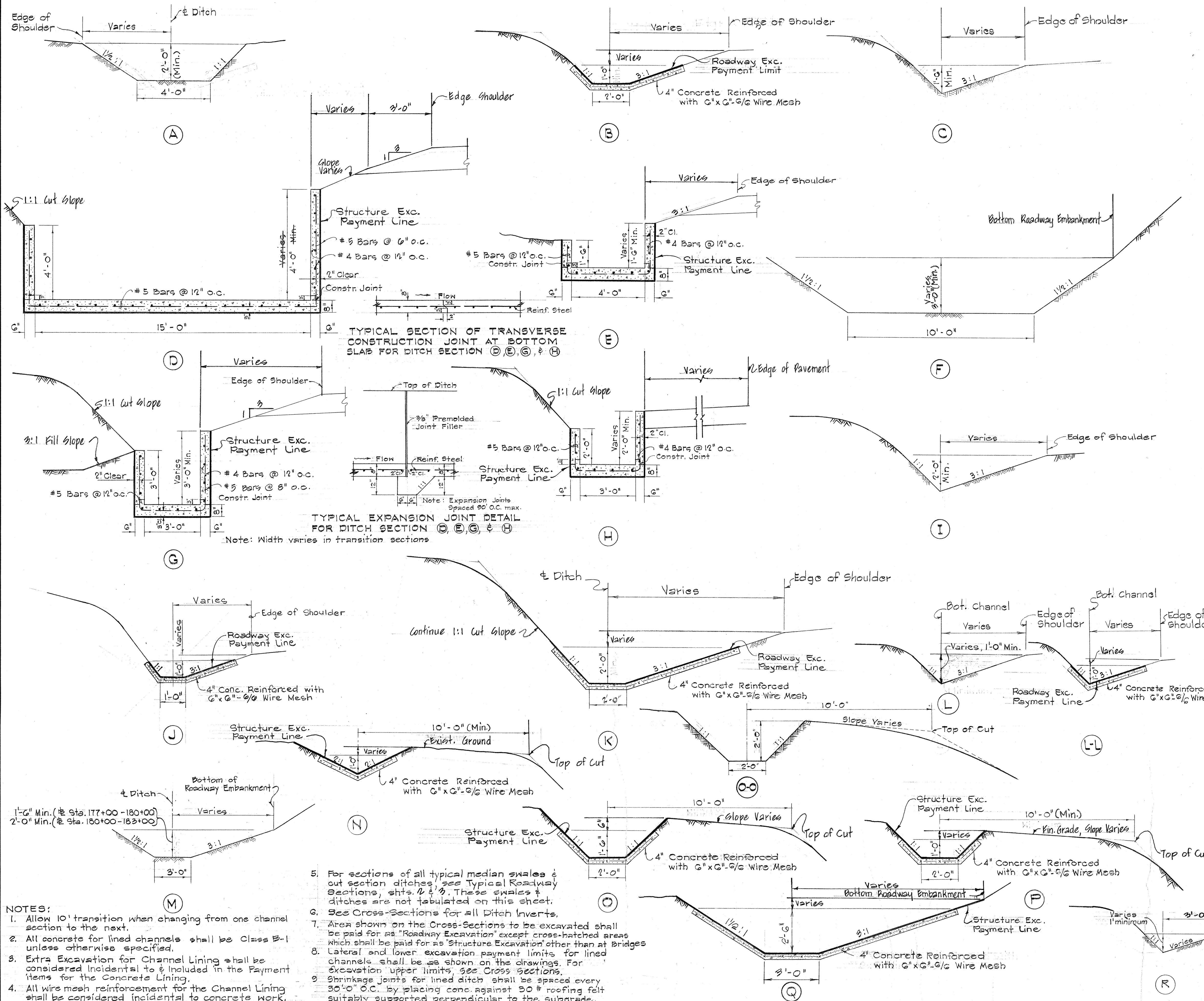




LOCATION	STATION	SEC. TION	STRUCT. EXC. C.Y.	CL. B-I CONC. C.Y.	REINF. STEEL #	LIN. FT.
	4+00	C	-	0	0	450
	8+50	B	-	37.8	0	471.2
	18+25	D	1558.1	330.0	22,508	600
	24+00	E	127.2	64.7	5,217	314.6
	27+10	F	-	0	0	545
	29+15	G	744.4	232.5	21,015	302.2
	32+00	H	220.5	118.1	2,404	554.5
	37+50	I	-	0	0	180
	47+00	J	-	0	0	225
	54+00	L	-	0	0	1180
	84+00	K	-	0.4	5,167	685.4
	91+00	B	-	40.3	1,512	602.3
	98+35	LL	-	10.6	588	126.5
	104+40	LL	-	17.3	624	325.6
	110+40	LL	-	21	740	375
	130+50	J	-	30.4	1,035	446
	135+00	B	-	26.8	861	340.5
	137+10	B	-	24.3	766	307.5
	141+00	B	-	24.3	766	307.5
	145+00	B	-	24.3	766	307.5
	148+50	M	-	0	0	140.5
	153+00	Q	-	30.3	1,252	122.7
	159+00	Q	-	6.6	236	125.1
	203+00	LL	-	0	0	175
	204+25	R	-	0	0	175
	206+00	R	-	0	0	175
	-1+04	O	305.8	44.4	1,527	580.2
	3+75	O	162.4	28	950	363.3
	4+00	O	162.4	28	950	363.3
	7+50	O	137.0	36.3	1,242	474
	76+50	O	137.0	36.3	1,242	474
	81+76	O	32.6	16	60	22.8
	81+41	O	32.6	16	60	22.8
	84+00	O	85.1	27	104	32.8
	84+15	O	85.1	27	104	32.8
	90+25	O	12	2	68	25
	91+00	O	175.3	32.0	980	353
	95+00	O	175.3	32.0	980	353
	98+00	P	89	18	605	300
	123+50	N	12.1	10.0	370	125.6
	123+50	N	45	15	578	408
	-4+72	A	0	0	0	308
	-1+04	A	3,575.4	1,271.6	66,044	15,747
	TOTALS		3,316	1,251	64,122	17,263

