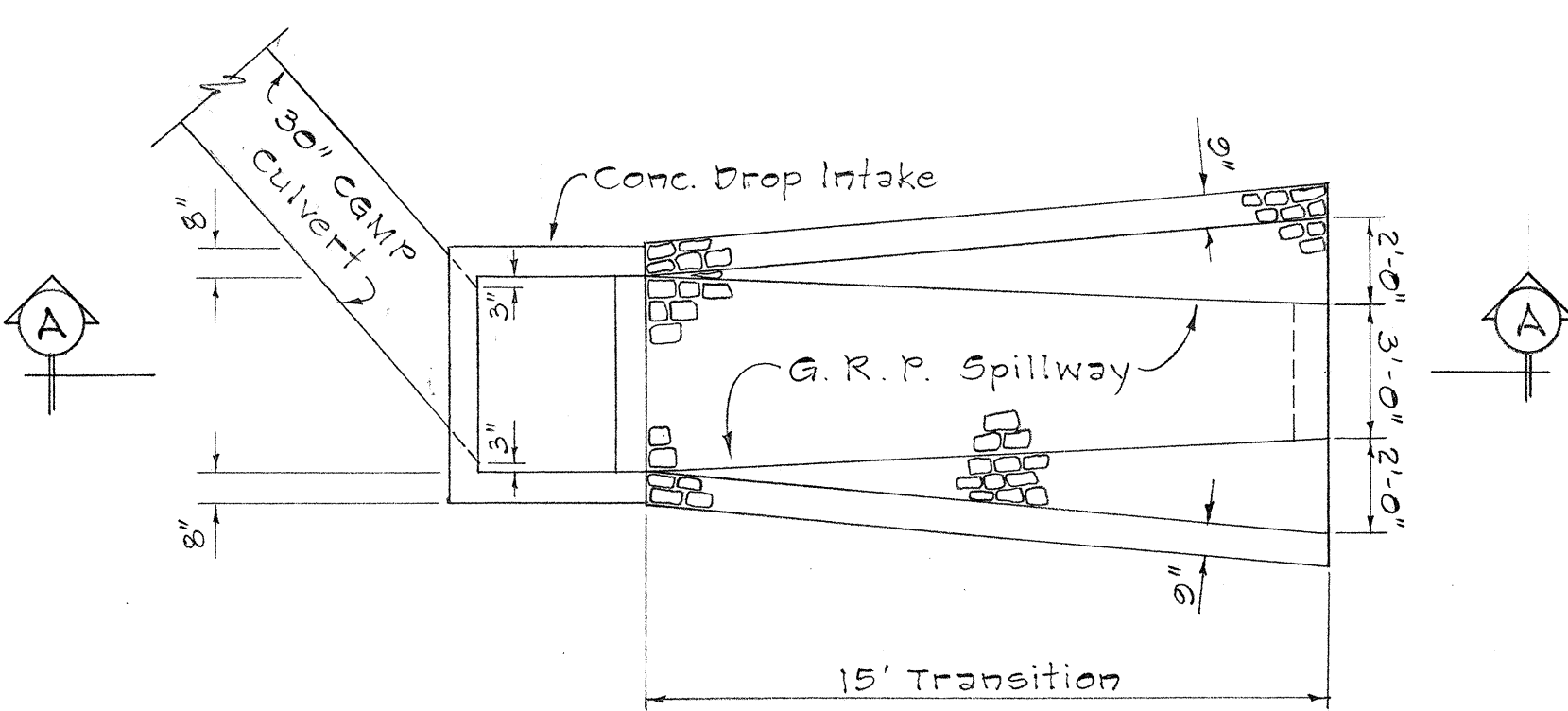
TYPICAL SECTION - PLAIN DITCH
Scale 1/2" = 1'-0"



SECTION "A-A"



PROFILE OF 30" CULVERT
Scale 1" = 20'



PLAN
CONCRETE DROP INTAKE
& G.R.P. SPILLWAY DETAILS
Scale 1/4" = 1'-0"

ESTIMATED QUANTITIES			All Cuts for (Keolu Intersection Area)
Item	Quantity	Unit	
Roadway Exc.	10,235	C.Y.	
Ditch and Channel Exc.	1,287	C.Y.	
Struct. Exc.	153	C.Y.	
Class B-1 Conc.	3.8	C.Y.	
Reinforcing Steel	255	Lbs.	
30-inch CGMP, 14 ga.	160.3	L.F.	
Grouted Rubble Paving	3.9	C.Y.	

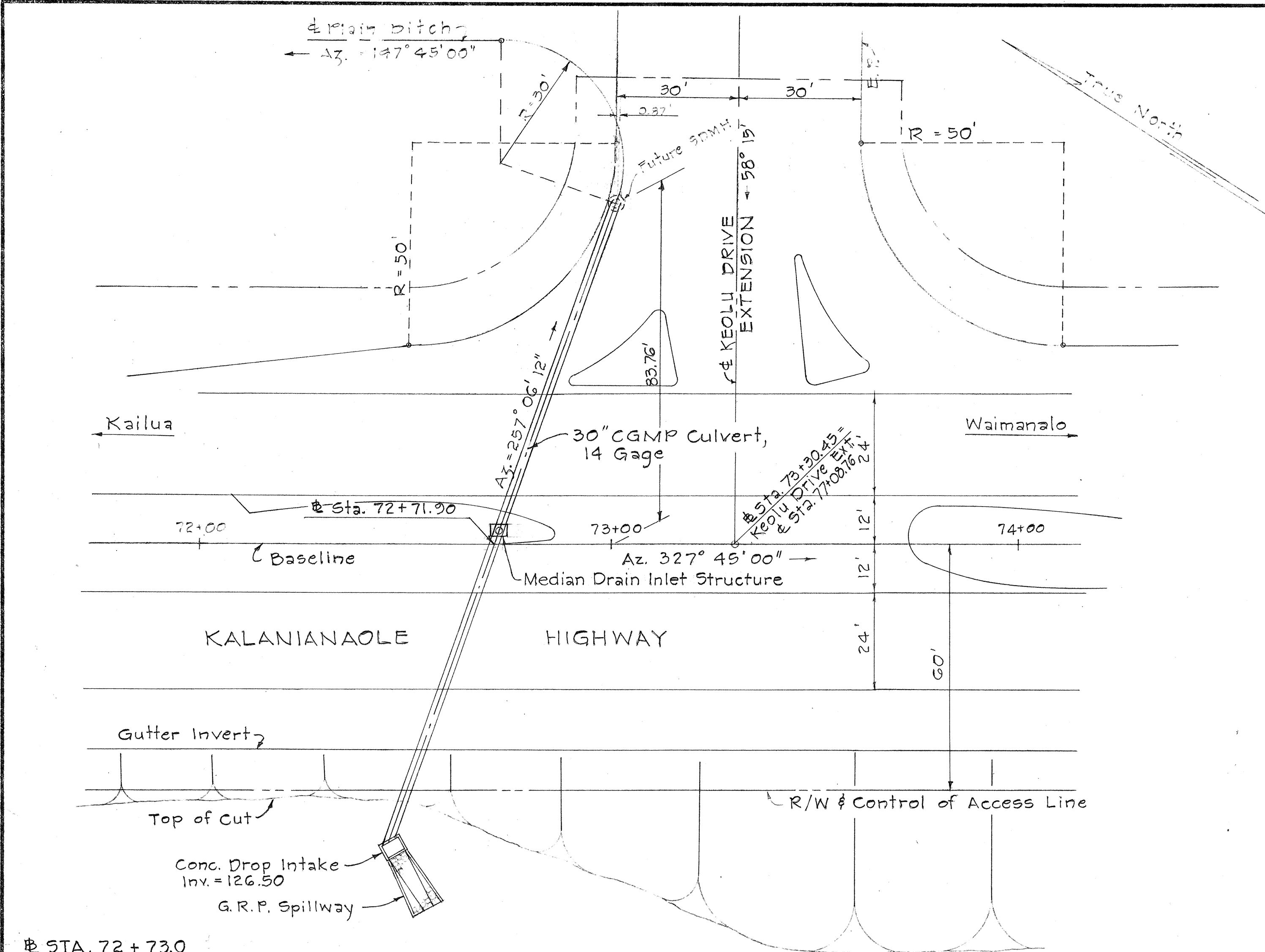
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAIL
30" CGMP CULVERT
@ STA. 72+71.90
KALANIANA'OLE HIGHWAY
PROJ. No. F-072-1(15)
Scale: As Noted
Feb., 1967

SHEET No. 22 OF 22 SHEETS

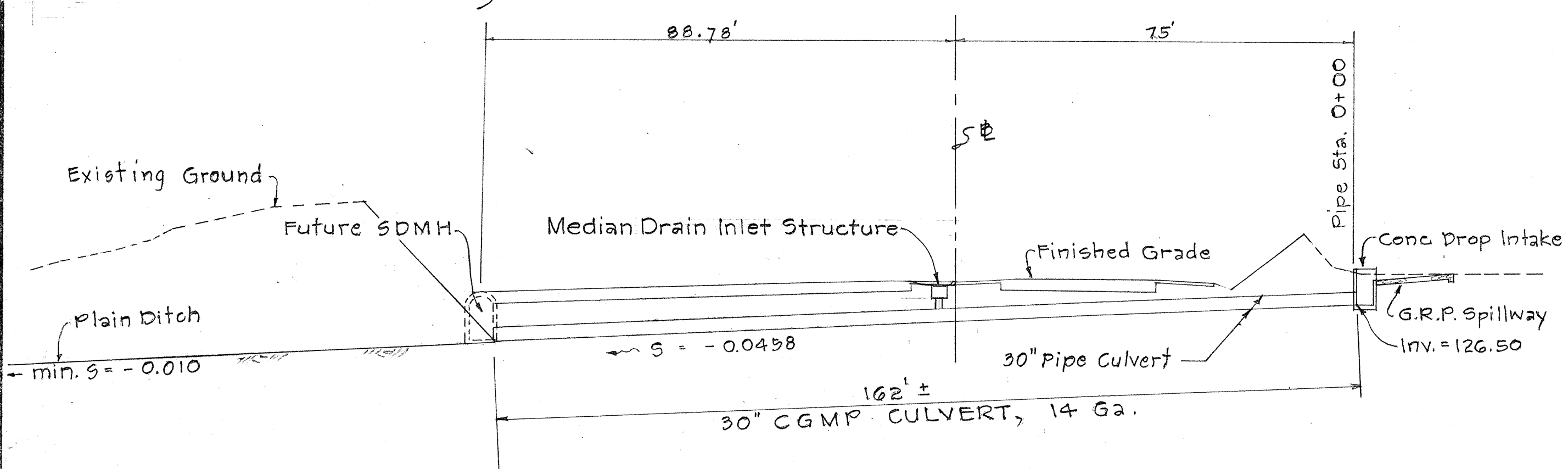
DATE	DESIGNED BY	CHECKED BY
DRAWN BY	QUANTITIES BY	
NOTE BOOK		
No.		

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(15)	1966	22A	

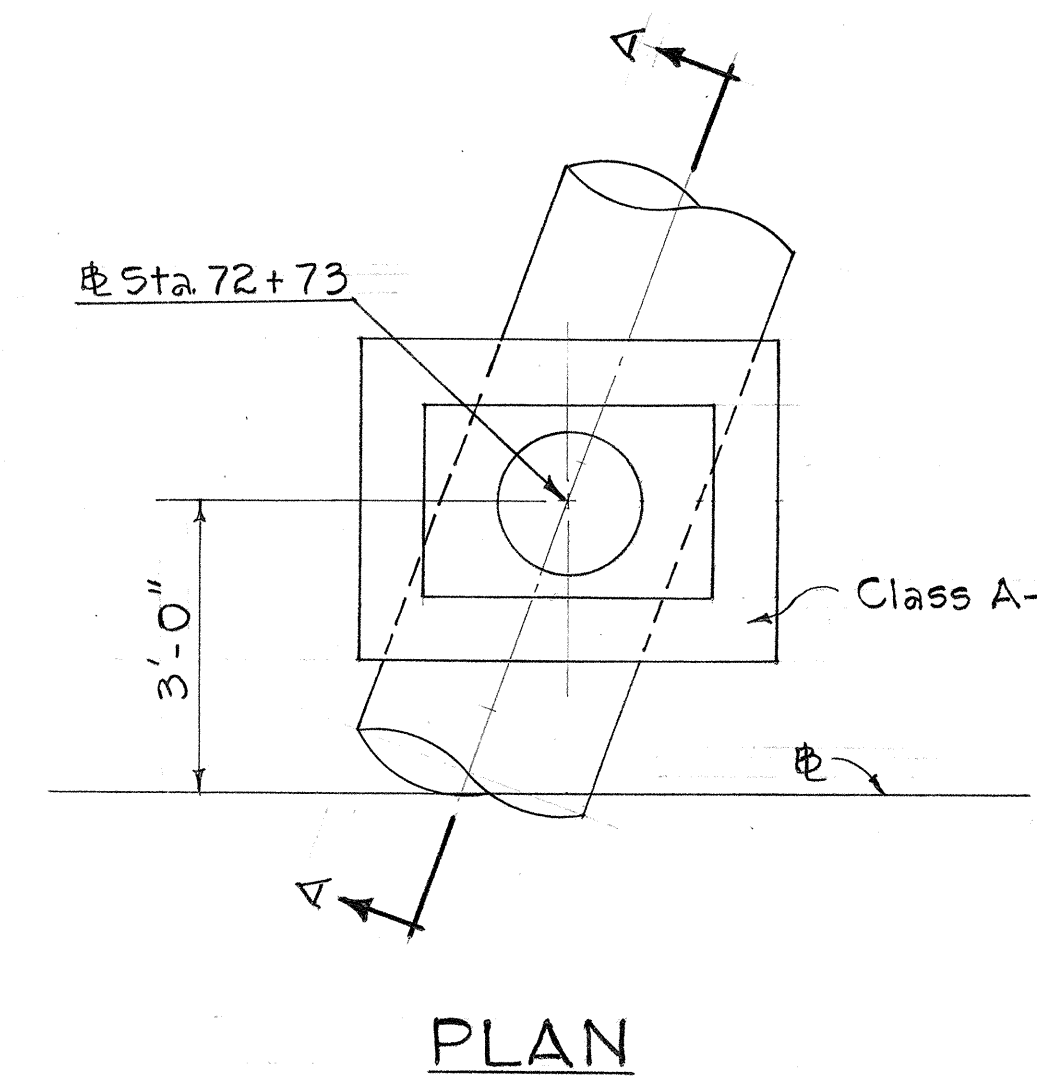


@ STA. 72 + 73.0
 Construct: Median Drain Inlet
 Install: 18" CGMP, 14 Ga.
 ESTIMATED QUANTITIES
 Structure Exc. = 8 CY.
 Class A-1 Conc. = 1 CY.
 Type 24-12 Frame & Gate = 1 Ea.
 18" Pipe Culvert = 3 LF.

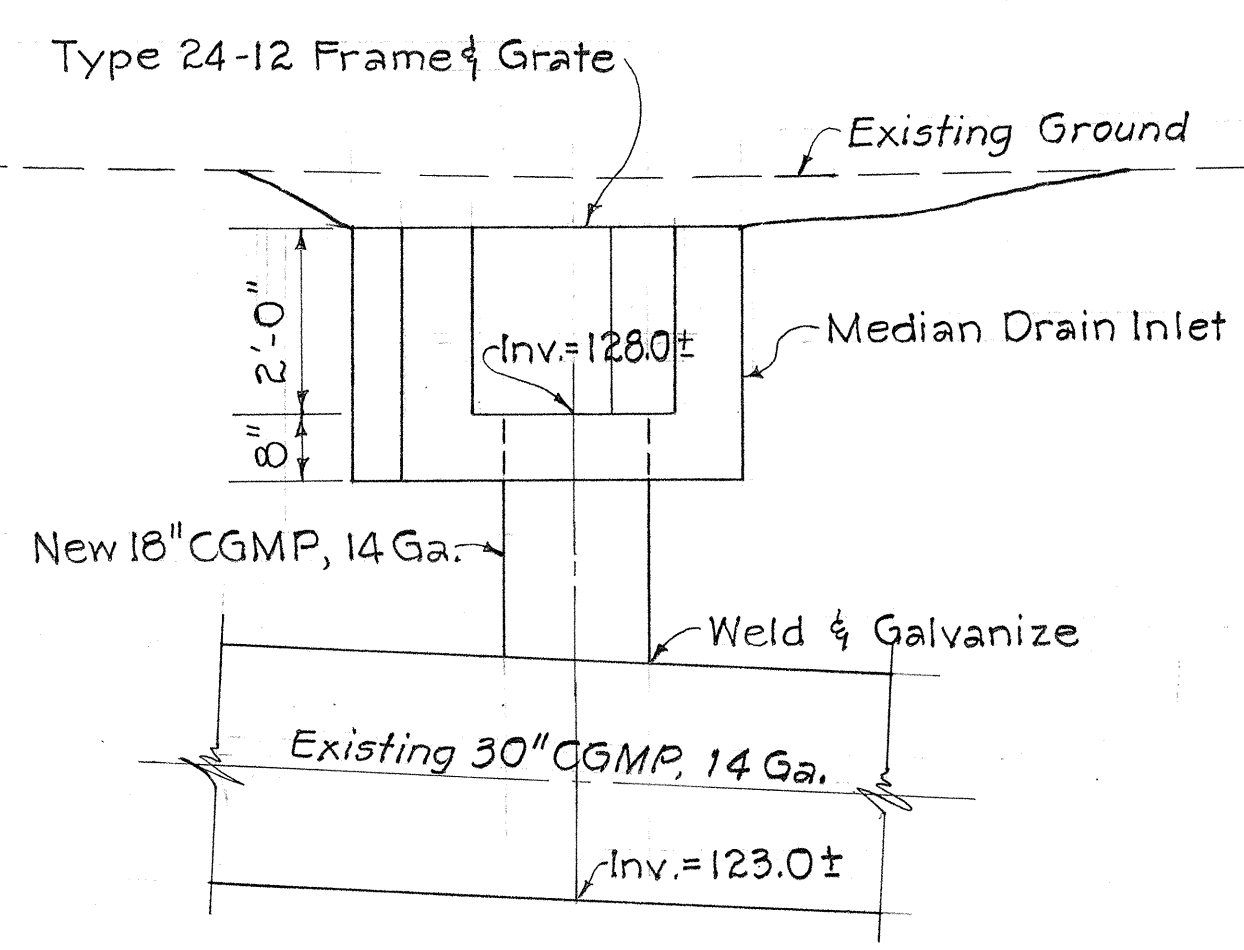
PLAN
 Scale 1" = 20'



PROFILE OF 30" CULVERT
 Scale 1" = 20'



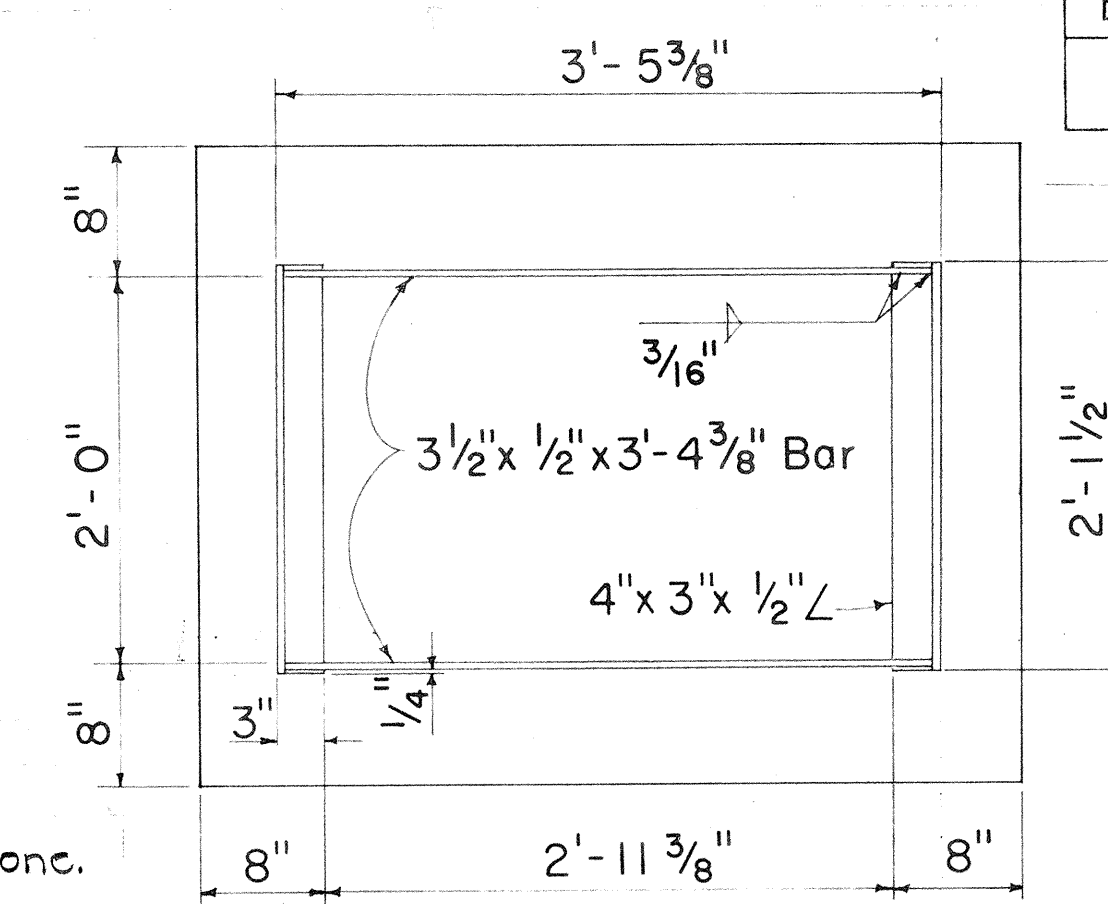
PLAN



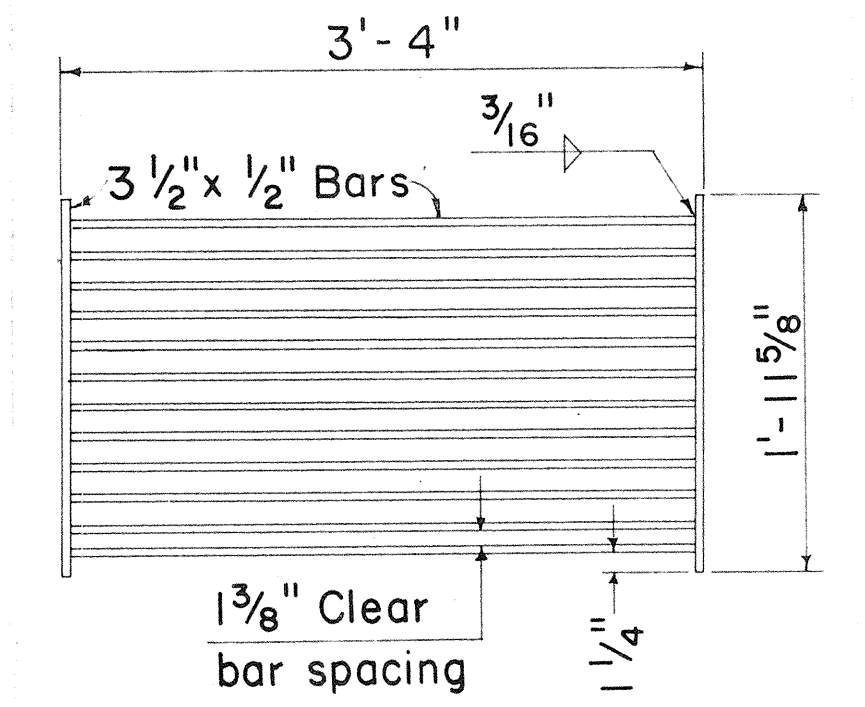
SECTION "A-A"

CONNECTION DETAIL OF MEDIAN DRAIN INLET STRUCTURE @ STA. 72 + 73.0 TO 30" CGMP CULVERT

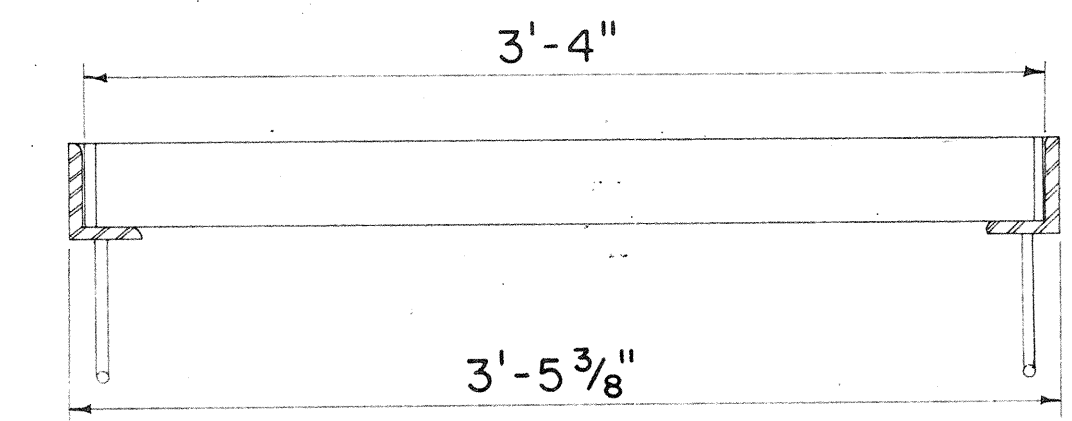
Scale: 1/2" = 1'-0"



