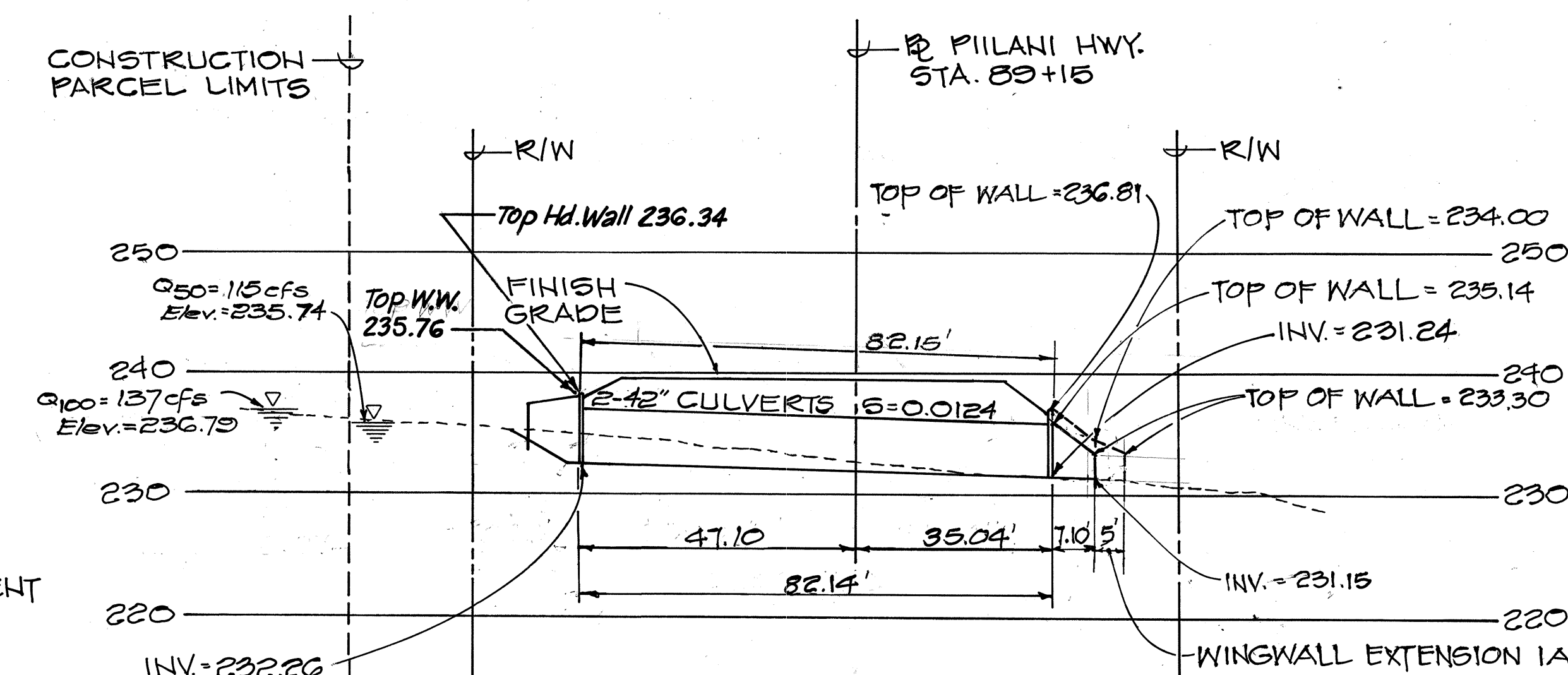
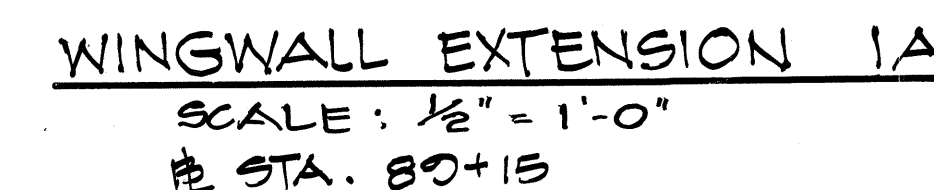
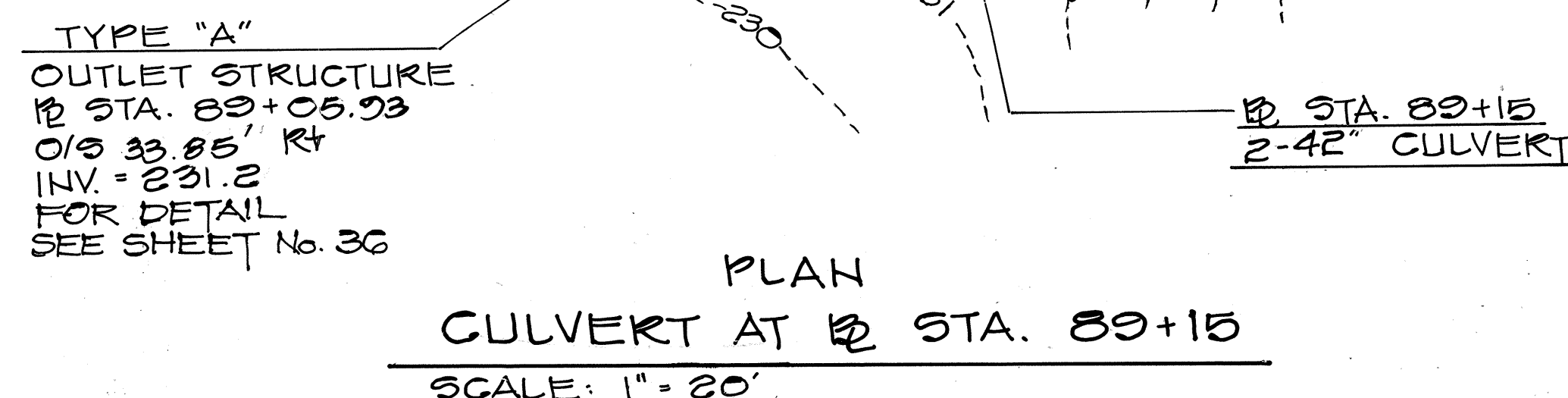


[illegible]

PROFILE
CULVERT AT STA. 89+15

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



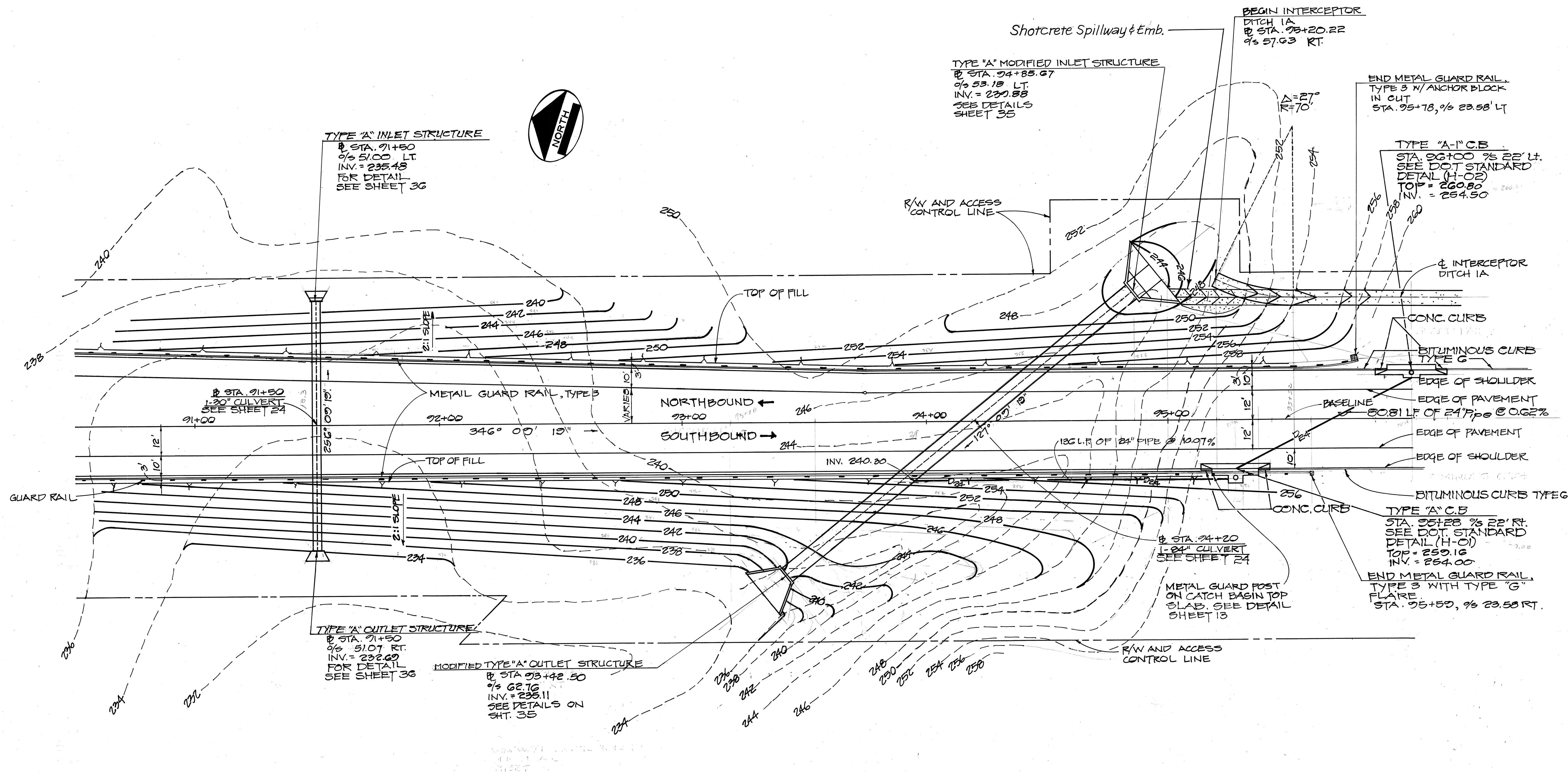
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PIILANI HIGHWAY
VICINITY OF KILOHANA STREET
TO WAILEA IKE DRIVE
F.A. PROJECT NO. F-031-I(3)

SCALE AS SHOWN DATE DEC. 1987

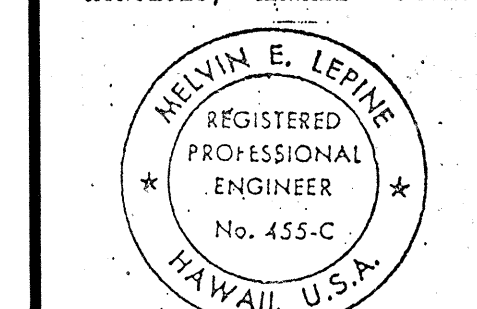
SHEET No. 1 OF 16 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-031-1(3)	1987	23	69



CULVERTS AT @ STA. 91+50 AND @ STA. 94+20

TRANS - MERIDIAN
 ENGINEERS & SURVEYORS
 864 S. BERETANIA STREET
 HONOLULU, HAWAII 96813



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

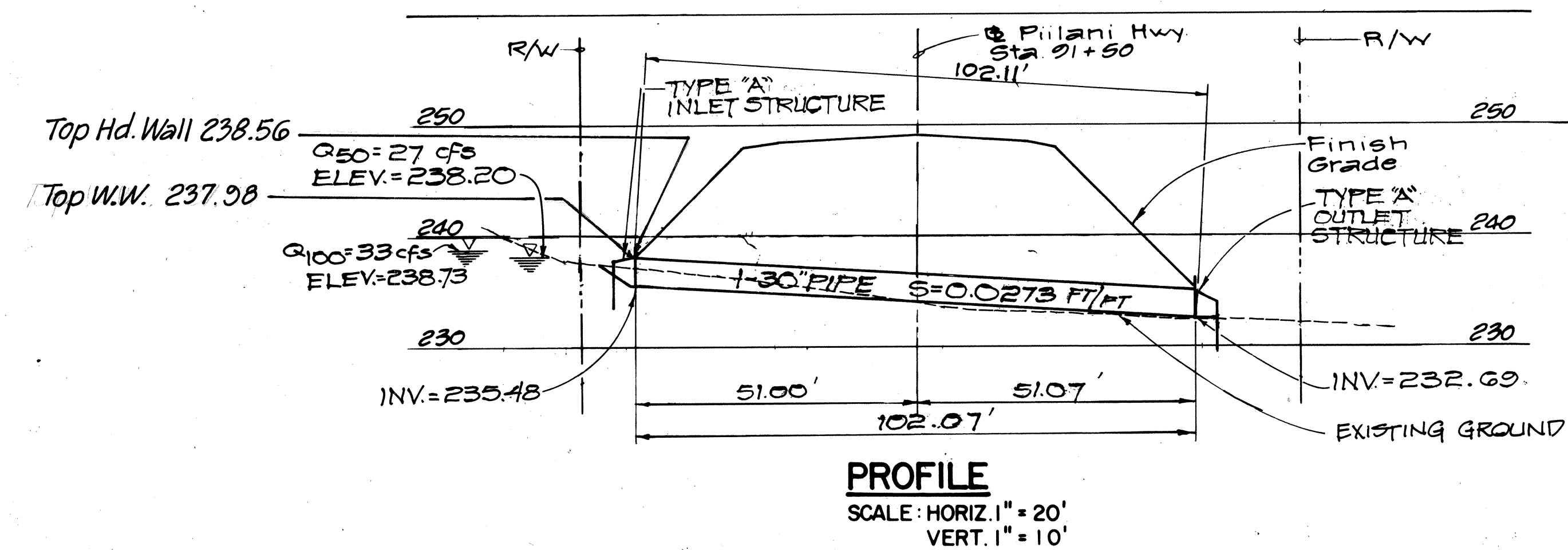
Melvin E. Lepine

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

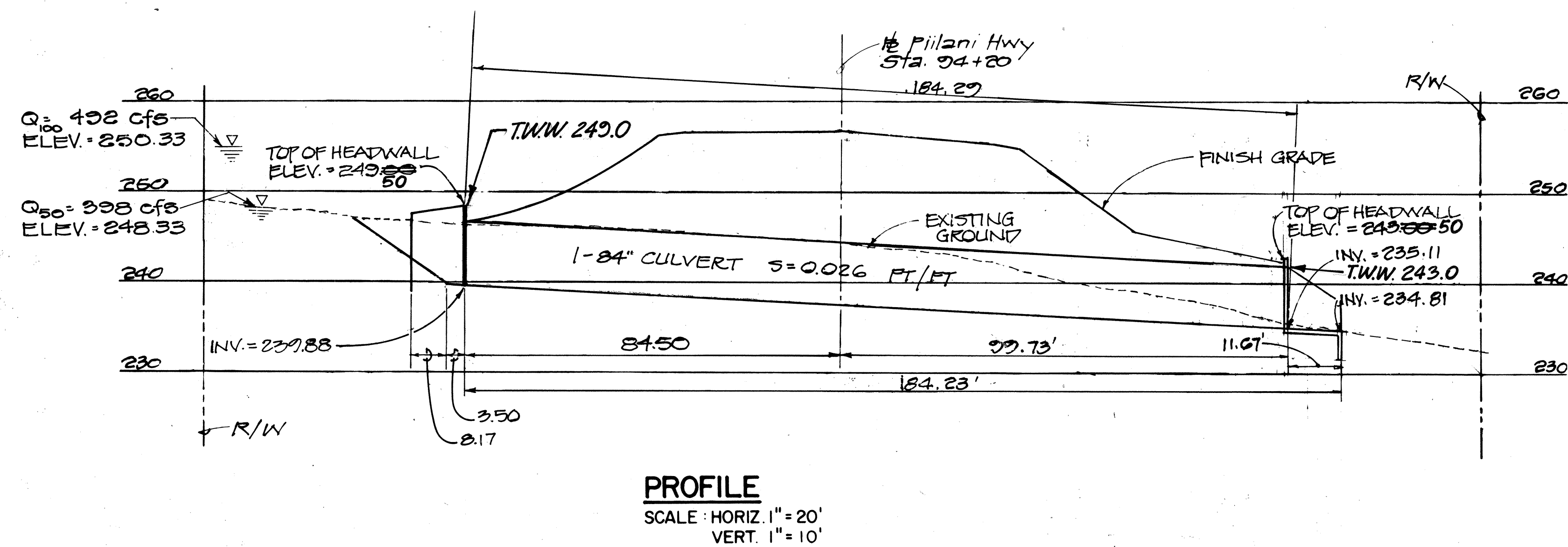
DRAINAGE DETAILS
 PIILANI HIGHWAY
 VICINITY OF KILOHANA STREET
 TO WAILEA IKE DRIVE
 F.A. PROJECT NO. F-031-1(3)
 SCALE AS SHOWN DATE DEC. 1987

SHEET No. 2 OF 16 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-031-1(3)	1987	24	69



CULVERT AT Sta. 91+50



CULVERT AT Sta. 94+20

SURVEY PLOTTED BY	DATE
DRAWN BY	.....
CHECKED BY	.....
NOTE BOOK	.....
.....	

TRANS - MERIDIAN
ENGINEERS & SURVEYORS
864 S. BERTANIAN STREET
HONOLULU, HAWAII 96813

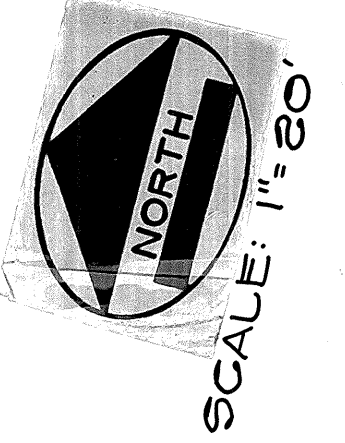
THIS WORK WAS PREPARED BY
MY OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
PIILANI HIGHWAY
VICINITY OF KILOHANA STREET
TO WAILEA IKE DRIVE
F A PROJECT NO F-031-1(3)
SCALE AS SHOWN DATE DEC. 1987

SHEET No. 3 OF 16 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-031-1(3)	1987	25	69



MODIFIED TYPE "A"
INLET STRUCTURE
@ STA. 113+69.80
O/S 57.05' LT.
INV. = 258.00
SEE DETAILS
SHT. 27

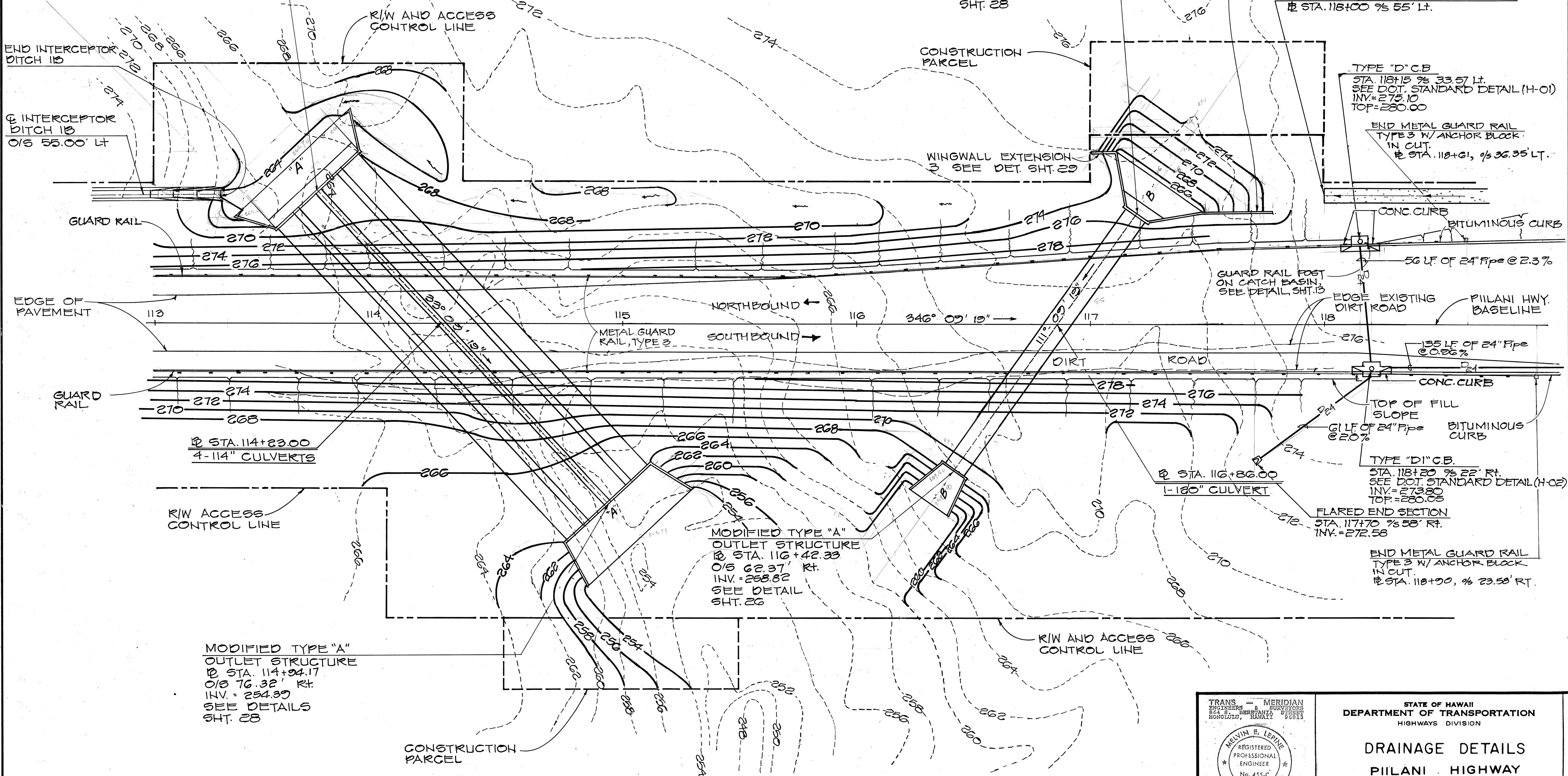
MODIFIED TYPE "A"
INLET STRUCTURE
@ STA. 117+19.41
O/S 47.72' LT.
INV. = 261.51
SEE DETAILS
SHT. 28

WINGWALL EXTENSION 4,
SEE DETAIL SHT. 29

BEGIN & INTERCEPTOR DITCH NO. 2-A
@ STA. 118+00 % 55' LT.

TYPE "D" C.B.
STA. 118+15 % 33.57' LT.
SEE DOT. STANDARD DETAIL (H-01)
INV. = 275.10
TOP = 280.00

END METAL GUARD RAIL
TYPE 3 W/ ANCHOR BLOCK
IN CUT.
@ STA. 118+01, % 36.35' LT.



MODIFIED TYPE "A"
OUTLET STRUCTURE
@ STA. 114+24.17
O/S 76.32' RT.
INV. = 254.37
SEE DETAILS
SHT. 28

MODIFIED TYPE "A"
OUTLET STRUCTURE
@ STA. 116+42.33
O/S 62.37' RT.
INV. = 268.82
SEE DETAIL
SHT. 26

@ STA. 116+86.00
1-180" CULVERT

TYPE "D1" C.B.
STA. 118+20 % 22' RT.
SEE DOT. STANDARD DETAIL (H-02)
INV. = 273.80
TOP = 280.05

FLARED END SECTION
STA. 117+70 % 58' RT.
INV. = 272.58

END METAL GUARD RAIL
TYPE 3 W/ ANCHOR BLOCK
IN CUT.
@ STA. 118+00, % 23.58' RT.

CULVERT AT @ STA. 114+23.00

CULVERT AT @ STA. 116+86.00

DATE	
DESIGNED BY	
DRAWN BY	
CHECKED BY	
NOTED BY	
NO.	