* Denotes G"xG"-G/8 Wire Mesh Reinforcement

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS
TYPICAL DITCH SECTIONS

FARRINGTON HIGHWAY
PROJECT No. S-0900(3)
JUNE, 1964

SHEET No. 1 OF 18 SHEETS

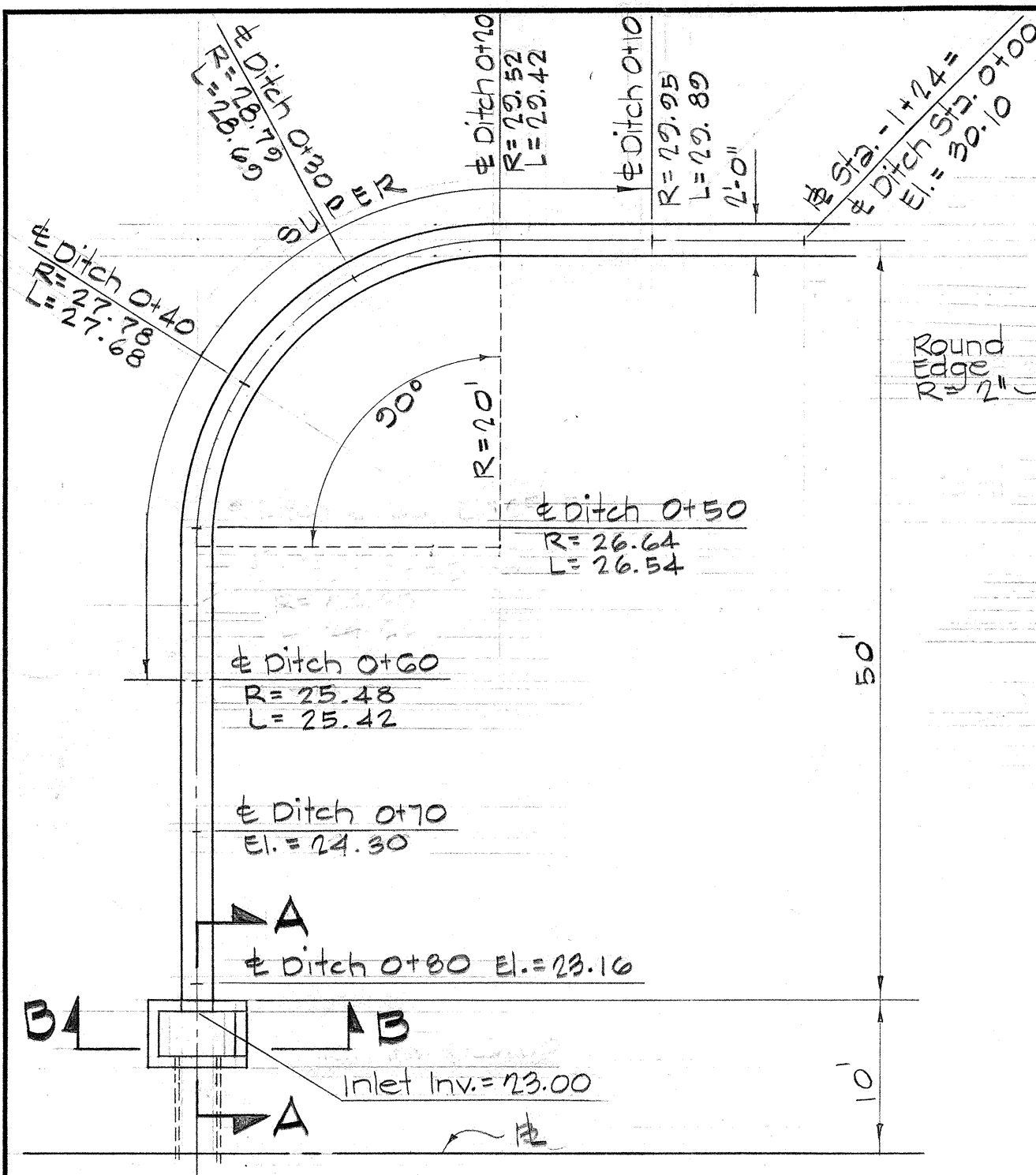
84

DATE: _____
DRAWN BY: _____
DESIGNED BY: _____
CHECKED BY: _____
ORIGINAL PLAN: _____
NOTE BOOK: _____
NO. _____

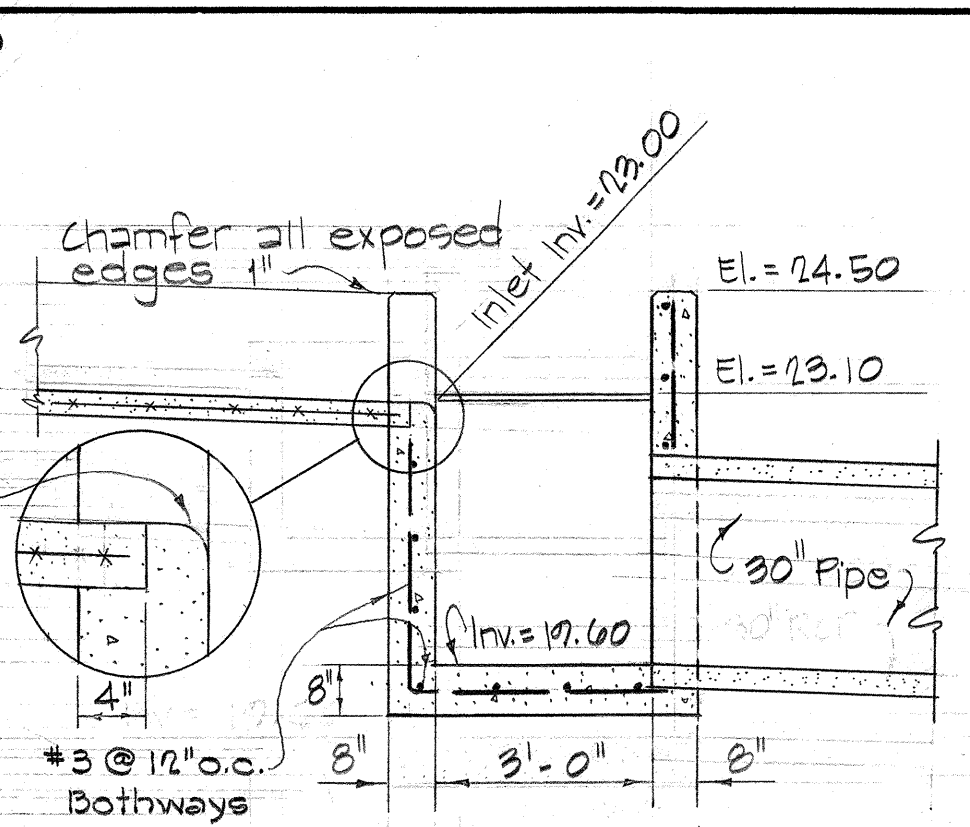
- NOTES:
- Allow 10' transition when changing from one channel section to the next.
 - All concrete for lined channels shall be Class B-1 unless otherwise specified.
 - Extra Excavation for Channel Lining shall be considered incidental to & included in the Payment Items for the Concrete Lining.
 - All wire mesh reinforcement for the Channel Lining shall be considered incidental to concrete work.