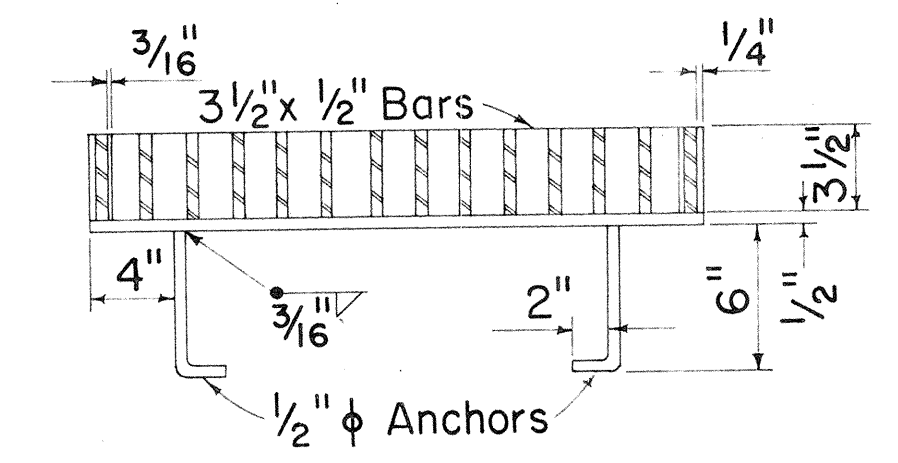
FRAME



GRATE



LONGITUDINAL SECTION
 (Thru Frame and Gate)



CROSS SECTION
 (Thru Frame and Gate)

TYPE 24-12 FRAME AND GRATE

CONTRACT CHANGE ORDER NO. 12

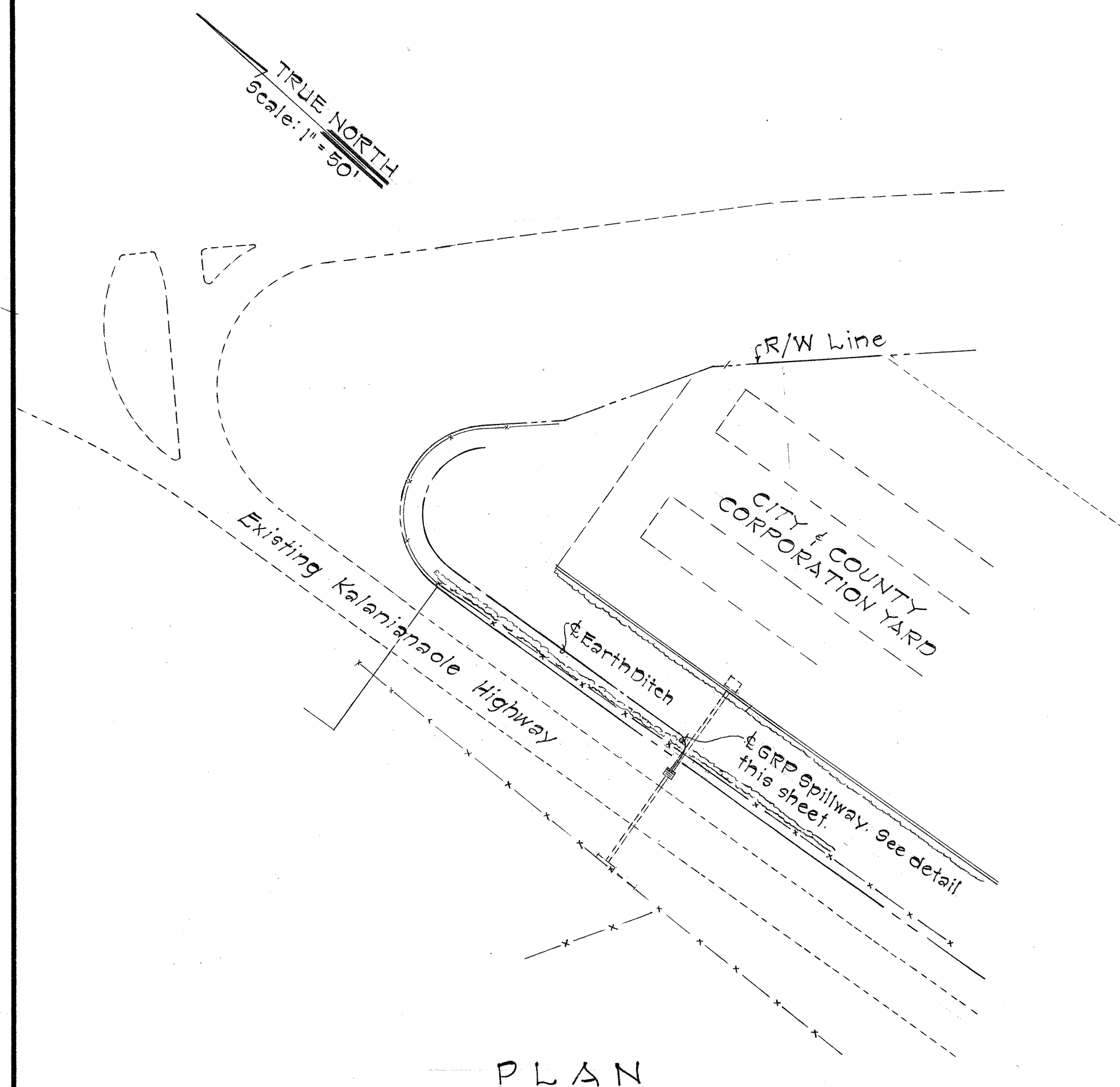
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
 DRAINAGE DETAIL
 30" CGMP CULVERT
 @ STA. 72+71.90
 KALANIANA'OLE HIGHWAY
 PROJ. NO. F-072-1(15)
 Scale: As Noted Oct., 1967

SHEET No. OF SHEETS

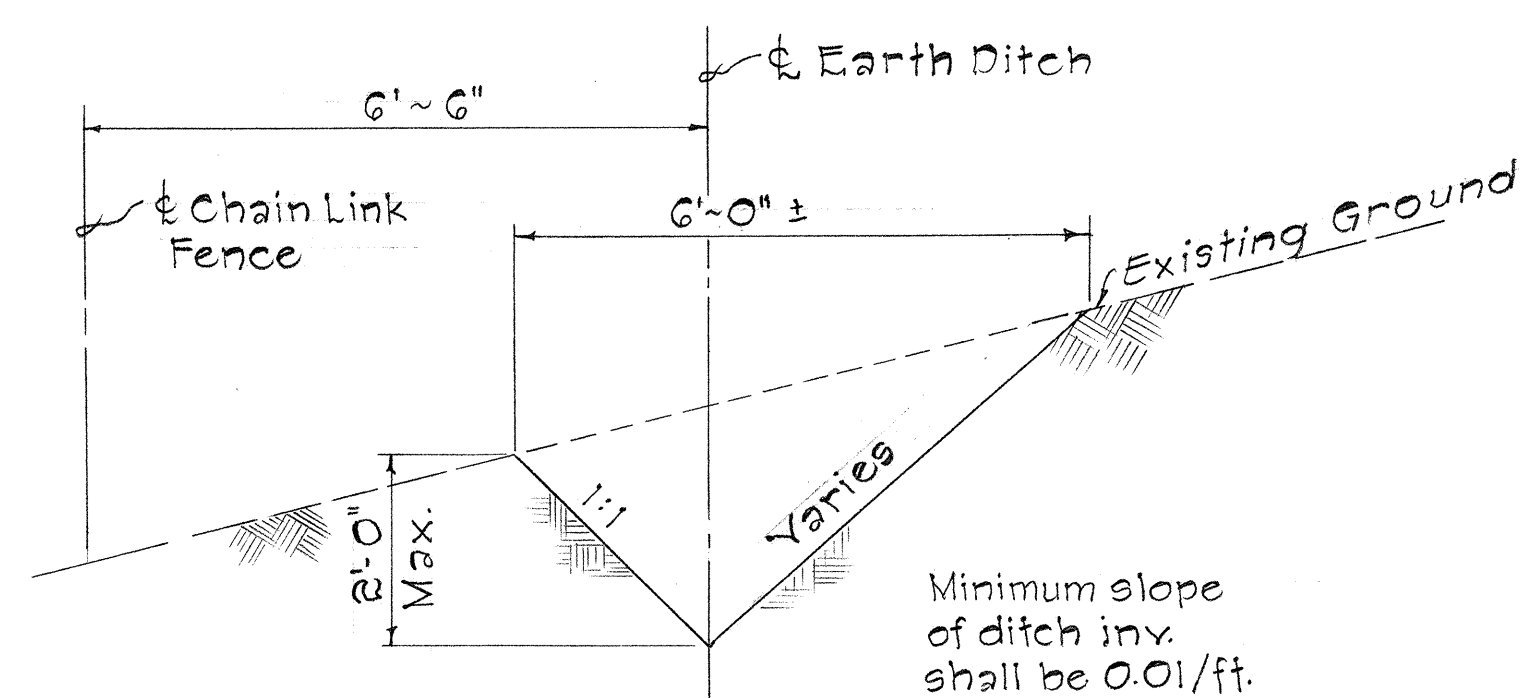
C.O. 22A

SHEET No. 7 OF 10 SHEETS

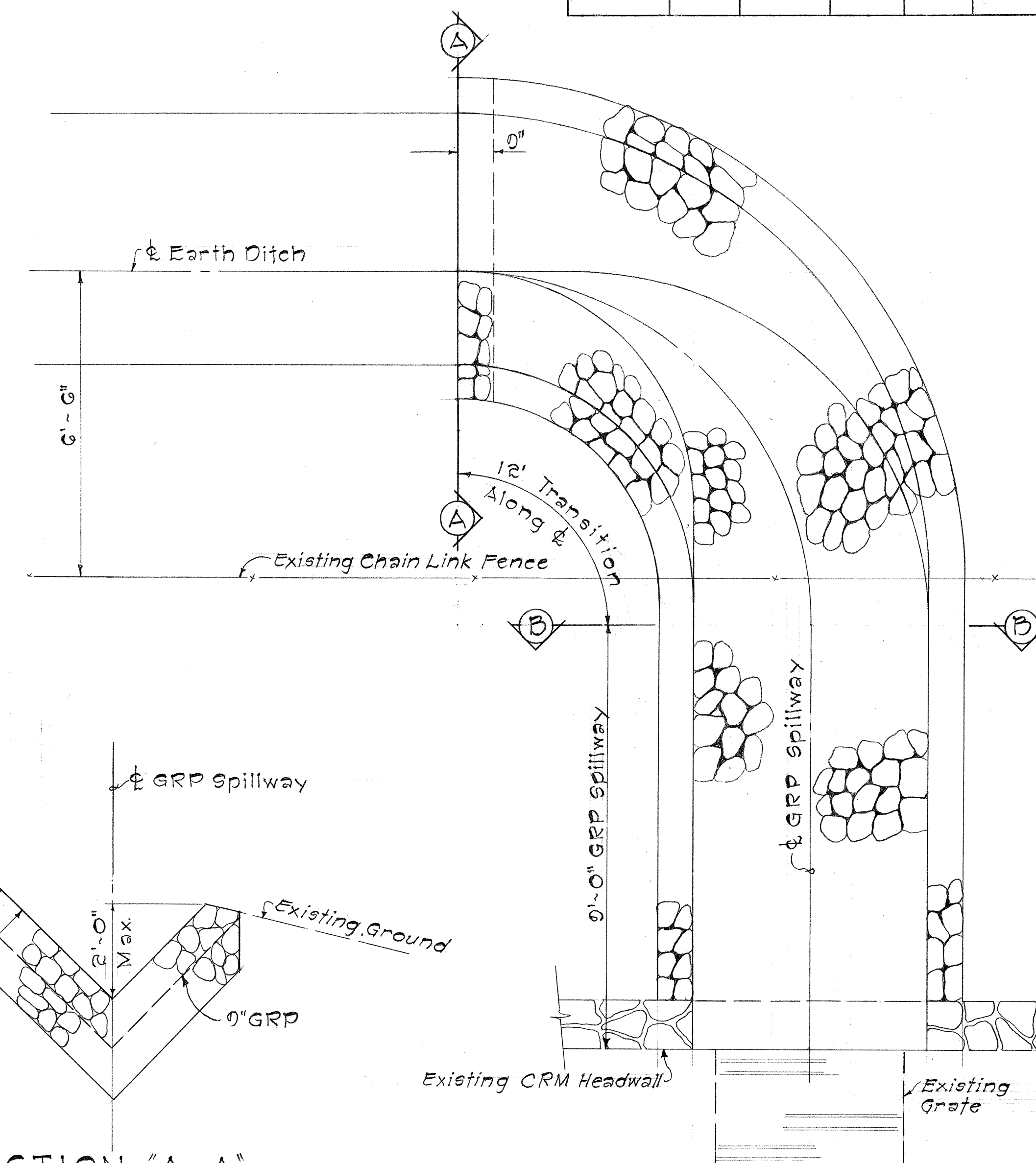
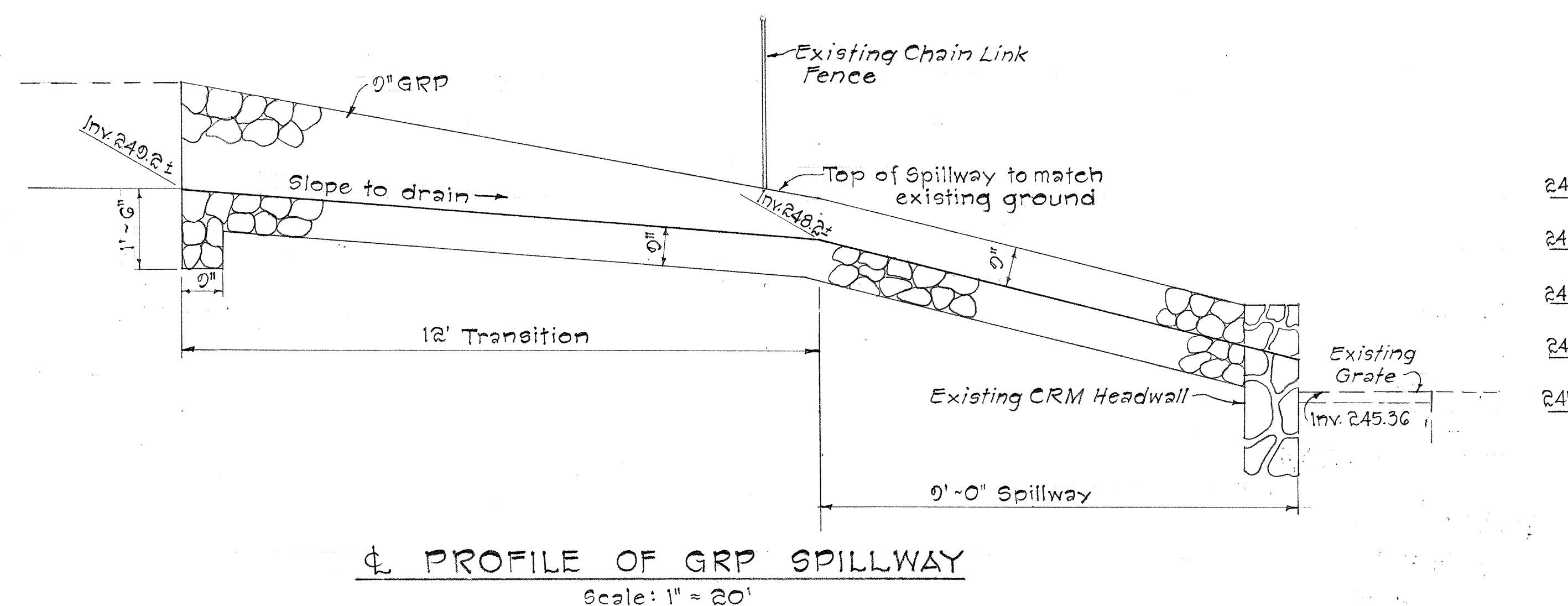
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.				



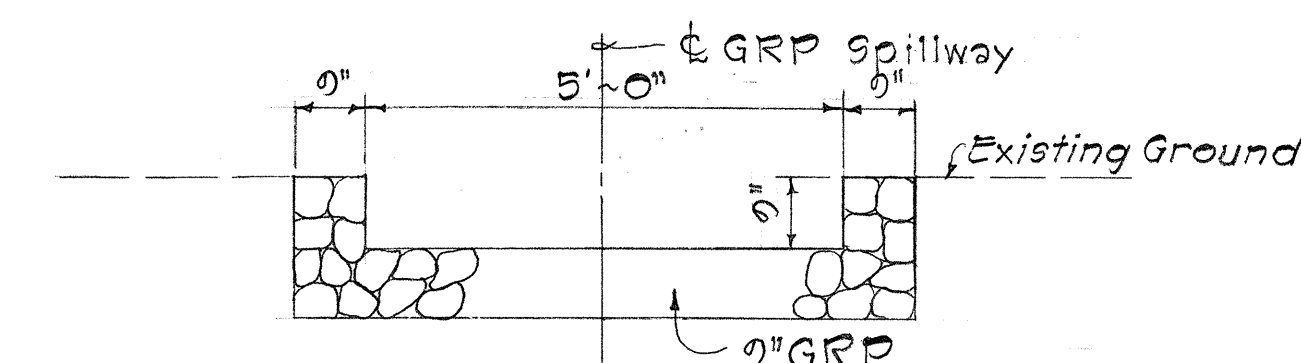
ESTIMATED QUANTITIES
Ditch & Channel Exc. = 35 C.Y. } L.S.
GRP = 5 C.Y.



TYPICAL SECTION OF
EARTH DITCH
Scale: 1/2" = 1'-0"



SECTION "A-A"



SECTION "B-B"

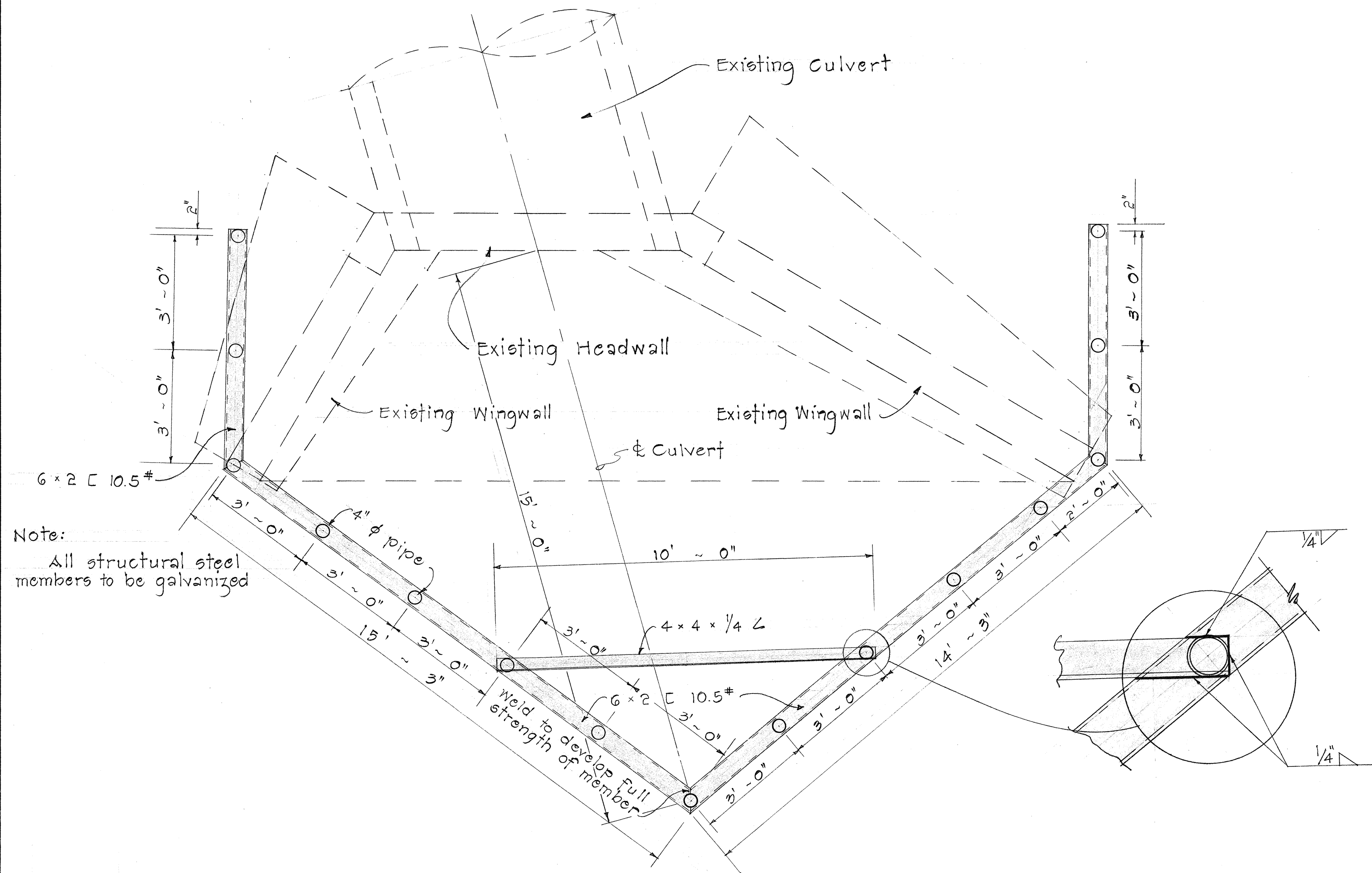
DETAIL OF G.R.P. SPILLWAY
Scale: 1/2" = 1'-0"

Y. H. Kim
CHIEF ENGINEER, DEPT. OF PUBLIC WORKS
11-24-67
DATE

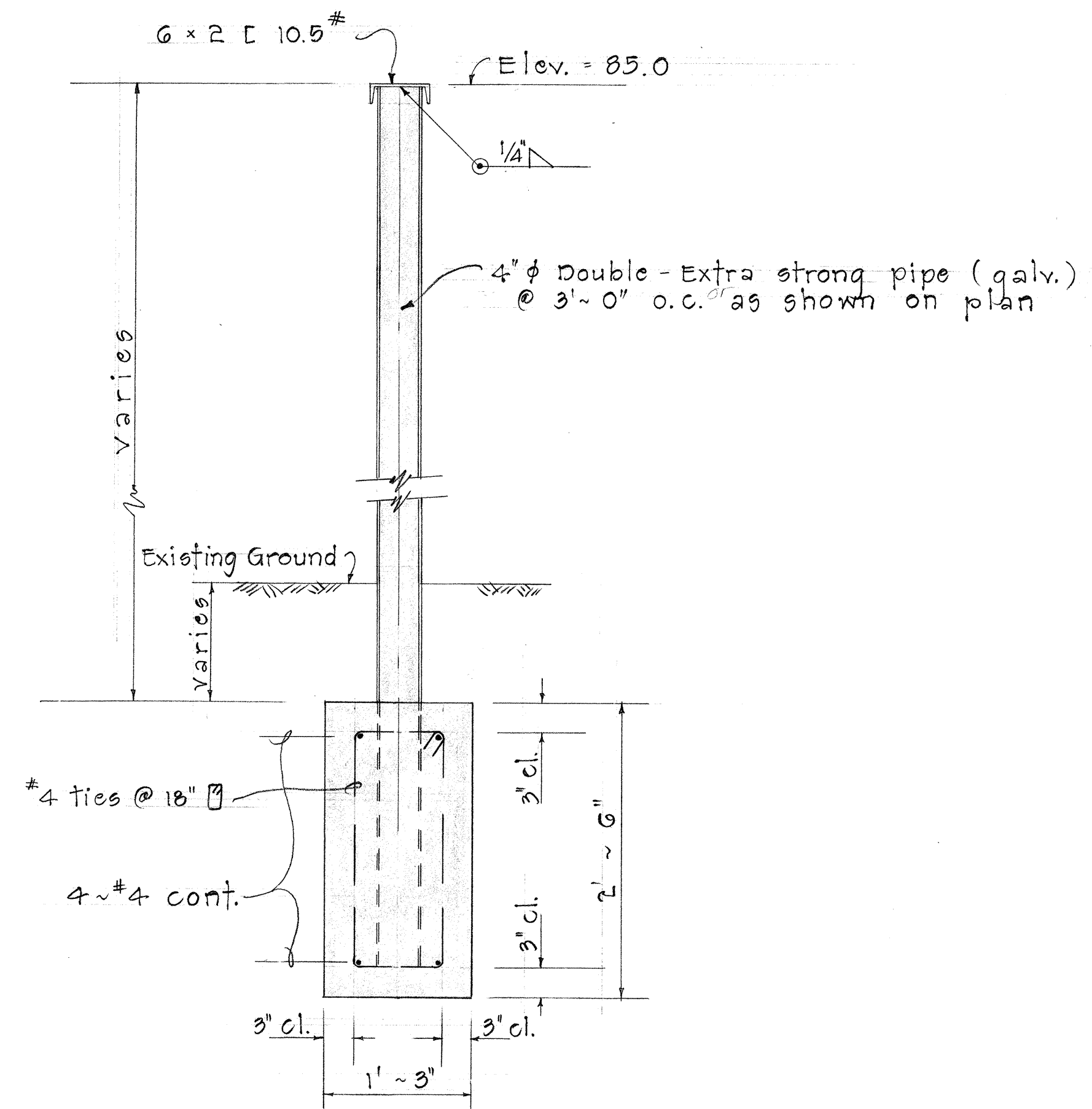
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE PLAN
AT
CITY & COUNTY CORP. YARD
KALANIANAʻOLE HIGHWAY
PROJ. No. F-072-1(15)
Scale: As Shown
Date: Nov. 1967
SHEET No. OF SHEETS