TRANS - MERIDIAN
ENGINEERS & SURVEYORS
854 E. BERKELEY AVE.
HONOLULU, HAWAII 96813

MELVIN E. LEPIRE
REGISTERED
PROFESSIONAL
ENGINEER
No. 455-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

Melvin E. Lepire

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

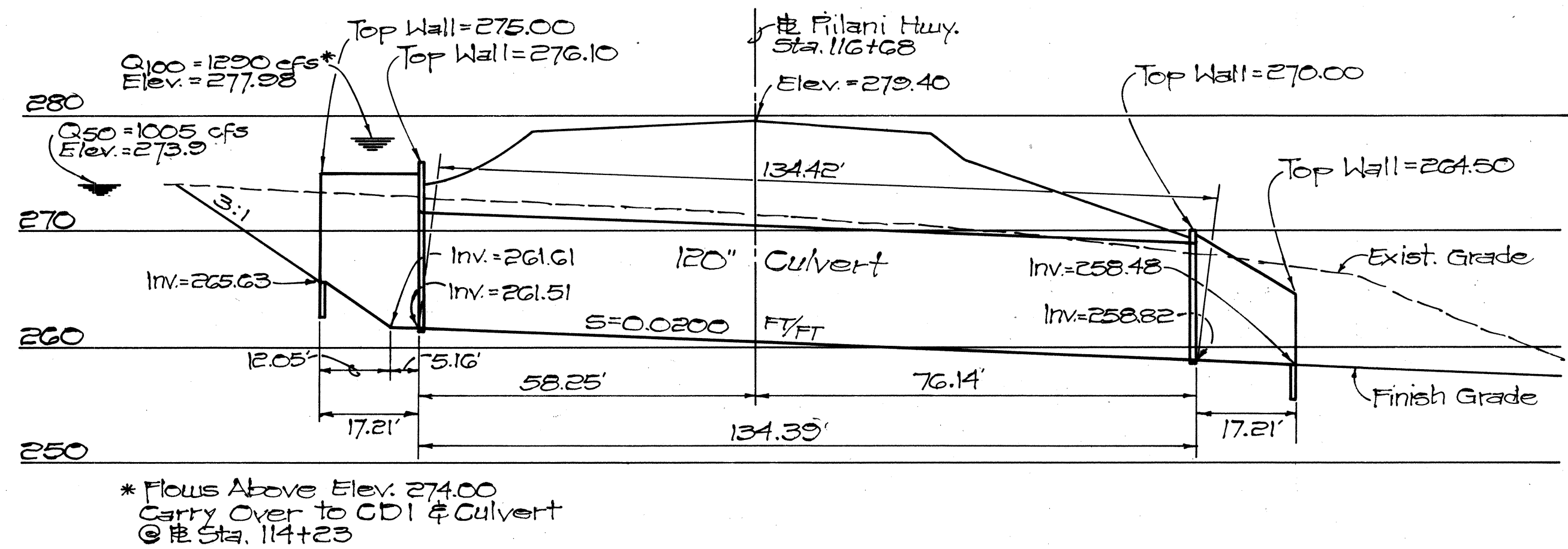
DRAINAGE DETAILS

PIILANI HIGHWAY
VICINITY OF KILOHANA STREET
TO WALEA IKE DRIVE
F.A. PROJECT NO. F-031-1(3)

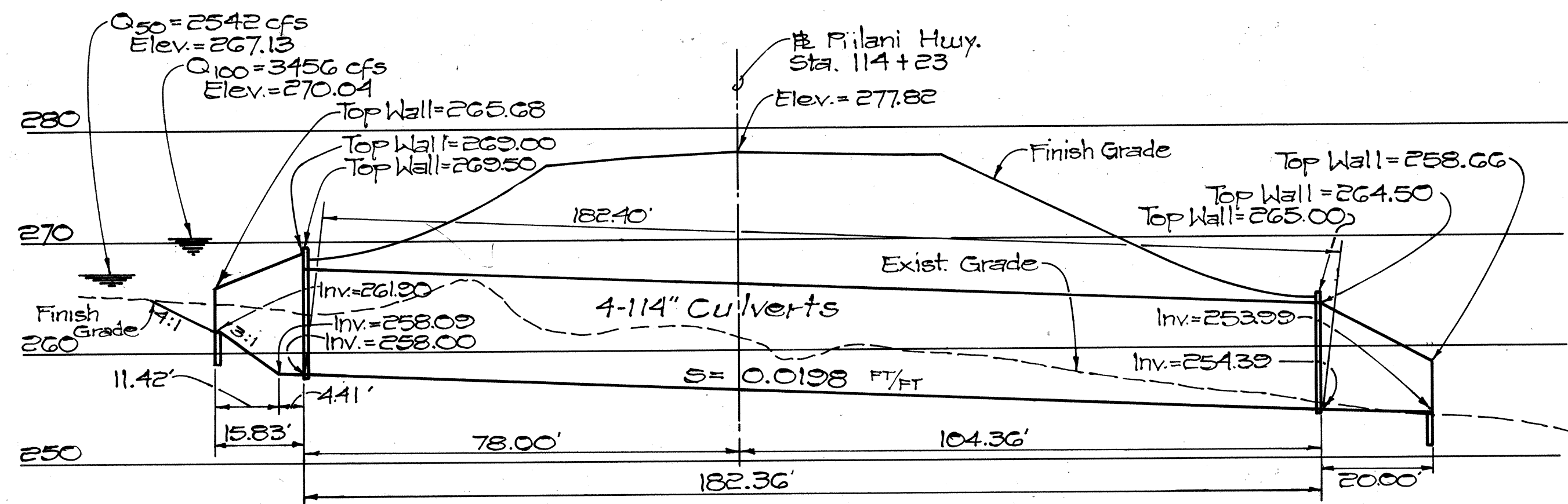
SCALE AS SHOWN DATE DEC. 1987

SHEET No. 4 OF 16 SHEETS

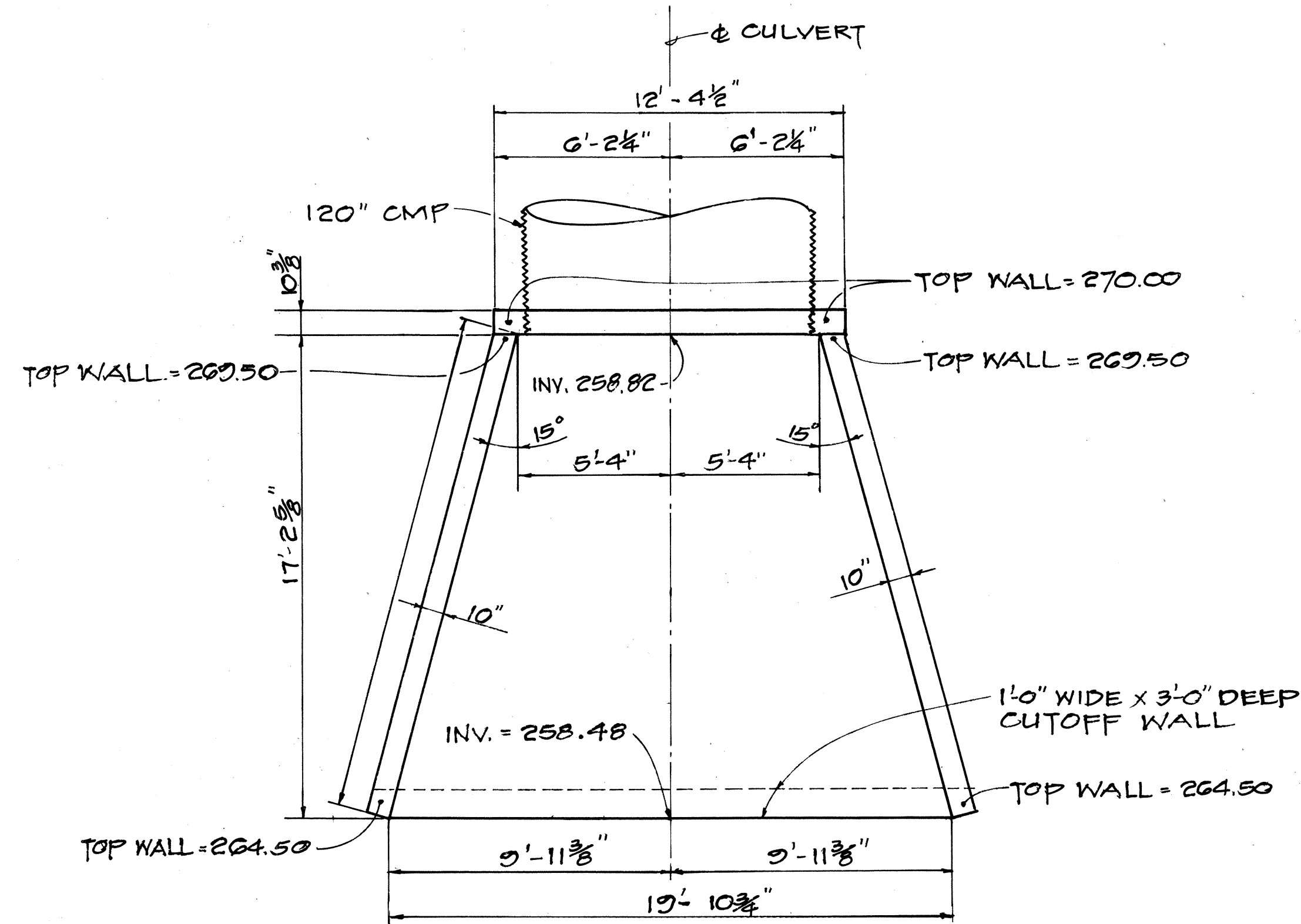
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-031-(3)	1987	26	69



PROFILE-CULVERT AT STA. 116+86
SCALE: HORIZ. 1"=20'
VERT. 1"=10'



PROFILE - CULVERTS AT STA. 114+23
SCALE: HORIZ. 1"=20'
VERT. 1"=10'



MODIFIED TYPE "A" OUTLET STRUCTURE FOR
CULVERT AT STA. 116+86
SCALE: 1/4"=1'-0"

- NOTES:
- FOR REINFORCEMENTS AND ADDITIONAL DETAILS, SEE SHEET 36.
 - 1" CHAMFER ON ALL EXPOSED CONCRETE EDGES.

DATE	_____
DESIGNED BY	_____
CHECKED BY	_____
NOTED BY	_____
ORIGINAL PLAN	_____
NOTE BOOK	_____

TRANS. - MERIDIAN
ENGINEERS & SURVEYORS
864 S. BERKELEY STREET
HONOLULU, HAWAII 96813

MELVIN E. LEFINE
REGISTERED
PROFESSIONAL
ENGINEER
No. 455-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

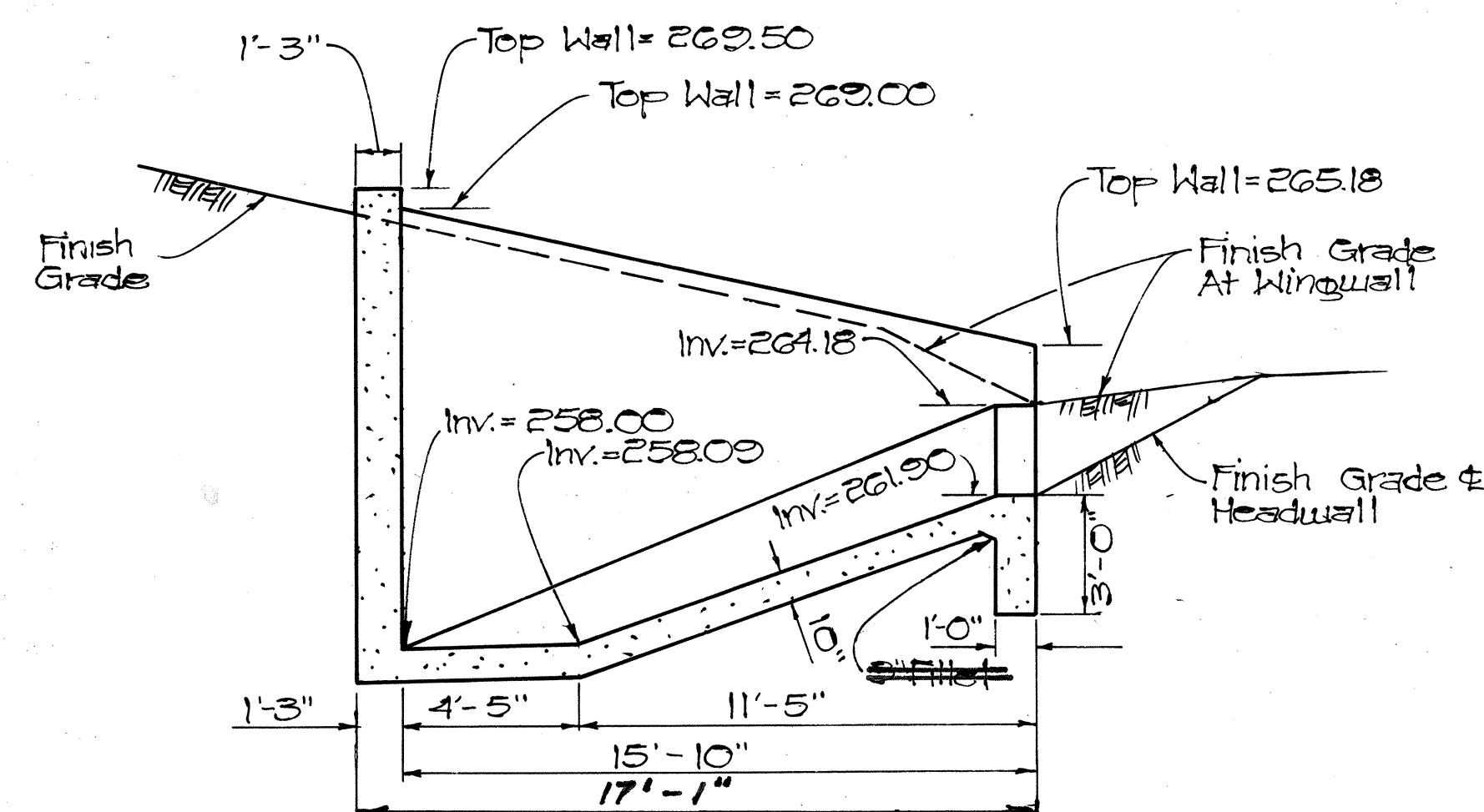
DRAINAGE DETAILS

PIILANI HIGHWAY
VICINITY OF KILOHANA STREET
TO WAILEA IKE DRIVE
F.A. PROJECT NO. F-031-(3)

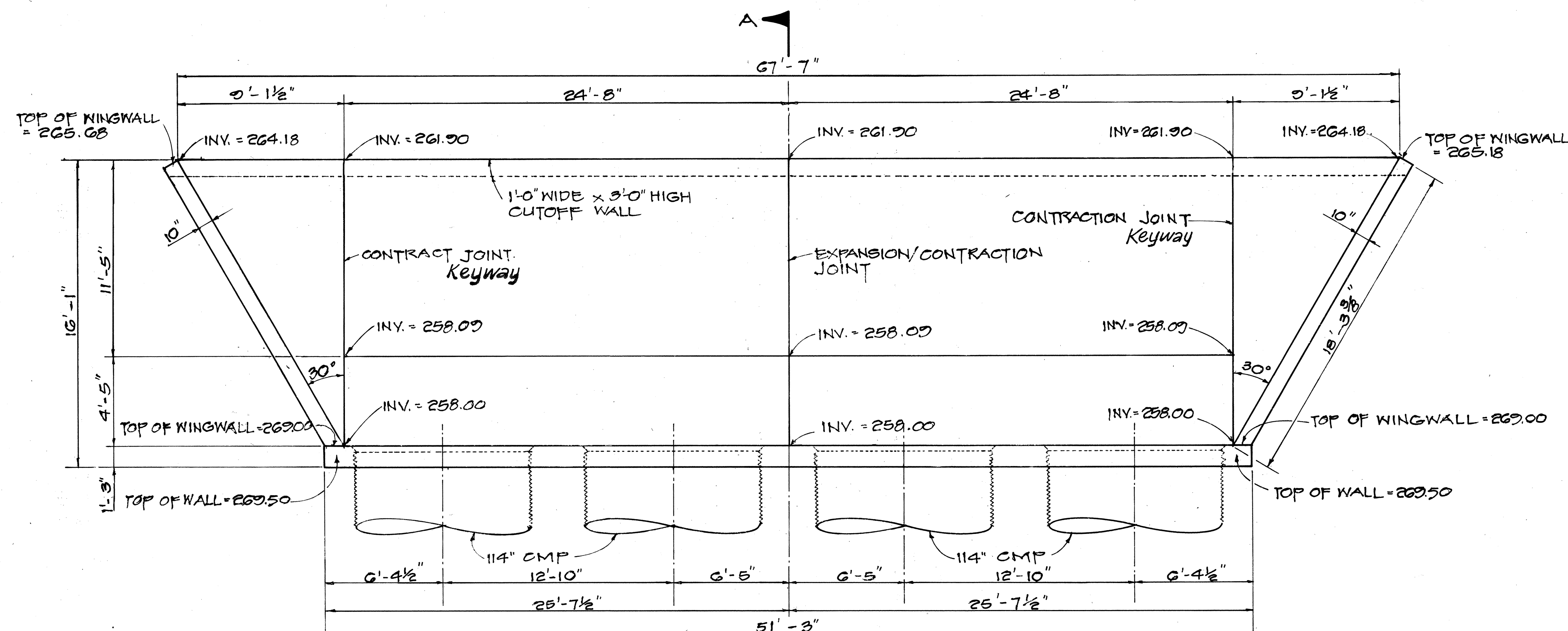
SCALE AS SHOWN DATE DEC. 1987

SHEET No. 5 OF 16 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-031-1(3)	1987	27	69



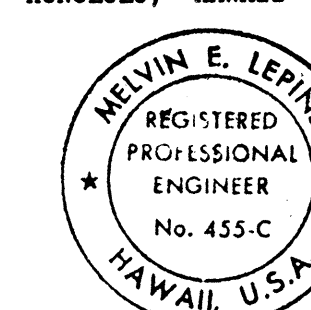
SECTION "AA"
Scale: 1/4" = 1'-0"



**MODIFIED TYPE "A" INLET STRUCTURE FOR
CULVERT AT STA. 114+23**
Scale: 1/8" = 1'-0"

- NOTES:
1. FOR REINFORCEMENTS AND ADDITIONAL DETAILS, SEE SHEET 36.
 2. 1" CHAMFER ON ALL EXPOSED CONCRETE EDGES.

TRANS - MERIDIAN
ENGINEERS & SURVEYORS
854 S. BERTANIA STREET
HONOLULU, HAWAII 96813



Melvin E. Levine
THIS WORK WAS PREPARED BY
MY OR UNDER MY SUPERVISION

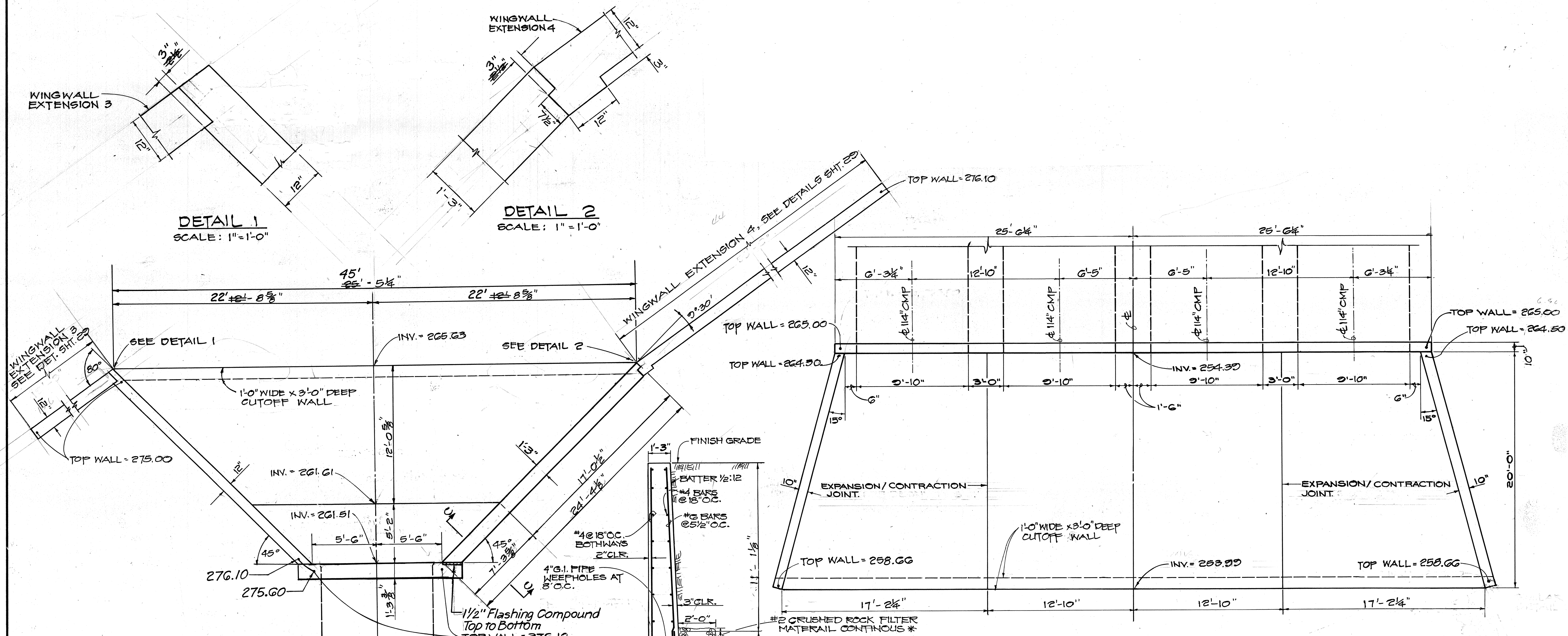
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
PILANI HIGHWAY
VICINITY OF KILOHANA STREET
TO WAILEA IKE DRIVE
F.A. PROJECT NO. F-031-1(3)

SCALE: AS SHOWN DATE

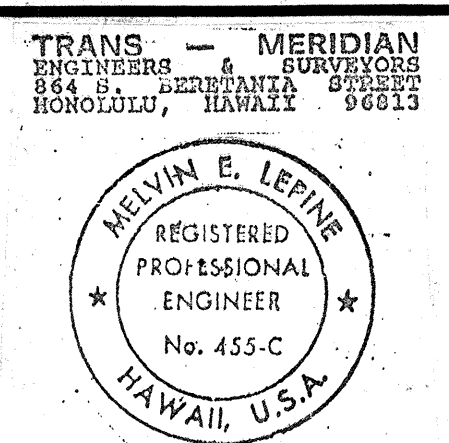
SHEET No. 6 OF 16 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-031-1(3)	1987	28	69



PLAN
MODIFIED TYPE "A" INLET STRUCTURE FOR CULVERT AT STA. 116+86
SCALE: 1/4"=1'-0"

PLAN
MODIFIED TYPE "A" OUTLET STRUCTURE FOR CULVERT AT STA. 114+23
SCALE: 1/4"=1'-0"