- For sections of all typical median swales & out section ditches, see Typical Roadway Sections, shts. 2 & 3. These swales & ditches are not tabulated on this sheet.
- See Cross-Sections for all Ditch Inverts.
- Area shown on the Cross-Sections to be excavated shall be paid for as "Roadway Excavation" except cross-hatched areas which shall be paid for as "Structure Excavation" other than at Bridges.
- Lateral and lower excavation payment limits for lined channels shall be as shown on the drawings. For excavation upper limits, see Cross Sections.
- Shrinkage joints for lined ditch shall be spaced every 30'-0" O.C. by placing conc. against 30 # roofing felt suitably supported perpendicular to the subgrade.

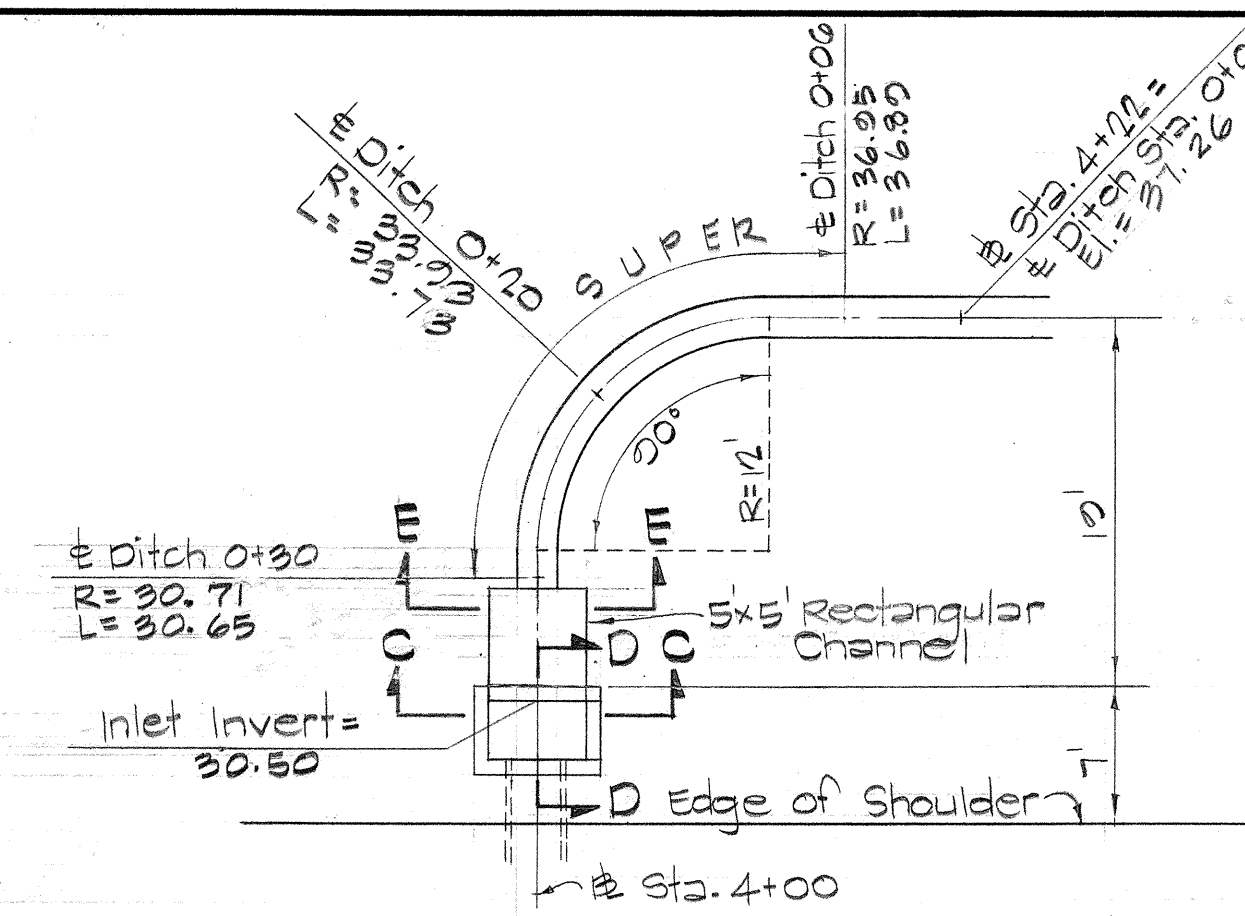
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	S-0900(3)	1965	85	162