23 A

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



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

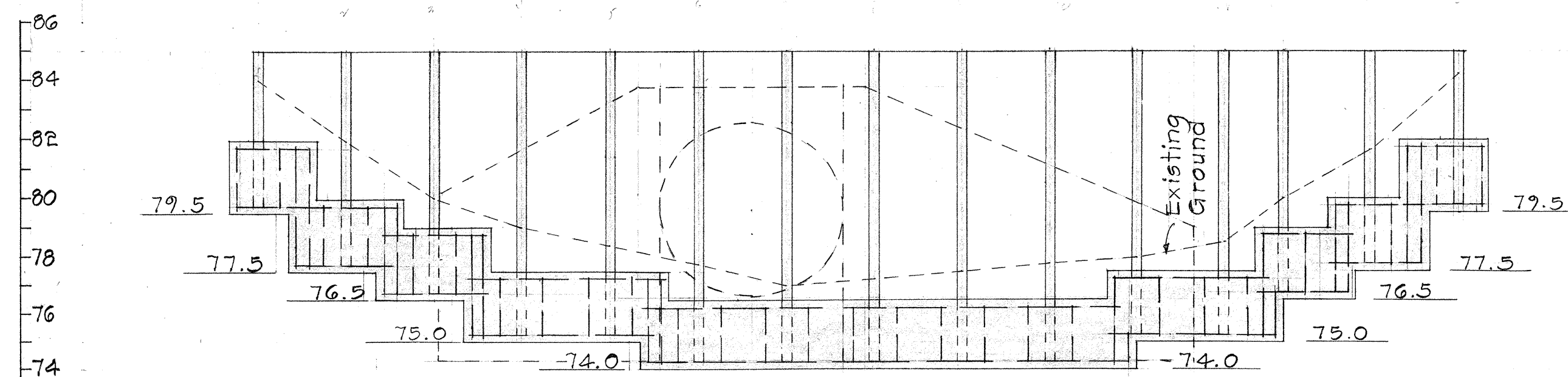


TYPICAL SECTION OF
DEBRIS RACK

Scale: 1" = 1' - 0"

ESTIMATED QUANTITIES

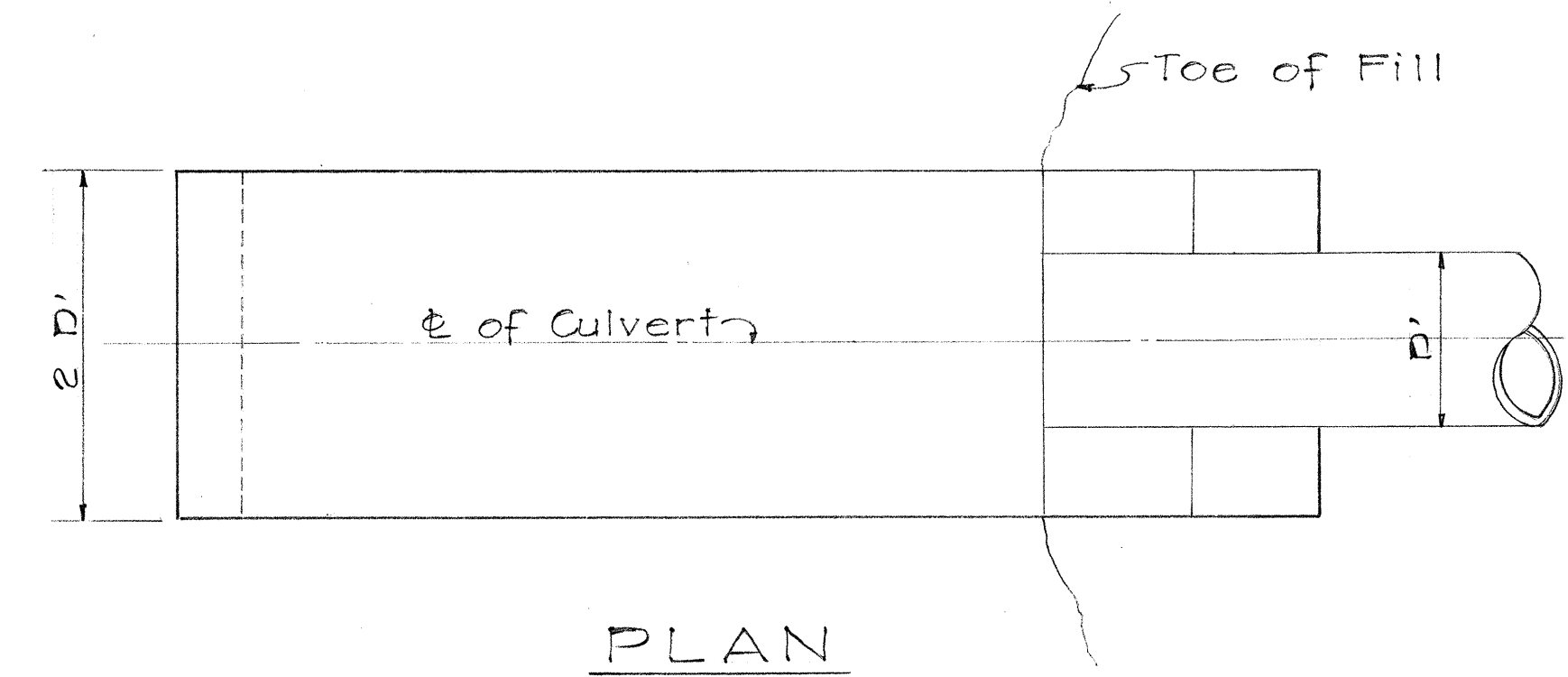
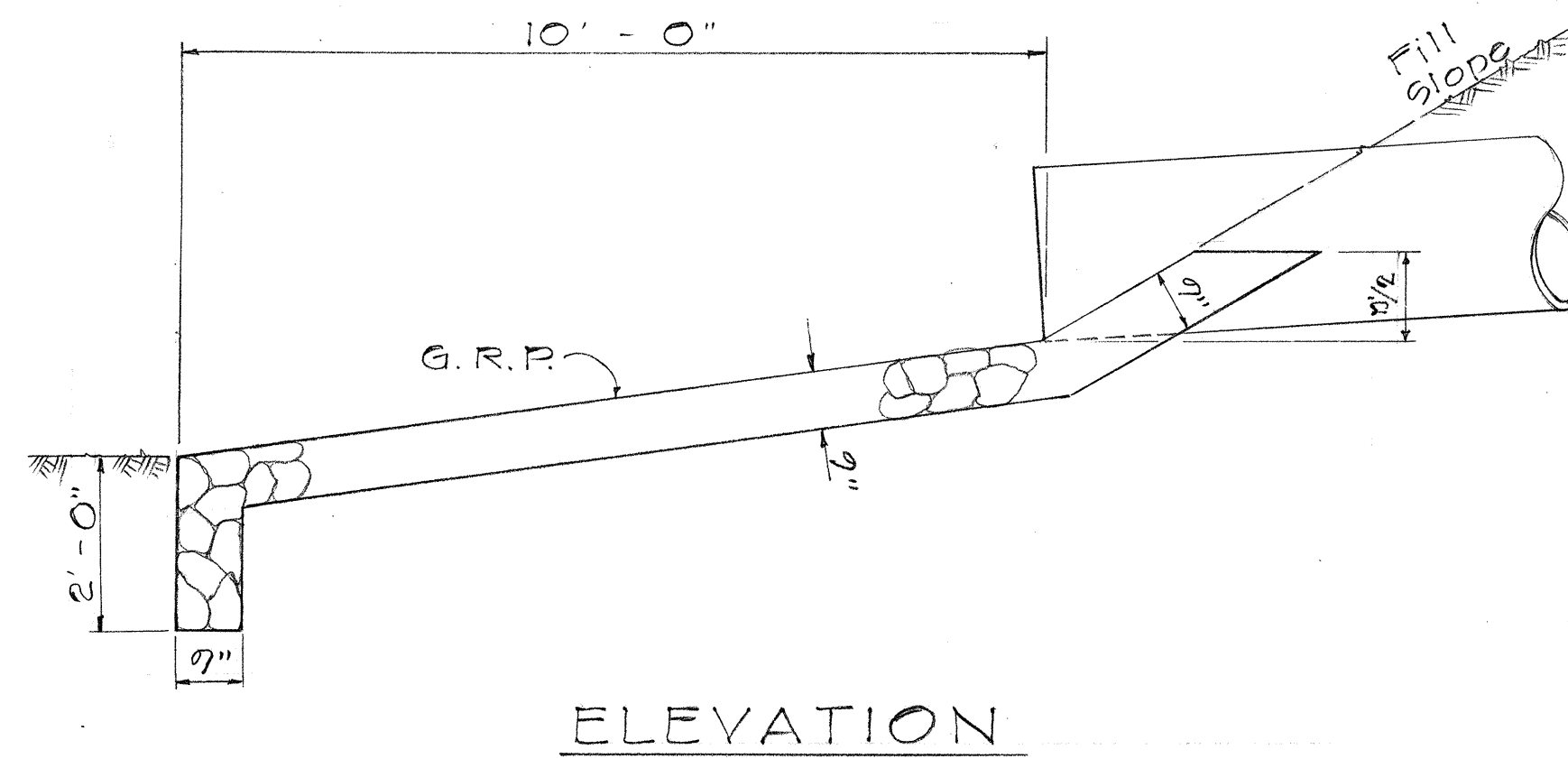
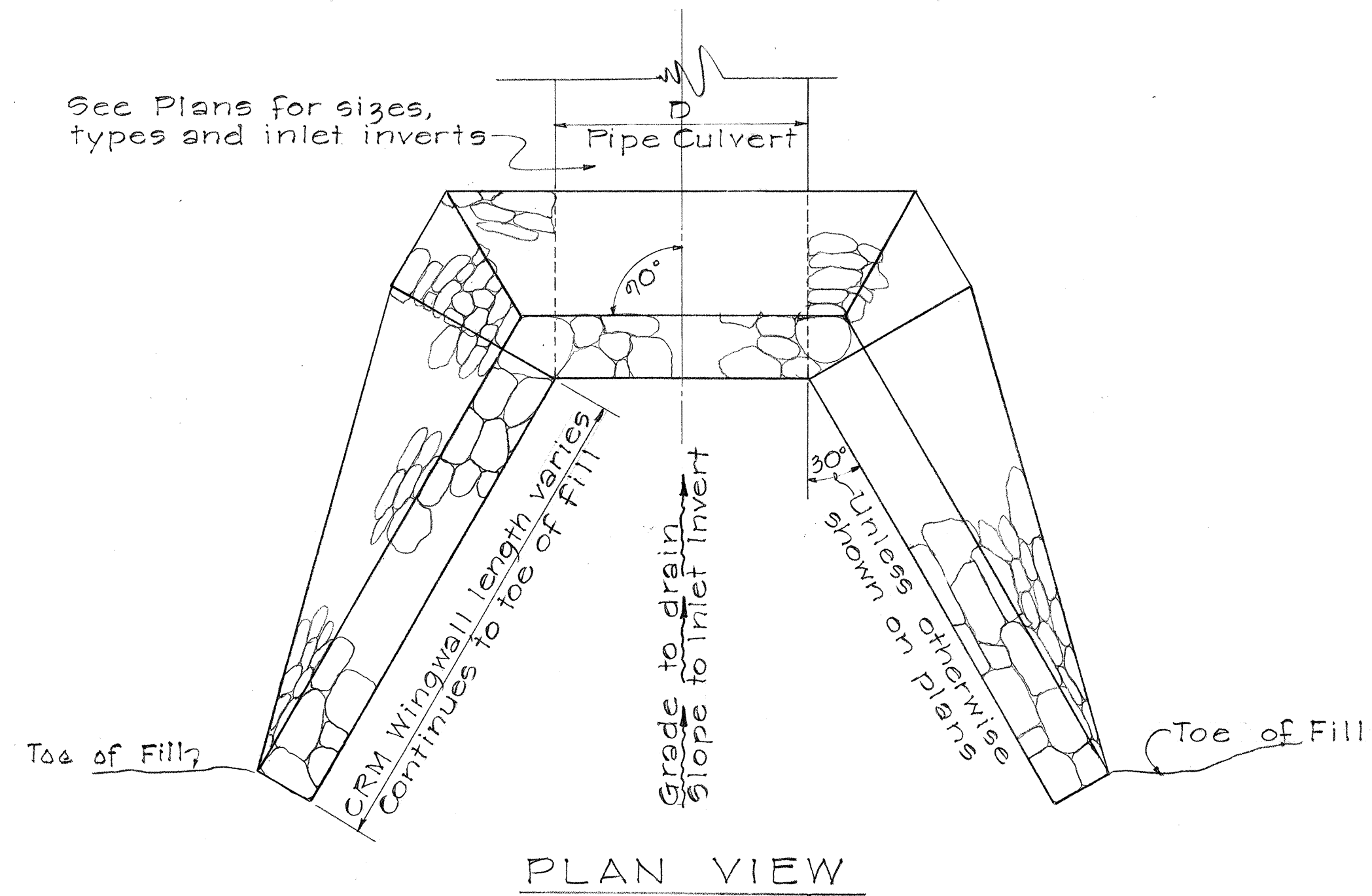
Structure Exc.	= 21.6 C.Y.	} L.S.
Class "A-1" Conc.	= 5.5 C.Y.	
Reinf. Steel (Reinf. Bars, L Iron, & L Iron)	= 800 Lbs.	
4" φ Double-Extra Strg. Pipe (Galv.)	= 136 L.F.	



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

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
DEBRIS RACK FOR INLET TO EXISTING 72" CULVERT AT STA. 67+24 KALANIANA'OLE HIGHWAY PROJ. No. F-072-1(15) Scale: As Shown Date: Oct. 1967	
SHEET No.	OF SHEETS

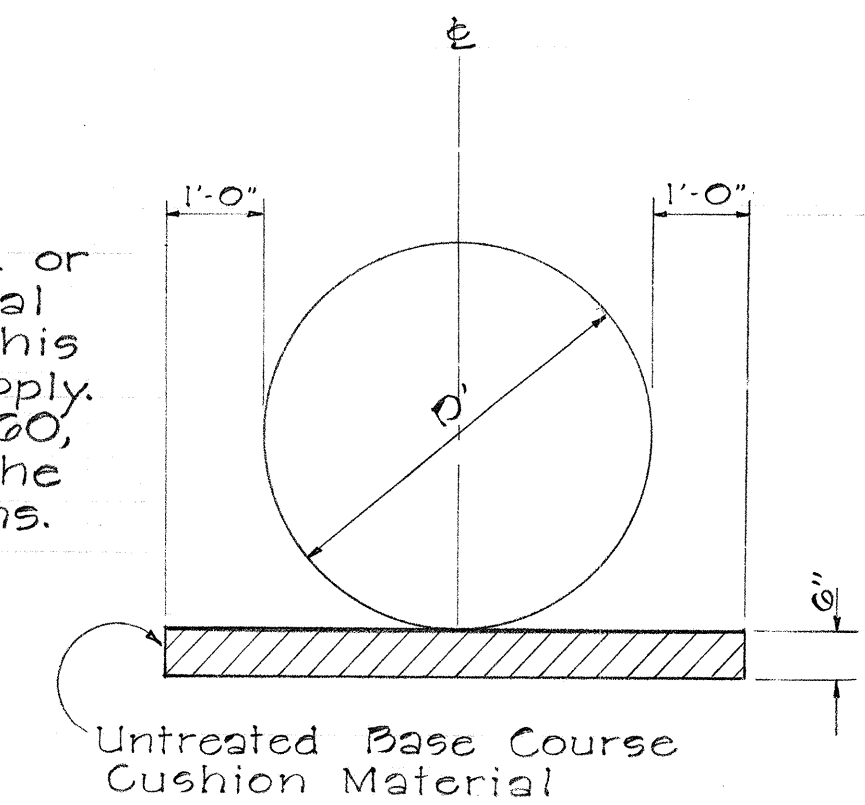
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072(108)	1966	24	58



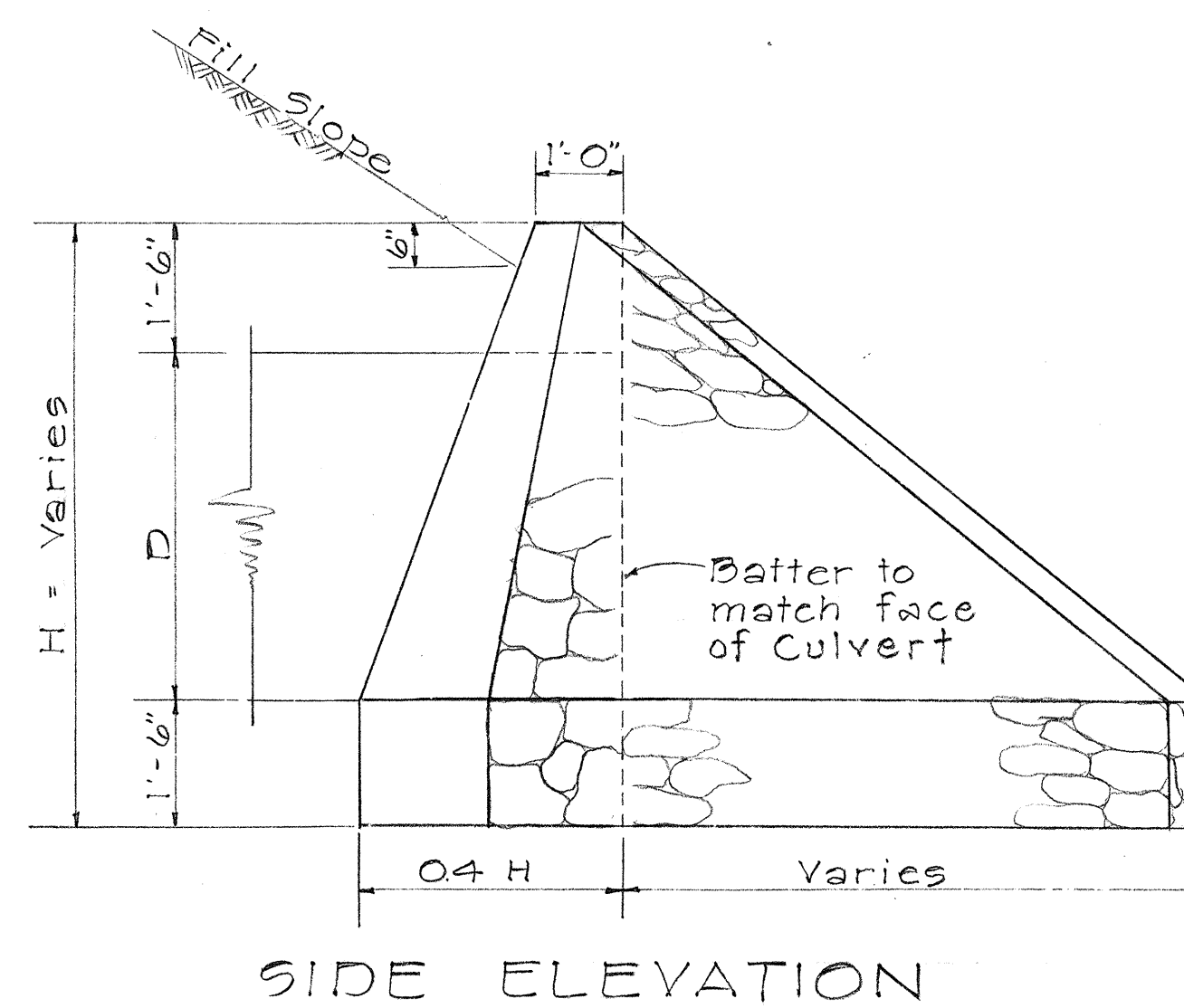
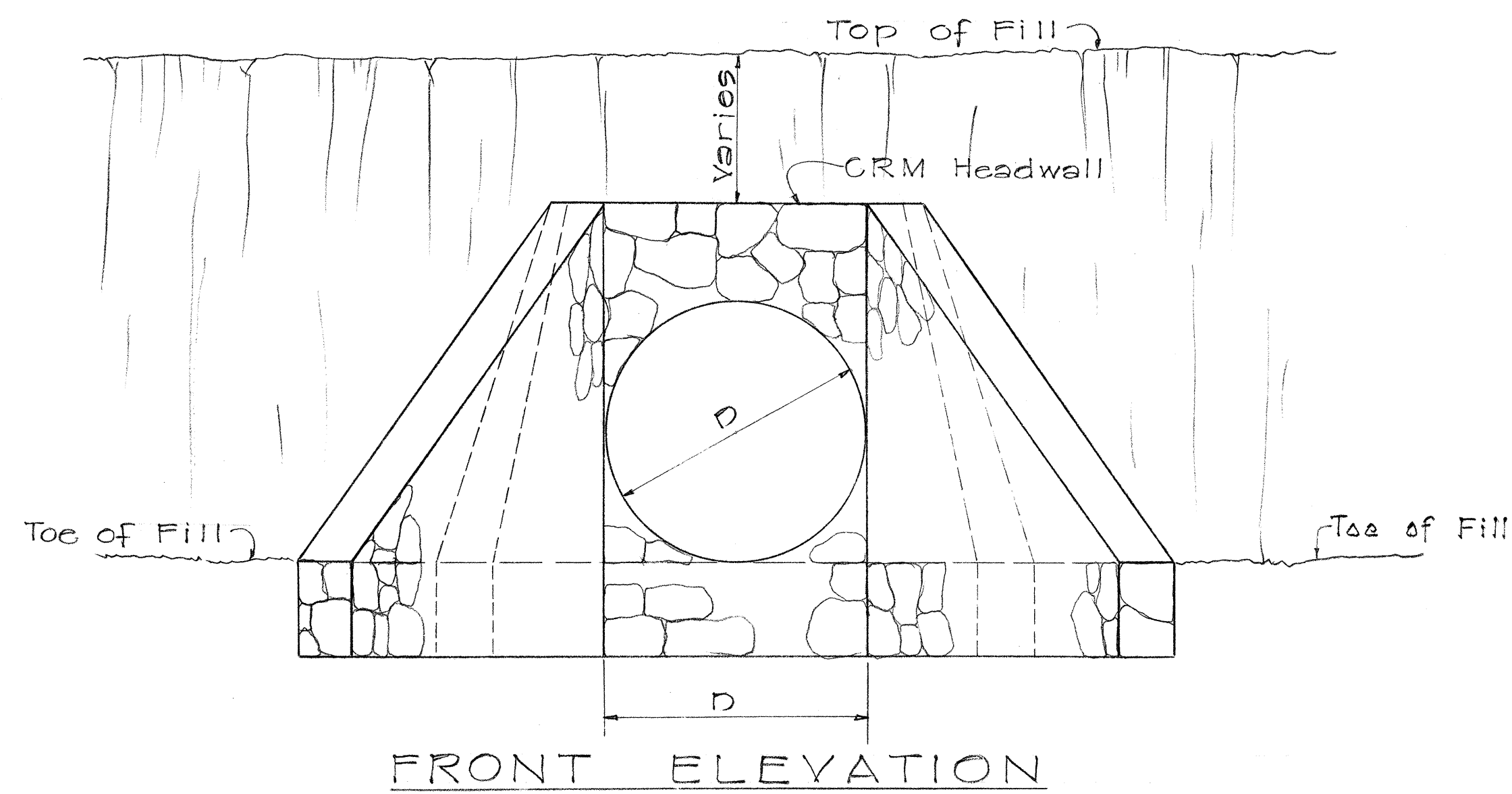
DETAIL - CULVERT OUTLET
Scale: 1/2" = 1'-0"

NOTE:

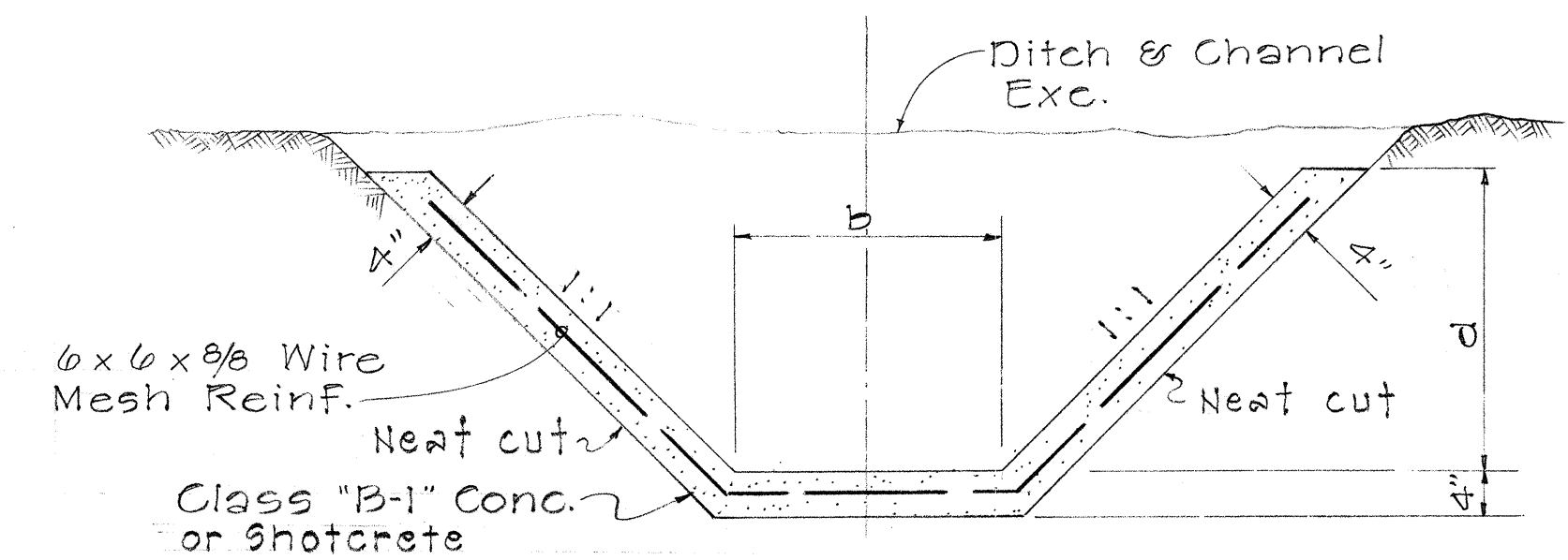
Where Solid Rock or Unsuitable Material is encountered, this detail does not apply. Refer to Section 60, Article 60.3 of the Special Provisions.