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

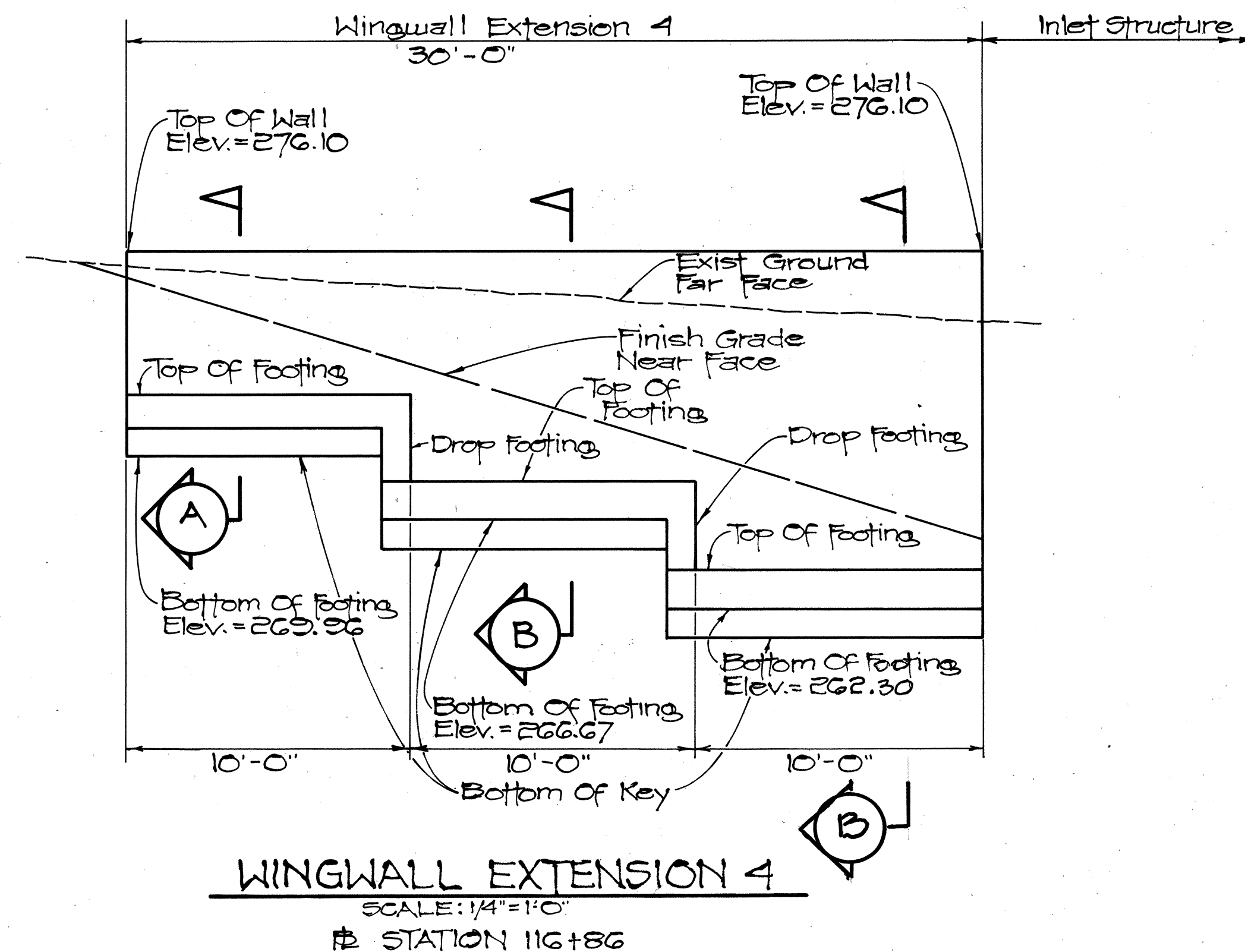
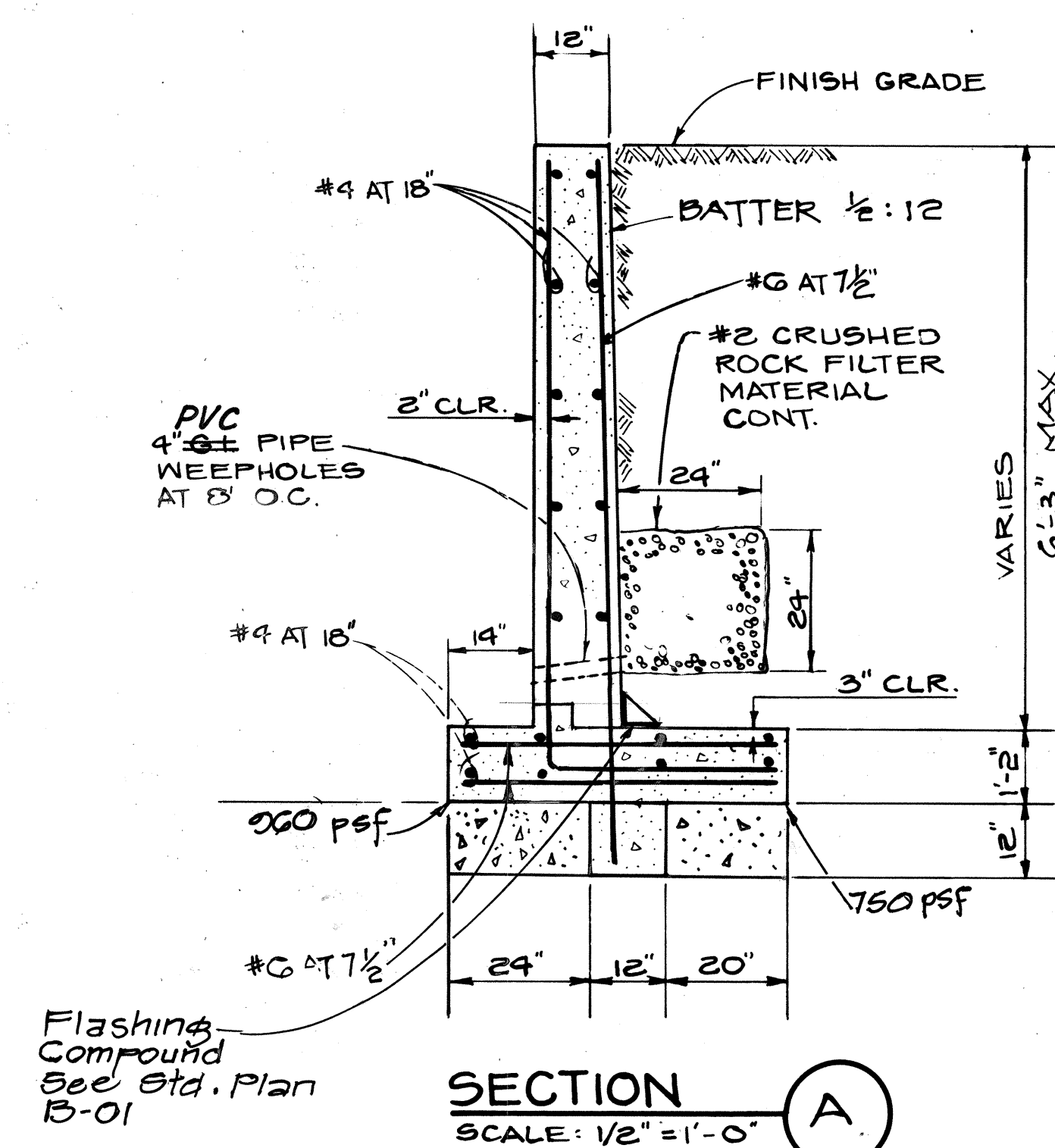
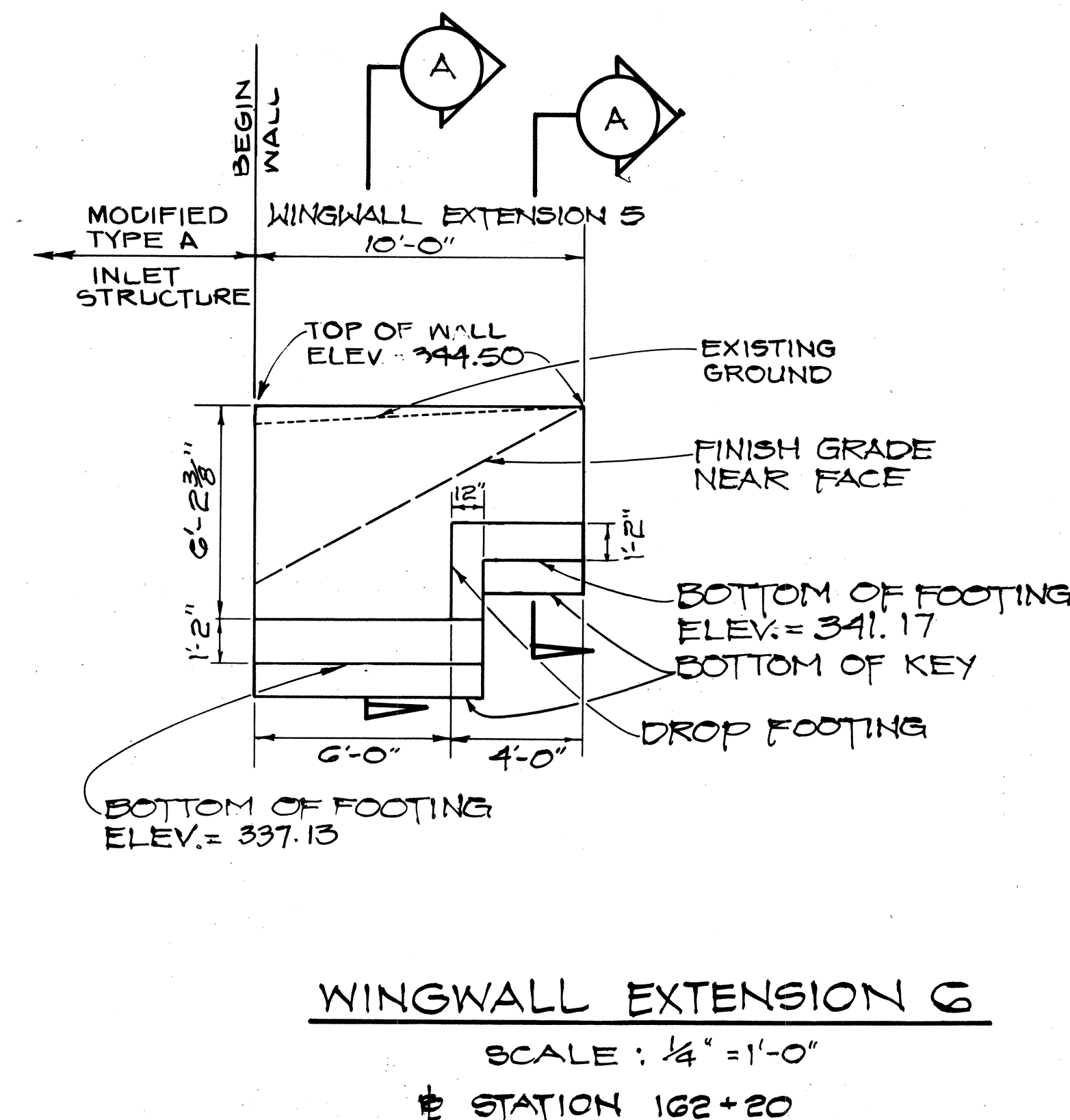
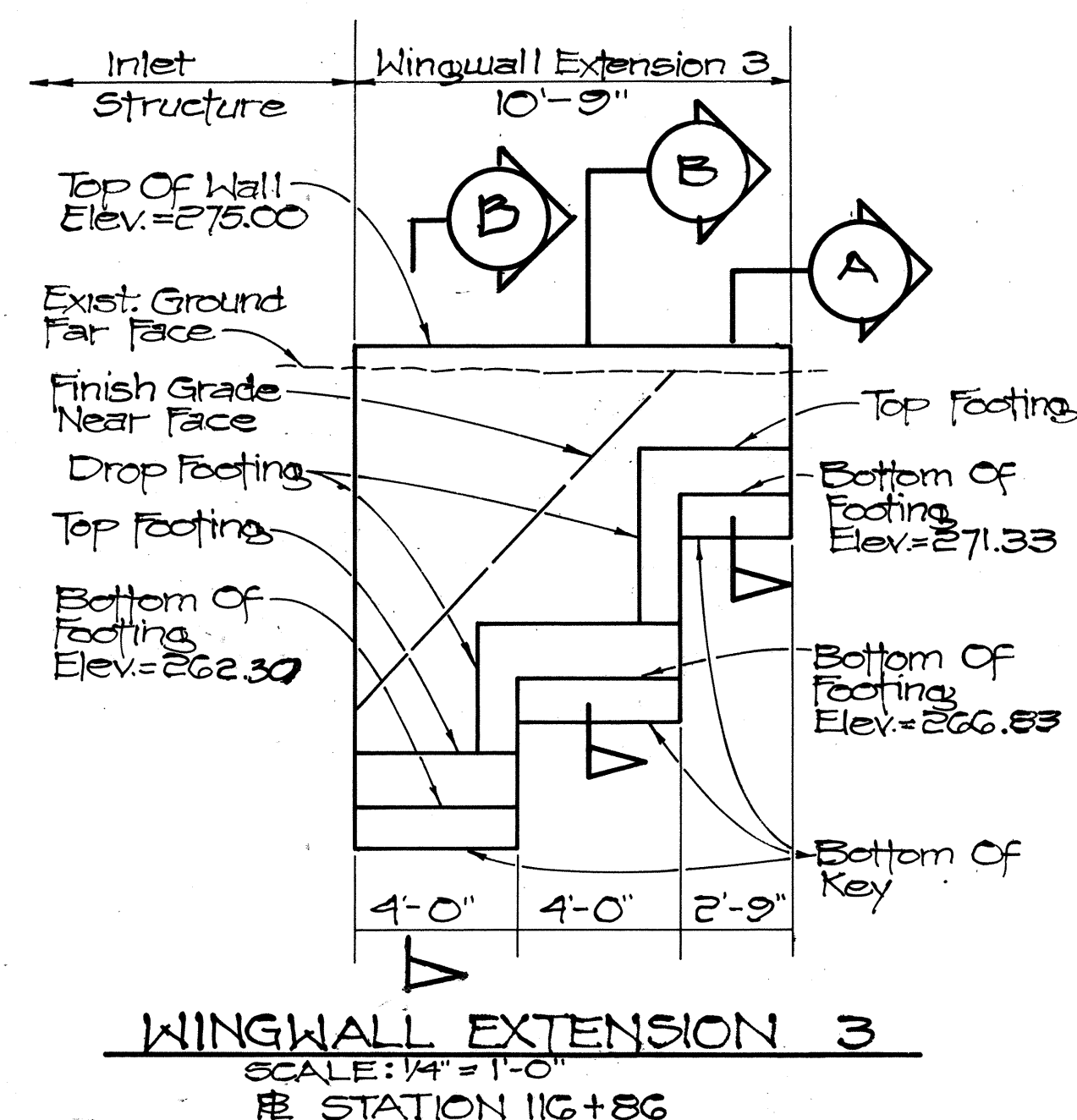
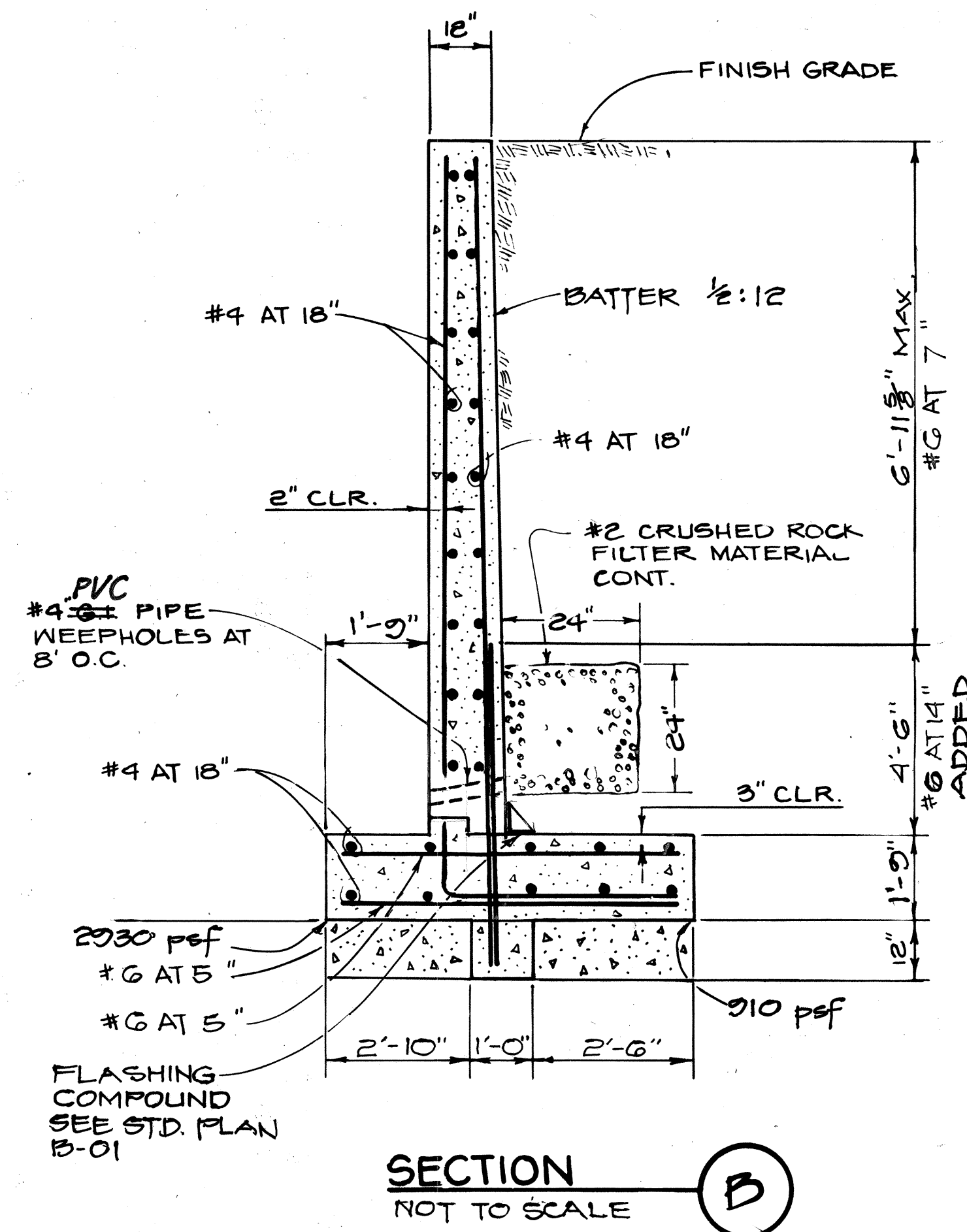
DRAINAGE DETAILS

PIILANI HIGHWAY
VICINITY OF KILOHANA STREET
TO WALEA IKE DRIVE
F.A. PROJECT NO. F-031-1(3)

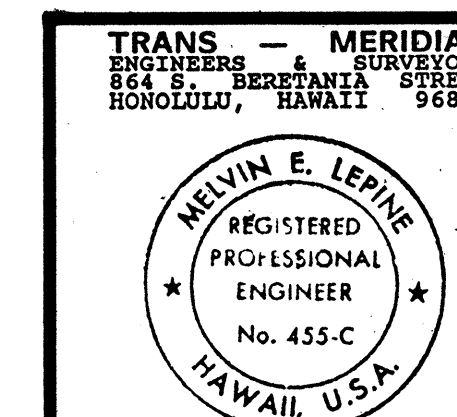
SCALE: AS SHOWN DATE: DEC. 1987

SHEET No. 7 OF 16 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-031-1(3)	1987	29	69



- NOTES:
1. FOR REINFORCEMENTS AND ADDITIONAL DETAILS, SEE SHEET 36.
 2. 1" CHAMFER ON ALL EXPOSED CONCRETE EDGES.



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

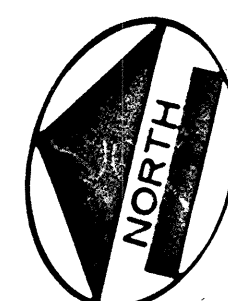
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
PILANI HIGHWAY
VICINITY OF KILOHANA STREET
TO WAILEA IKE DRIVE
F.A. PROJECT NO. F-031-1(3)

SCALE: AS SHOWN DATE

SHEET No. 8 OF 16 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-03H(3)	1987	30	69



Drop Spillway Structure

Sta. 124+03.27
 92.88' % Rt.
 Top = 297.00
 Weir = 292.00
 Inv. = 279.11

Inlet Structure See Sht. 31

Sta. 124+73.26
 40.88' % Lt.
 Top = 288.00
 Inv. = 278.21

Conc. Drop Intake

Sta. 125+32
 9/5 55' Lt.
 Inv. = 292.00

Begin Interceptor Ditch 3A

(Type "B")
 Sta. 125+56.33
 9/5 55' Lt.
 Inv. = 292.08

Interceptor Ditch Transition
 See Sheet 37

30-inch Drain Outlet

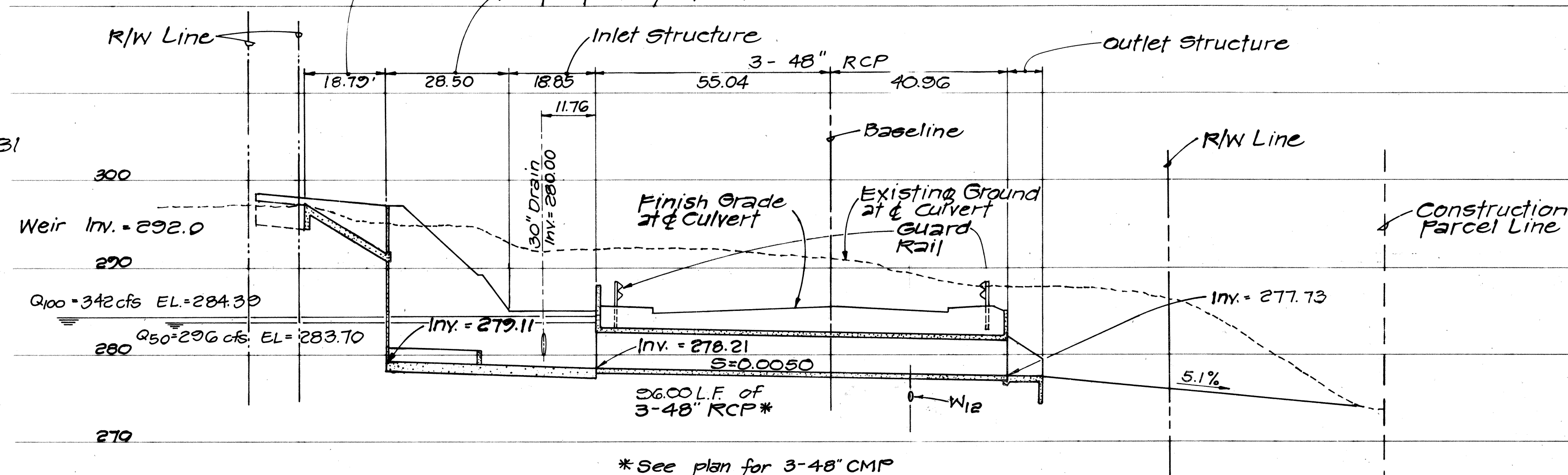
Sta. 124+07.26
 9/5 56.33' Lt.
 Inv. = 280.00

R/W & Access
 Control Line

Drop Spillway Inlet

Drop Spillway Structure

Outlet Structure



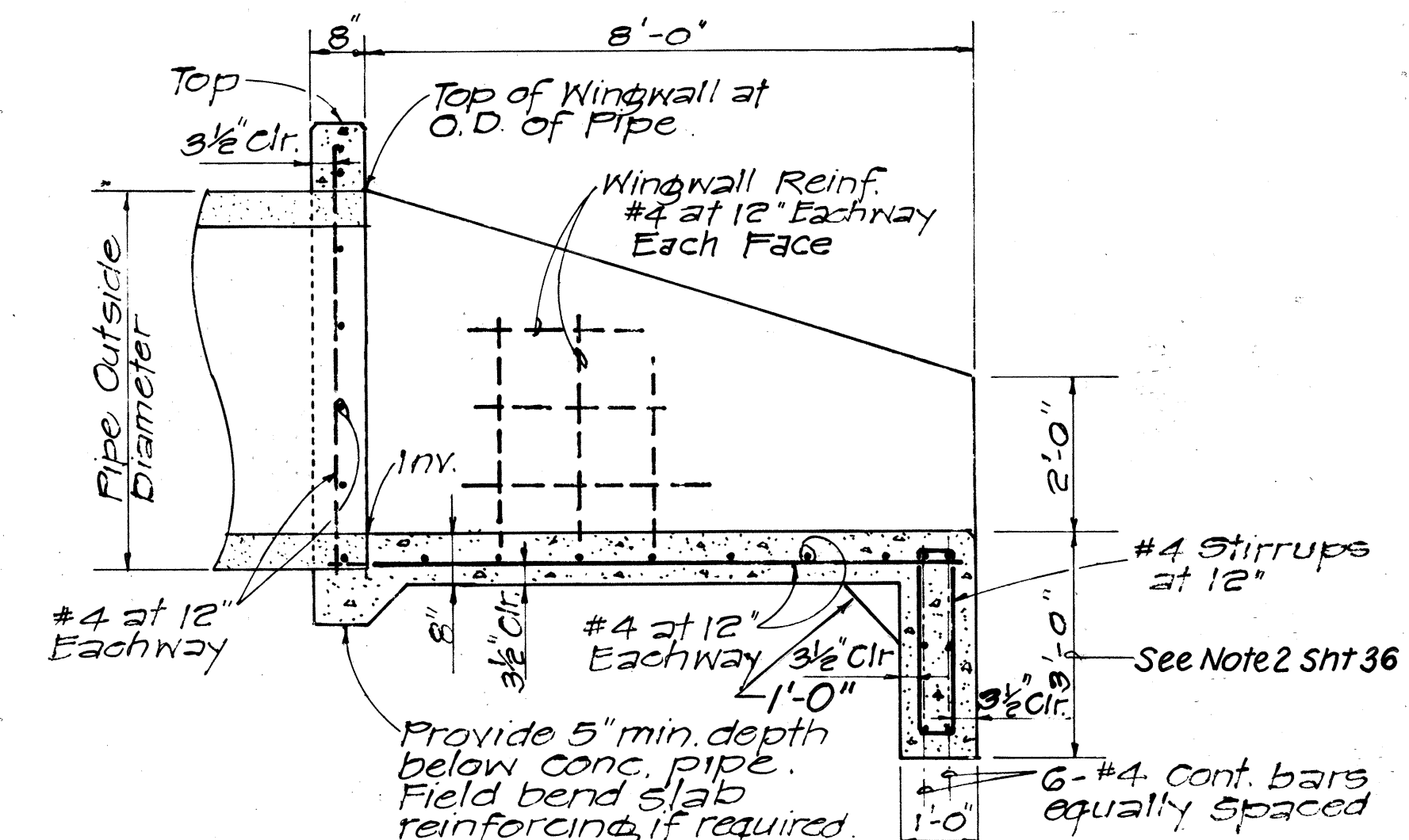
PROFILE RCP CULVERT AT STA. 124+50

SCALE: HORIZ. 1"=20'

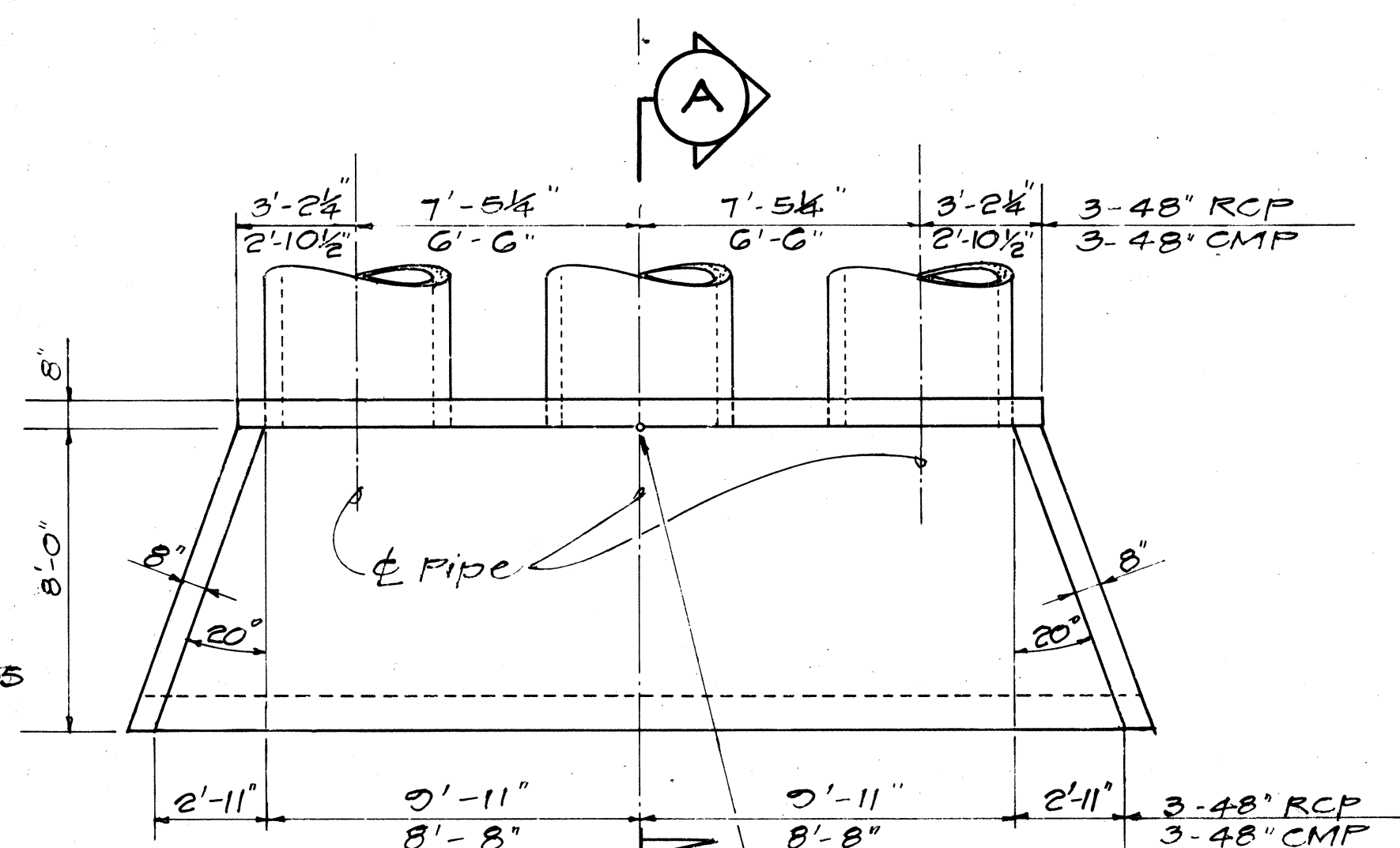
VERT. 1"=10'

NOTE:

1" CHAMFER FOR ALL EXPOSED
 CONC. EDGES.