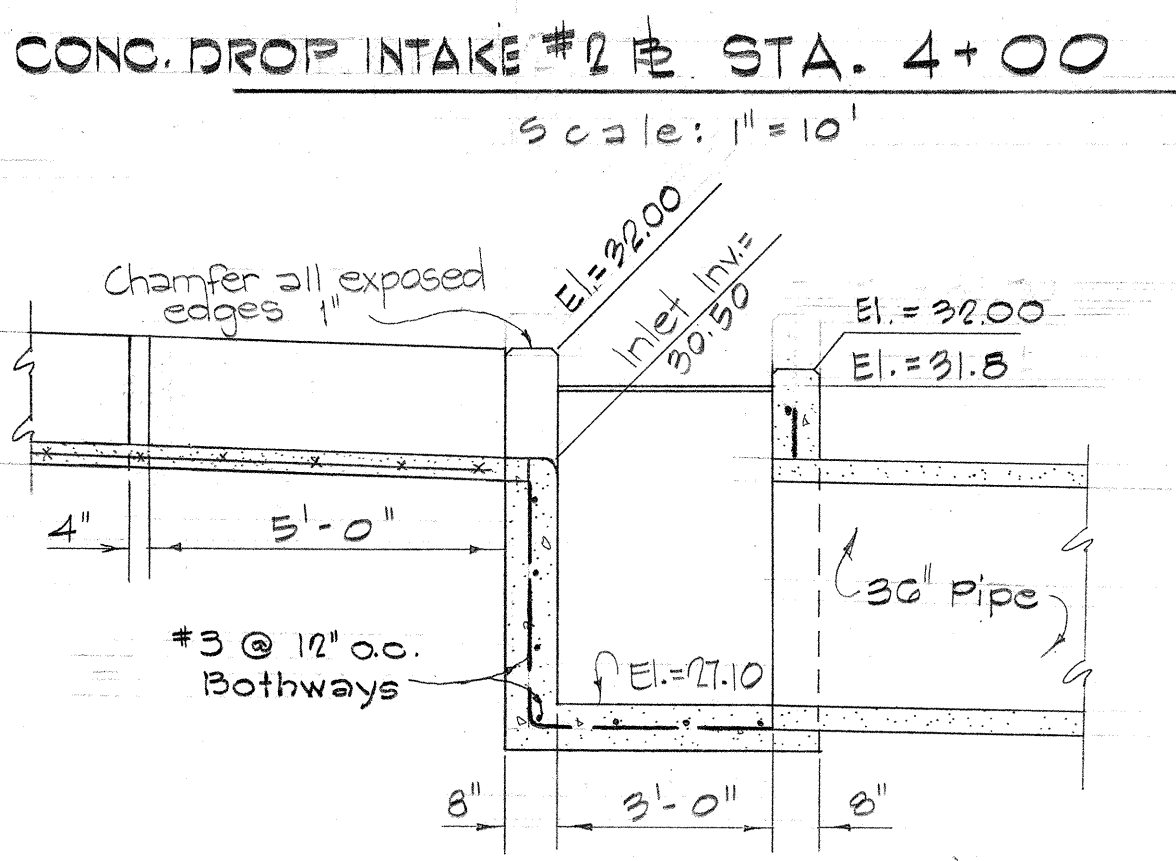
CONC. DROP INTAKE #1
STA. -1+64
 Scale: 1" = 10'