PIPE FOUNDATION FOR
SECTIONAL PLATE PIPE CULVERTS
Not to Scale



DETAILS OF CRM INLET STRUCTURE
Scale: 1/2" = 1'-0"



CONCRETE LINED DITCH (b x d)
Not to Scale

ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
NO.	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

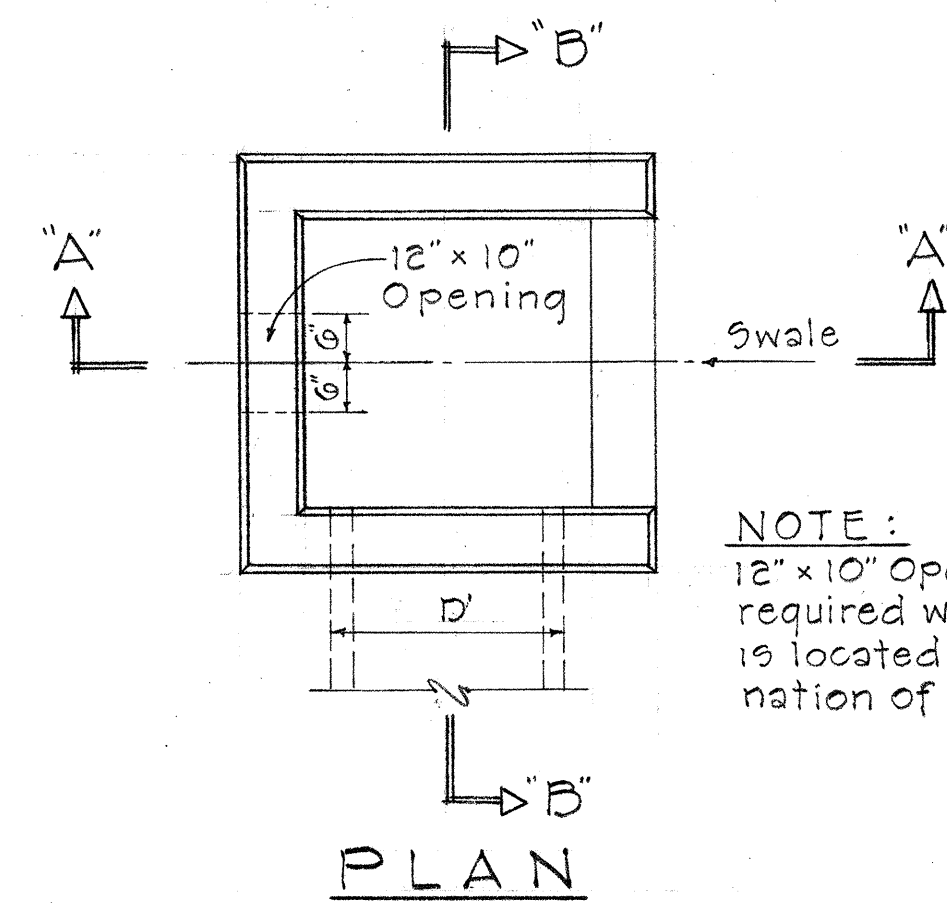
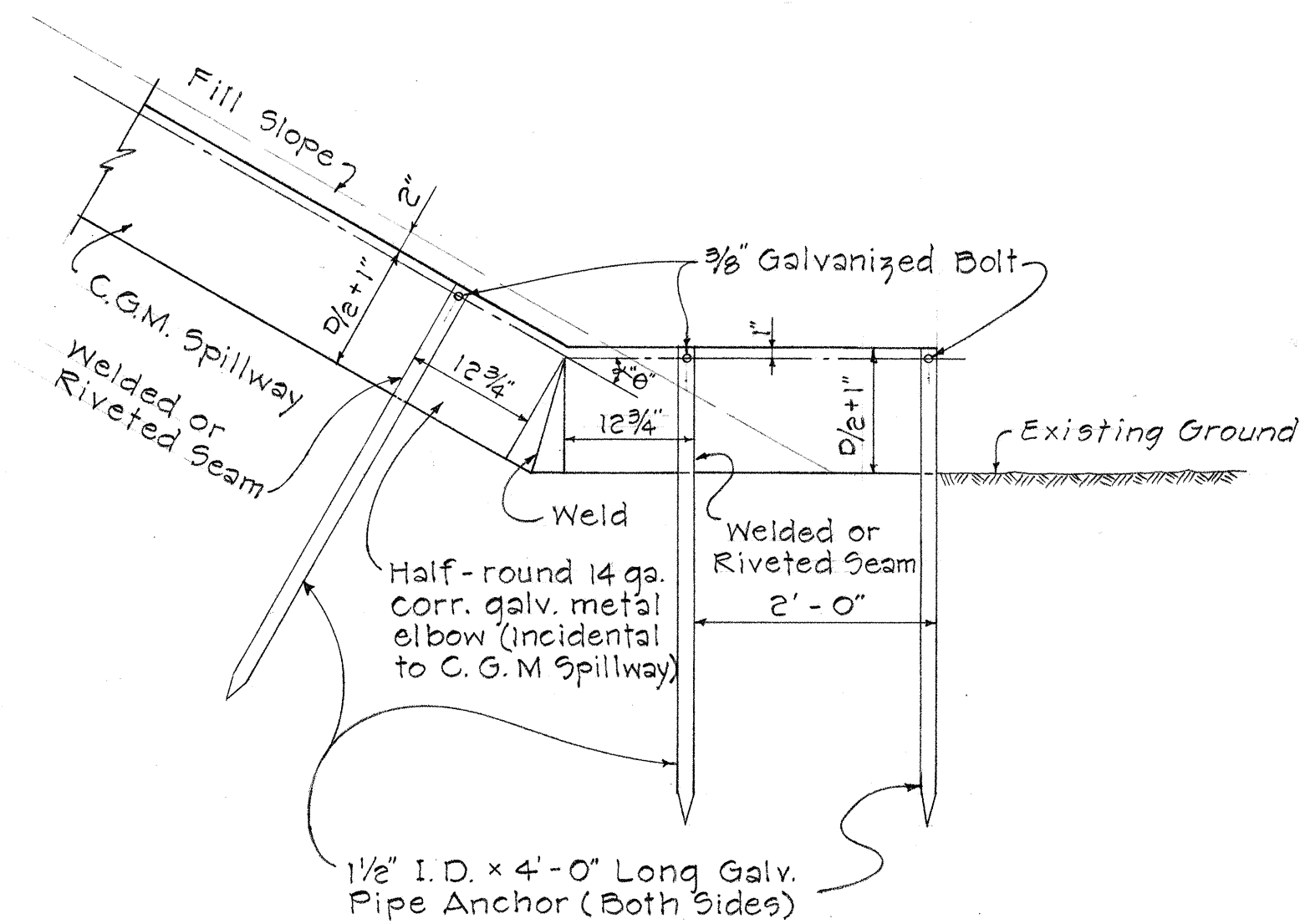
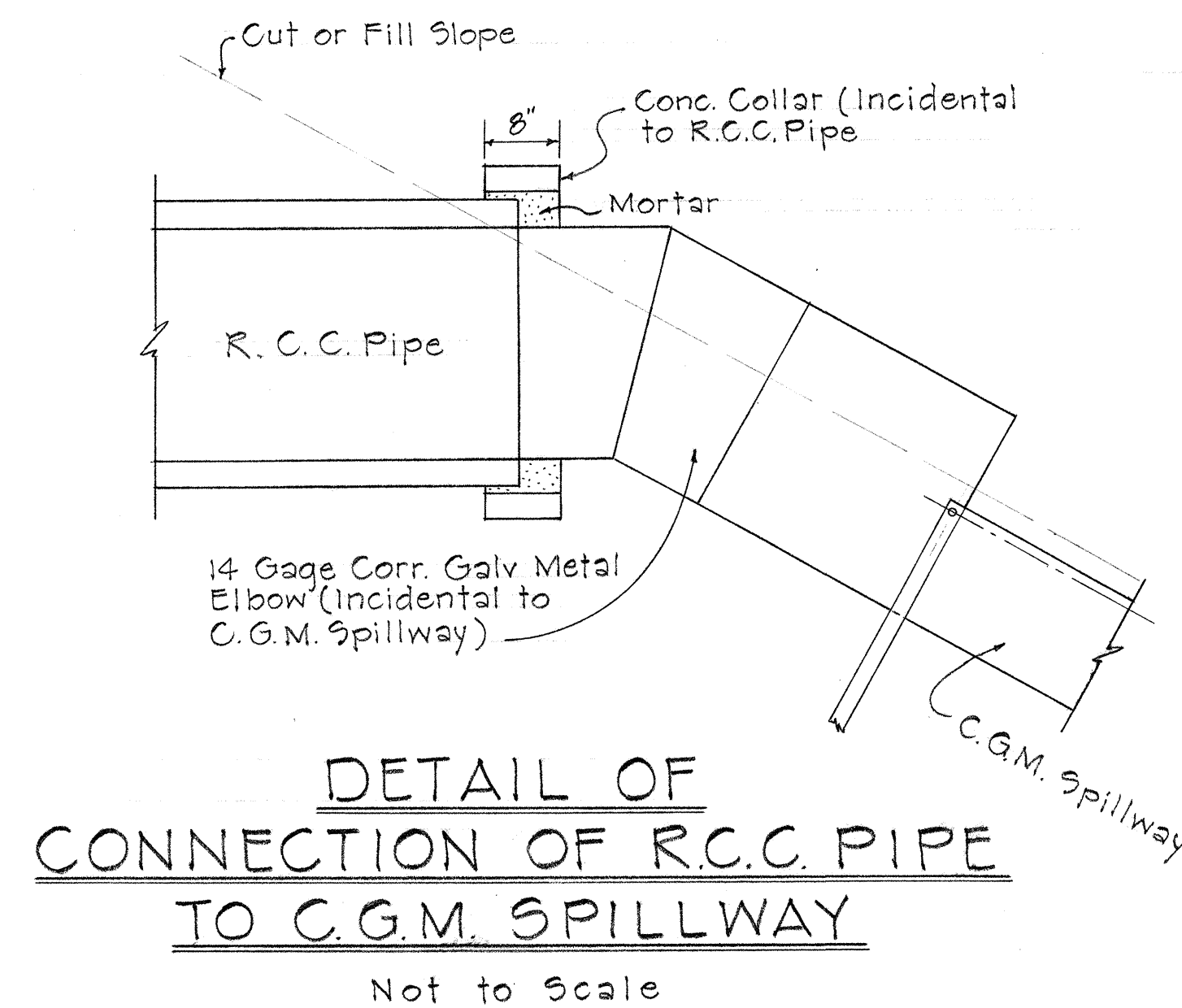
CRM INLET STRUCTURE - CULVERT OUTLET
PIPE FOUNDATION FOR SECT'L PLATE PIPE
CULVERTS - CONC. LINED DITCHES

KALANIANA'OLE HIGHWAY
PROJ. NO. F-072-1(15)
SCALE AS NOTED

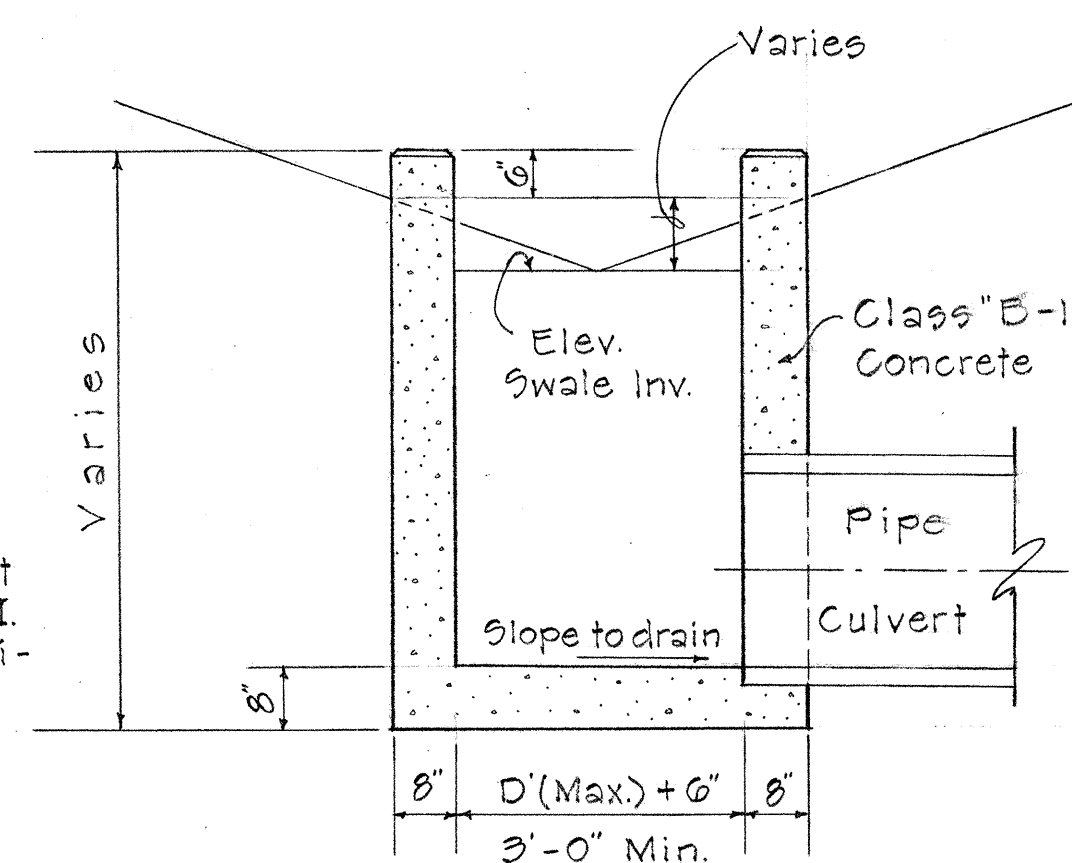
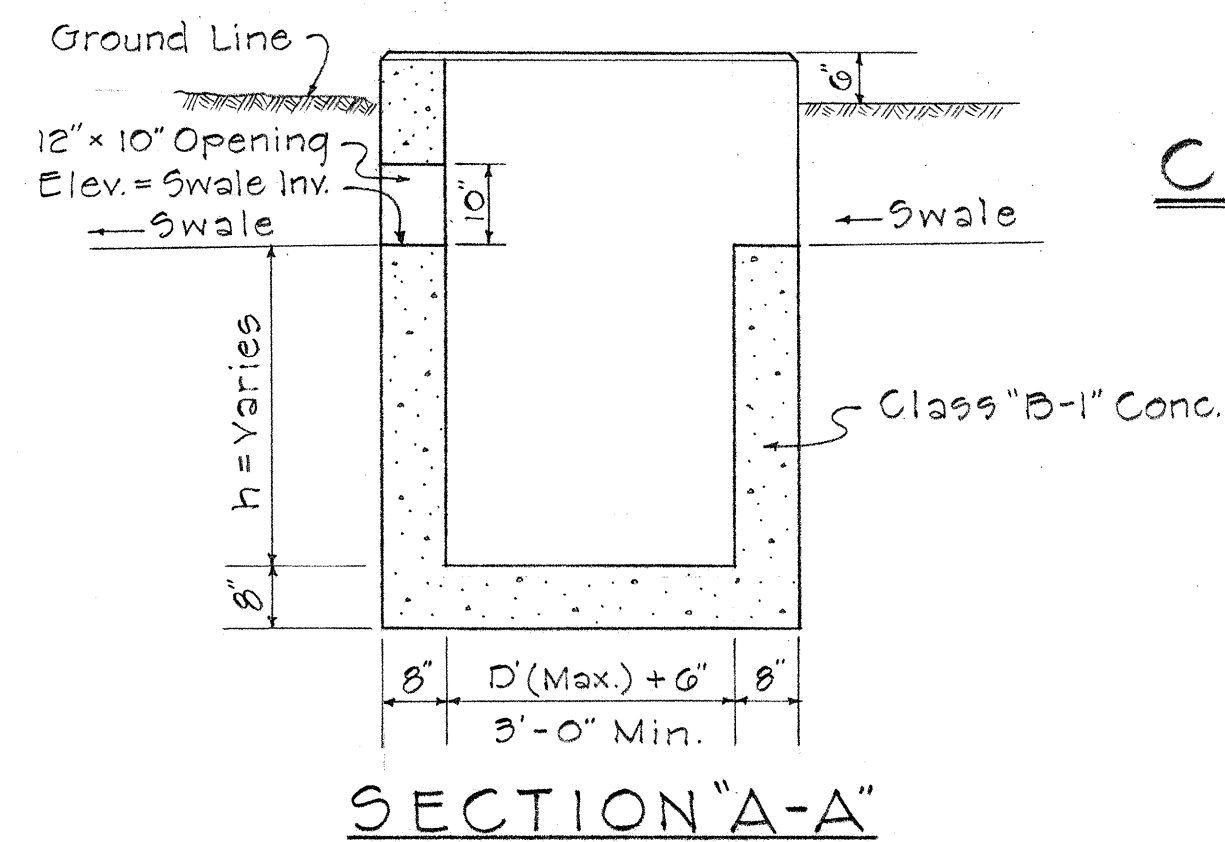
FEB. 1966

SHEET No. 8 OF 10 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(13)	1966	25	58



NOTE: 12' x 10' Opening not required when C.D.I. is located at termination of swale.



TYPE "A" CONCRETE DROP INTAKE

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

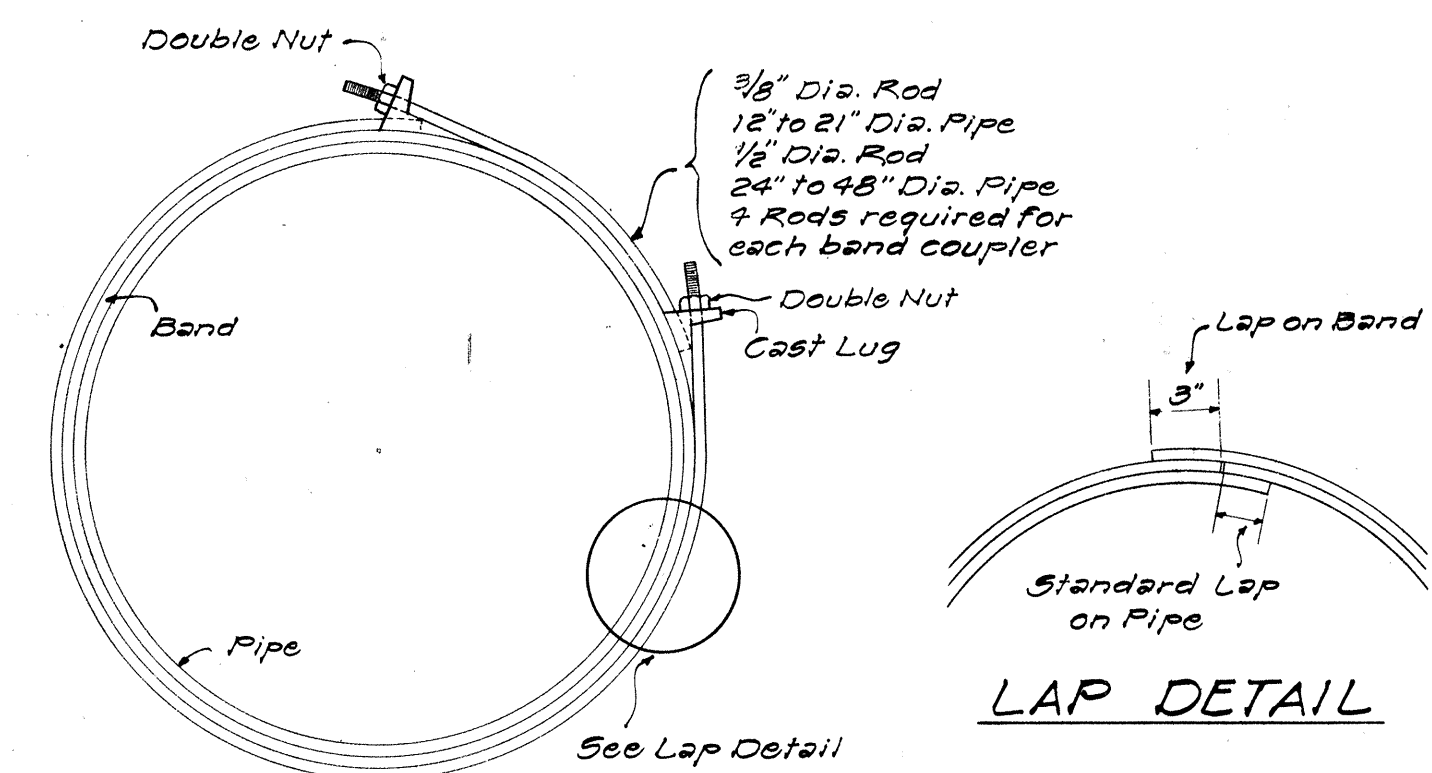
DRAINAGE DETAILS

CONNECTION OF RCCP TO CGM SPILLWAY
CGM SPILLWAY AT TOE OF FILL
TYPE "A" CONCRETE DROP INTAKE

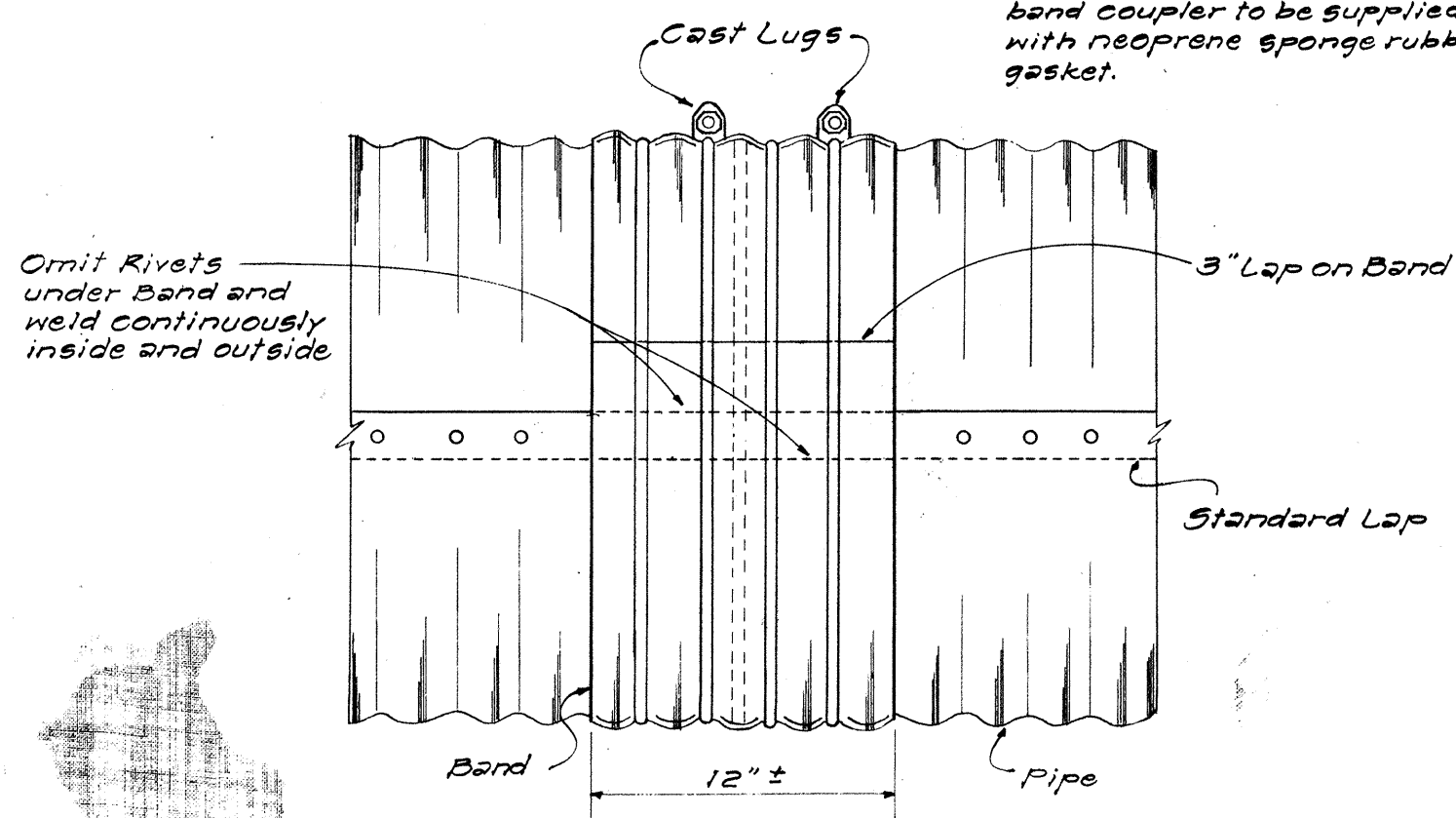
KALANIANA'OLE HIGHWAY
PROJ. NO. F-072-1(13)