SECTION A



OUTLET STRUCTURE FOR 3-48" CULVERTS

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

3-48" CMP
 Sta. 124+30.35
 9/5 40.85' Rt.
 Top = 280.74
 Inv. = 276.21

Outlet Structure

3-48" RCP
 Sta. 124+30.20
 9/5 37.12' Rt.
 Top = 285.34
 Inv. = 277.73

Conc. Headwall See Sht. No. 35

Sta. 124+03.30
 62' % Rt.
 Top = 279.47
 Inv. = 276.48

Sta. 124+47.13, % 214C Rt (48" CMP)
 Sta. 124+48.20, % 2093 Rt (48" RCP)

Type "B" 50MH
 Top = 284.99 (48" CMP)
 Inv. = 285.00 (48" RCP)
 Inv. = 277.84

Outlet Structure 124+32.69
 Sta. 124+30.90 (3-48" RCP)
 37.12' % Rt.
 Top = 285.00
 Inv. = 277.73

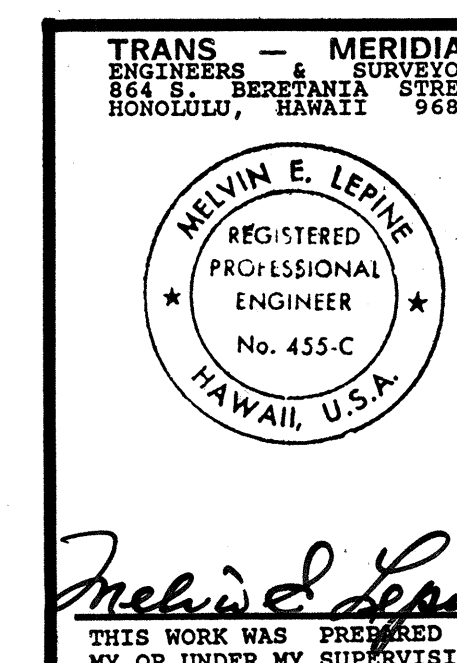
Sta. 124+03.30
 62' % Rt.
 Top = 279.47
 Inv. = 276.48

CULVERT AT STA. 124+50.00

SCALE: 1"=20'

Limits of Construction
 Parcel

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



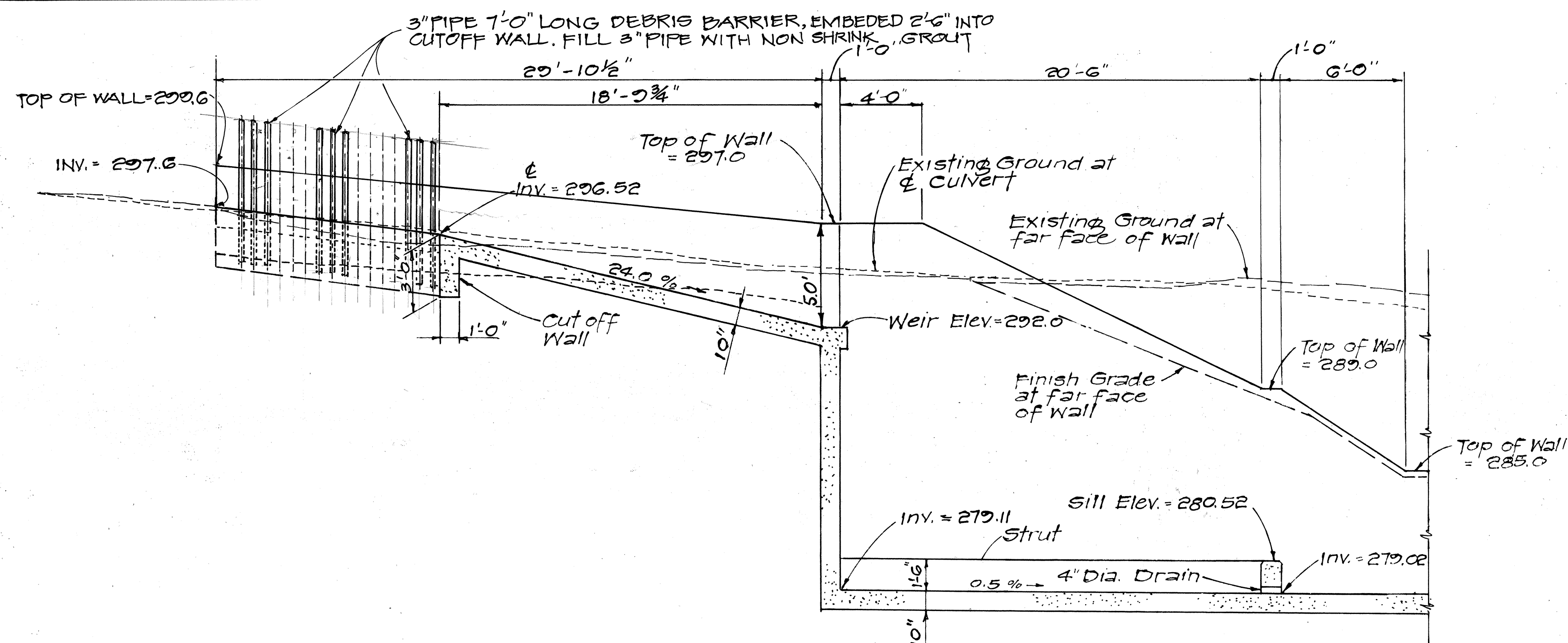
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

DRAINAGE DETAILS
 PIILANI HIGHWAY
 VICINITY OF KILOHANA STREET
 TO WAILEA IKE DRIVE
 F.A. PROJECT NO. F-031-1(3)

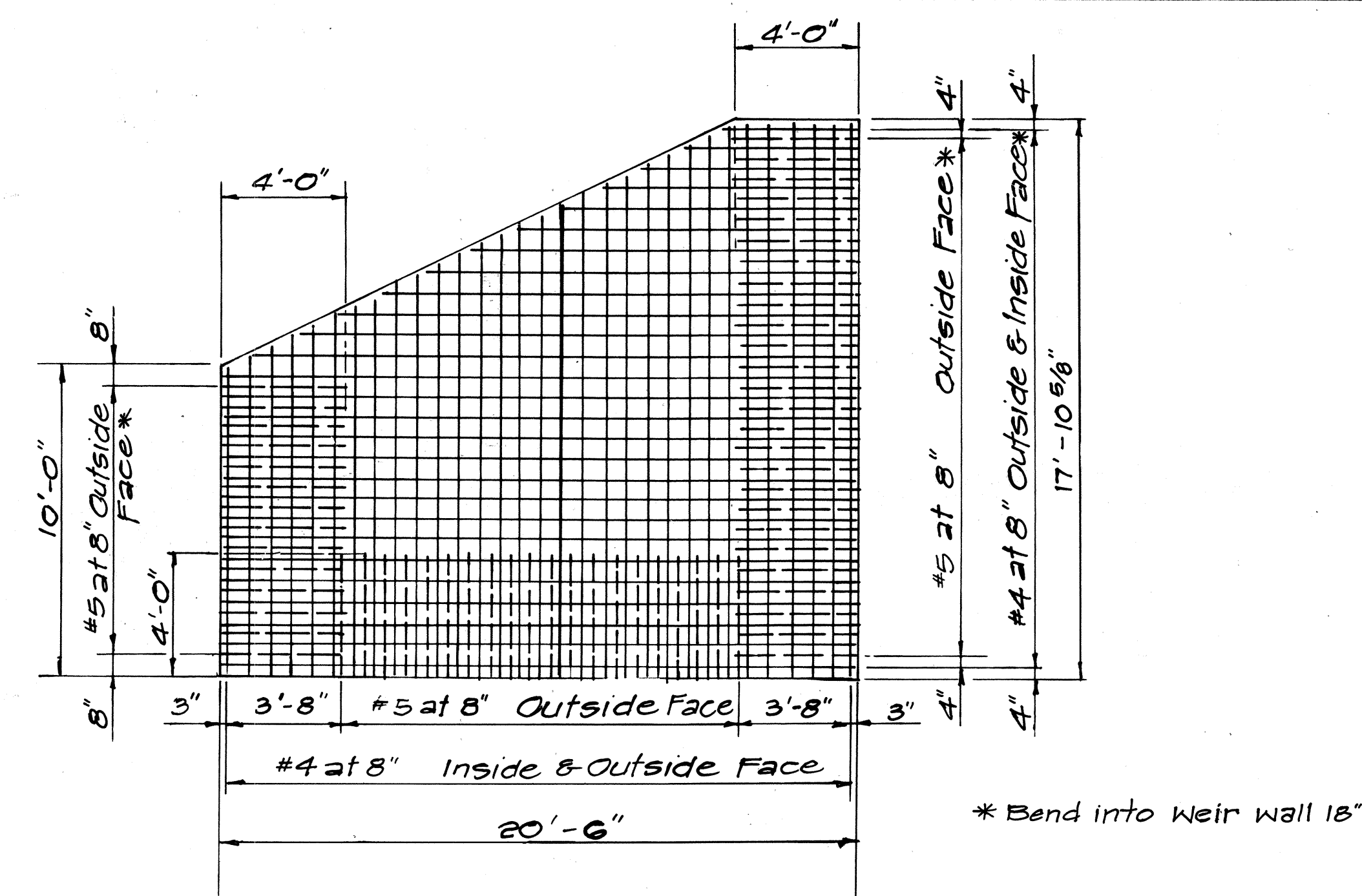
SCALE: AS SHOWN DATE DEC. 1987

SHEET No. 3 OF 16 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-031-1(3)	1987	32	69

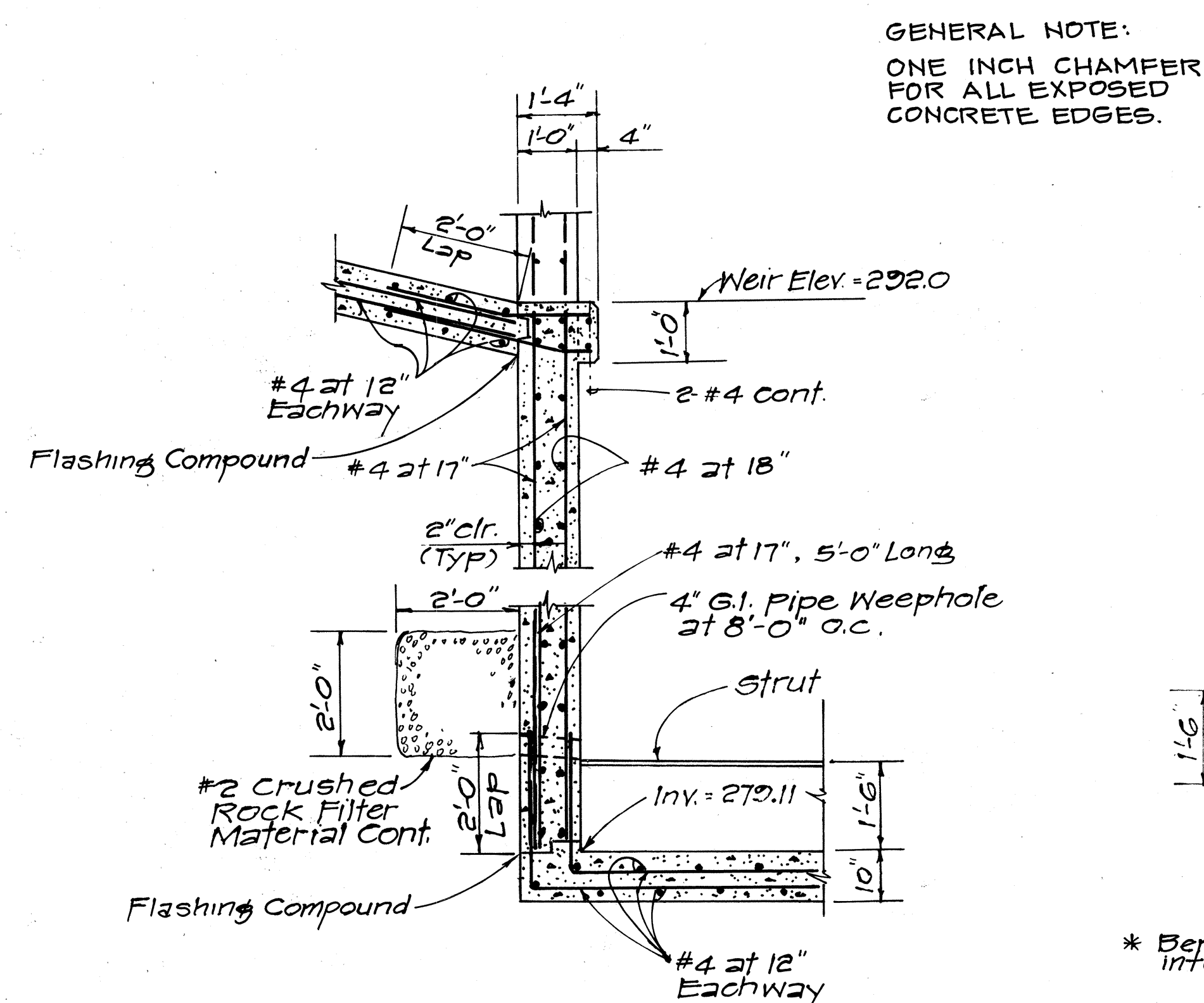


SECTION (A)
SCALE: $\frac{1}{4}" = 1'-0"$

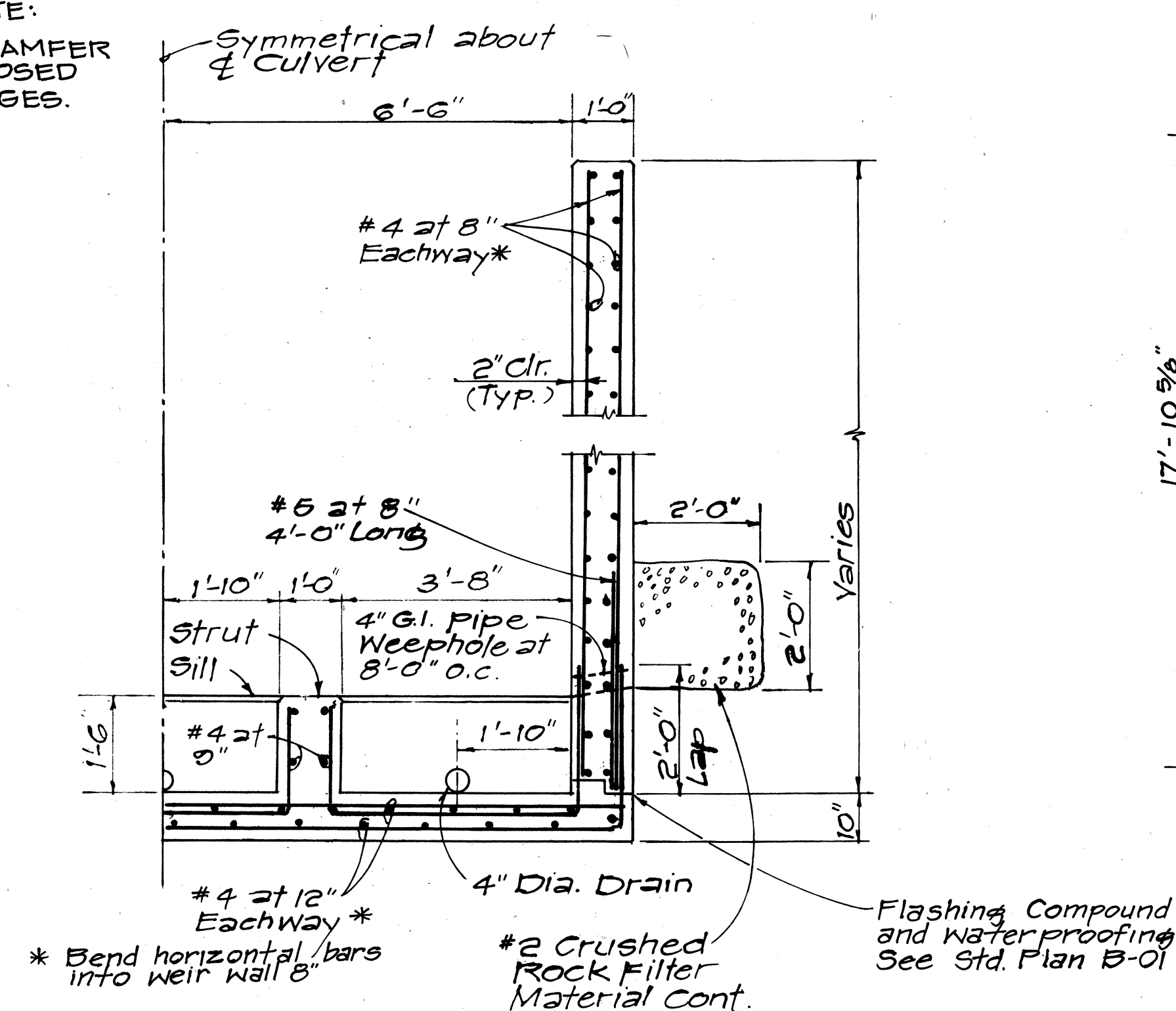


DROP SPILLWAY WALL REINFORCEMENT

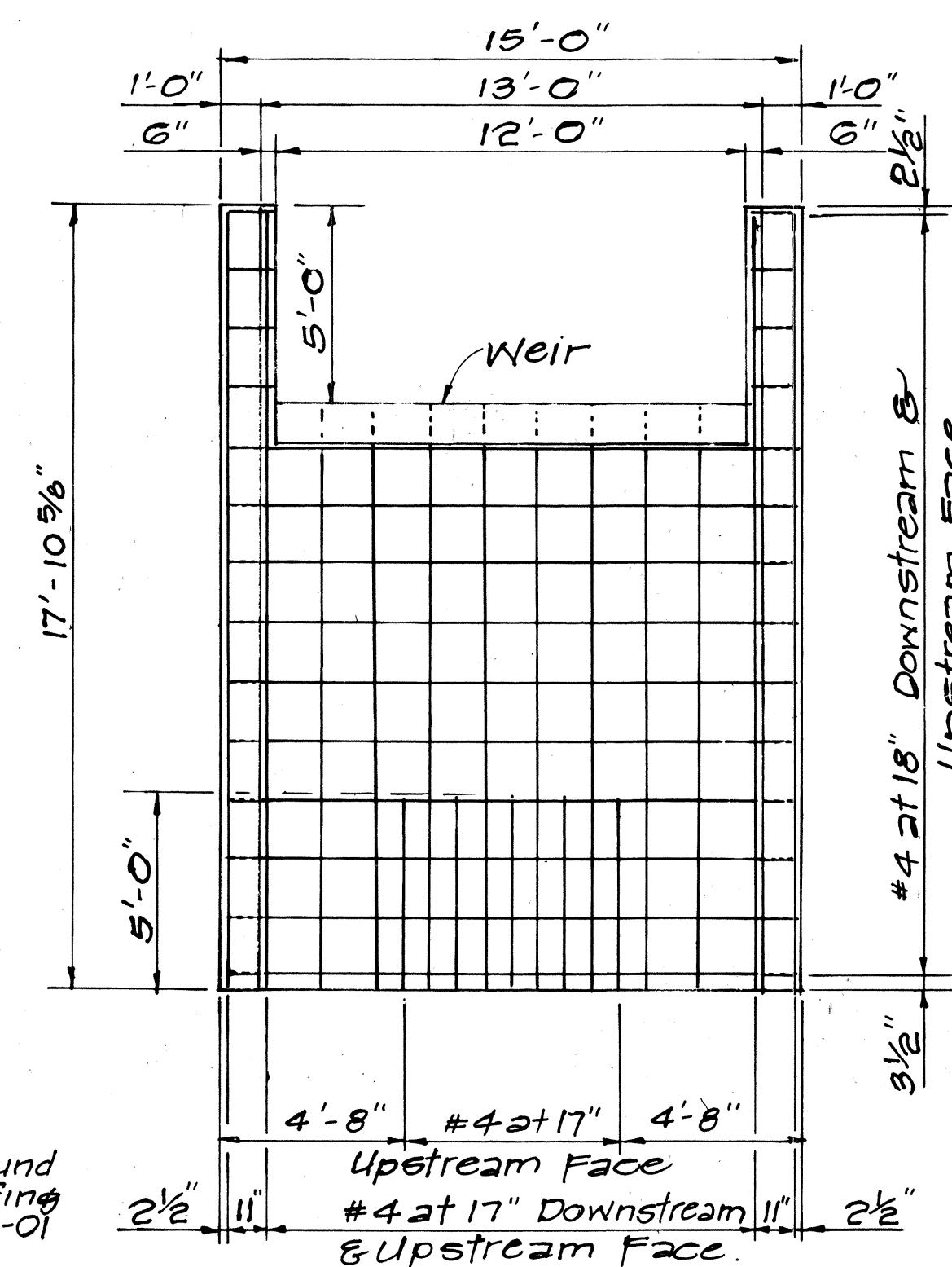
SCALE: $\frac{1}{4}'' = 1'-0''$



TYPICAL WEIR WALL SECTION
SCALE: $\frac{1}{2}'' = 1'-0''$



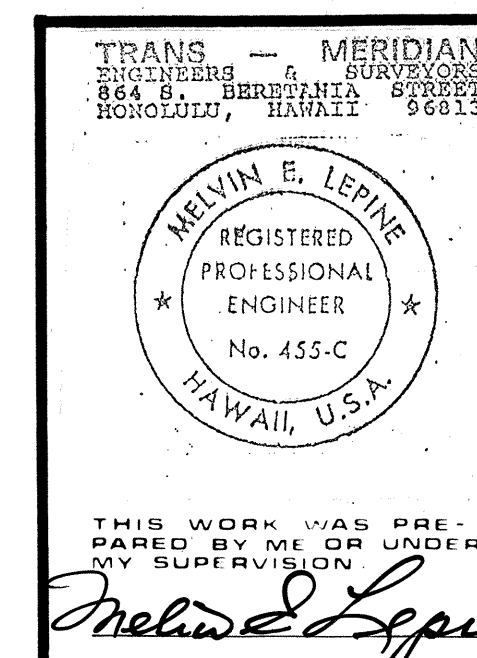
TYPICAL DROP SPILLWAY
HALF SECTION
SCALE: 1/2" = 1'-0"