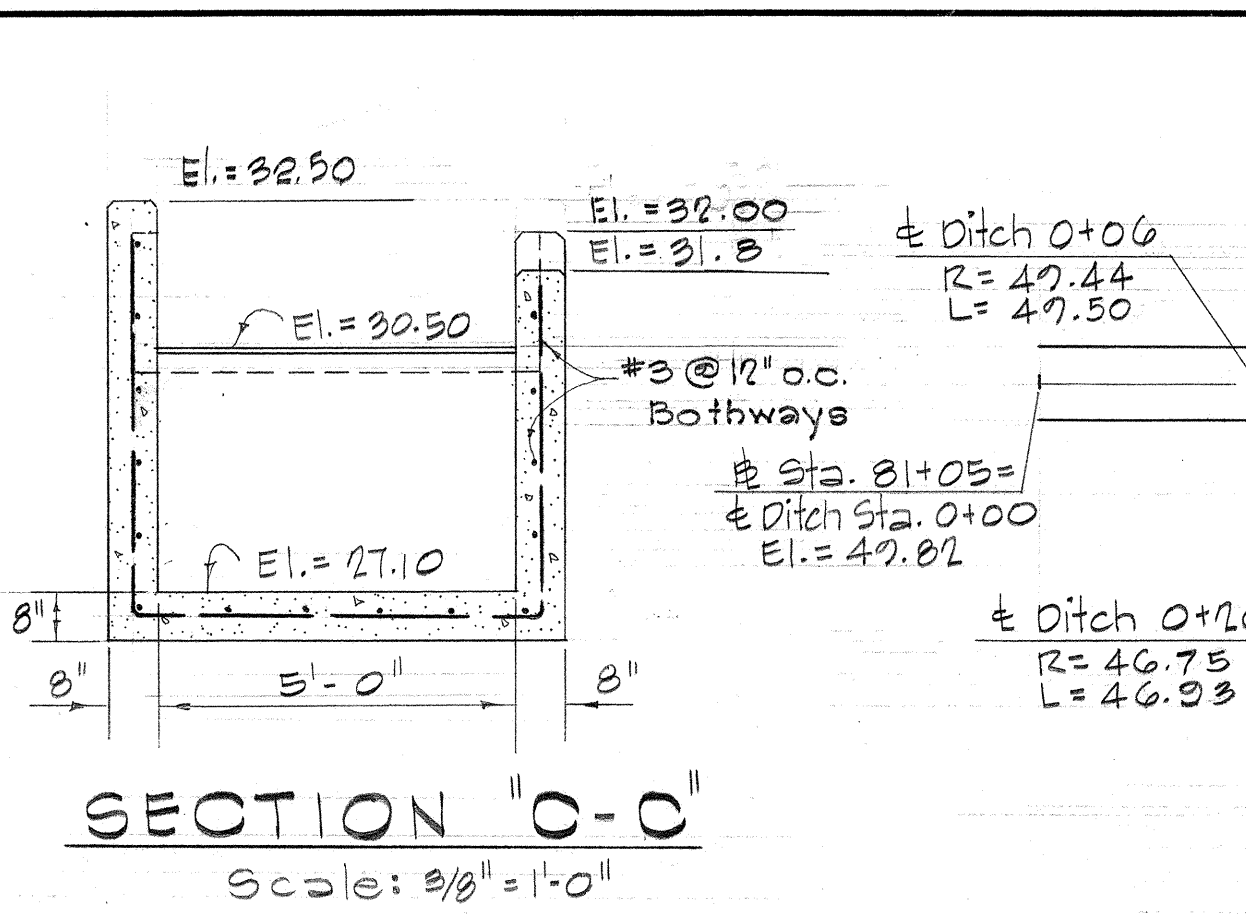
SECTION "A-A"
 Scale: 3/8" = 1'-0"



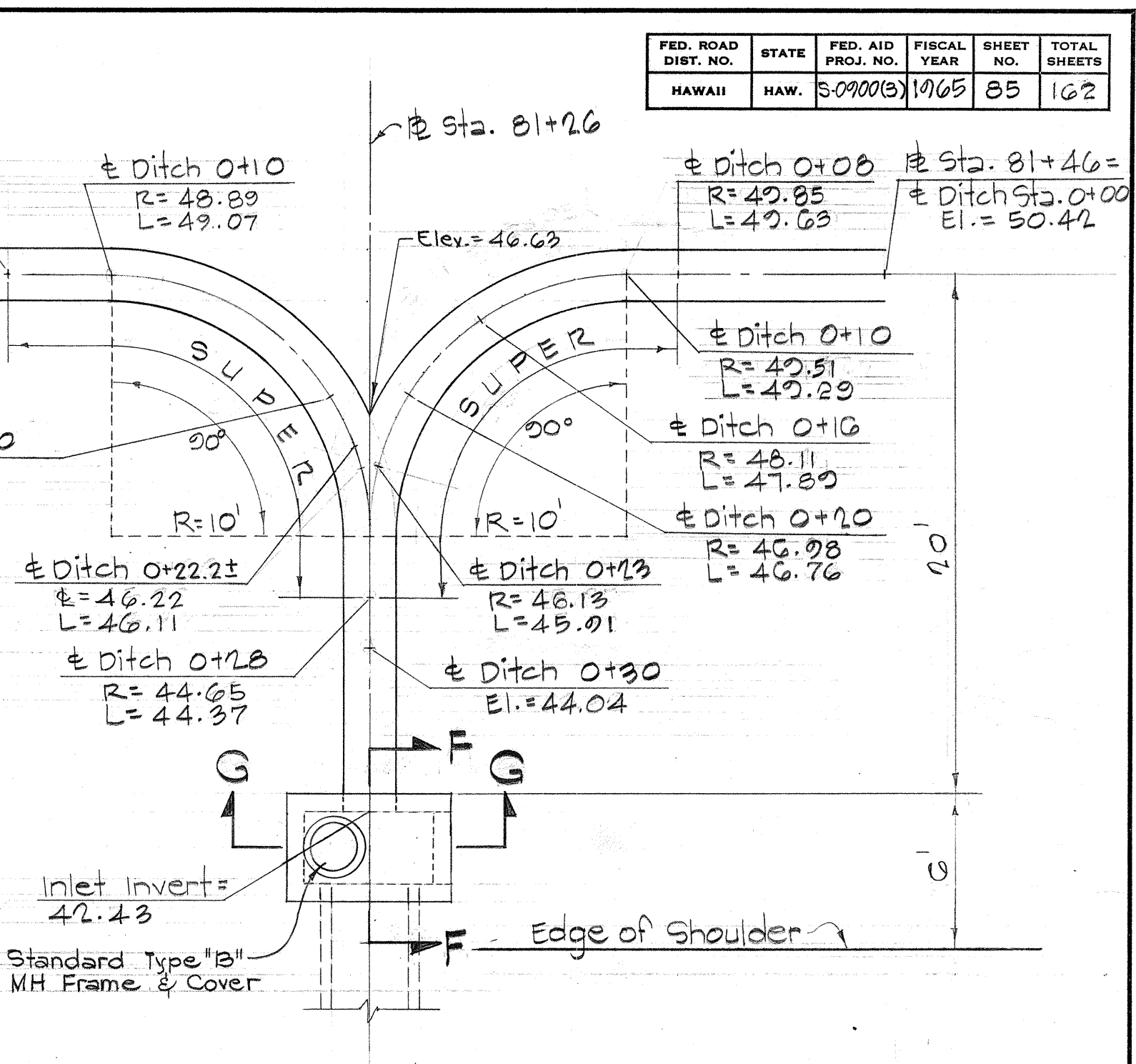
SECTION "B-B"
 Scale: 3/8" = 1'-0"