SCALE: AS NOTED FEB. 1966

SHEET No. 25 OF 10 SHEETS

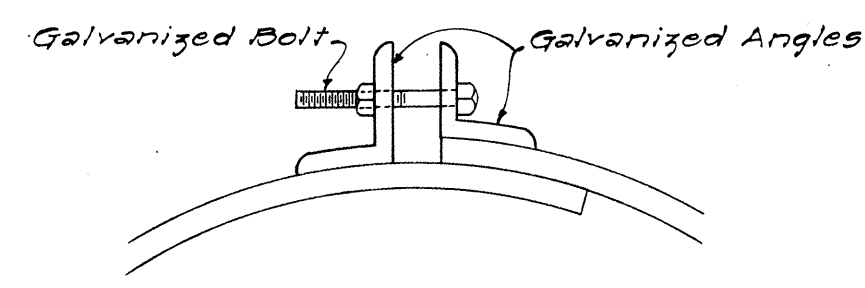


END VIEW

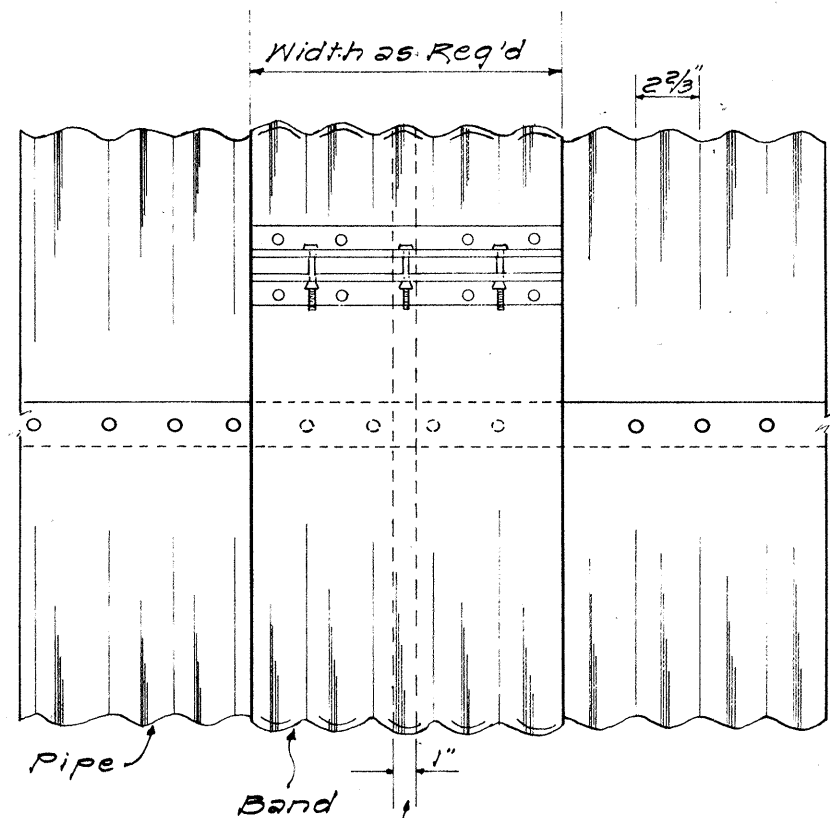


SIDE VIEW

DETAIL OF WATERTIGHT BAND COUPLER
NOT TO SCALE

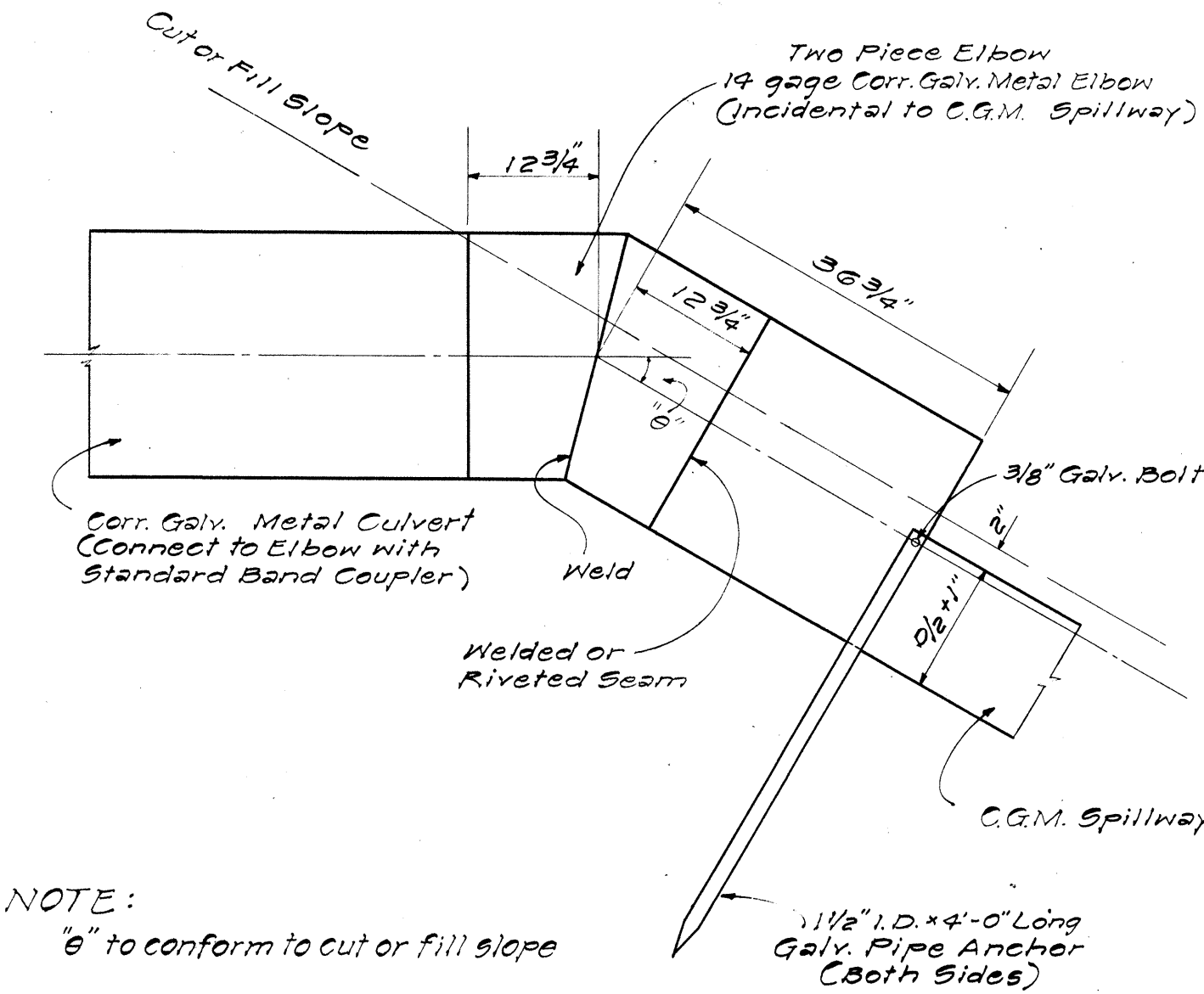


BAND DETAIL



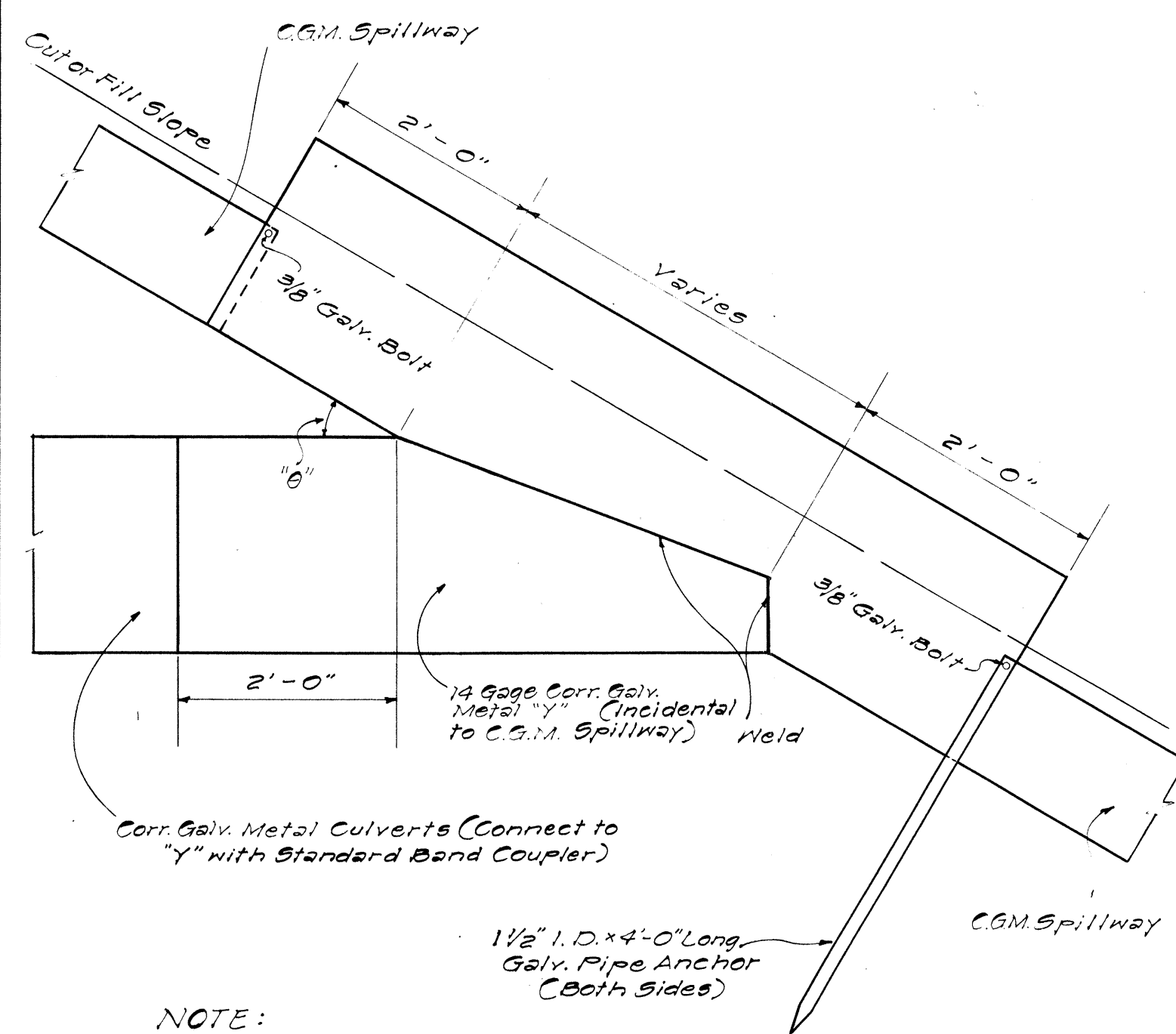
SIDE VIEW

DETAIL OF STANDARD BAND COUPLER
NOT TO SCALE



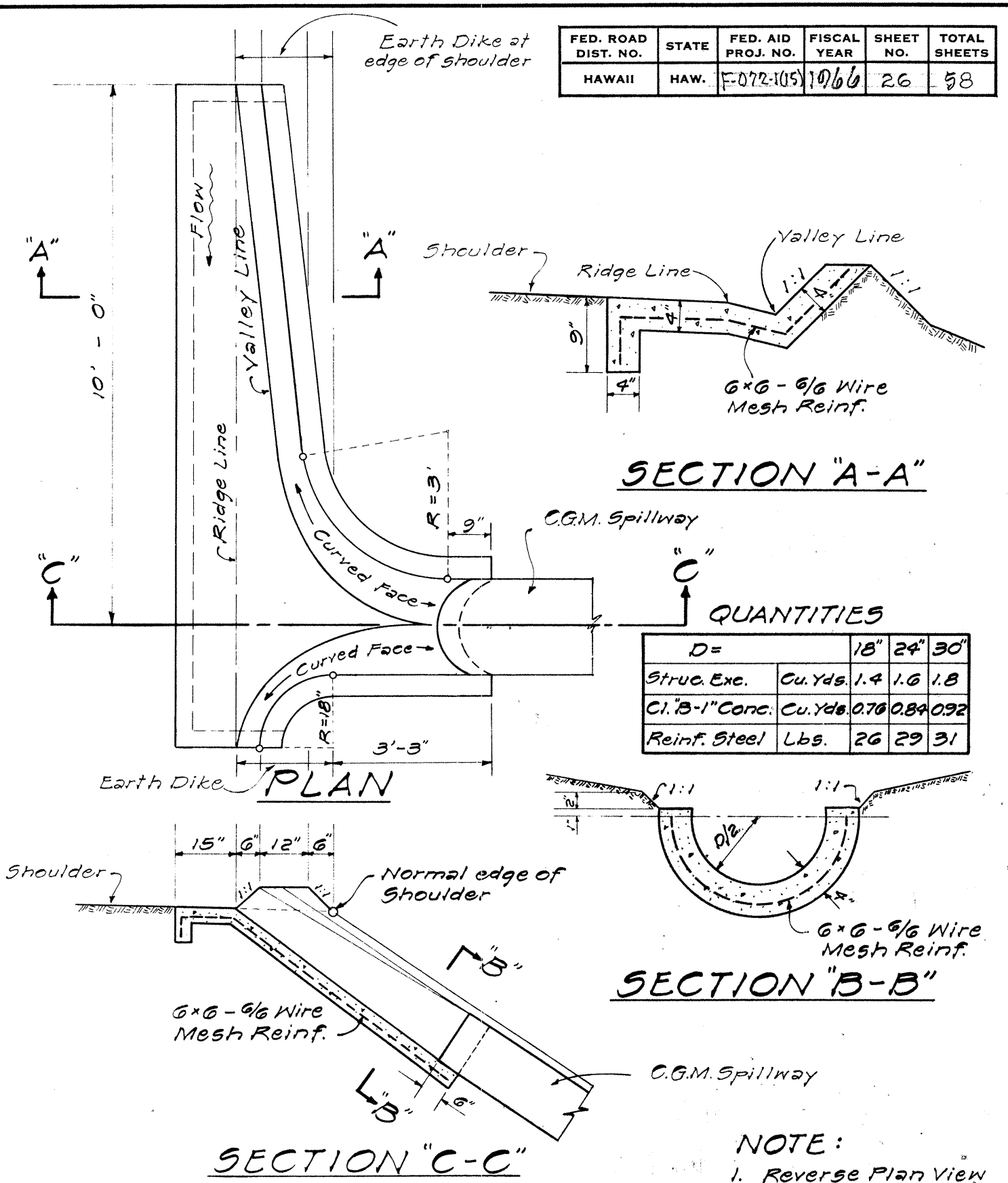
NOTE:
"b" to conform to cut or fill slope

DETAIL OF CULVERT
TO SPILLWAY CONNECTION
NOT TO SCALE



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

DETAIL OF CULVERT
TO SPILLWAY "Y" CONNECTION
NOT TO SCALE



SECTION "A-A"

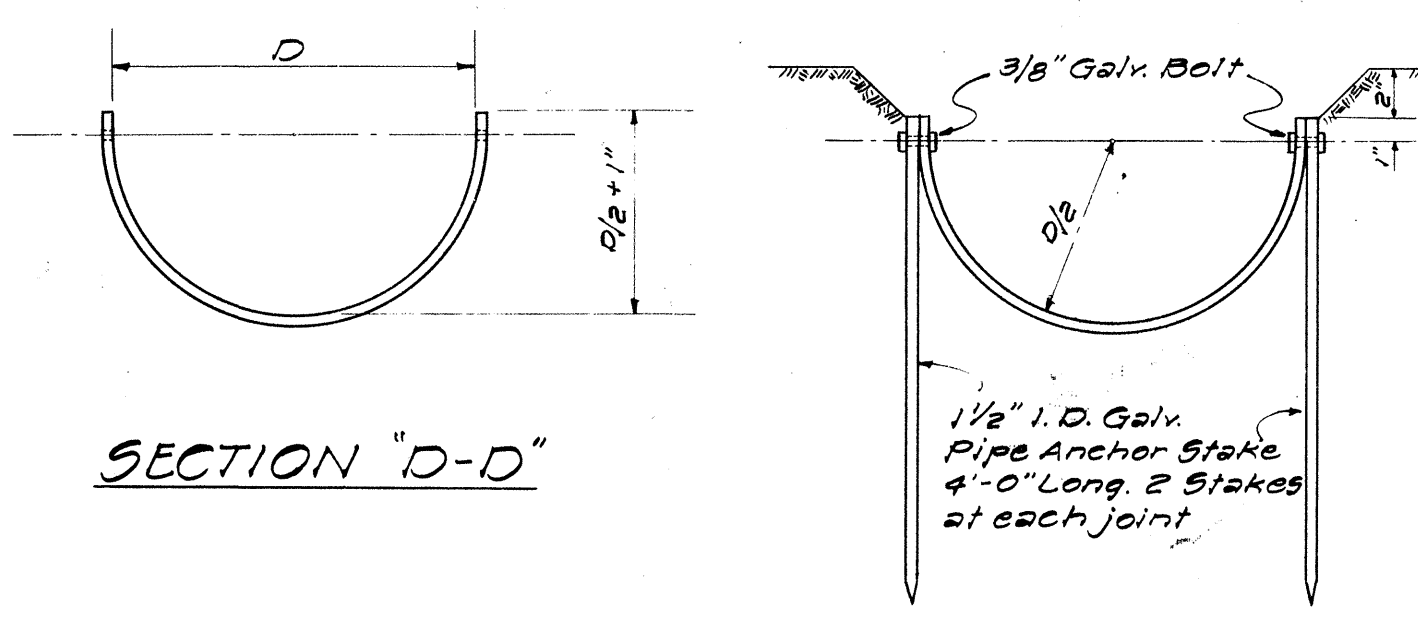
QUANTITIES

D=	18"	24"	30"
Struc. Exc.	Cu. Yds. 1.4	1.6	1.8
Cl. B-1 Conc.	Cu. Yds. 0.76	0.89	0.98
Reinf. Steel	Lbs. 26	29	31

SECTION "B-B"

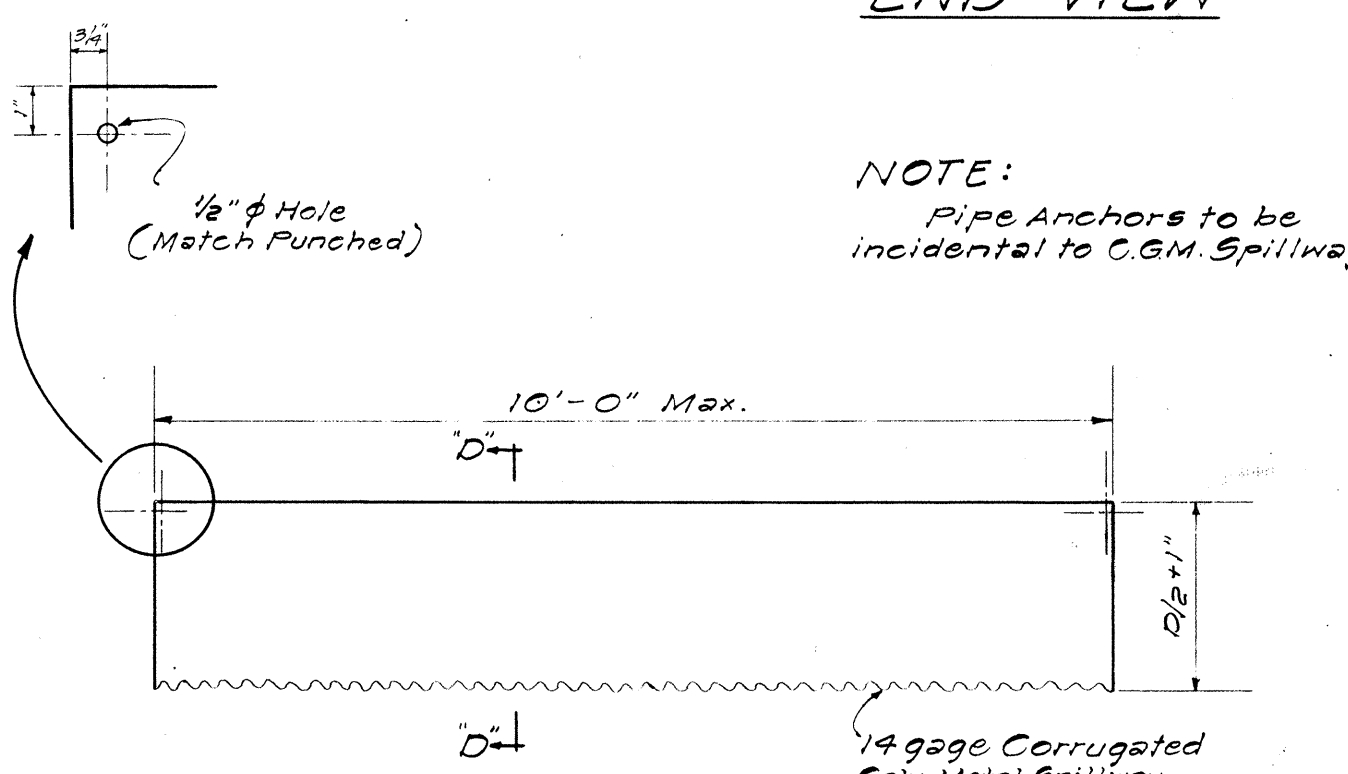
SECTION "C-C"

DETAIL OF SPILLWAY INLET
NOT TO SCALE



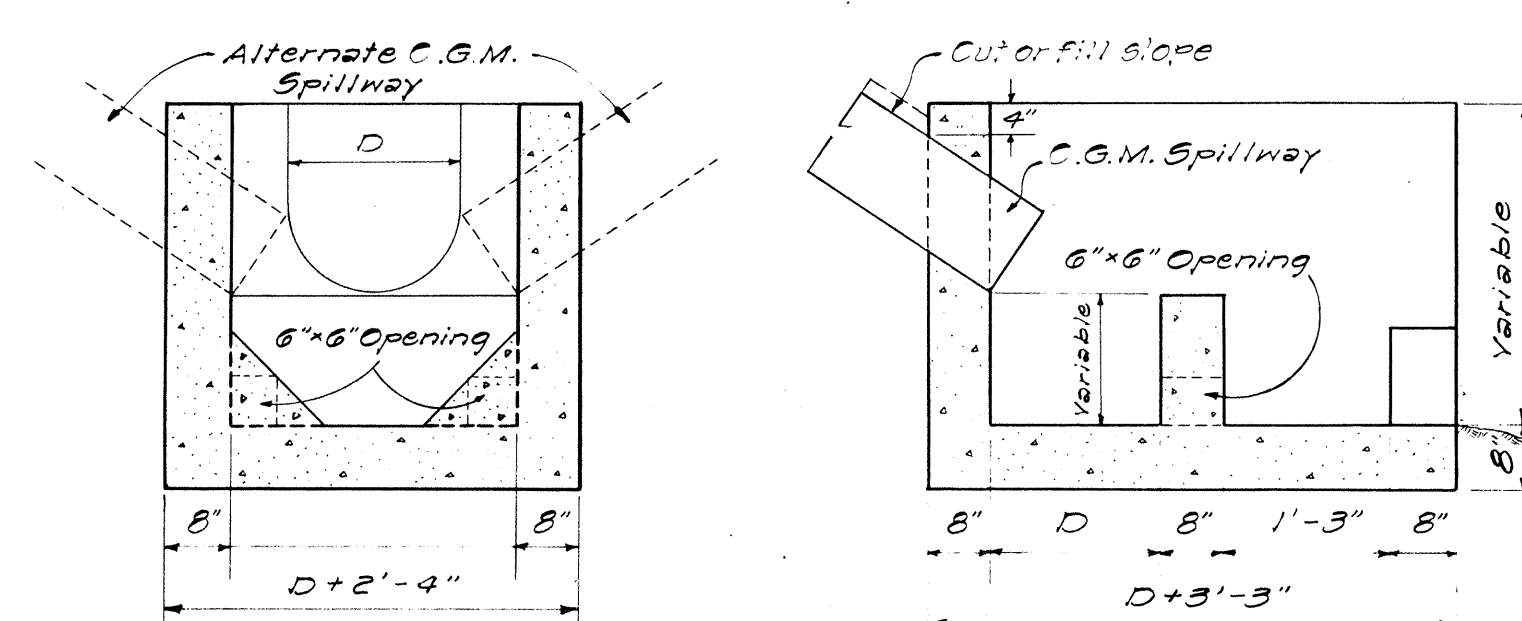
SECTION "D-D"

END VIEW



SIDE VIEW

C G.M. SPILLWAY
NOT TO SCALE



SECTION "H-H"

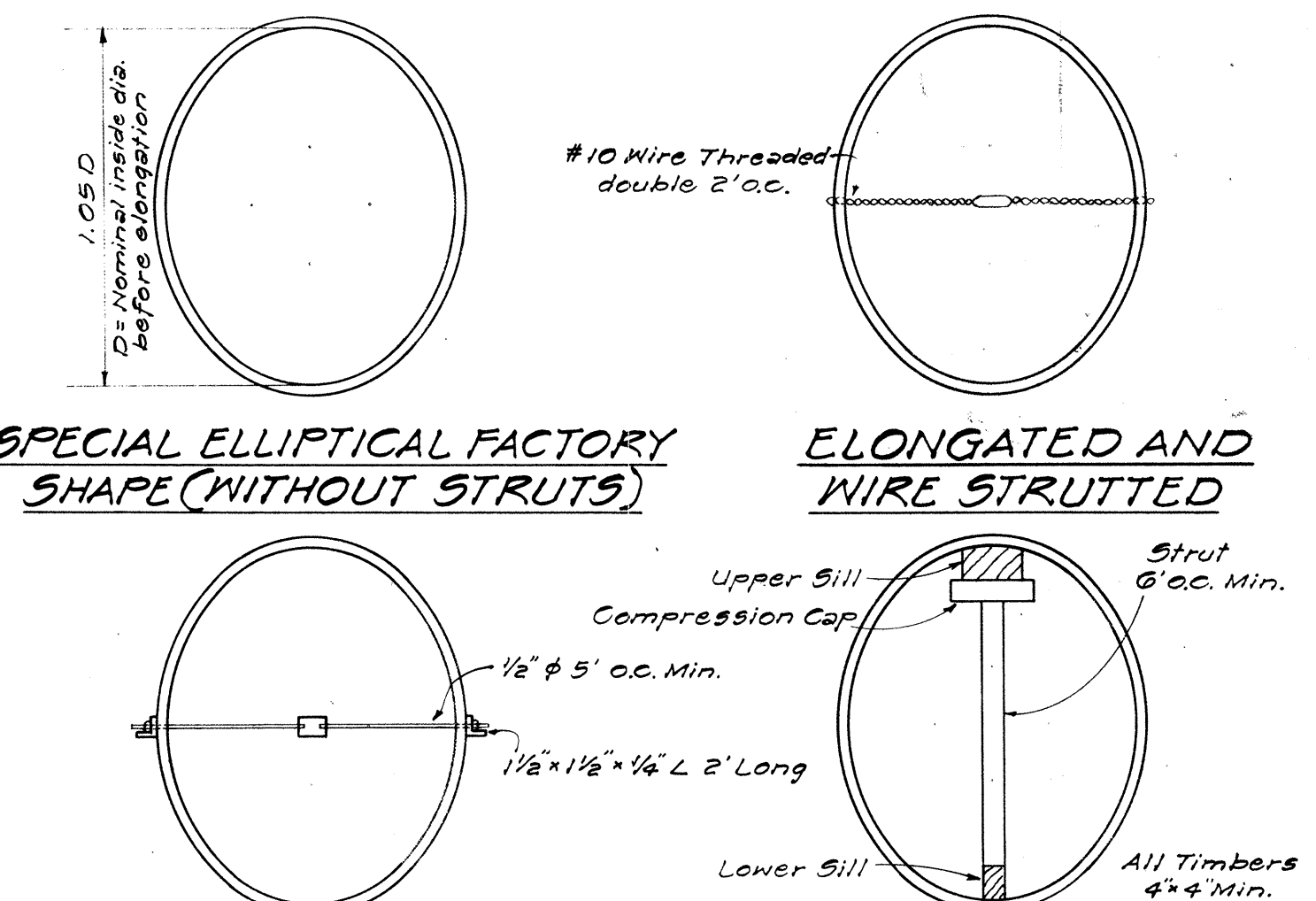
SECTION "G-G"