WEIR WALL REINFORCEMENT

SCALE: $\frac{1}{4}" = 1'-0"$

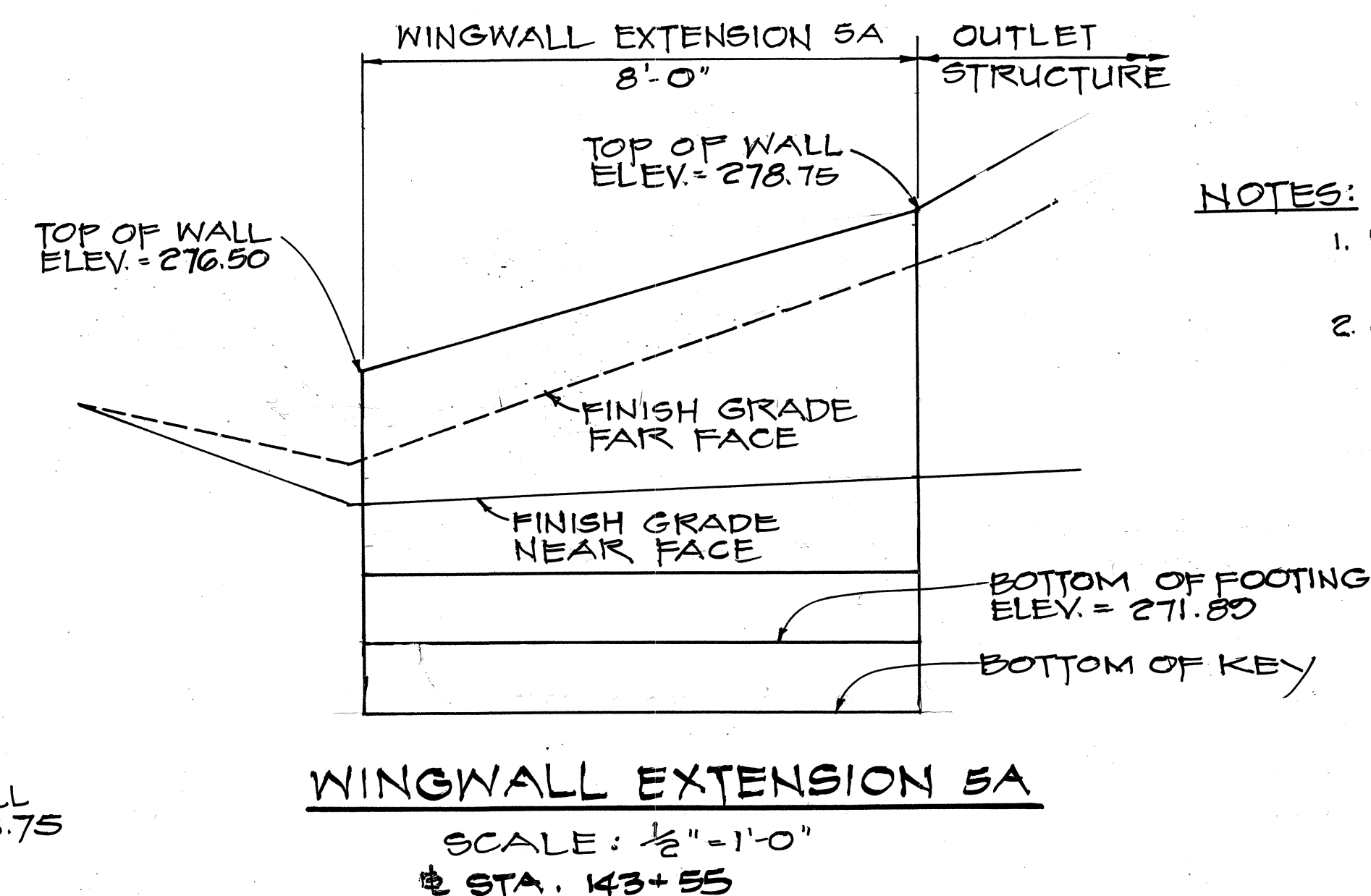
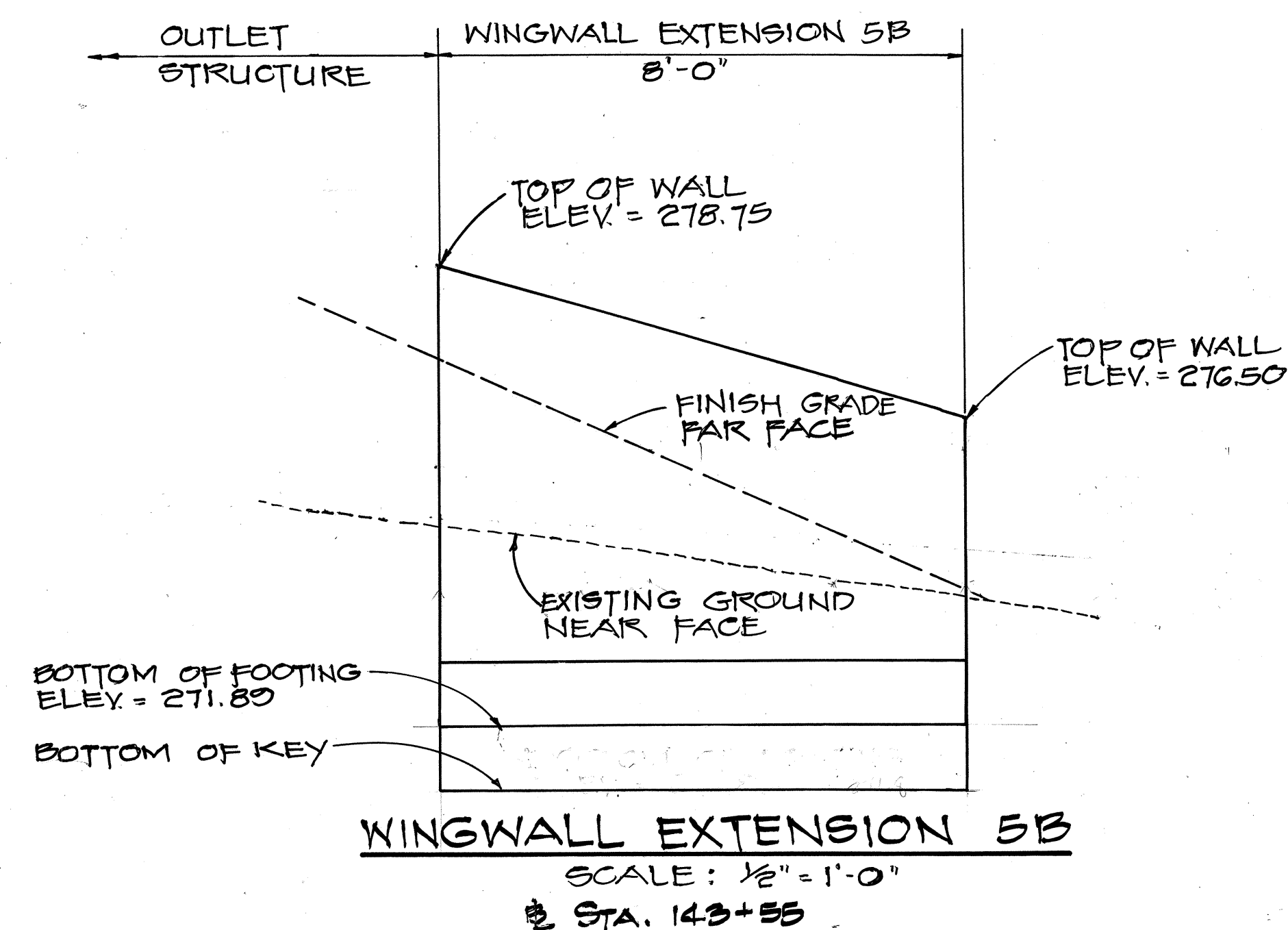
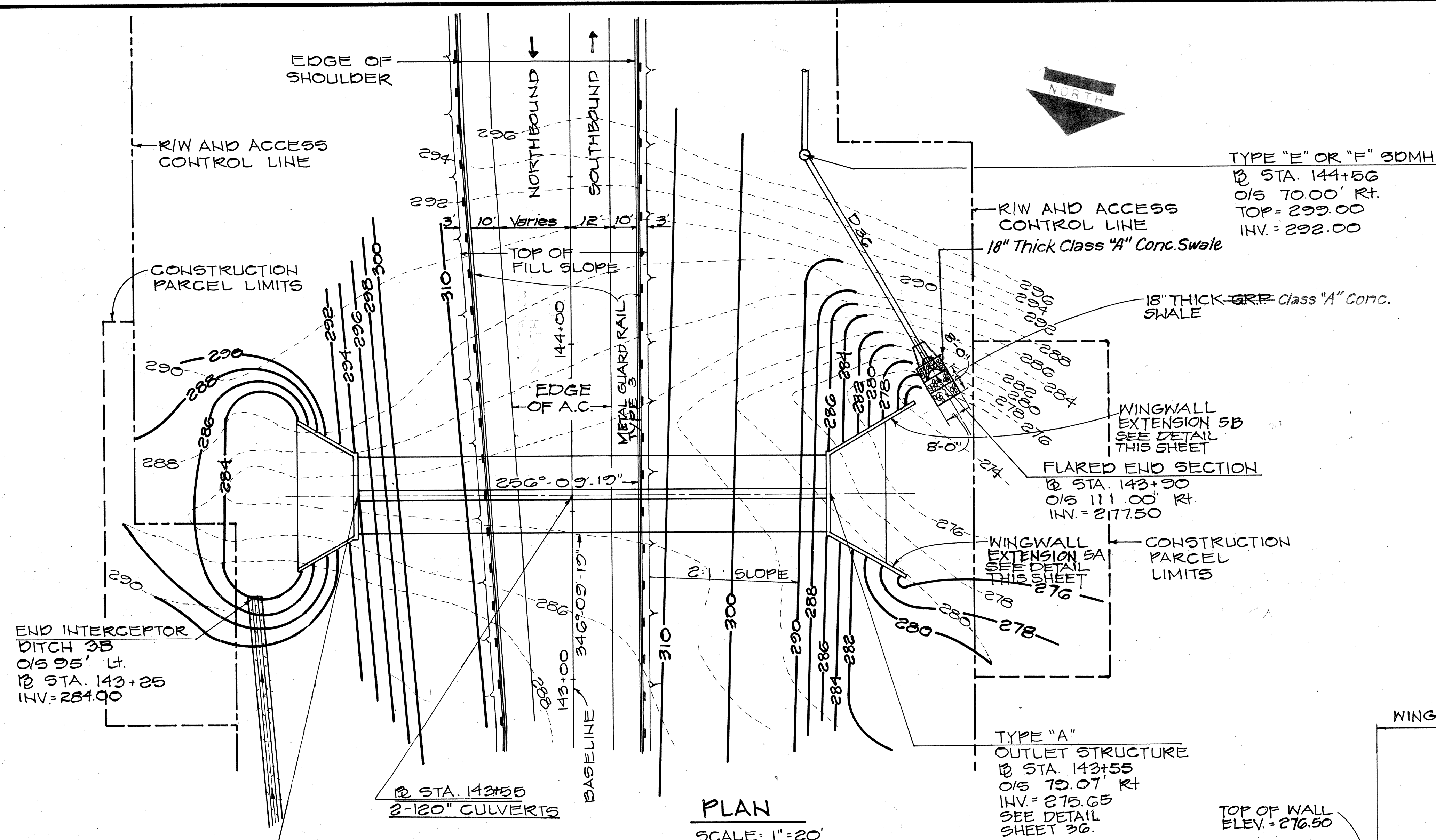
ORIGINAL PLAN	SURVEY PLOTTED BY _____ DATE _____
	DRAWN BY _____
	TRACED BY _____
NOTE BOOK	DESIGNED BY _____
	QUANTITIES BY _____
No. _____	CHECKED BY _____



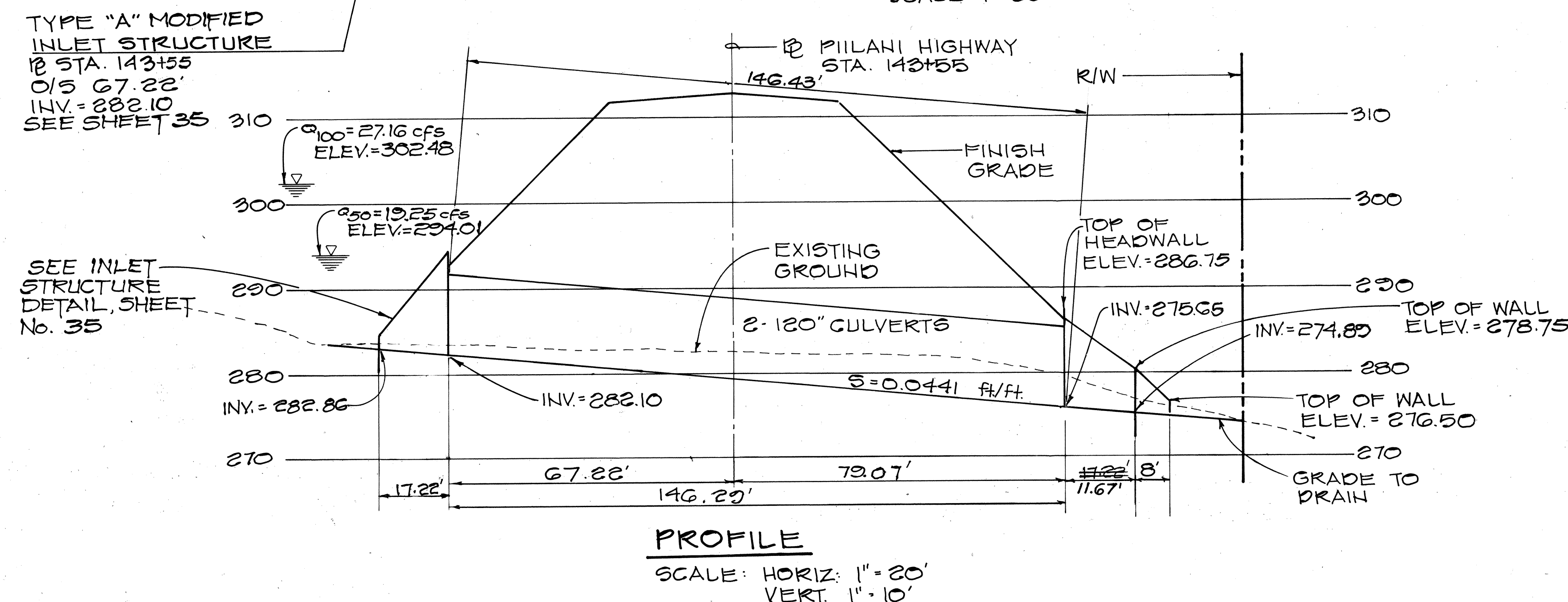
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
PIILANI HIGHWAY
 VICINITY OF KILOHANA STREET
TO WAILEA IKE DRIVE
 F.A. PROJECT NO. F-031-I(3)
 SCALE: AS SHOWN DATE DEC. 1987

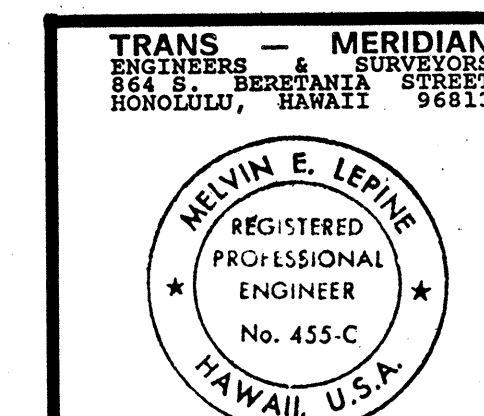
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-031-I(3)	1987	33	69



- NOTES:
1. FOR REINFORCEMENTS, SEE SHEET 20, SECTION A
 2. ONE INCH CHAMFER ON ALL EXPOSED CONC. EDGES.



CULVERT AT @ STA. 143+55



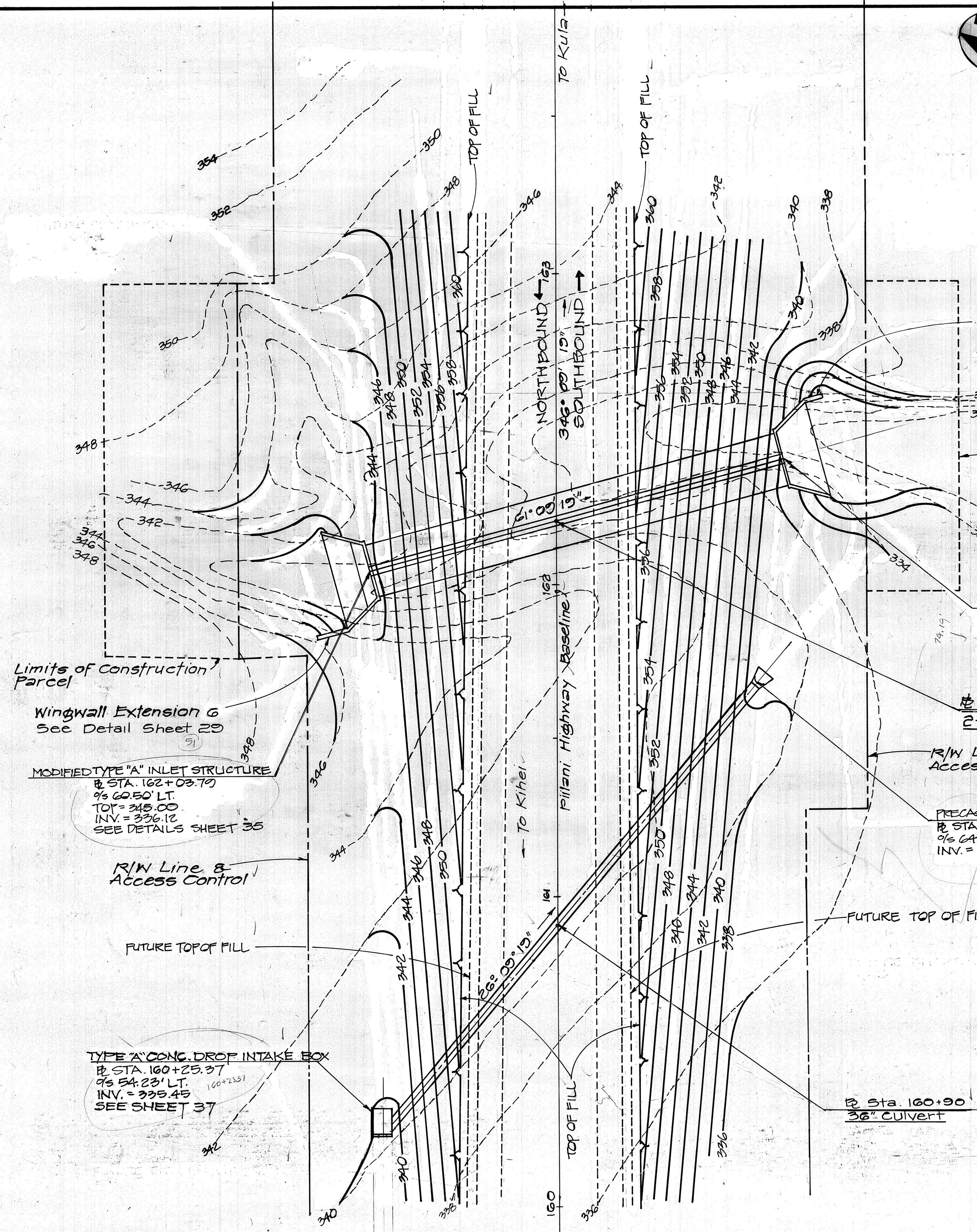
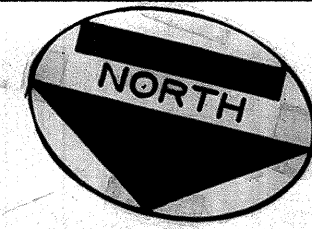
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

DRAINAGE DETAILS
 PILANI HIGHWAY
 VICINITY OF KILOHANA STREET
 TO WAILEA IKE DRIVE
 F.A. PROJECT NO. F-031-I(3)

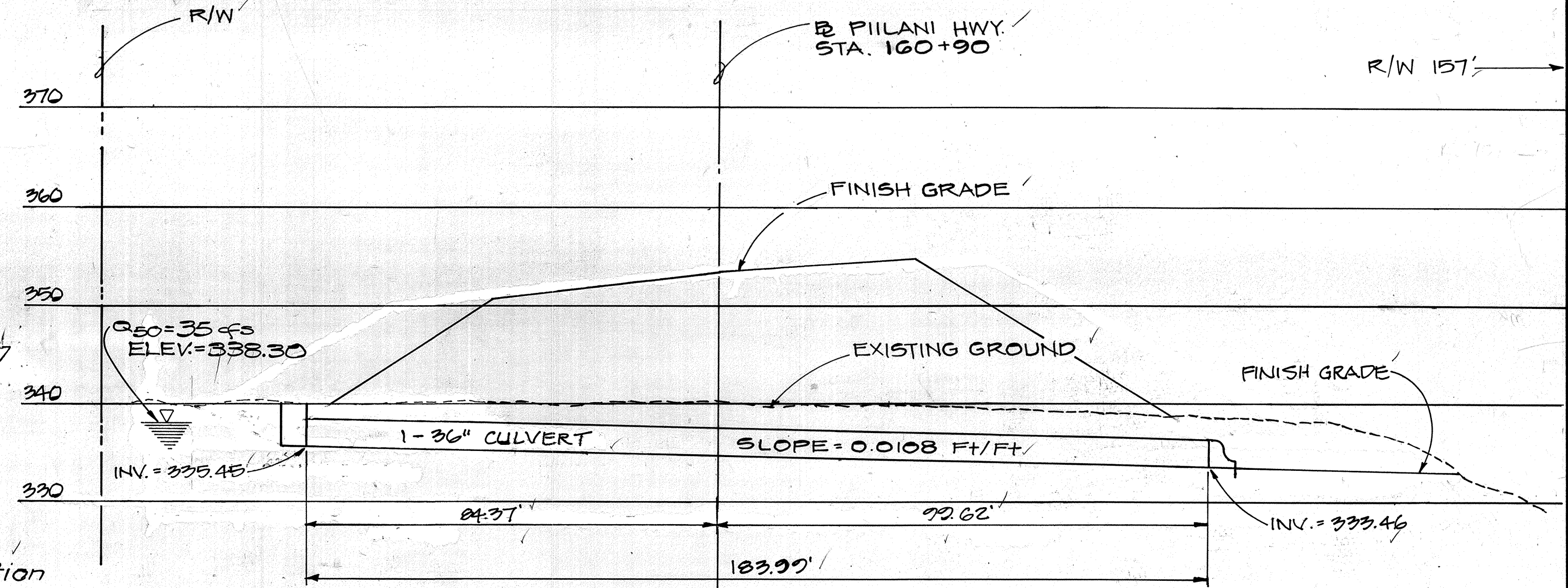
SCALE: AS SHOWN DATE DEC. 1987

SHEET No. 12 OF 16 SHEETS

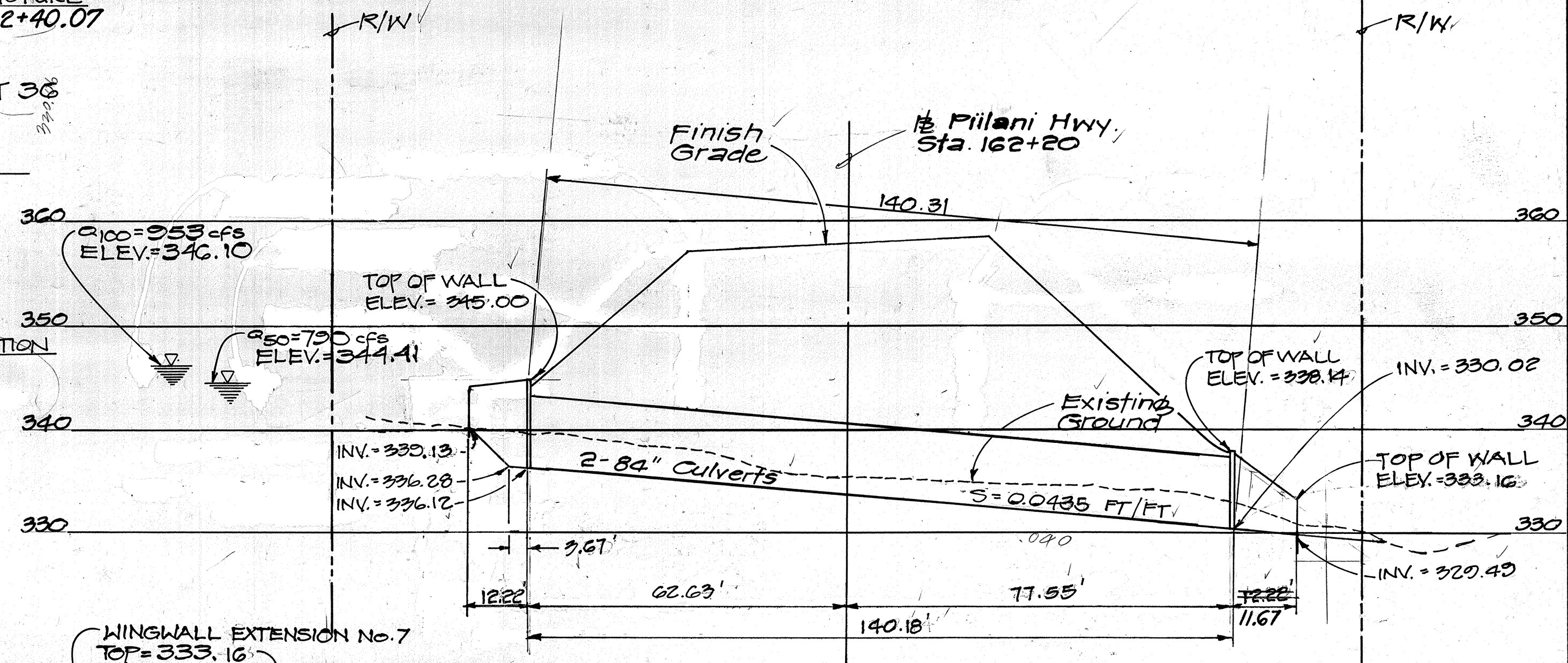
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-031-1(3)	1987	34	69



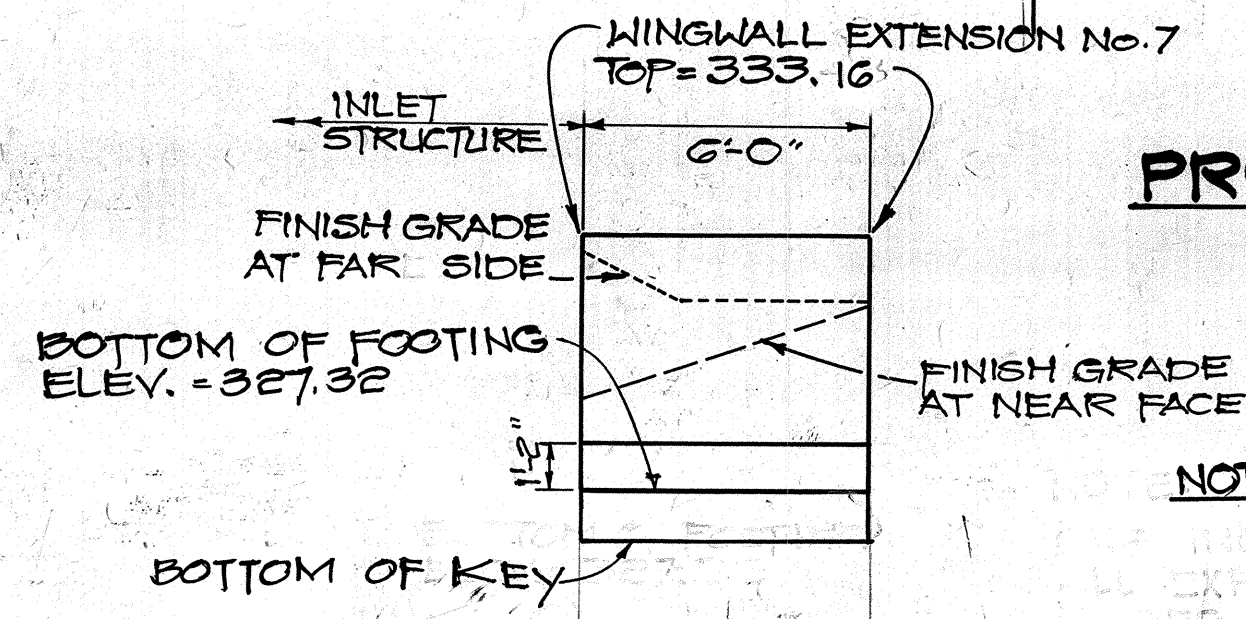
PLAN - CULVERT AT STA. 160+90 & 162+20
SCALE: 1" = 20'



PROFILE - CULVERT AT STA. 160+90
SCALE: HORIZ. 1" = 20'
VERT. 1" = 10'

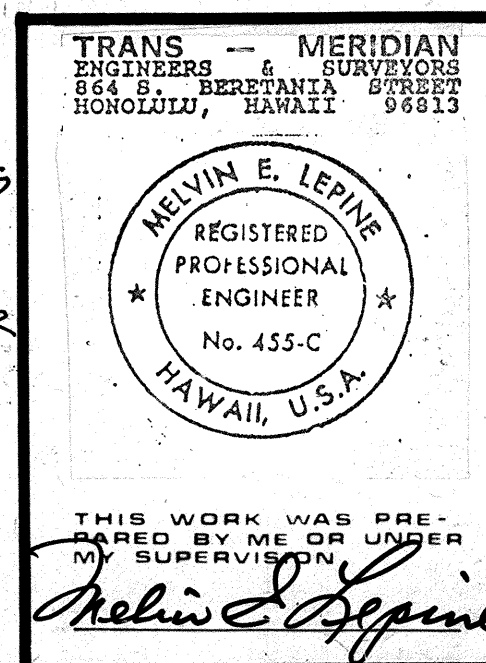


PROFILE - CULVERT AT STA. 162+20
SCALE: HORIZ. 1" = 20'
VERT. 1" = 10'



WINGWALL EXTENSION 7
SCALE: 1/4" = 1'-0"
STA. 162+20

- NOTES:**
1. FOR REINFORCEMENTS SEE SHEET 29, SECTION A
 2. ONE INCH CHAMFER ON ALL EXPOSED CONC. EDGES.