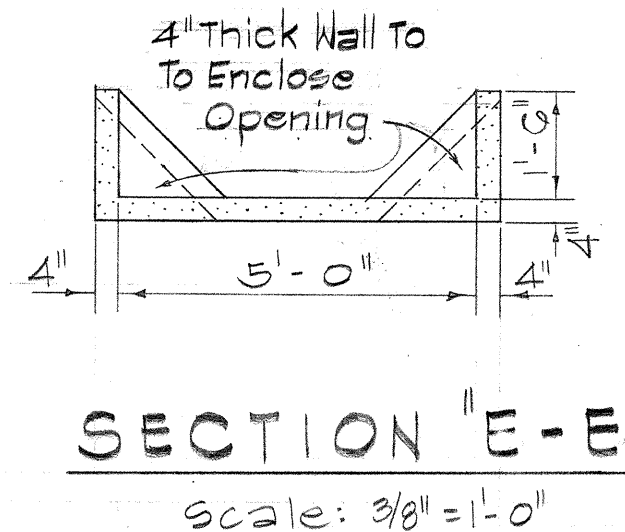
SECTION "C-C"
 Scale: 3/8" = 1'-0"



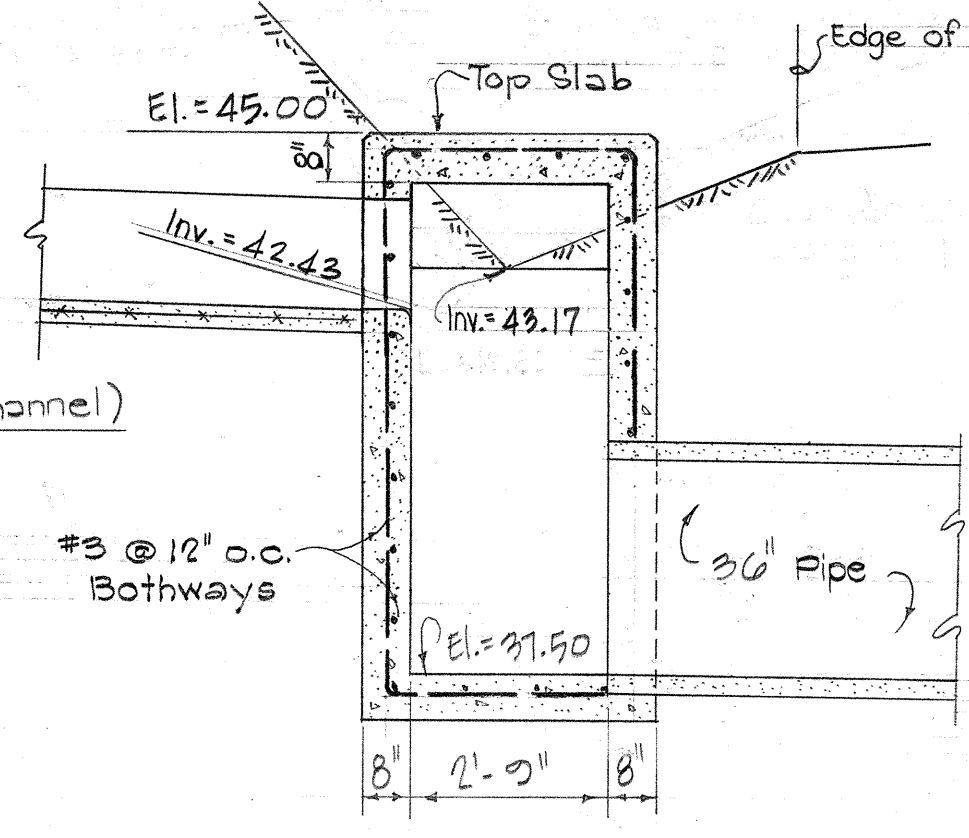
SECTION "D-D"
 Scale: 3/8" = 1'-0"