QUANTITIES

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

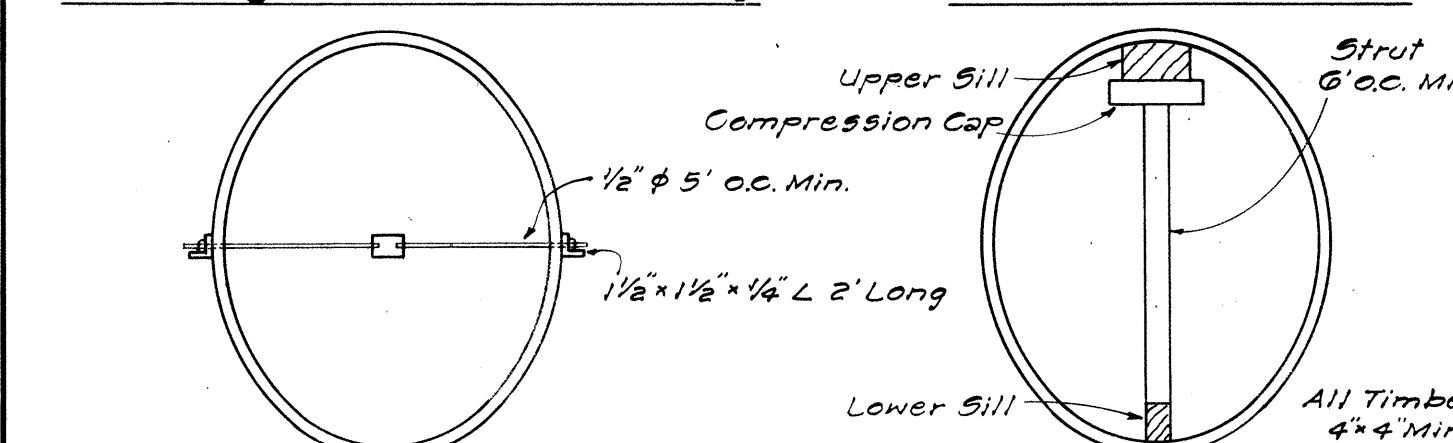
NOTE:
All Concrete to be Class "B-1"

DETAILS OF CONC. DROP BOX
AT OUTLET OF C.G.M. SPILLWAY
NOT TO SCALE



SPECIAL ELLIPTICAL FACTORY
SHAPE (WITHOUT STRUTS)

ELONGATED AND
WIRE STRUTTED



ELONGATED WITH
ROD AND TURNBUCKLE

ELONGATED WITH
TIMBER STRUT

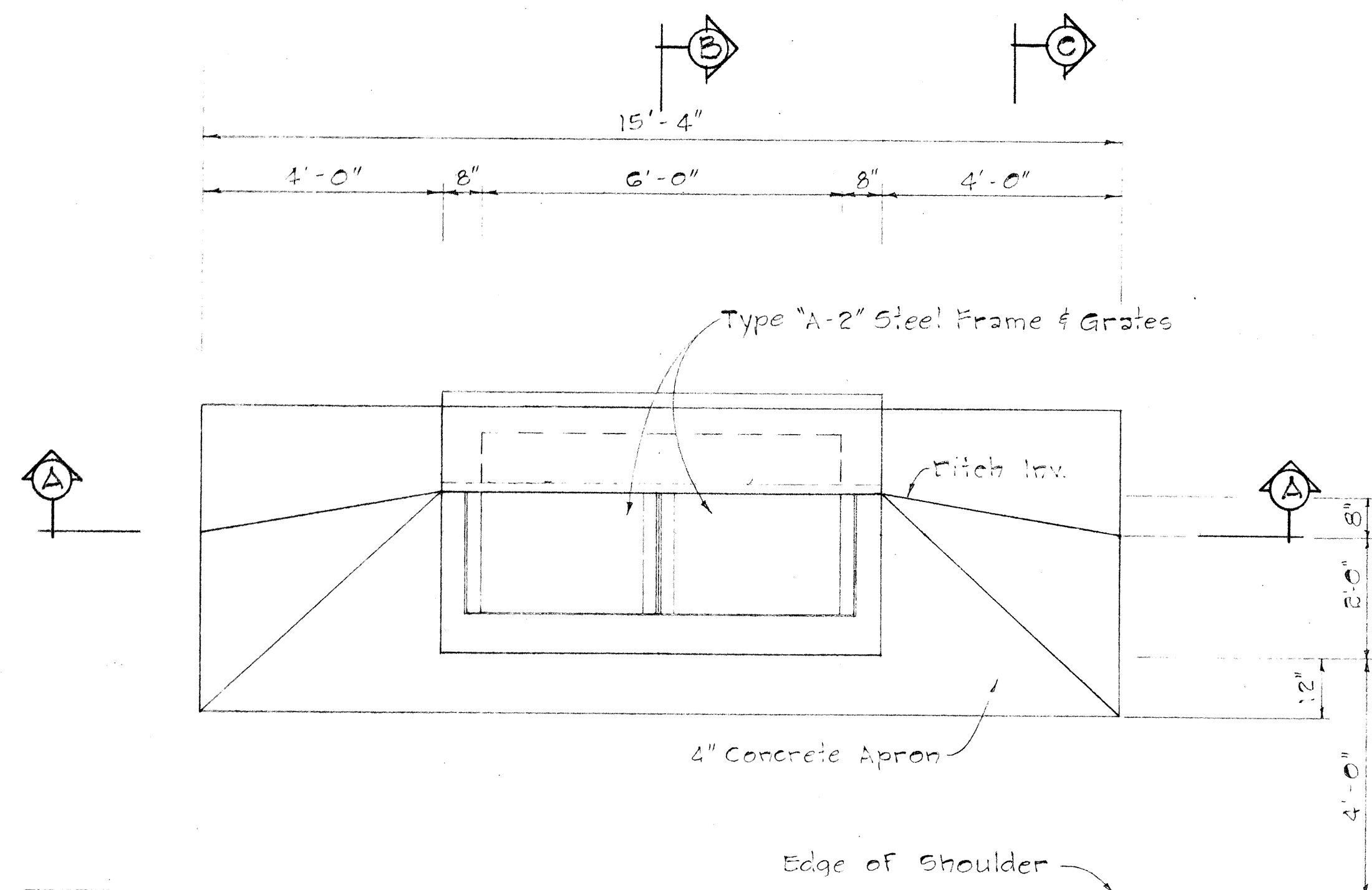
METHOD OF ELONGATING AND
STRUTTING CORRUGATED PIPE
NOT TO SCALE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
CORRUGATED GALVANIZED METAL
CULVERTS, SPILLWAYS, AND
SPECIAL DETAILS
SCALES AS NOTED
SHEET NO. 10 OF 10 SHEETS

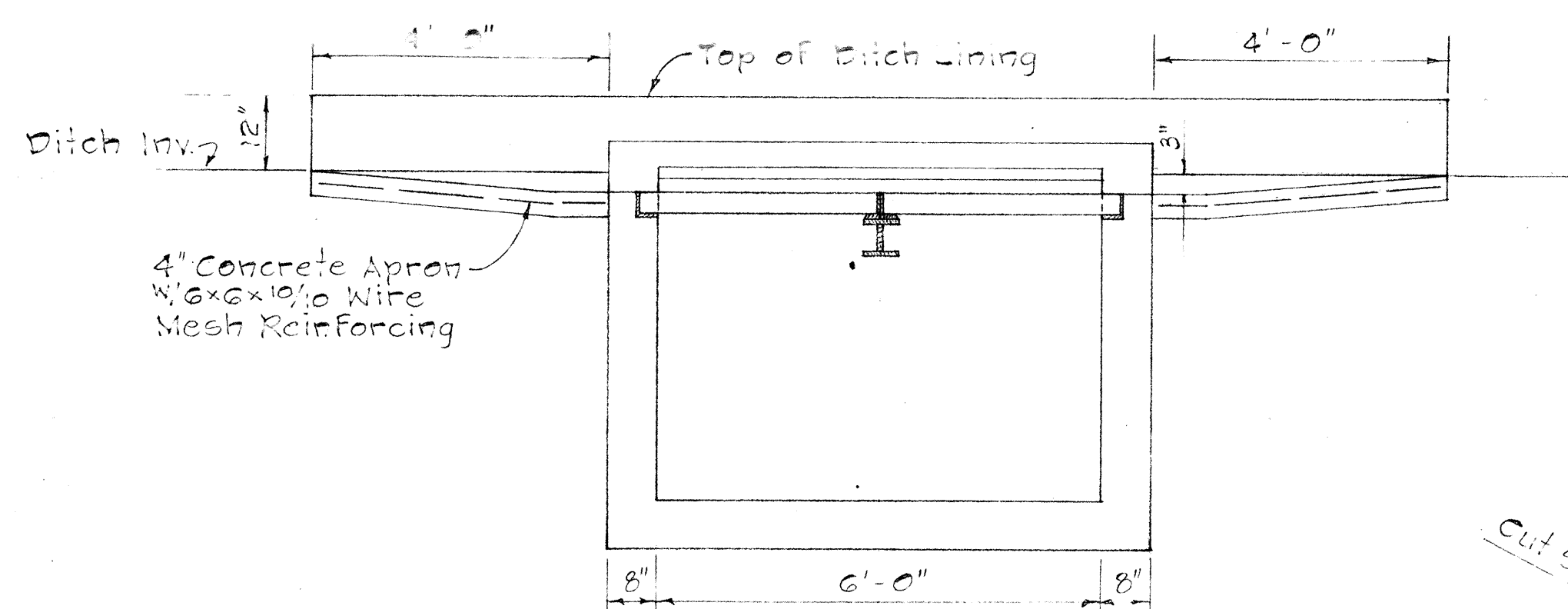
APPROVED: DATE: 5-14-61
DIRECTOR OF TRANSPORTATION

DATE: 5-24-61
DRAWN BY: R. Y.
CHECKED BY: O. M.
DESIGNED BY: O. M.
NOTE BOOK: No.

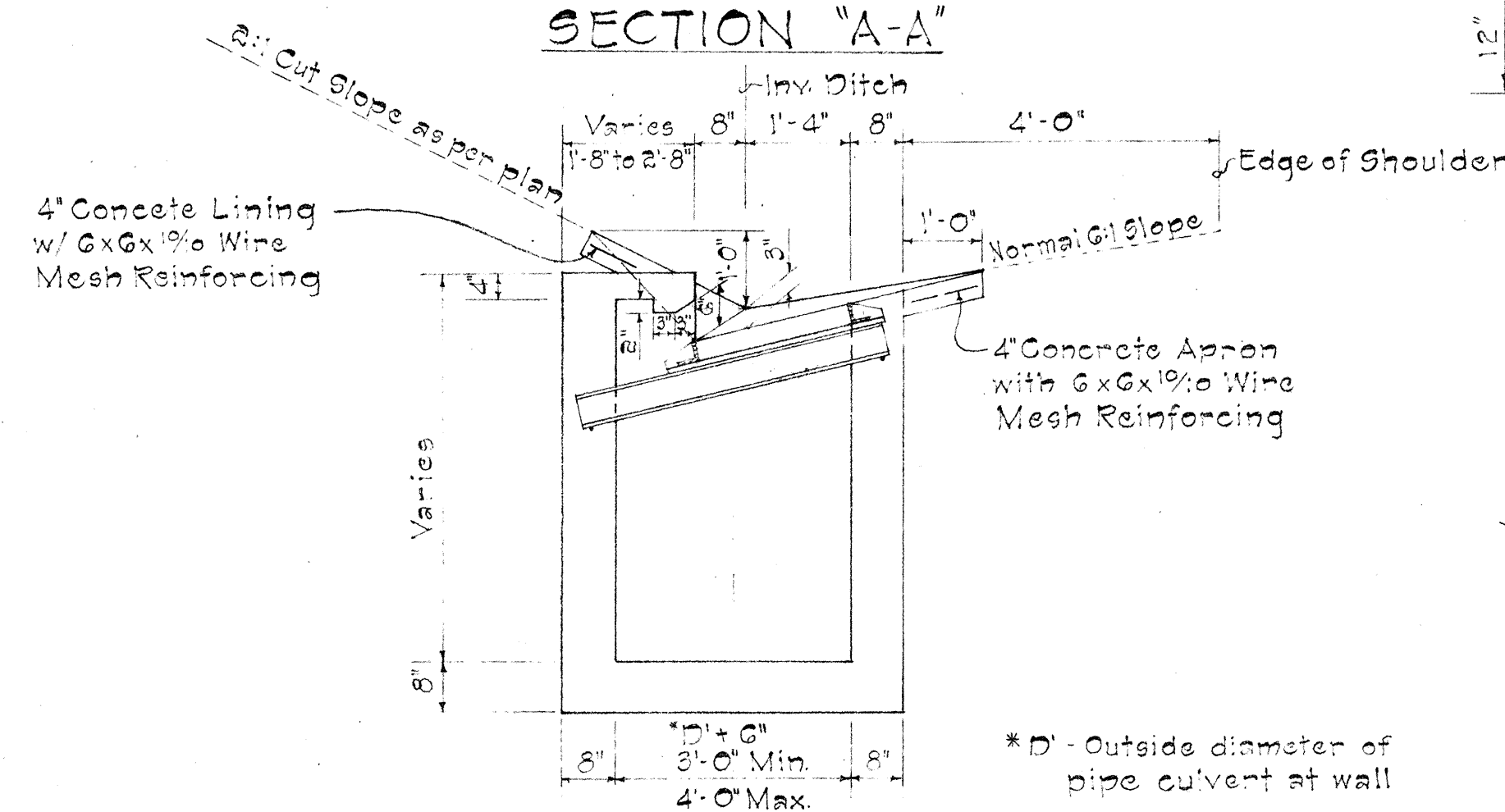
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(15)	1966	26A	



PLAN

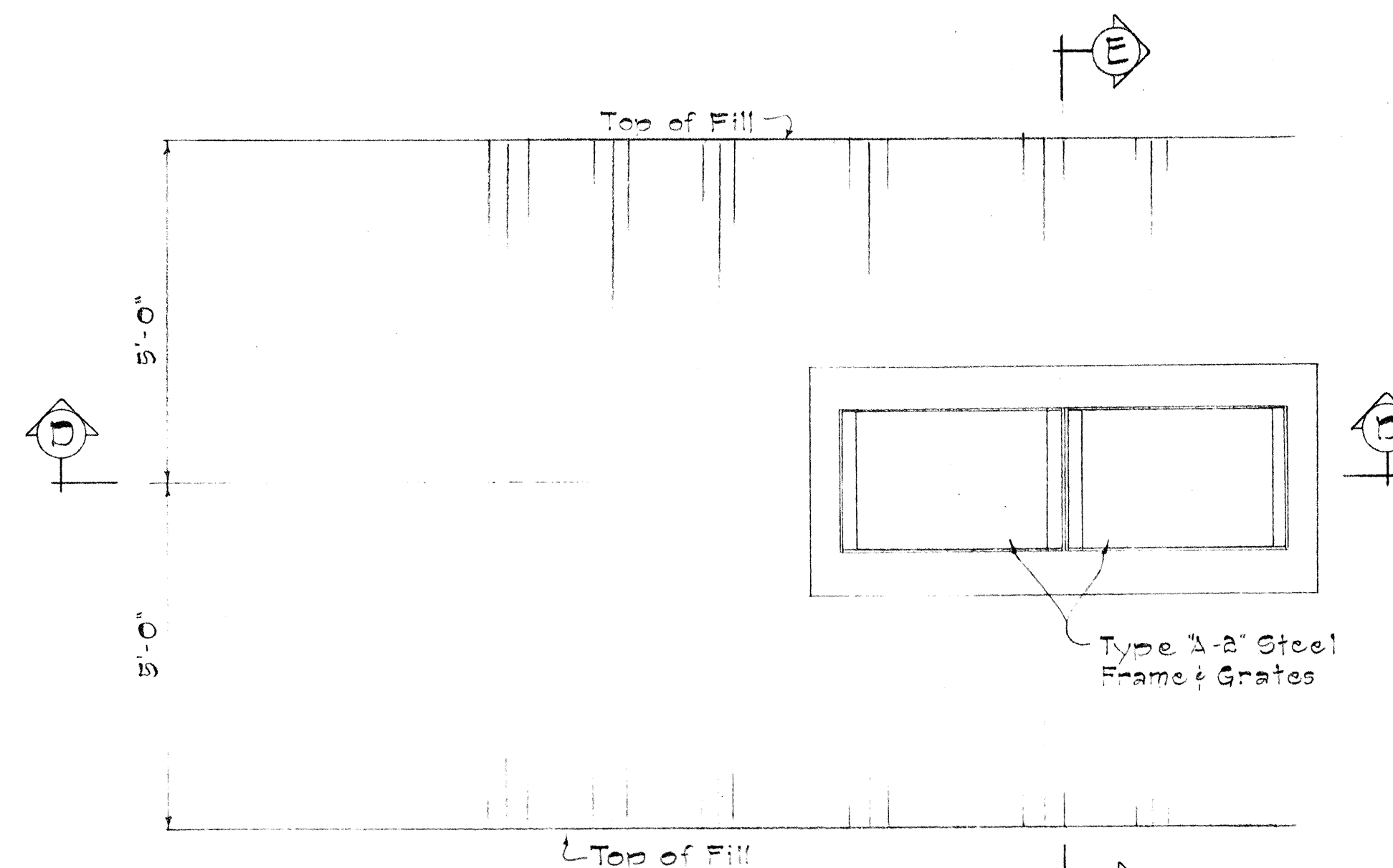


SECTION "A-A"

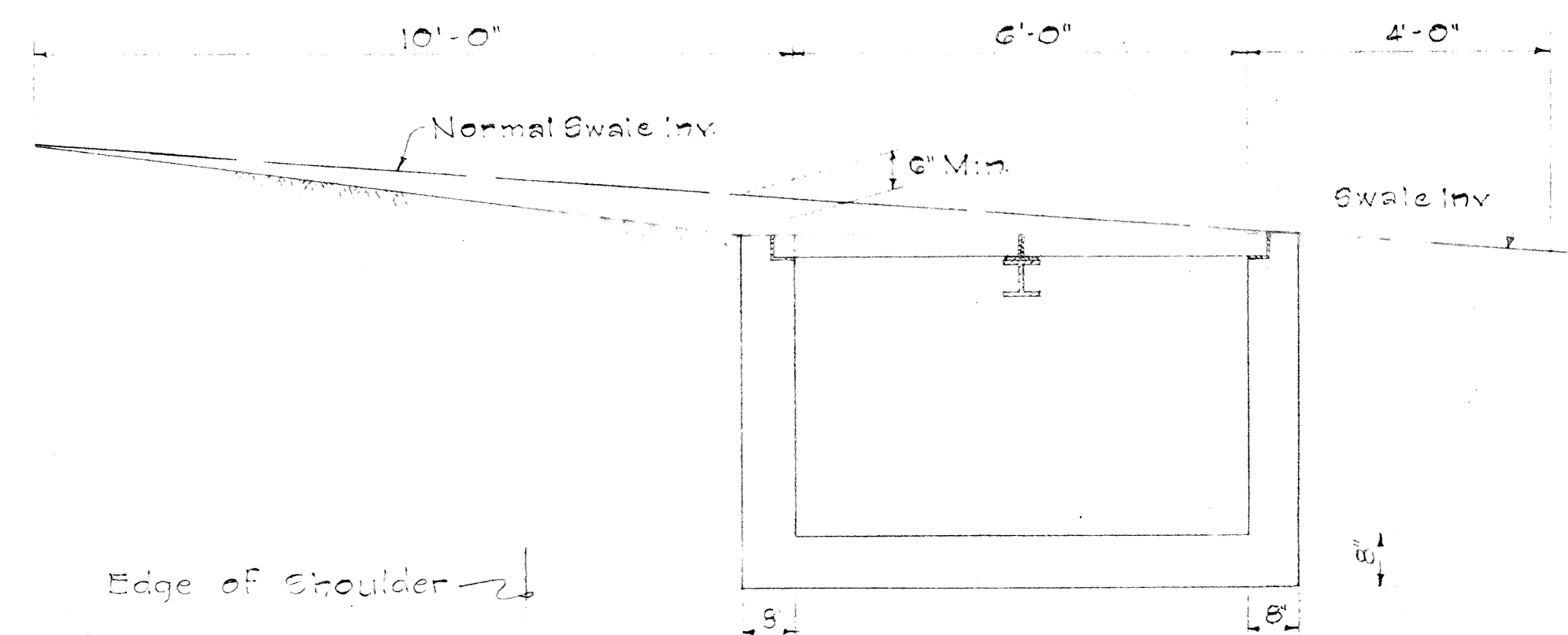


SECTION "B-B"
TYPE "A" SHOULDER DROP INTAKE

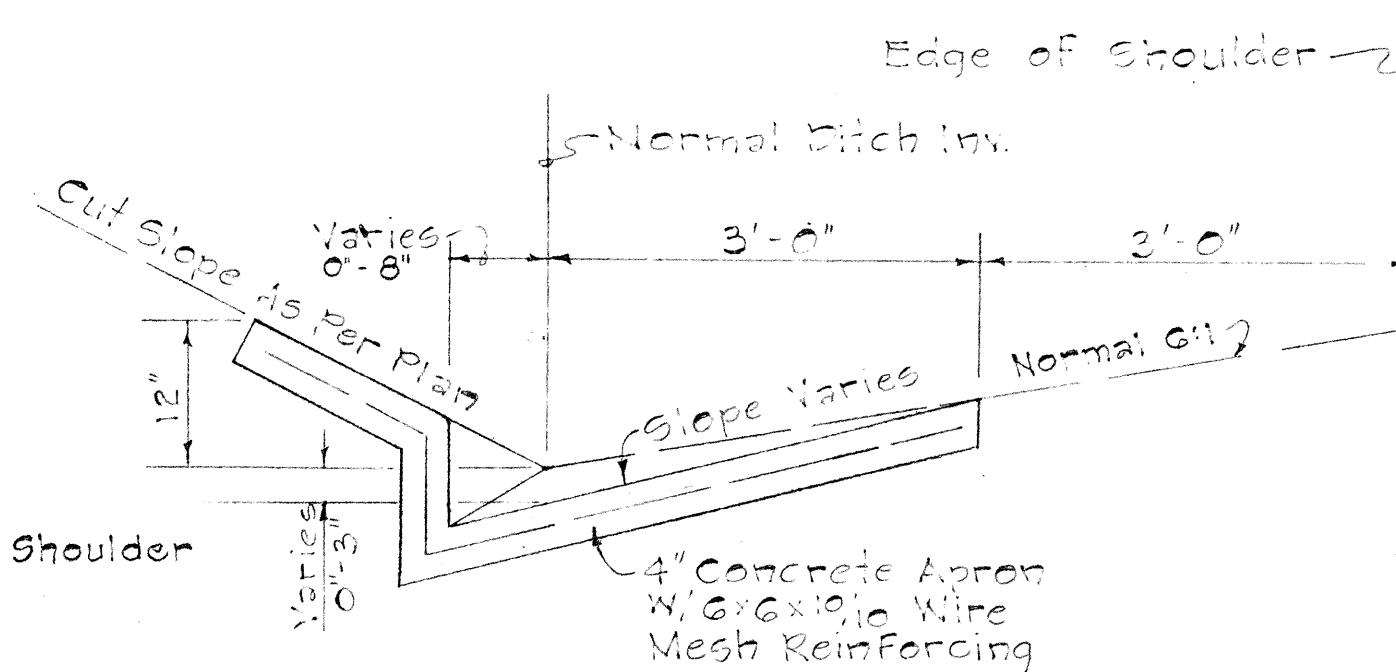
Scale: 1/2" = 1'-0"