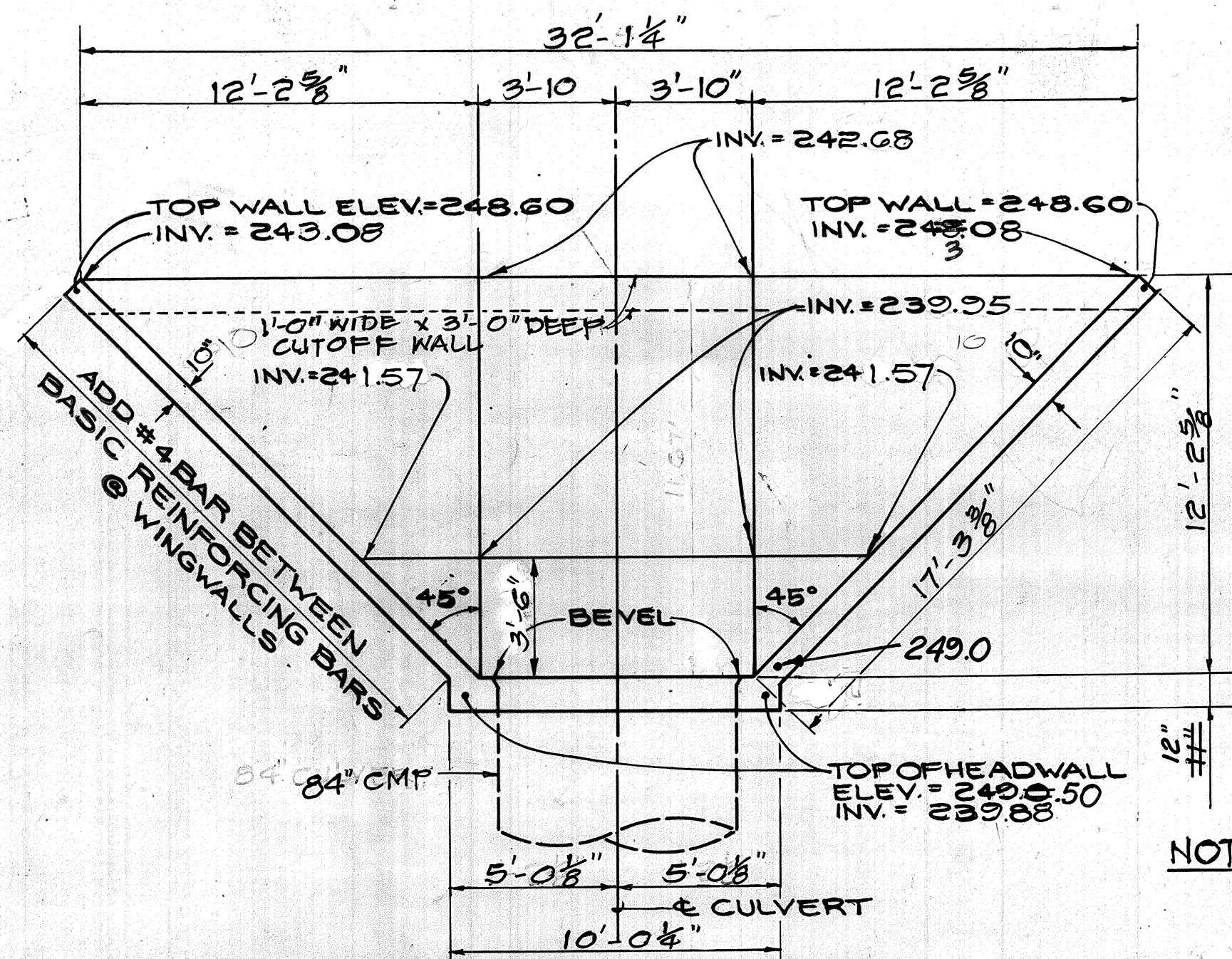


STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
PIILANI HIGHWAY
VICINITY OF KILOHANA STREET
TO WAILEA IKE DRIVE

F.A. PROJECT NO. F-031-1(3)
SCALE: AS SHOWN / S DATE DEC. 1987
SHEET No. 13 OF 16 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-031-1(3)	1987	35	69

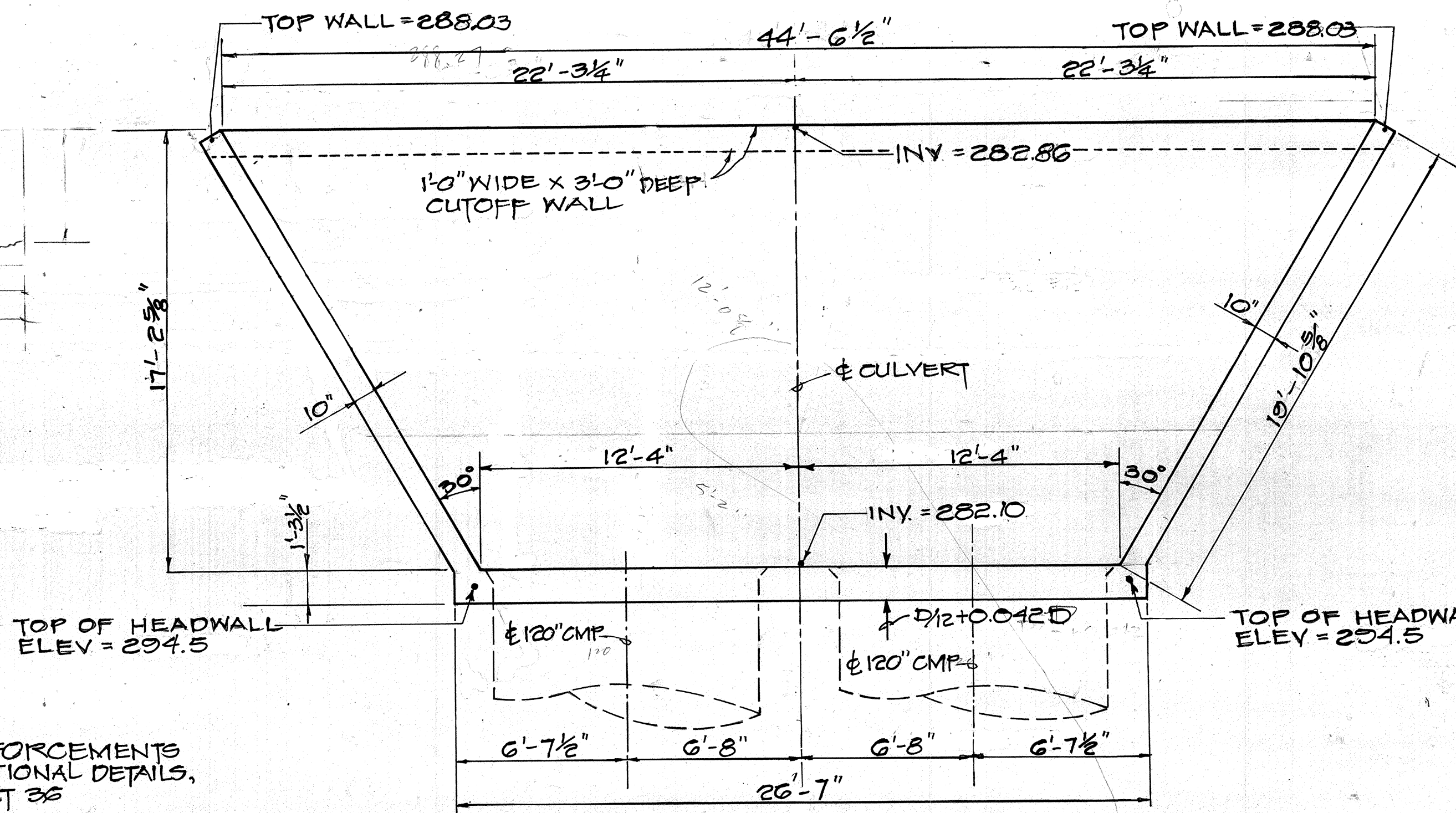


PLAN-MODIFIED TYPE "A" INLET STRUCTURE AT STA. 94+20

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

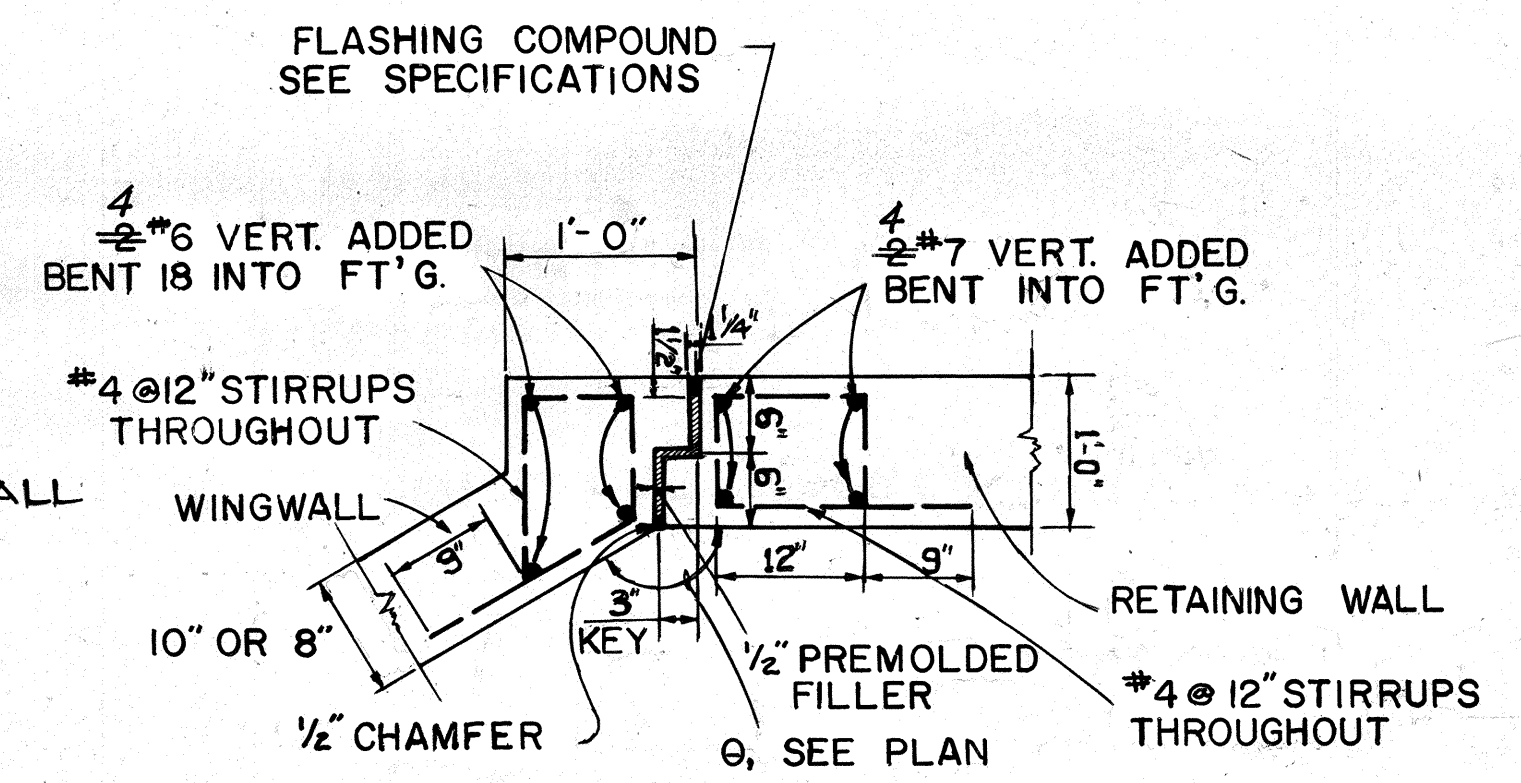
NOTES:

1. FOR REINFORCEMENTS AND ADDITIONAL DETAILS, SEE SHEET 35
2. ONE INCH CHAMFER ON ALL EXPOSED CONCRETE EDGES.



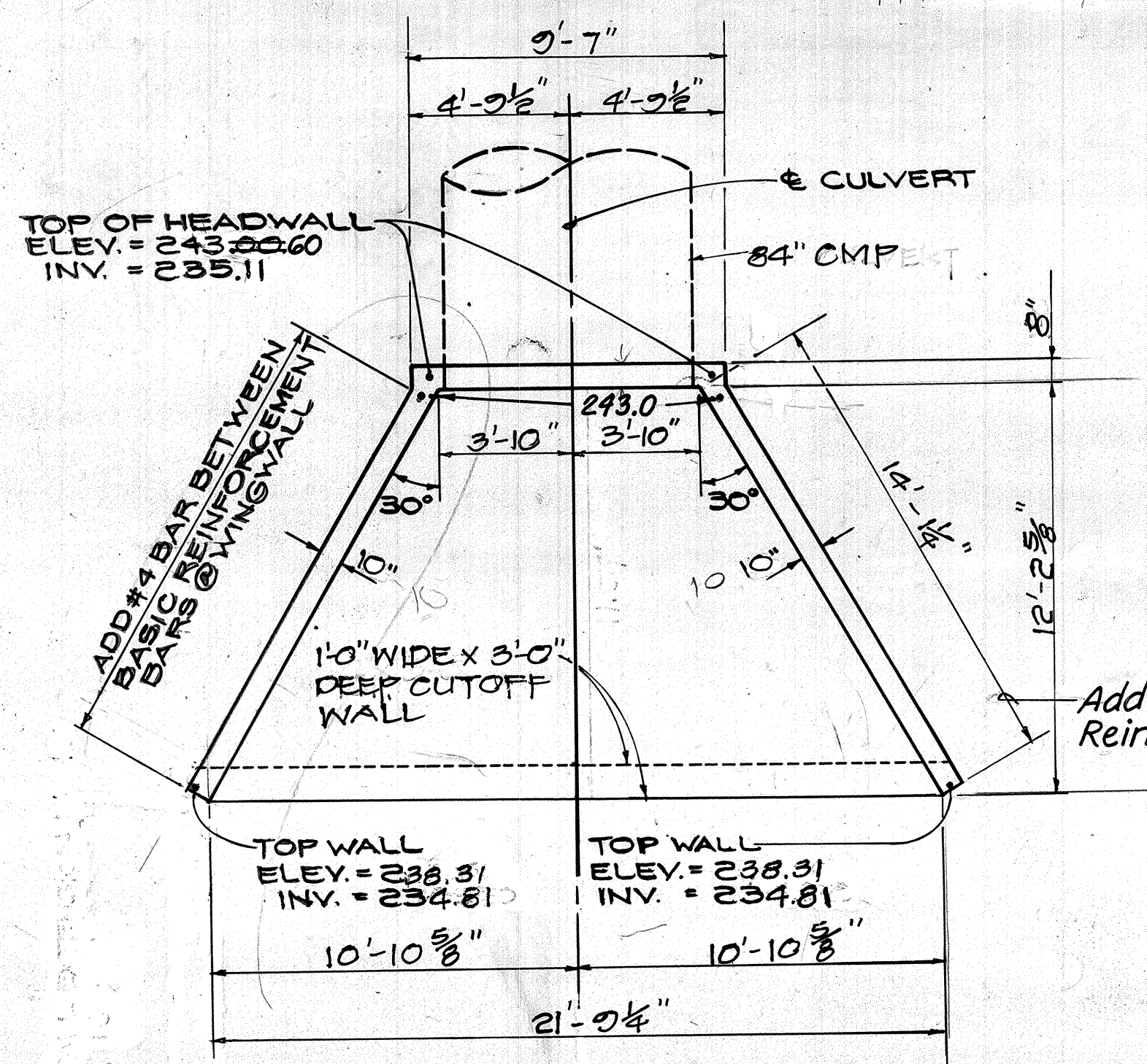
PLAN-MODIFIED TYPE "A" INLET STRUCTURE AT STA. 143+55

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



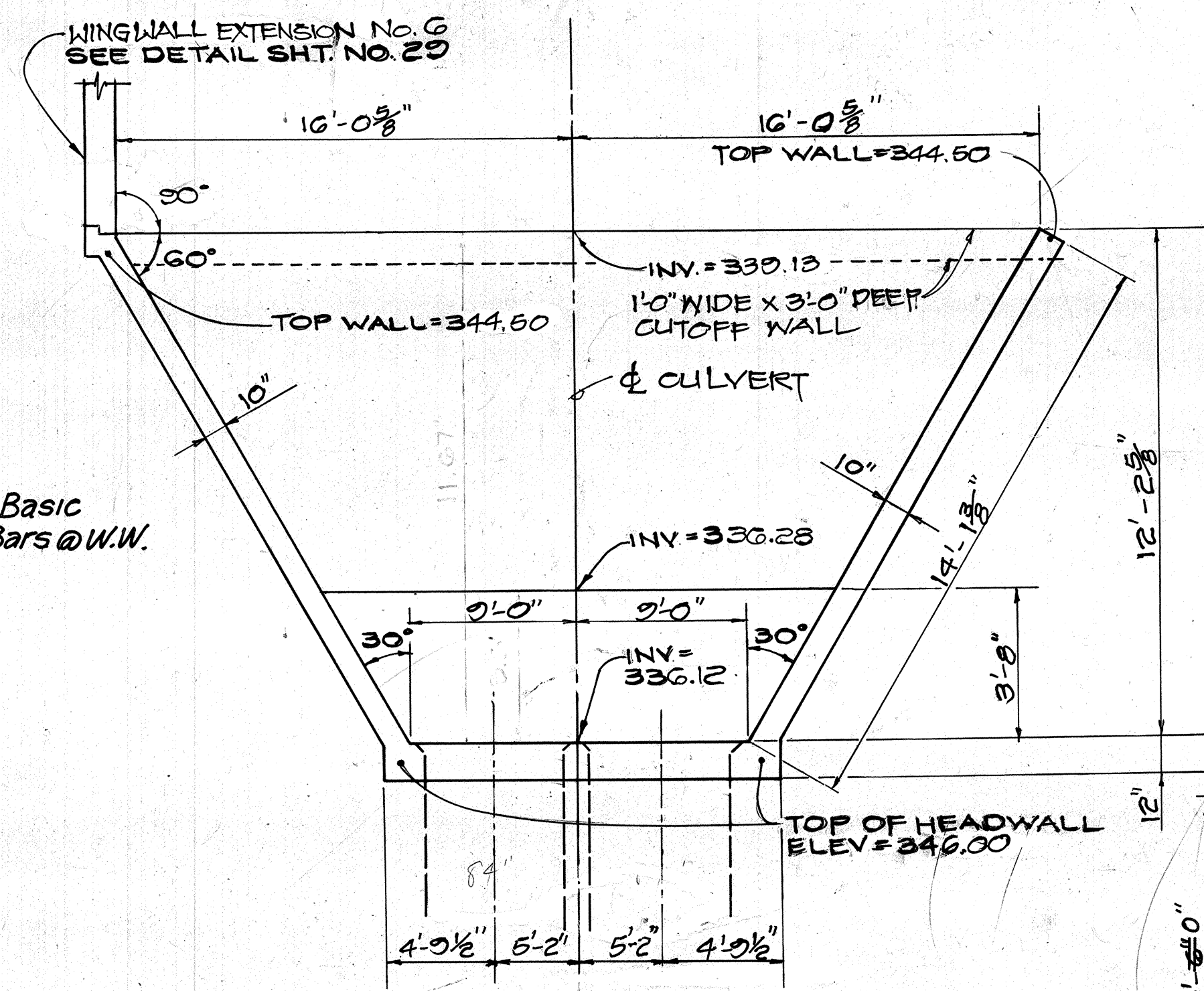
TYPICAL RETAINING WALL CONNECTION DETAIL

NOT TO SCALE



PLAN-MODIFIED TYPE "A" OUTLET STRUCTURE AT STA. 94+20

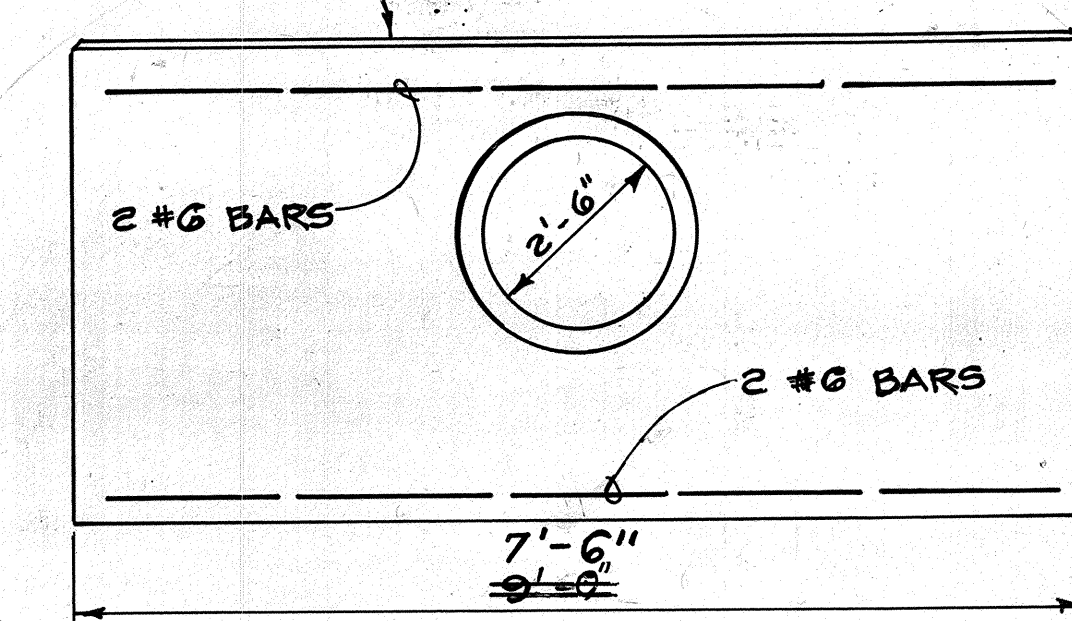
SCALE: 1/4" = 1'-0"



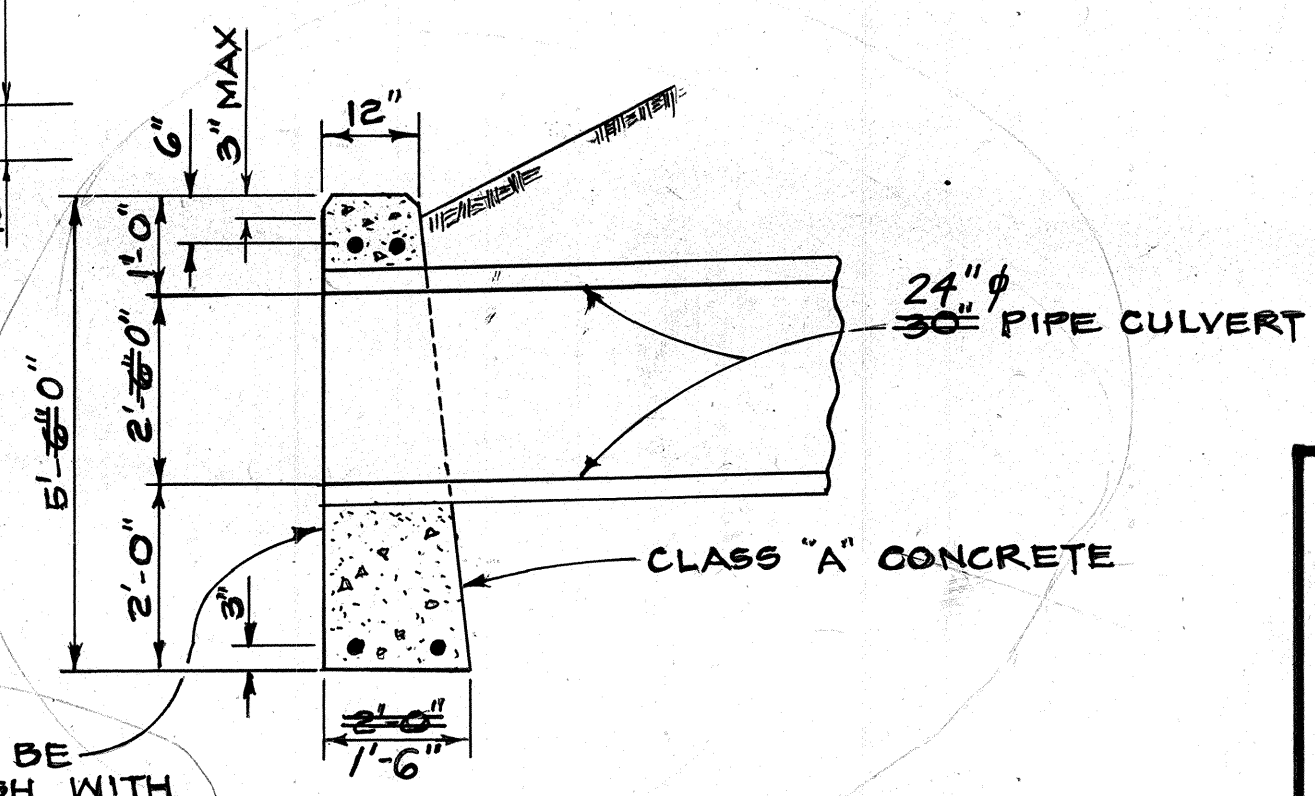
PLAN-MODIFIED TYPE "A" INLET STRUCTURE AT STA. 162+20