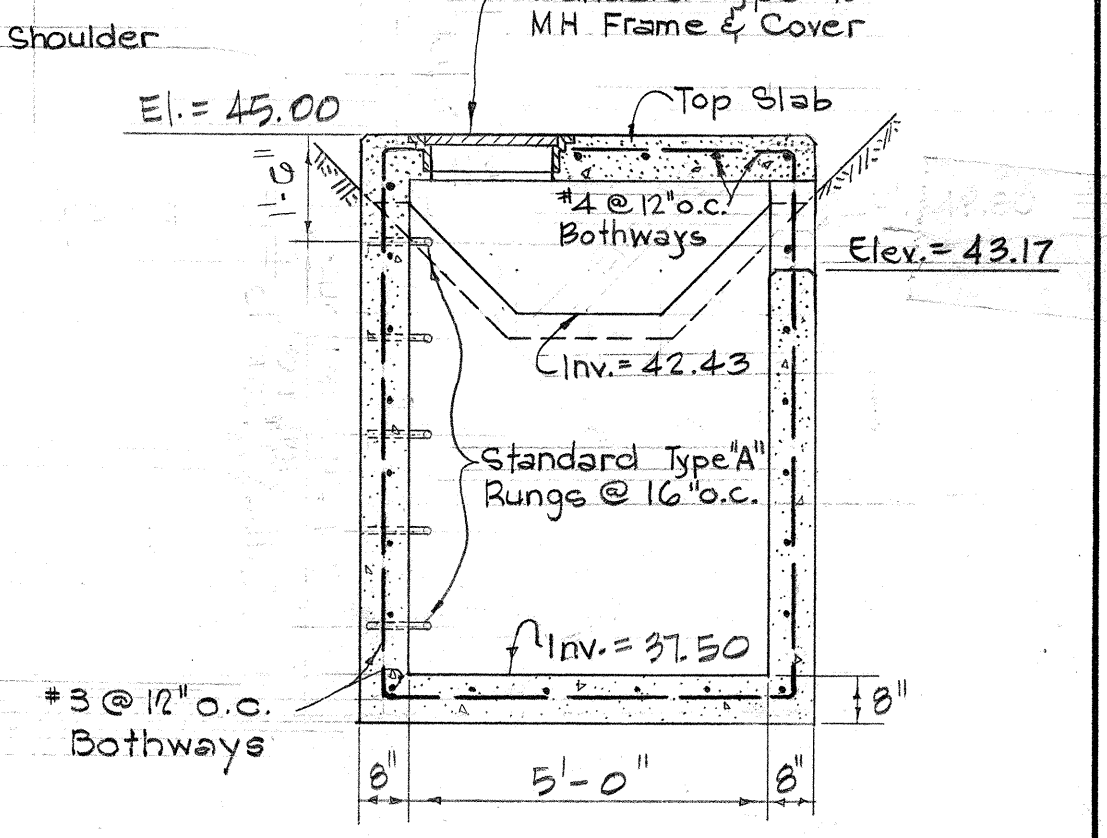
CONC. DROP INTAKE #2
STA. 4+00
 Scale: 3/8" = 1'-0"



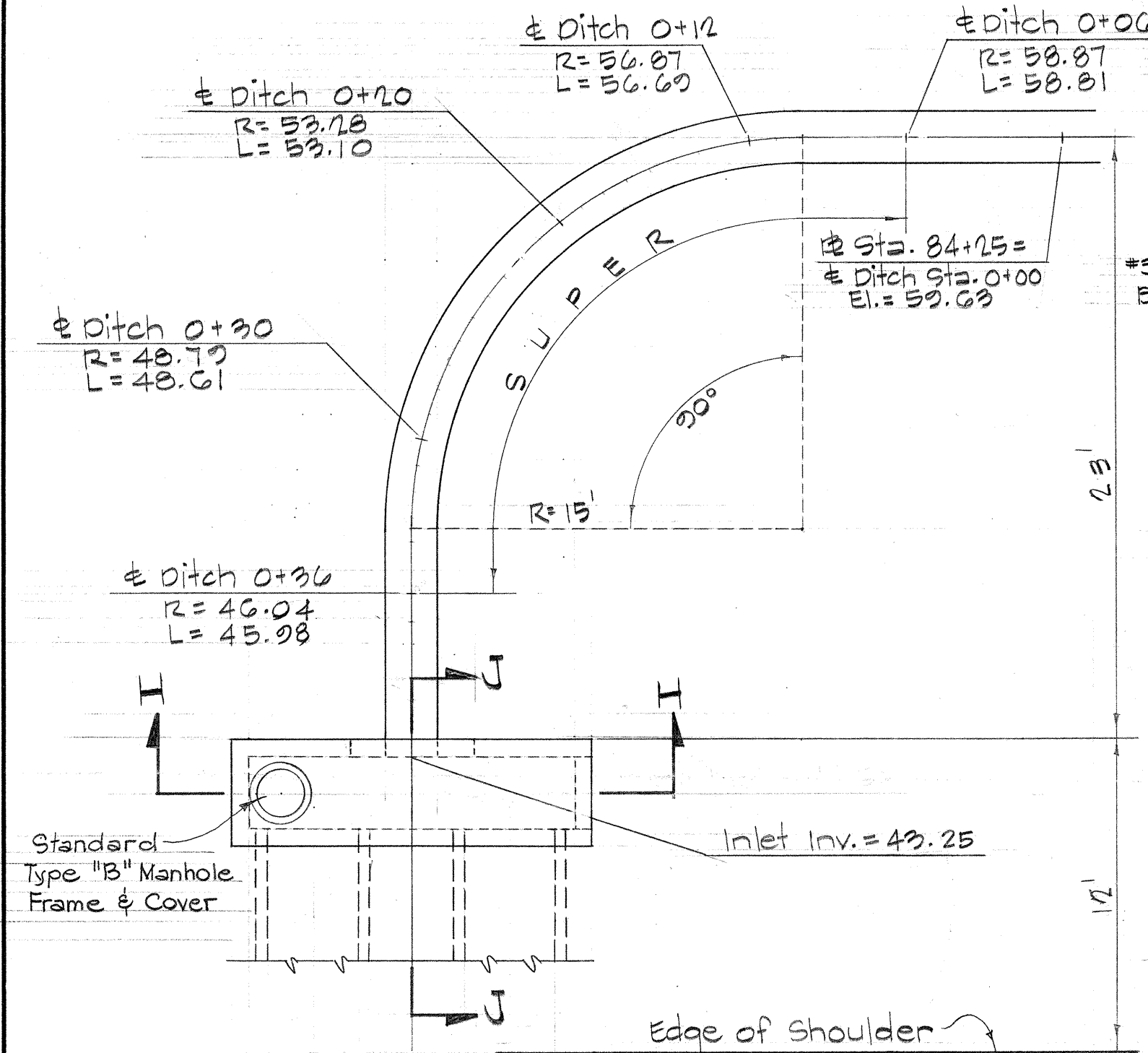
SECTION "E-E"
 Scale: 3/8" = 1'-0"