PLAN

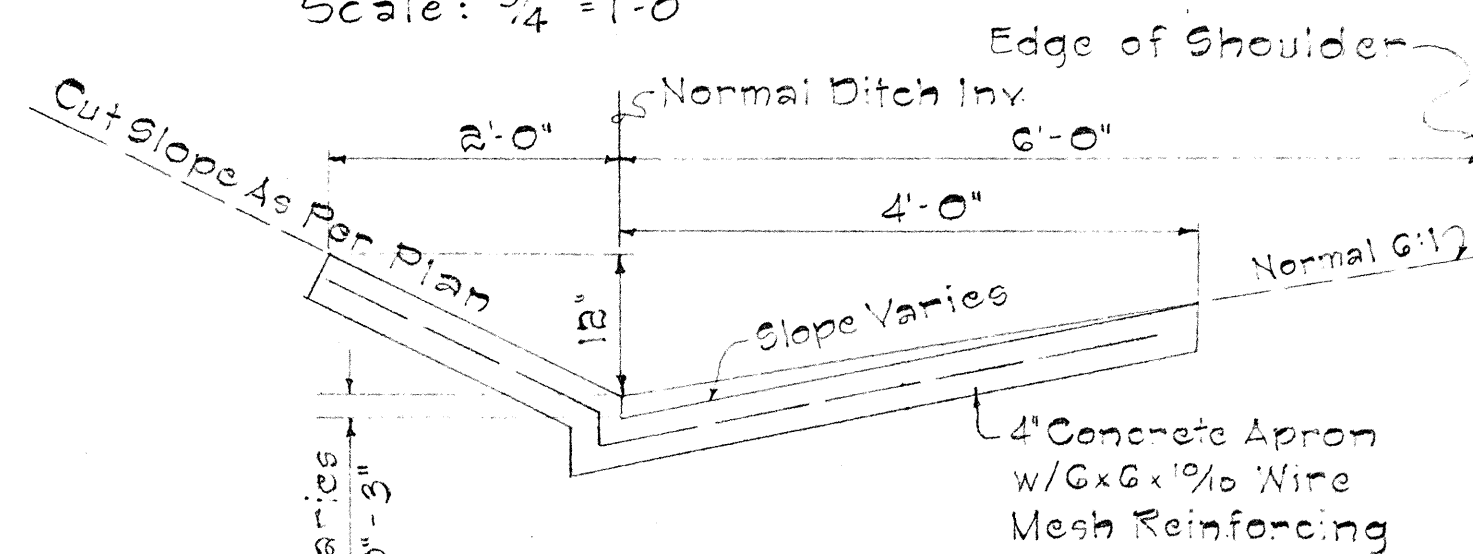


SECTION "D-D"



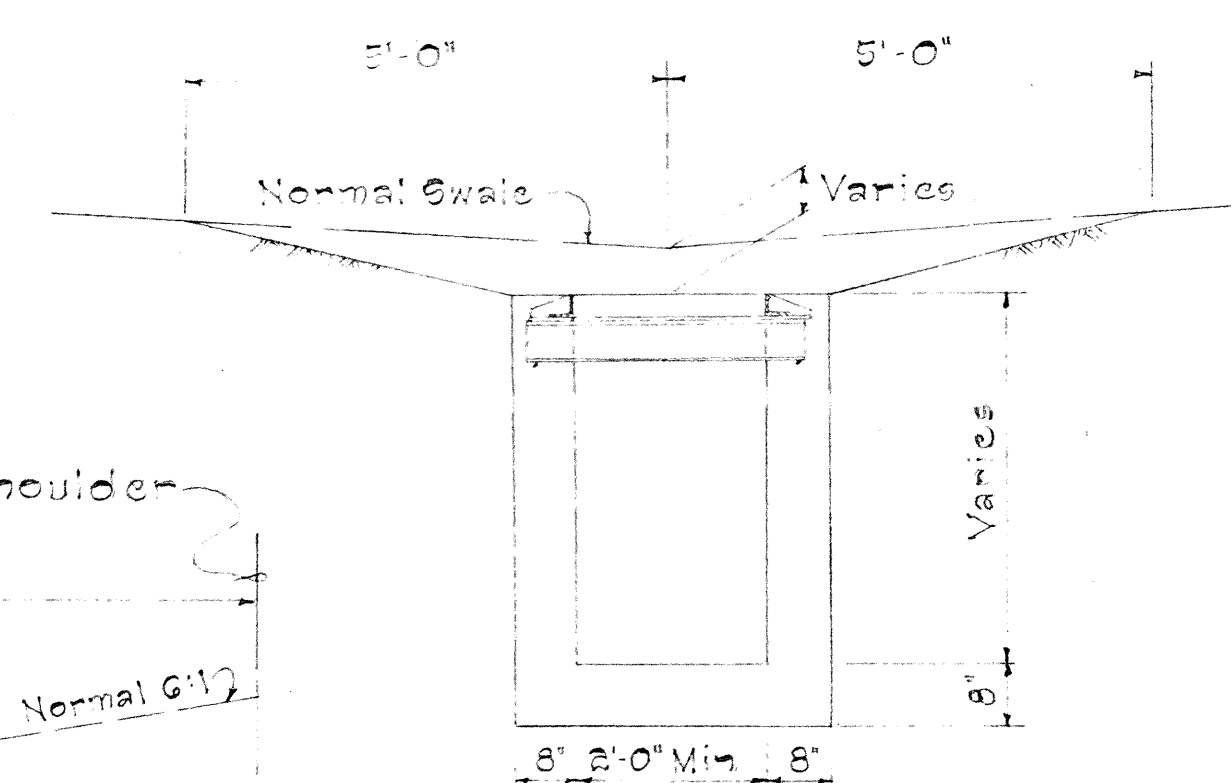
SECTION "C-C"

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



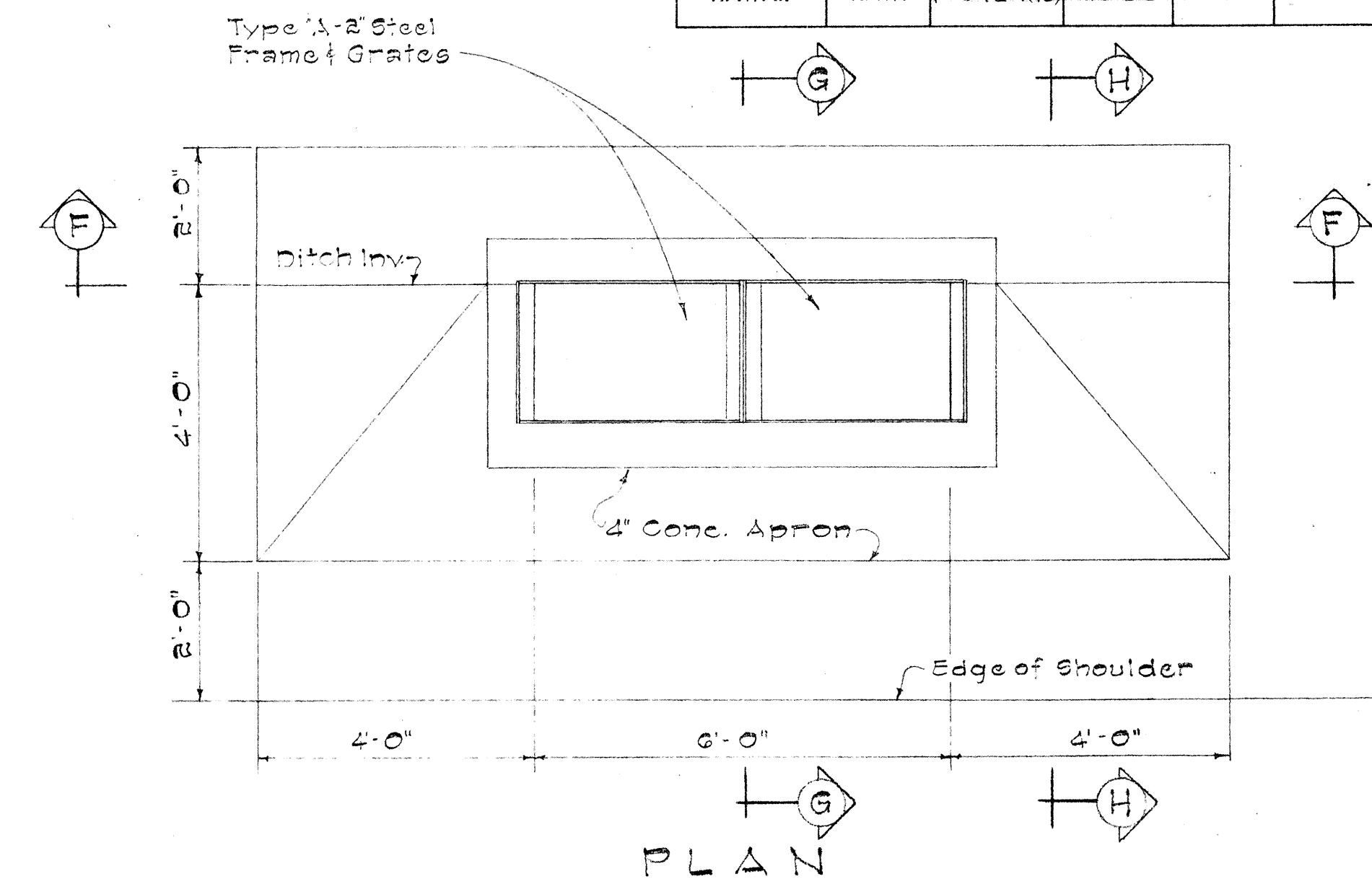
SECTION "H-H"

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

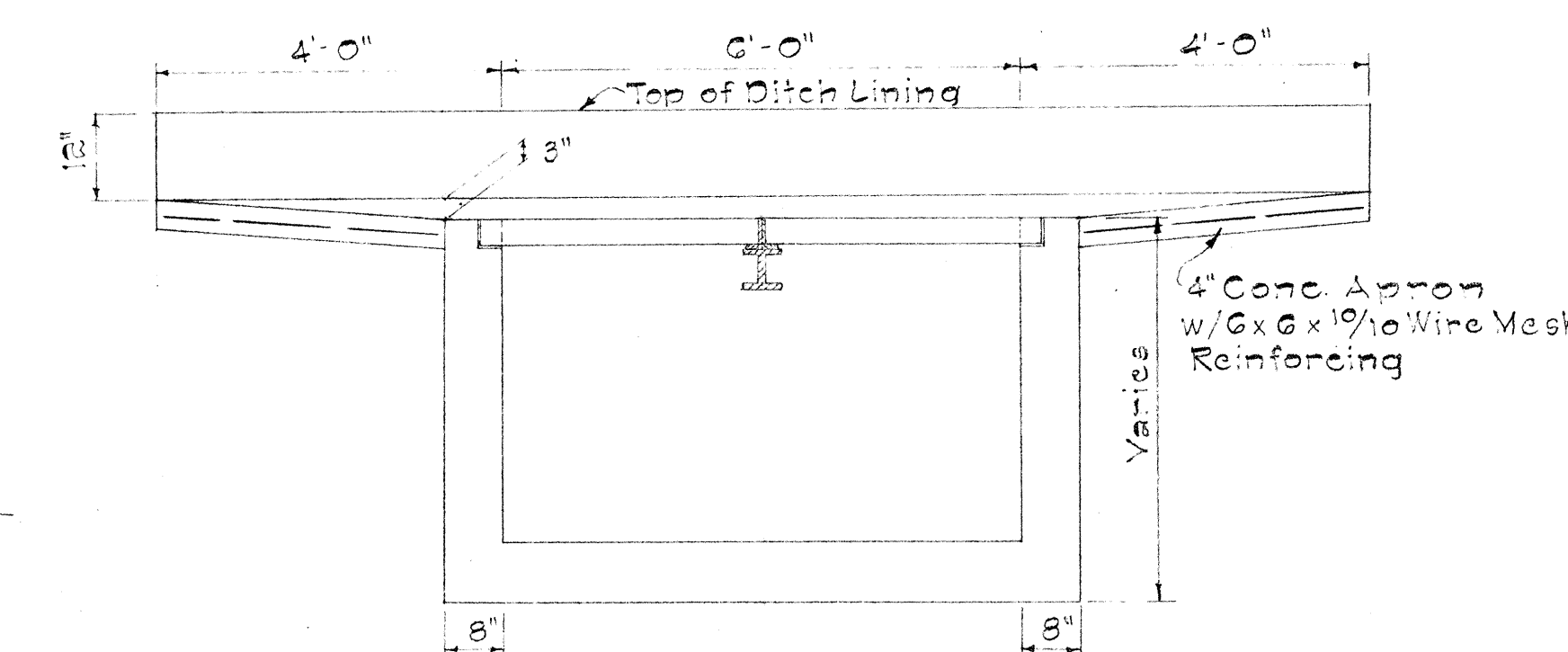


SECTION "E-E"
MEDIAN DROP INTAKE

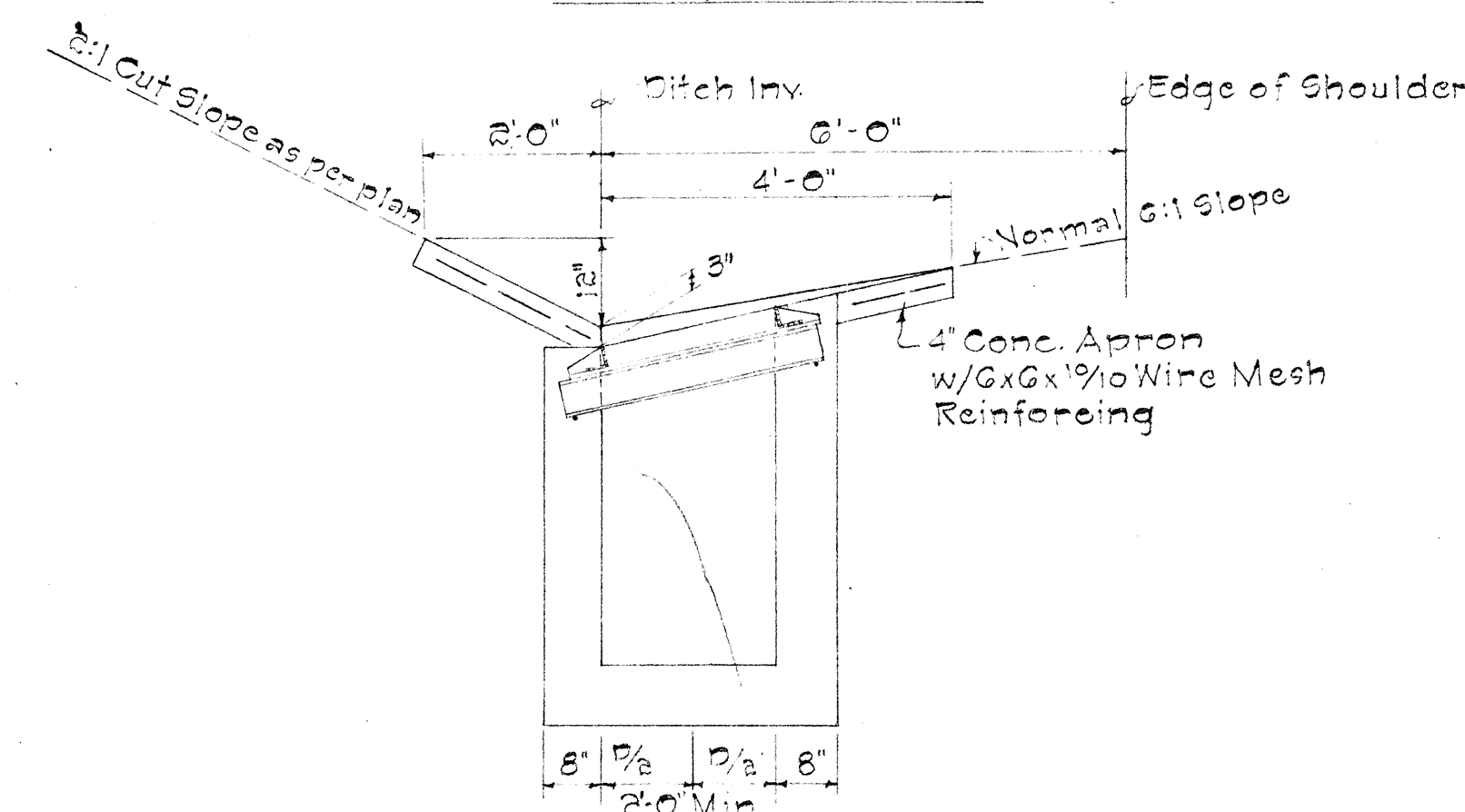
Scale: 1/2" = 1'-0"



PLAN



SECTION "F-F"



SECTION "G-G"
TYPE "B" SHOULDER DROP INTAKE

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
MEDIAN DROP INTAKE

KALANIANA'OLE HIGHWAY
PROJ. No. F-072-1(15)

Scale: As Shown Date: March, 1967

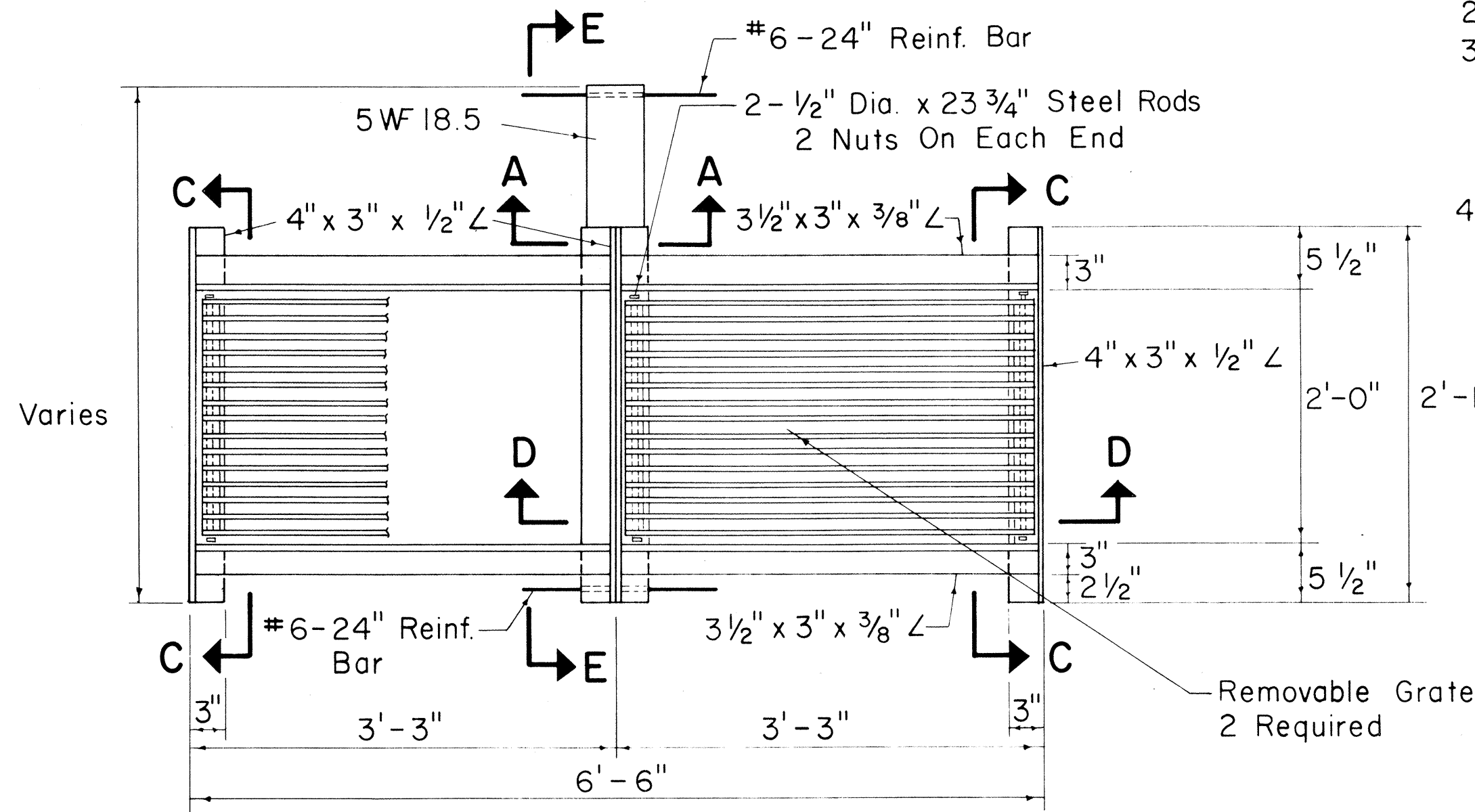
SHEET NO. OF SHEETS

26A

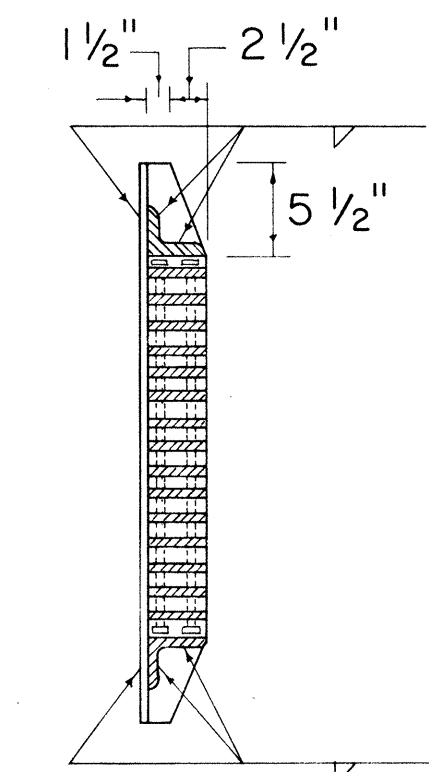
Revised: Jan. 25, 1967

NOTE:

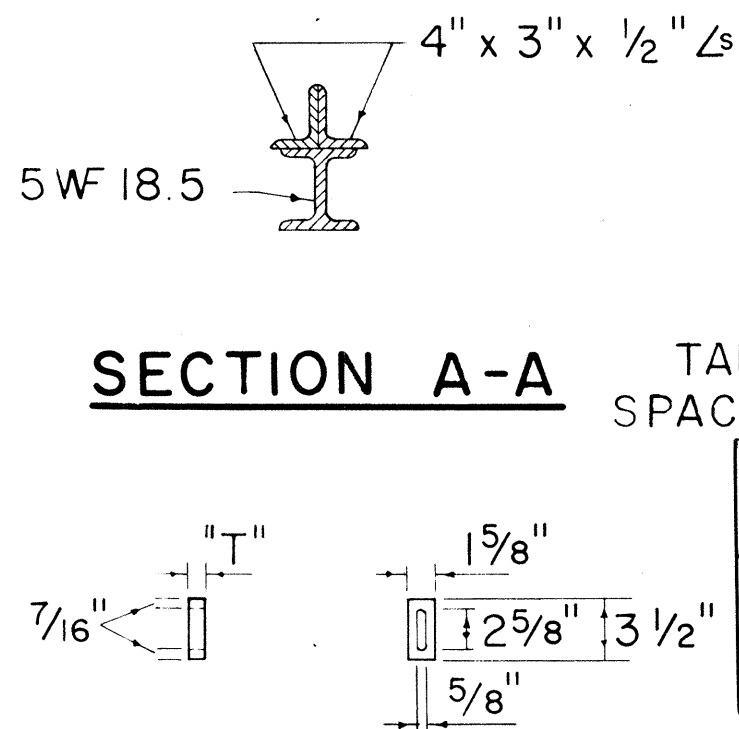
1. All welds $\frac{3}{8}$ " unless otherwise noted.
2. All steel shall be structural grade.
3. Grates and Frame shall be hot dip galvanized after fabrication in accordance with Section 44 (H) of the Standard Specifications.
4. Detail of Types "A-1" and "A-2" Steel Frame and Grates are identical except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