NOT TO SCALE

CHAMFER ALL EXPOSED EDGES ONE INCH



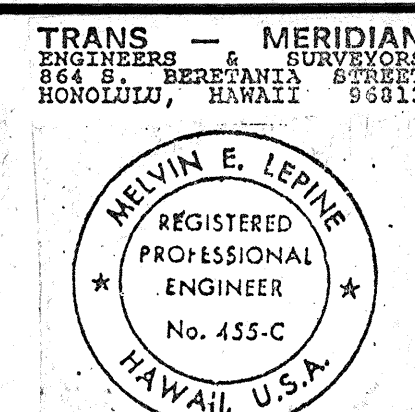
ELEVATION



CONCRETE HEADWALL

NOT TO SCALE

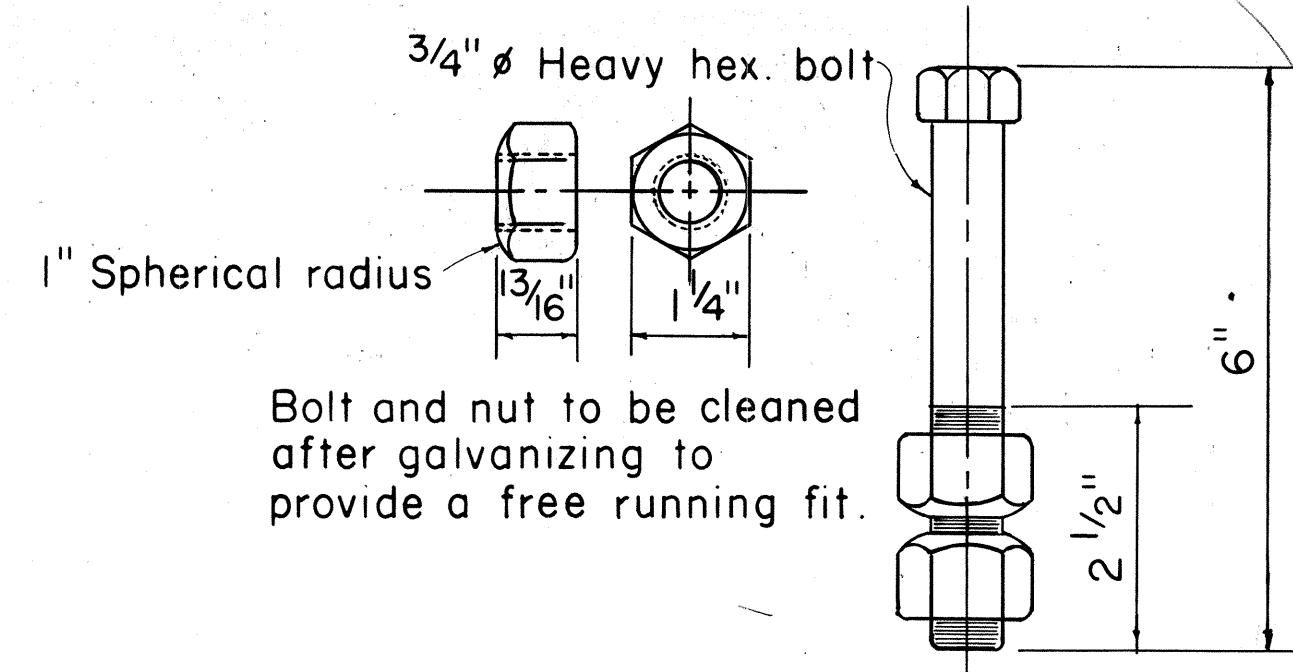
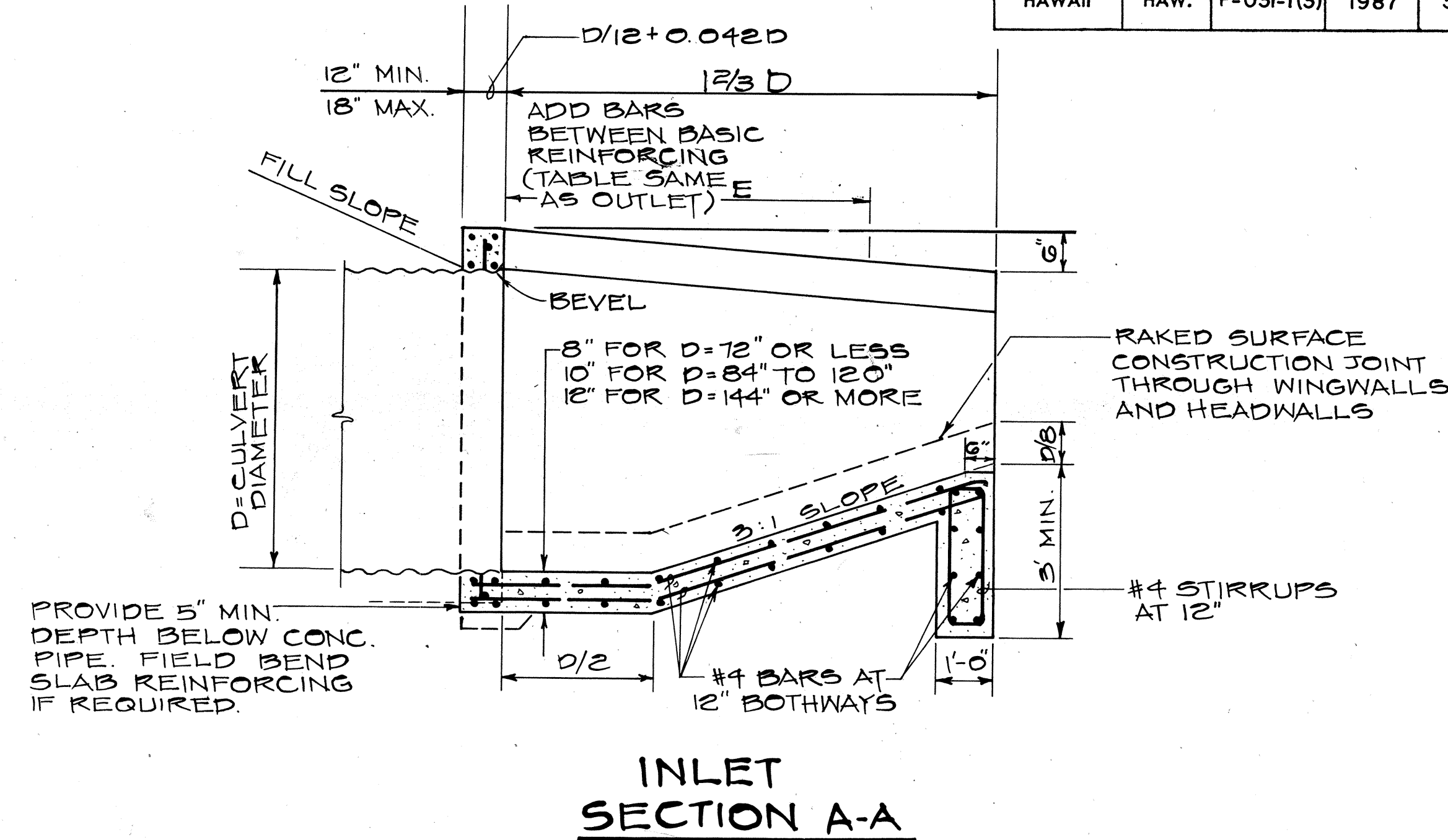
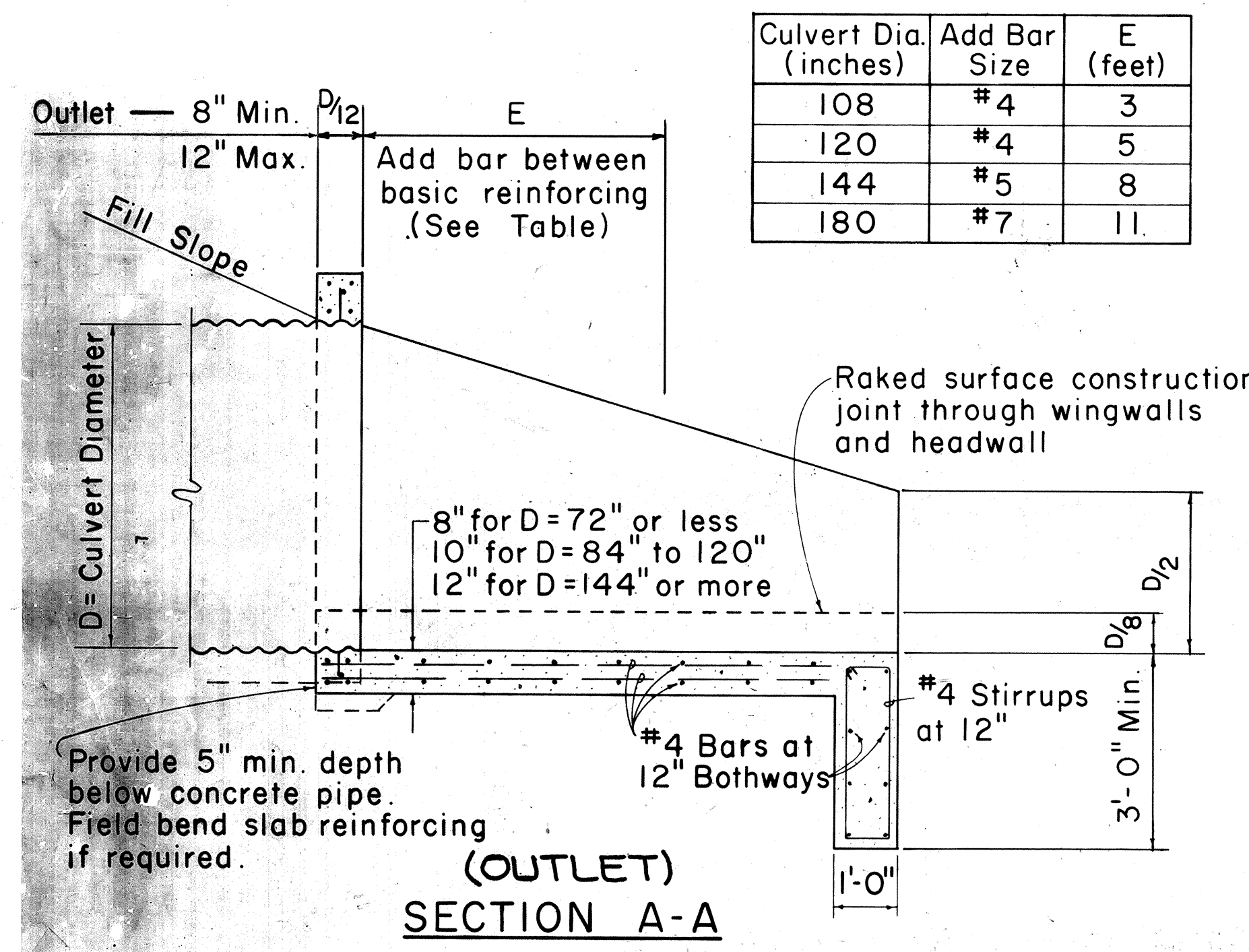
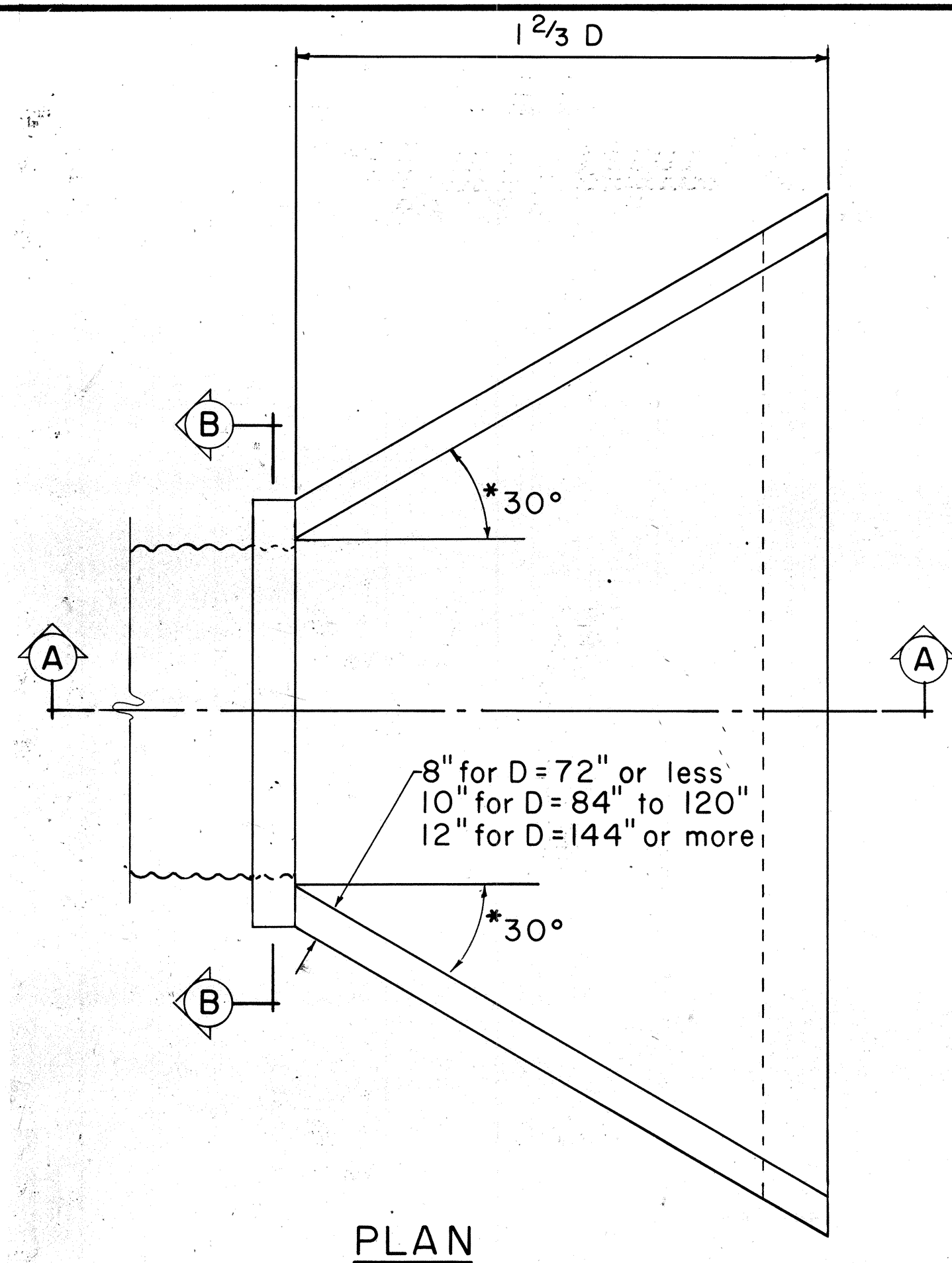
CULVERT SHALL BE NEATLY CUT FLUSH WITH THIS FACE.



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
PILANI HIGHWAY
VICINITY OF KILOHANA STREET
TO WALEA IKE DRIVE
FA. PROJECT NO. F-031-1(3)
SCALE: AS SHOWN DATE DEC. 1987

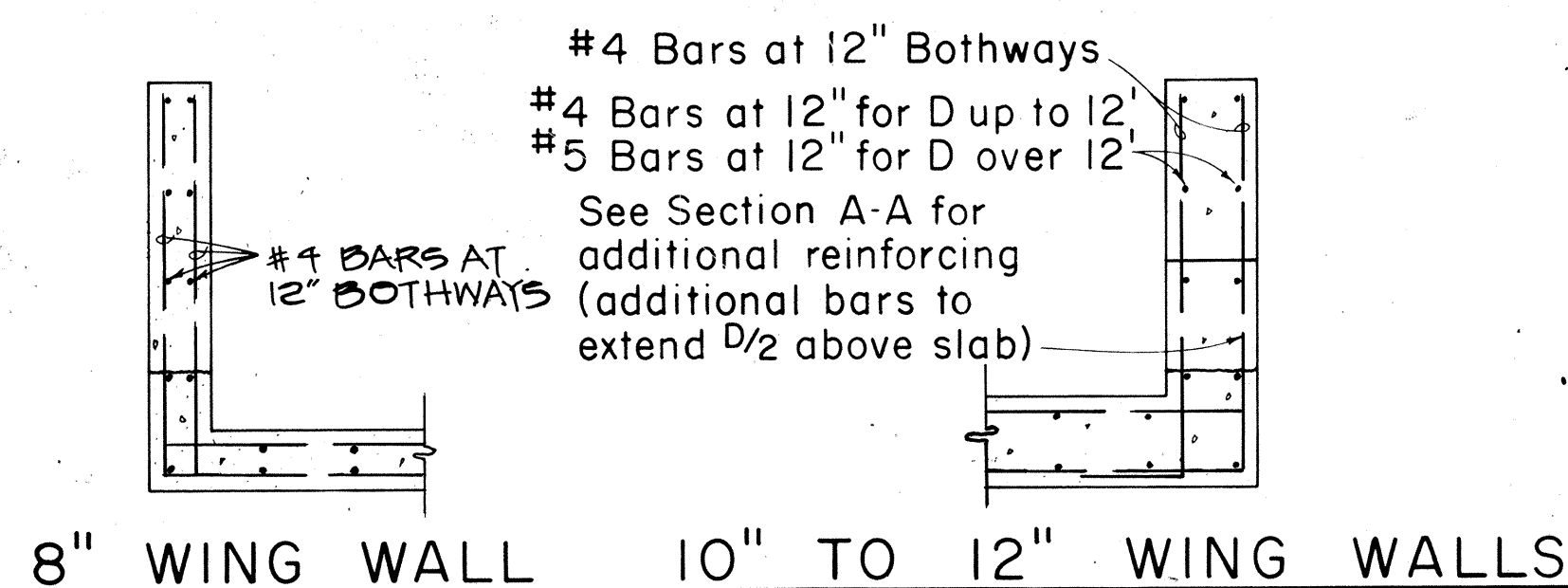
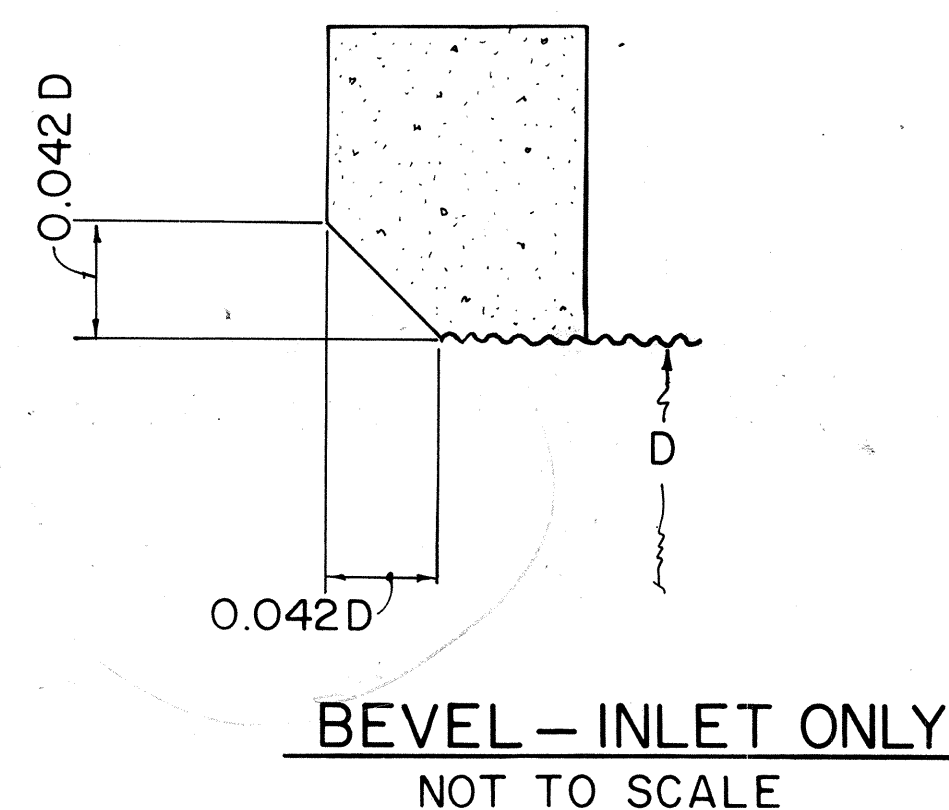
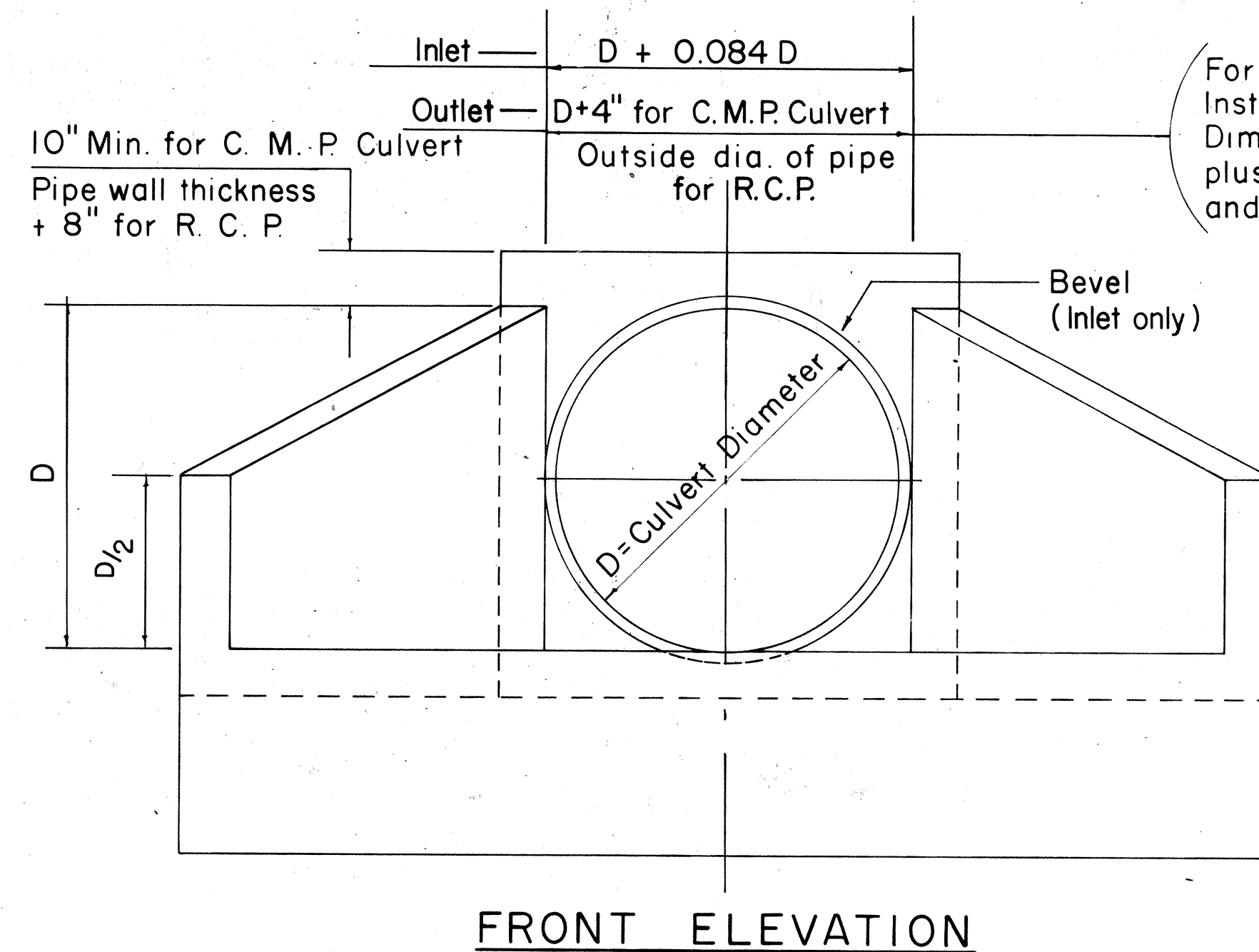
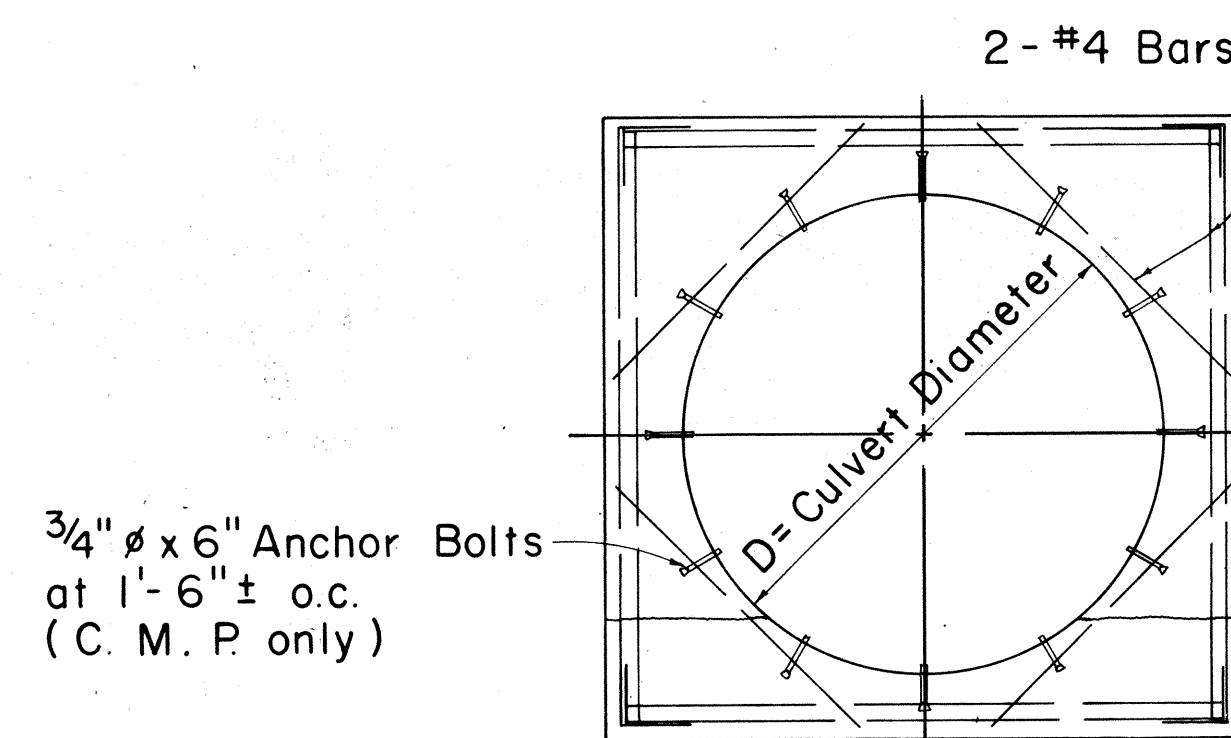
SHEET No. 14 OF 16 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-031-1(3)	1987	36	69

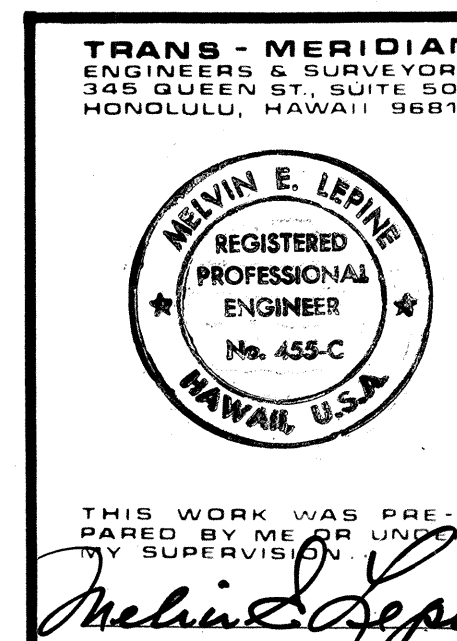


GENERAL NOTES

- Concrete: All concrete shall be Class A.
- Cut-off 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 backfill 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.
- One Inch Chamfer: All exposed concrete edges.
- All Reinforcing Steel: ASTM - A 615, Grade 40

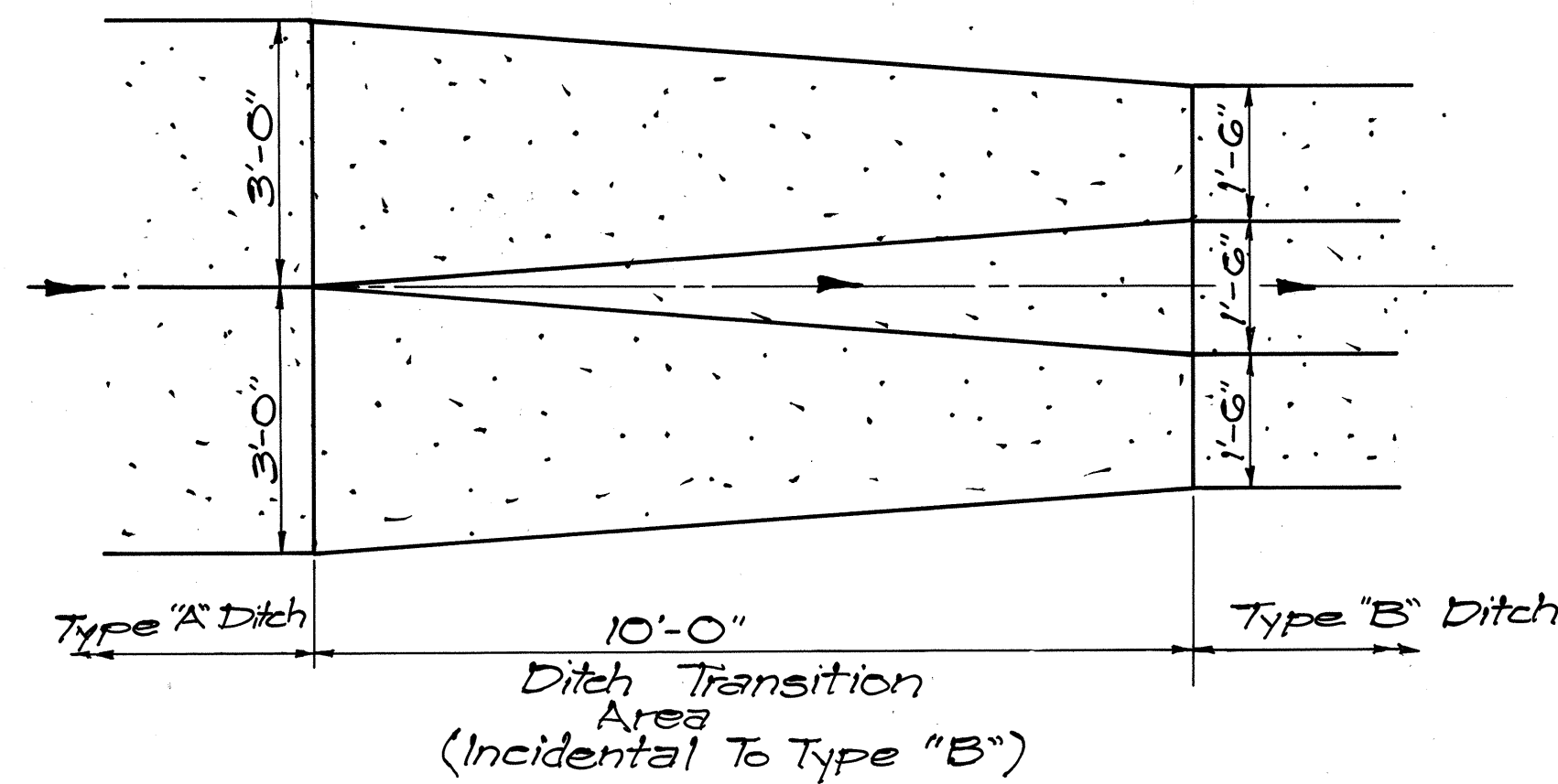
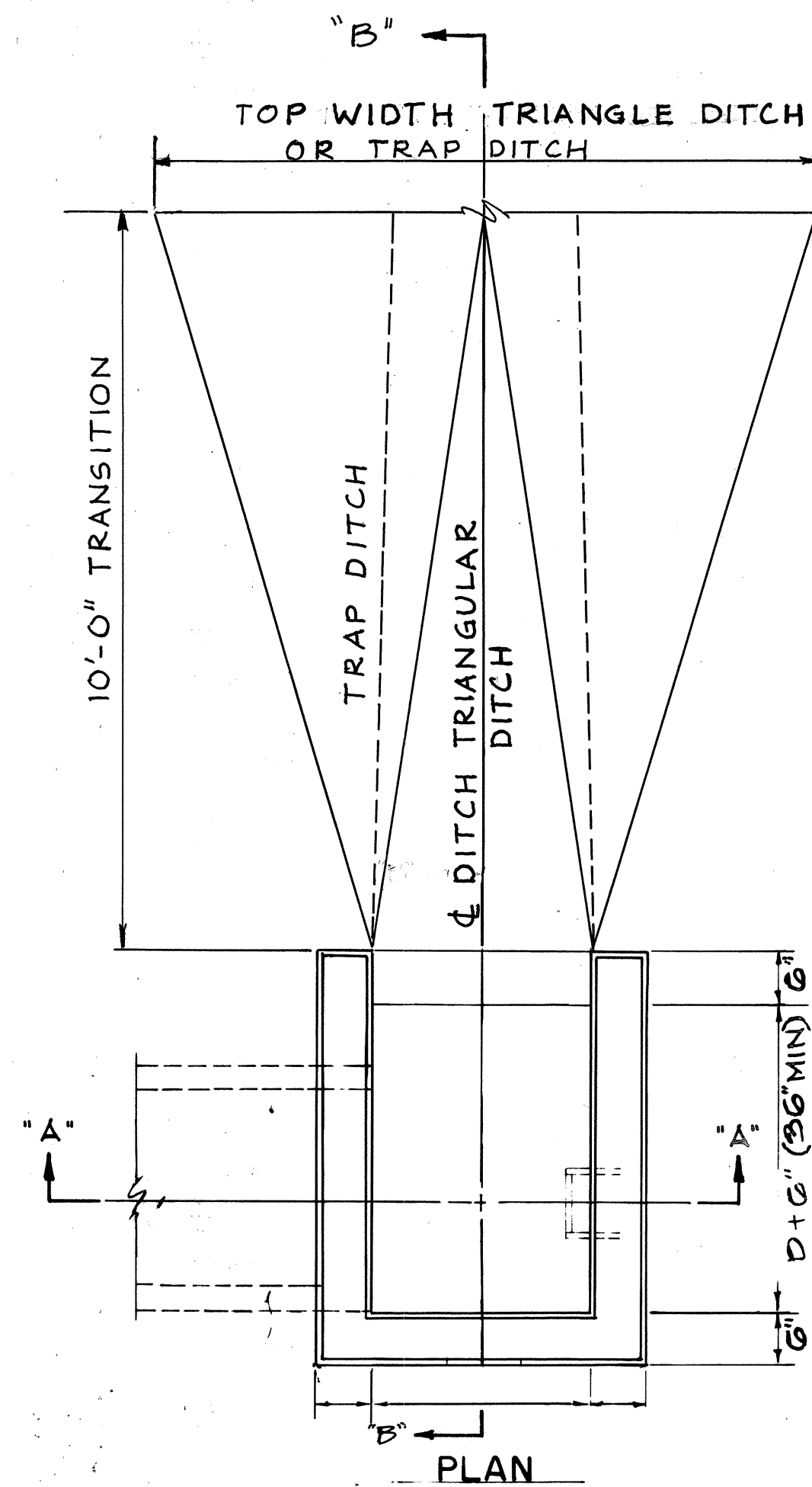


TYPE A - INLET, OUTLET STRUCTURE FOR CULVERT SIZES 30 IN. TO 180 IN. DIAMETER

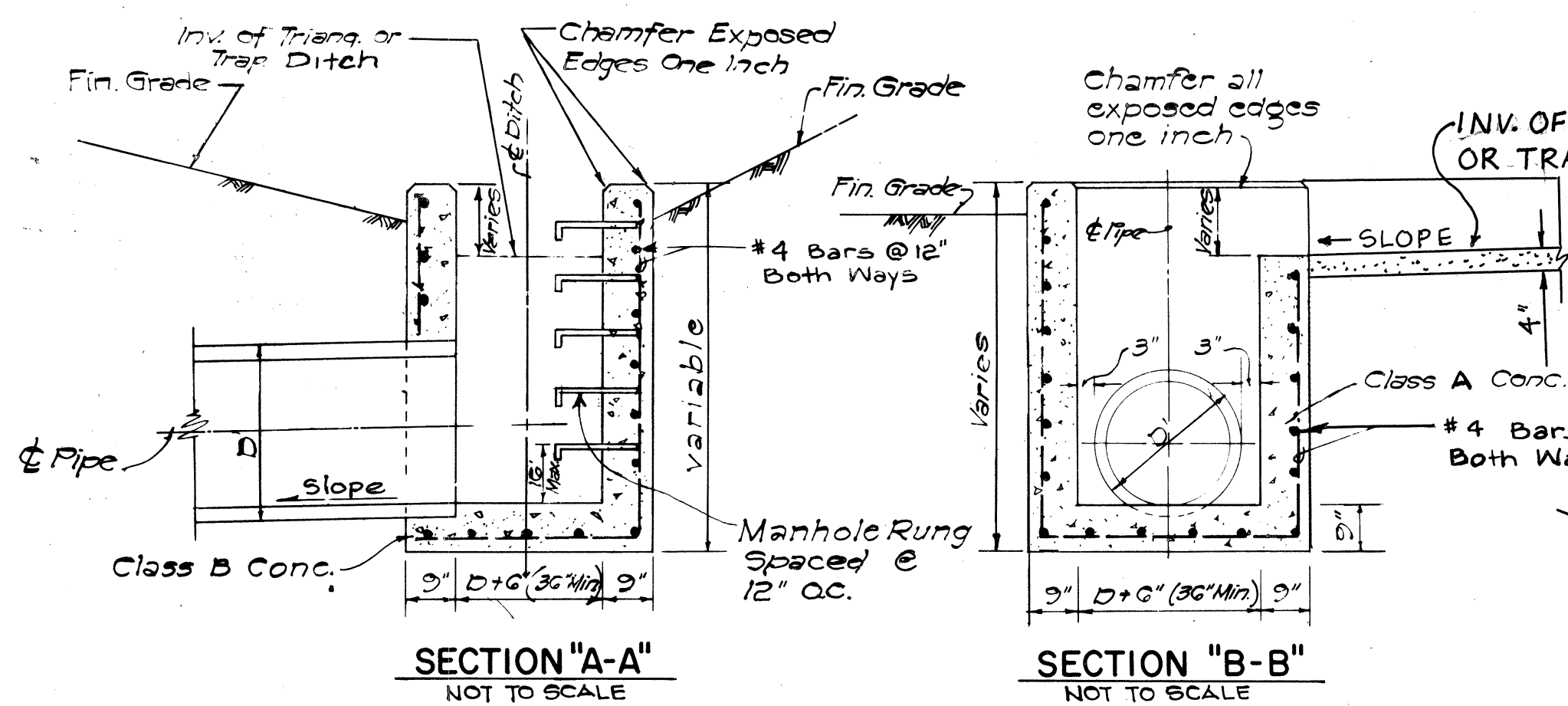
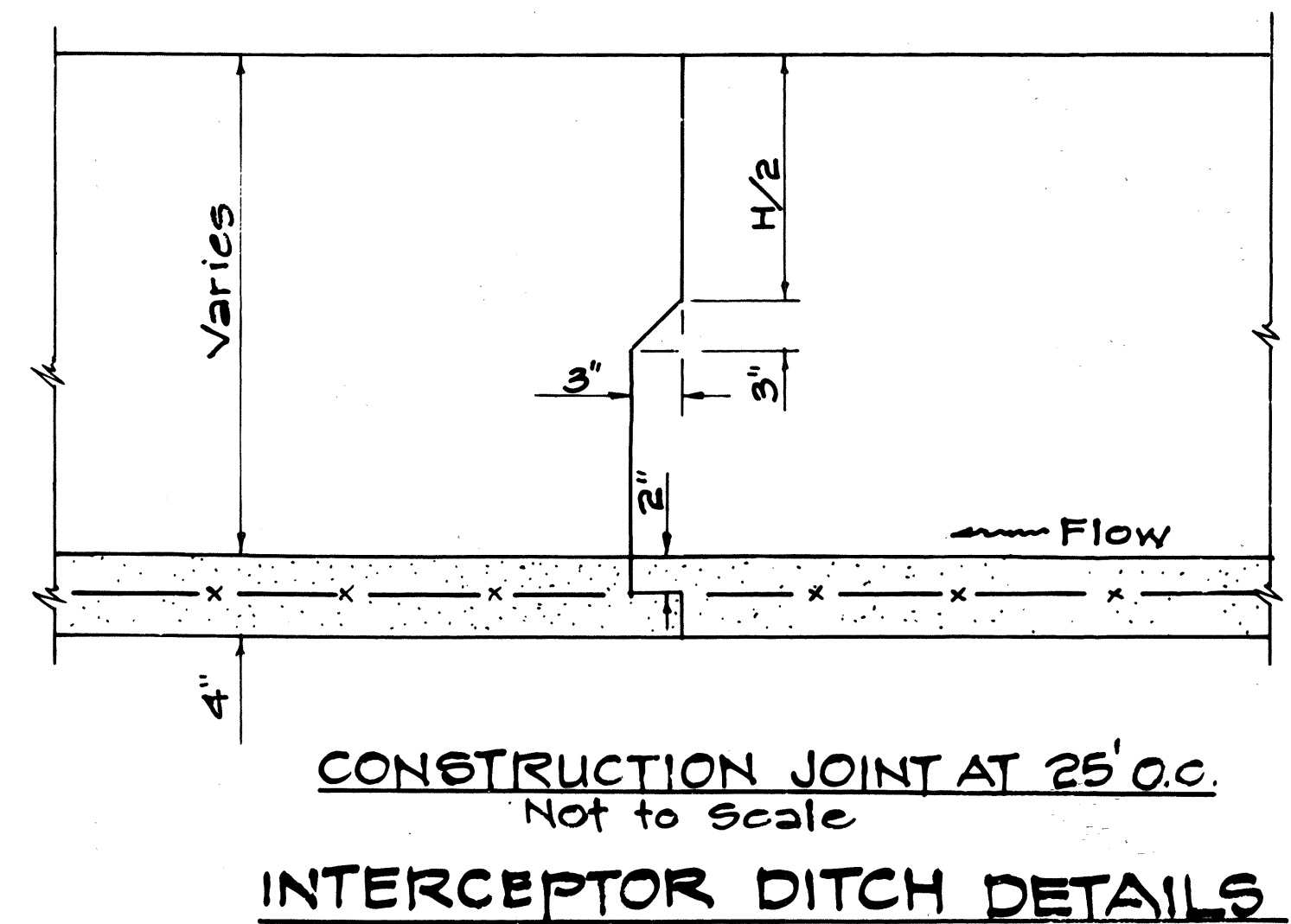
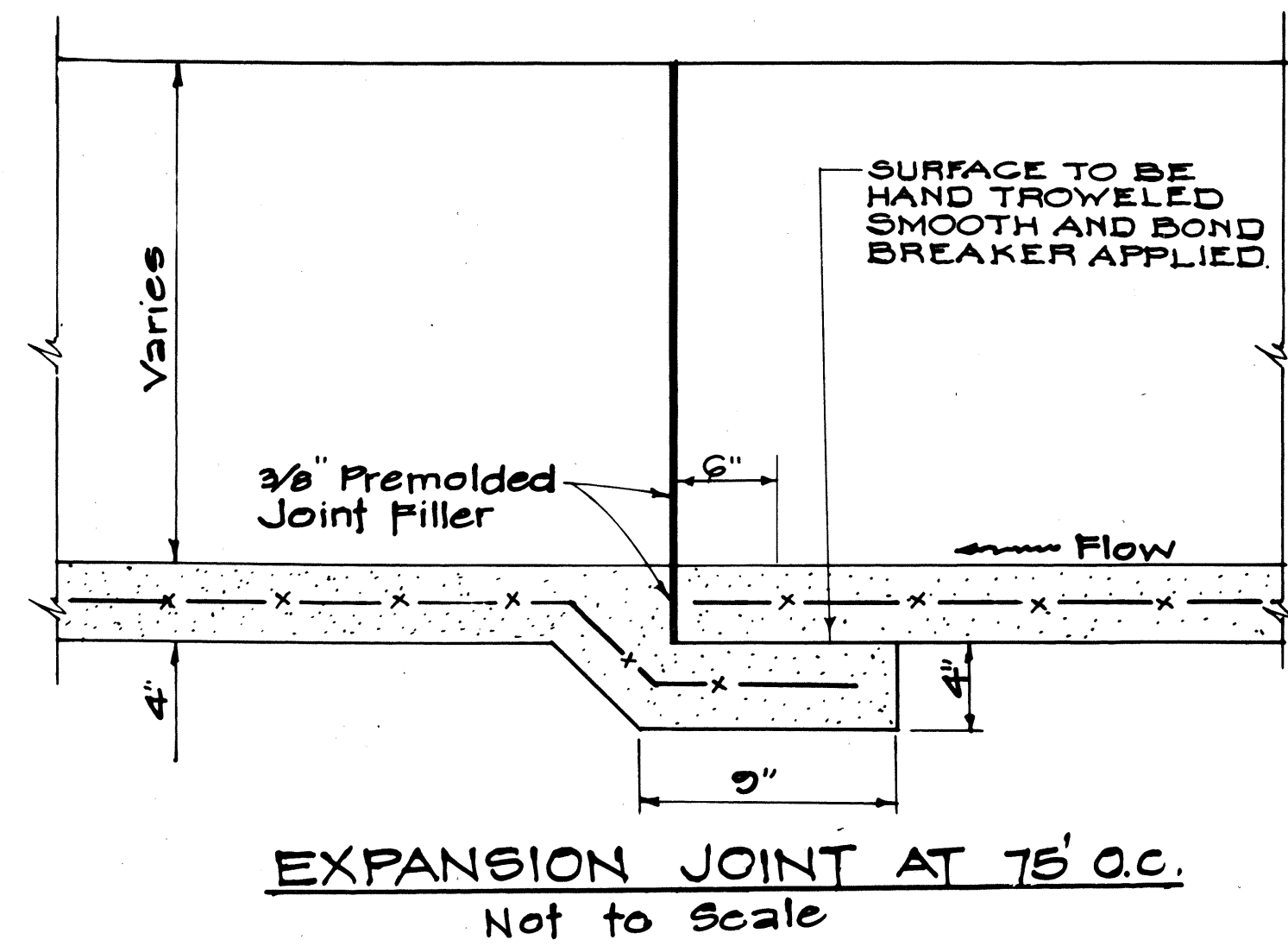
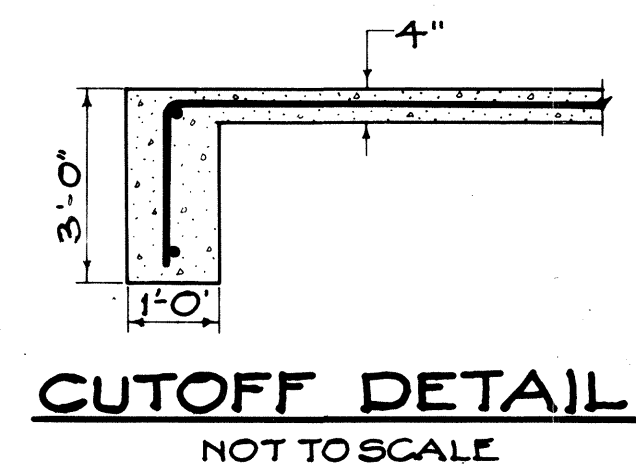


STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
PILANI HIGHWAY
VICINITY OF KILOHANA STREET
TO WALEA IKE DRIVE
F.A. PROJECT NO. F-031-1(3)
SCALE: AS SHOWN DATE DEC. 1987
SHEET No. 15 OF 16 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-031-H(3)	1987	37	69



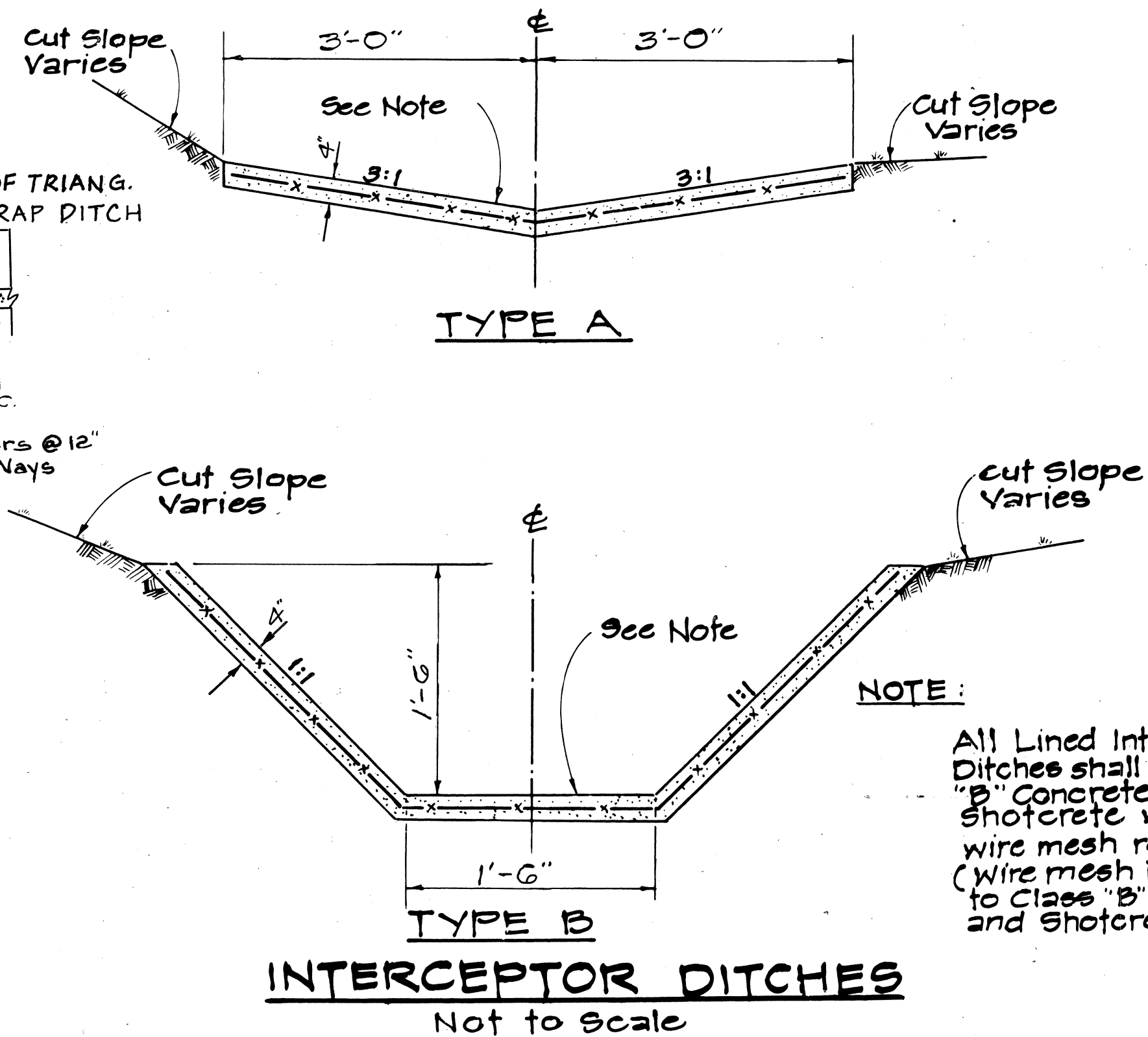
INTERCEPTOR DITCH TRANSITION
Scale: 1/2"=1'-0"



DETAIL OF TYPE "A" CONCRETE DROP INTAKE

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 Rings (12" o.c.) are required when "H" is greater than 4 feet 6 inches. Only one ring (16 inches from the bottom) is required if "H" is 4 feet 6 inches or less. Manhole Rings may be placed at any location as ordered by the Engineer.



INTERCEPTOR DITCHES
Not to Scale

NOTE:
All Lined Interceptor Ditches shall be 4" Class "B" Concrete or Shotcrete w/ 6"x6"x1910 wire mesh reinforcing. (Wire mesh incidental to Class "B" Concrete and Shotcrete)

DATE	.....
DESIGNED BY	.....
DRAWN BY	.....
CHECKED BY	.....
IN CHARGE	.....
APPROVED BY	.....
ORIGINAL PLAN	.....
NOTE BOOK	.....
NO.	.....

TRANS. — "MERIDIAN"

REGISTERED PROFESSIONAL ENGINEER

NO. 455-C

HAWAII, U.S.A.

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

DRAINAGE DETAILS

PILANI HIGHWAY

VICINITY OF KILOHANA STREET TO WAILEA IKE DRIVE

F.A. PROJECT NO. F-031-H(3)

SCALE: 1"= 50'

DATE DEC. 1987

SHEET No. 16 OF 16 SHEETS