PLAN



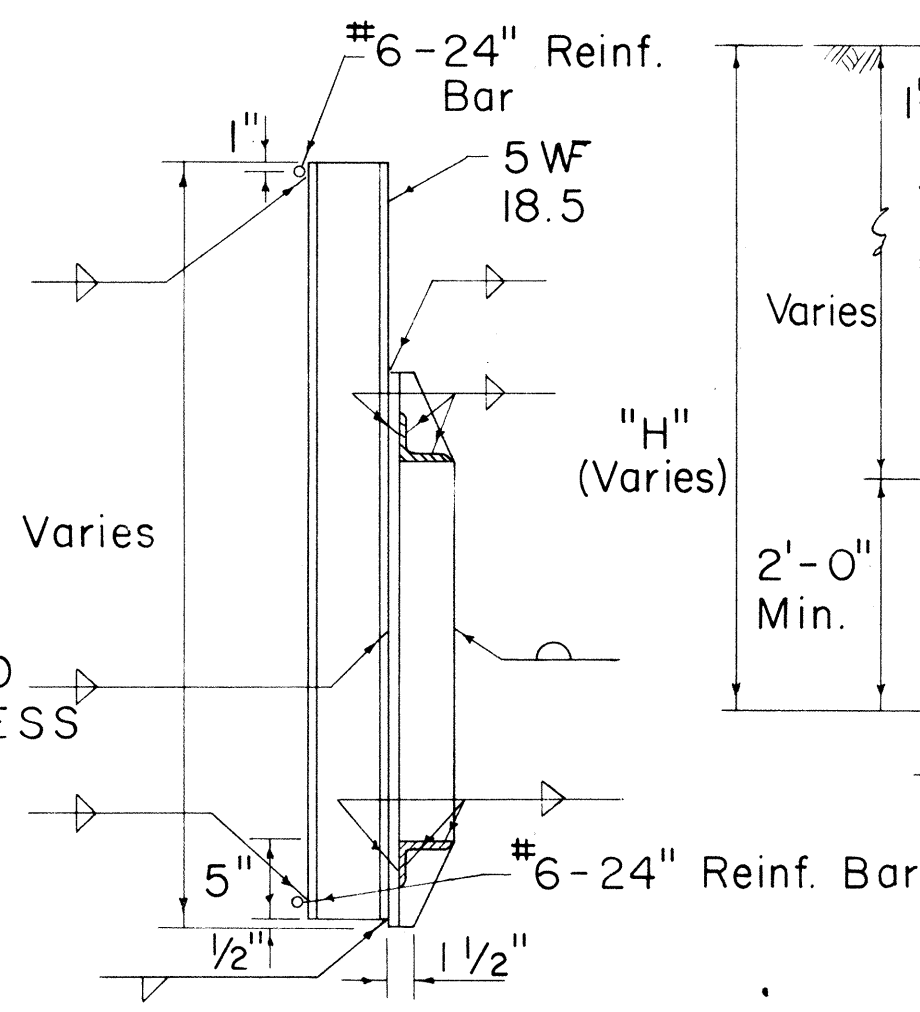
SECTION C-C



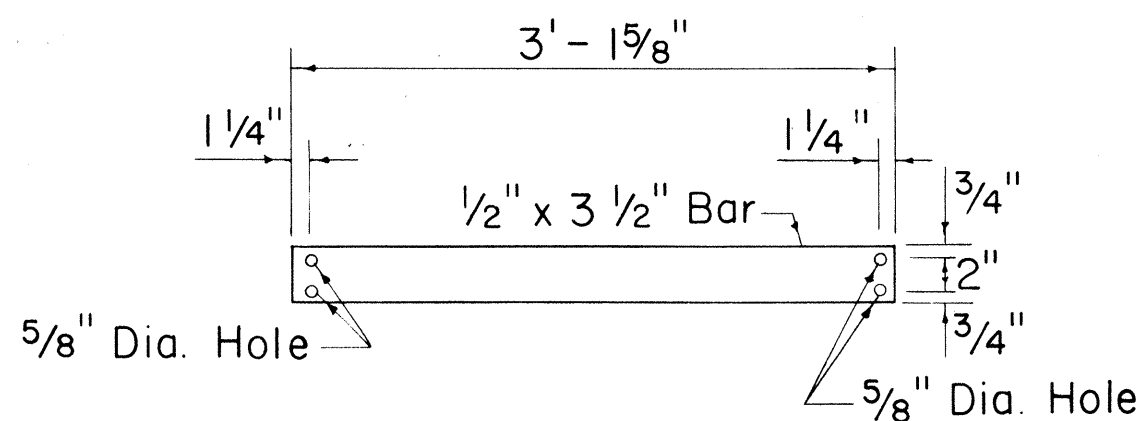
SECTION A-A

TABLE OF END SPACER THICKNESS

TYPE FRAME & GRATES	"H" (in.)
A - 1	1
A - 2	1 3/8



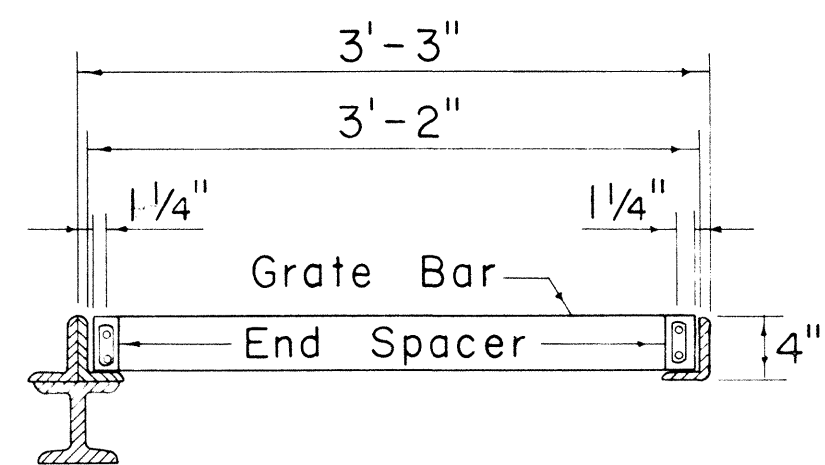
SECTION E-E



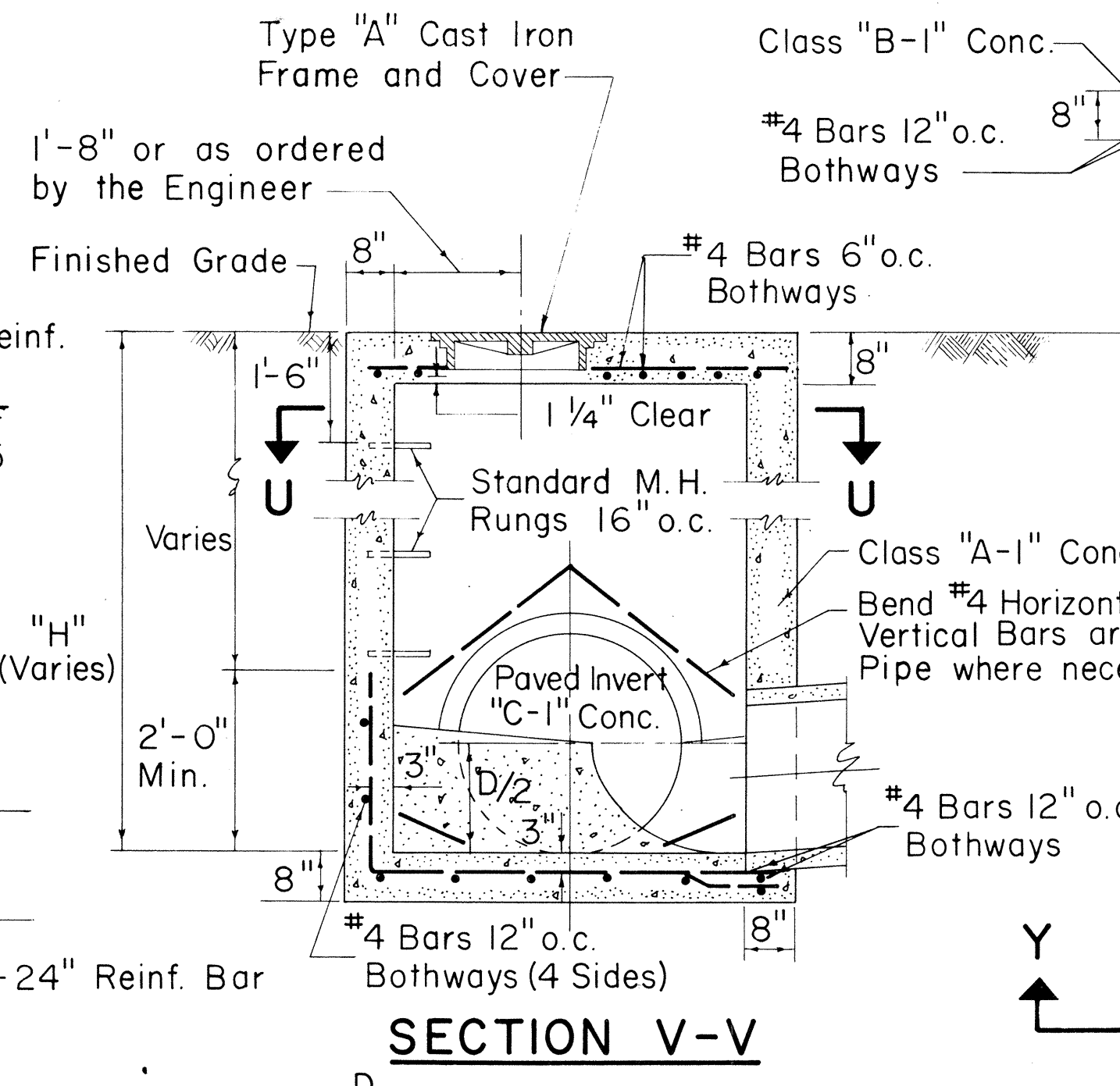
GRATE BARS

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

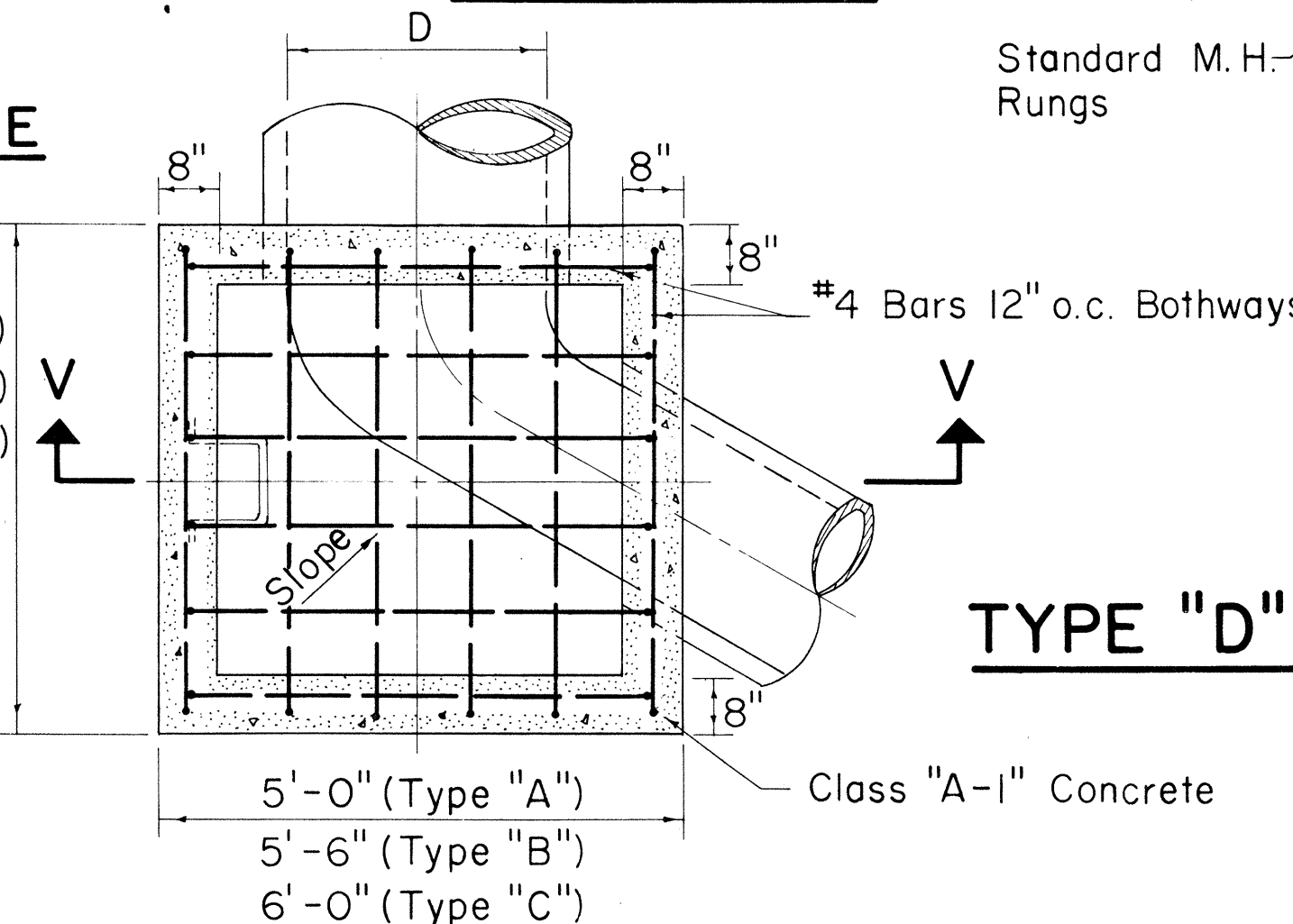
Scale: 1" = 1'-0"



SECTION D-D



SECTION V-V

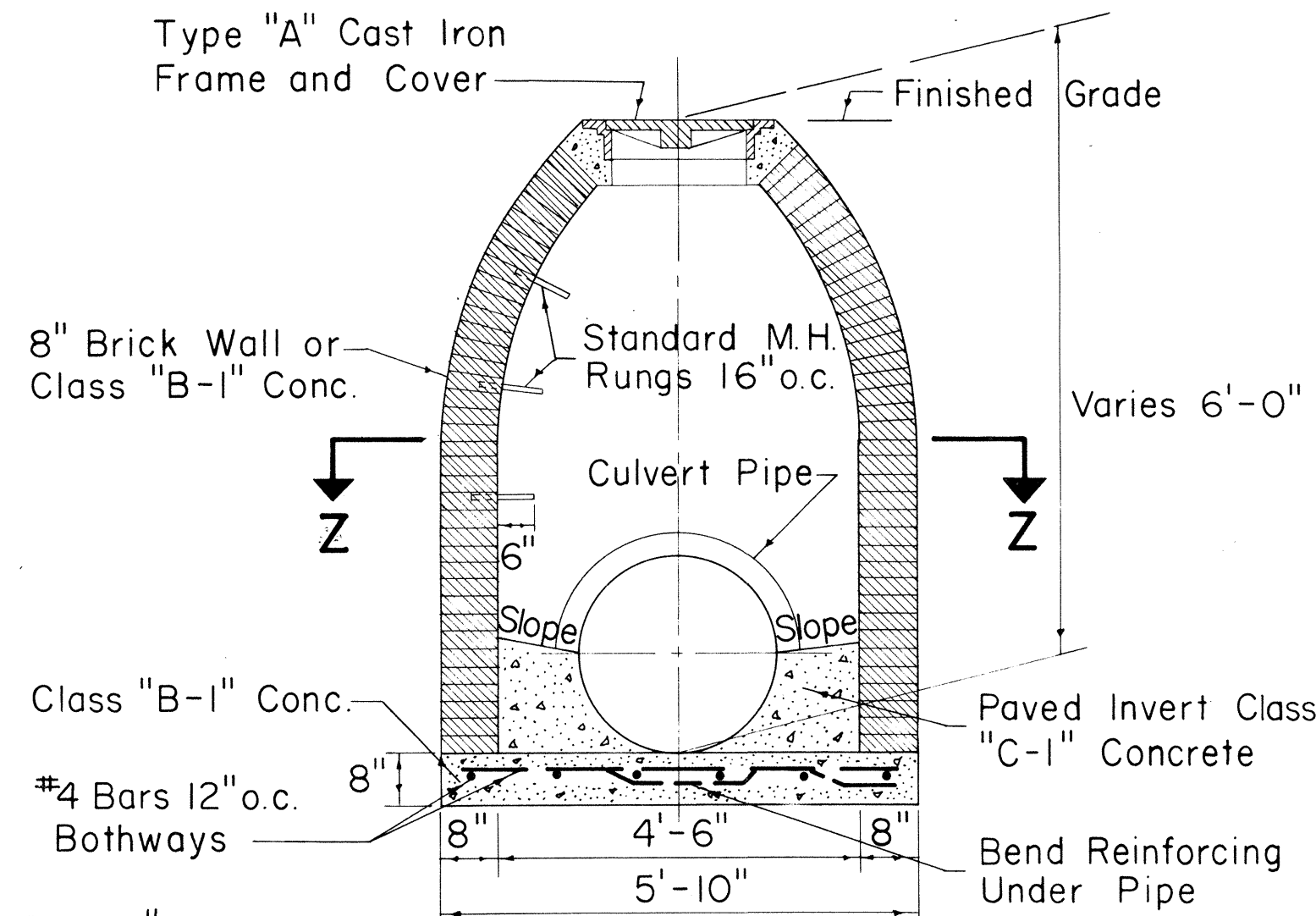


SECTION U-U

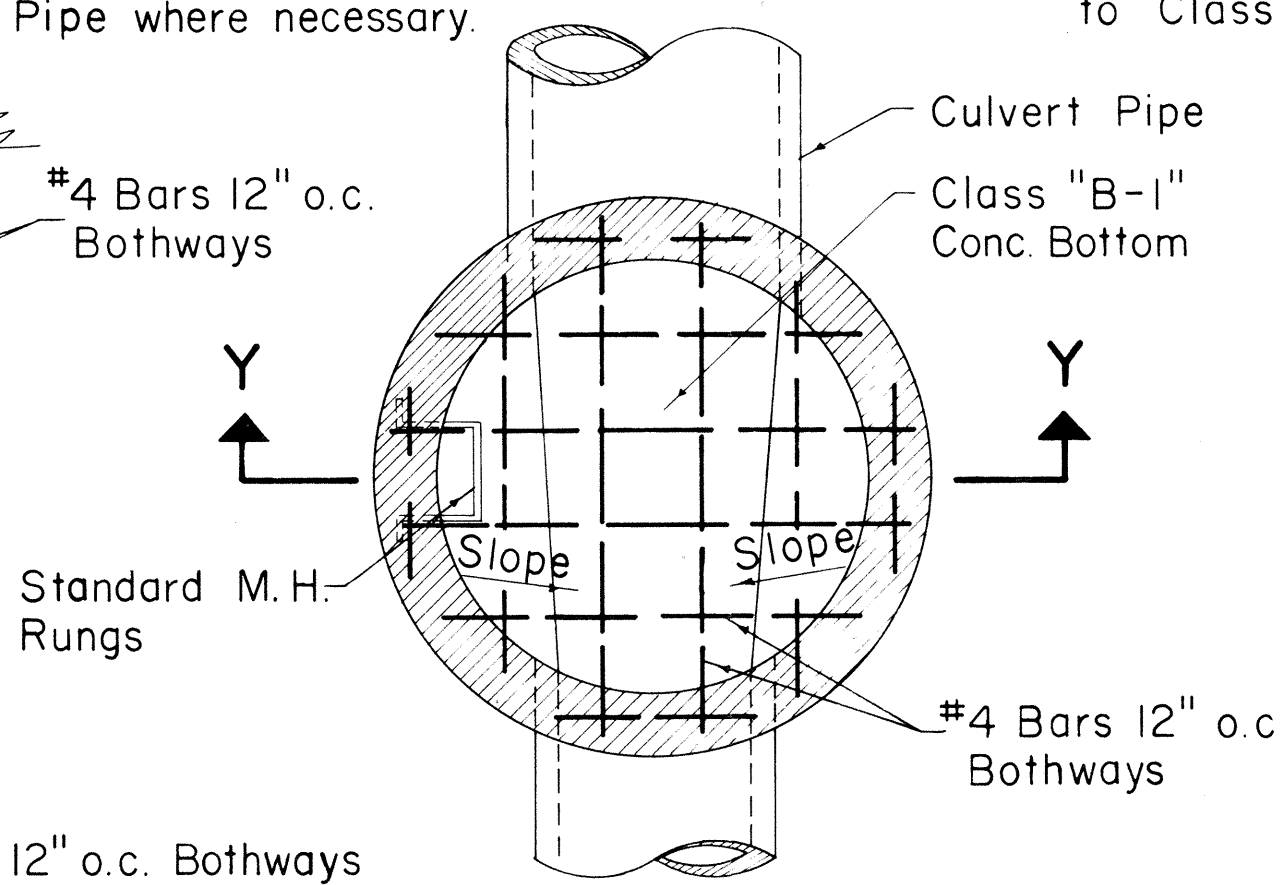
TYPE "A", "B", & "C"

S.D.M.H.

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



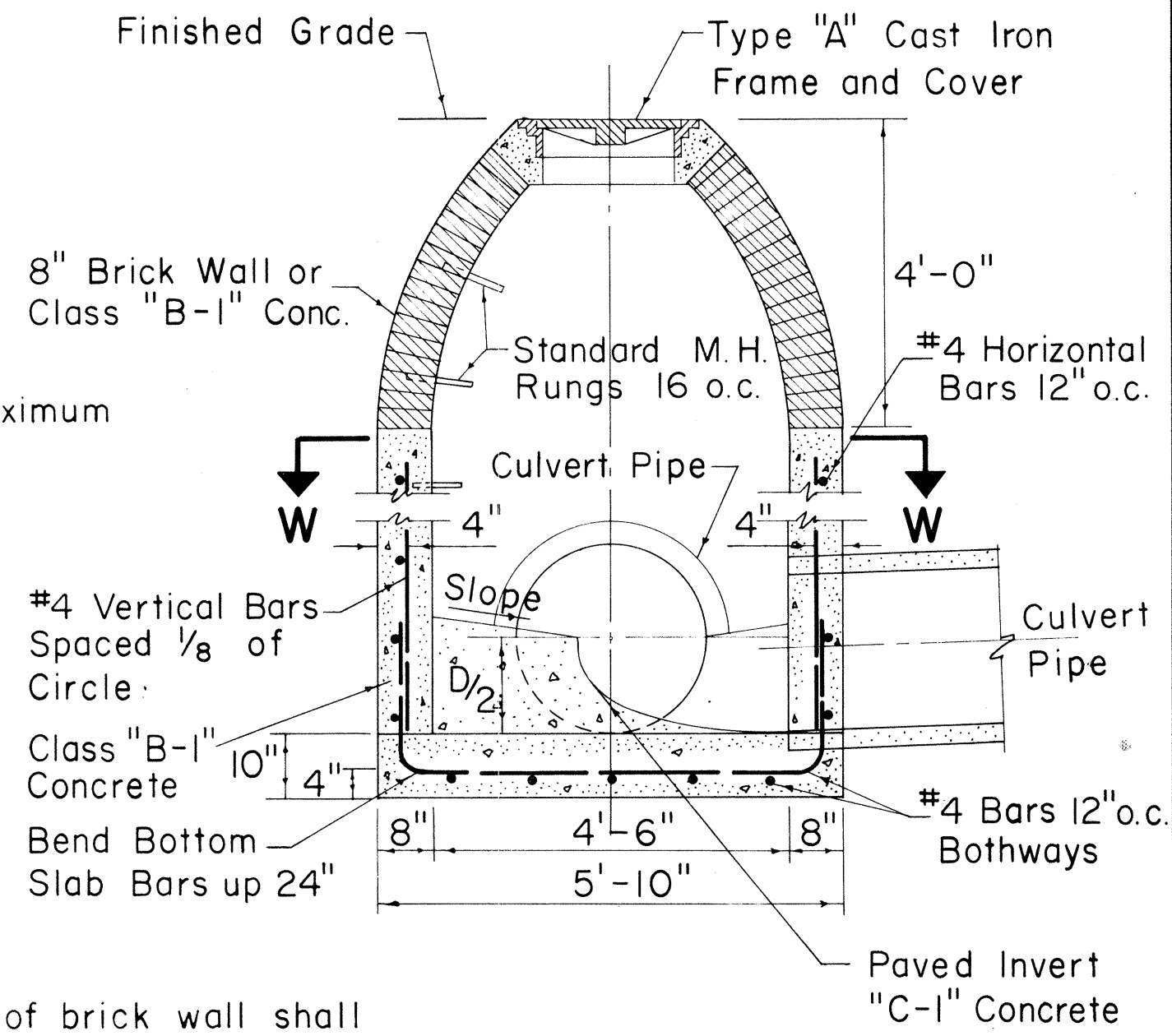
SECTION Y-Y



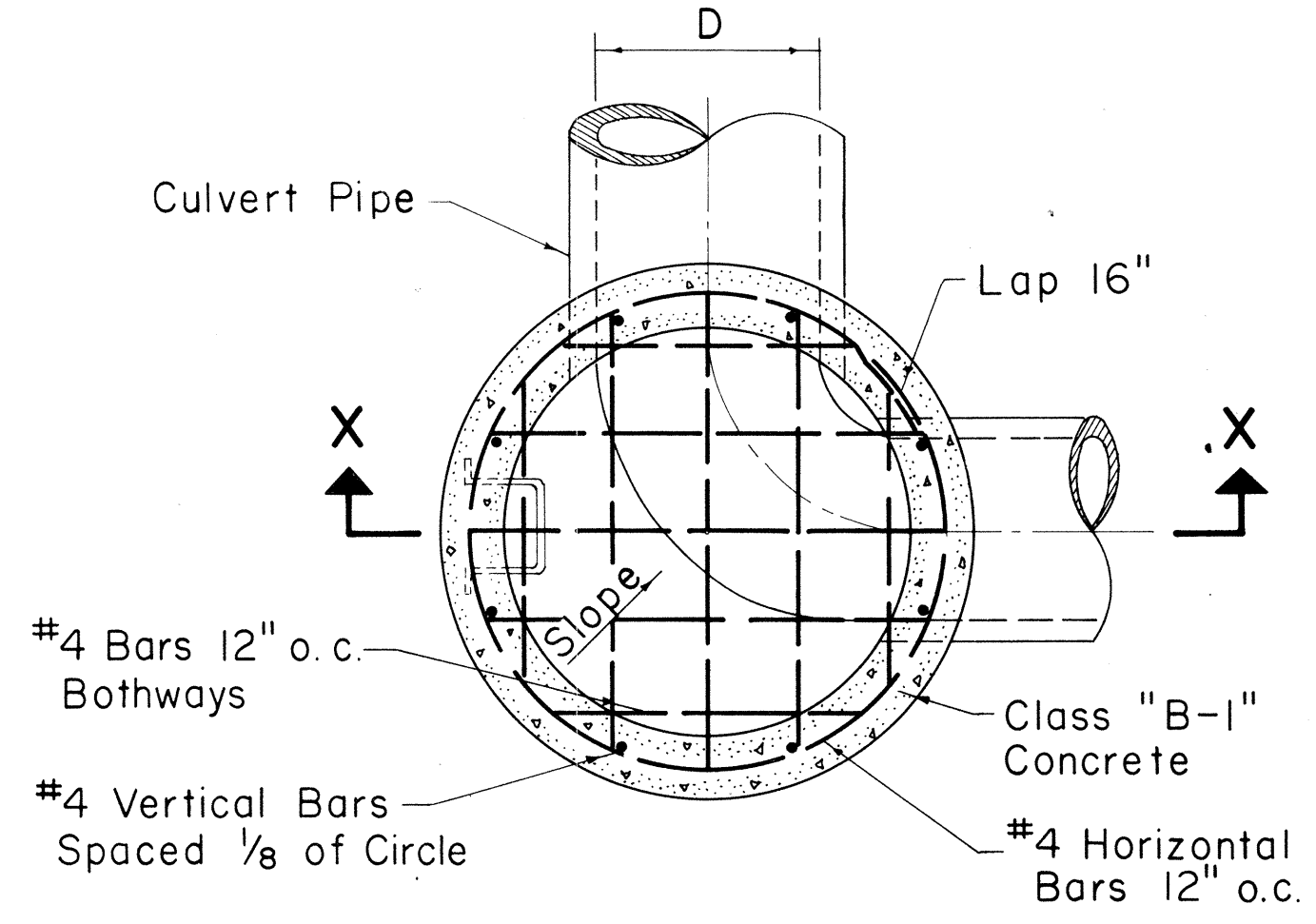
SECTION Z-Z

TYPE "D" STORM DRAIN MANHOLE

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



SECTION X-X



SECTION W-W

TYPE "E" STORM DRAIN MANHOLE

Scale: 1/2" = 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.	OF SHEETS