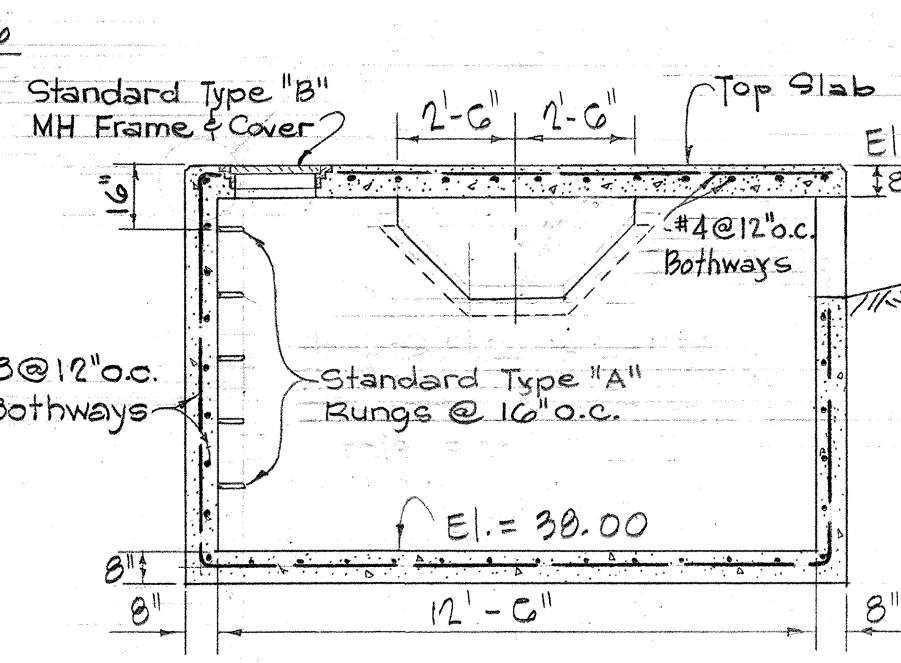
SECTION "F-F"
 Scale: 3/8" = 1'-0"



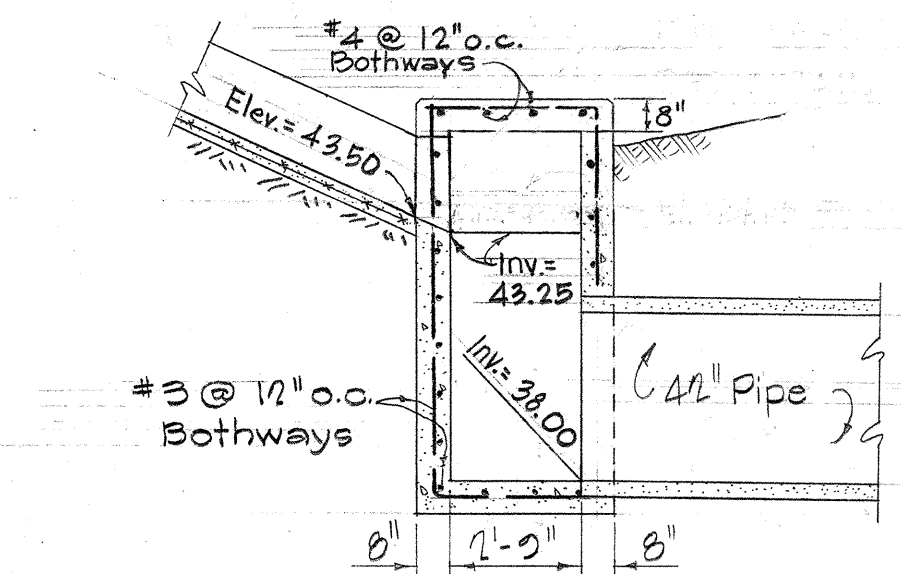
SECTION "G-G"
 Scale: 3/8" = 1'-0"



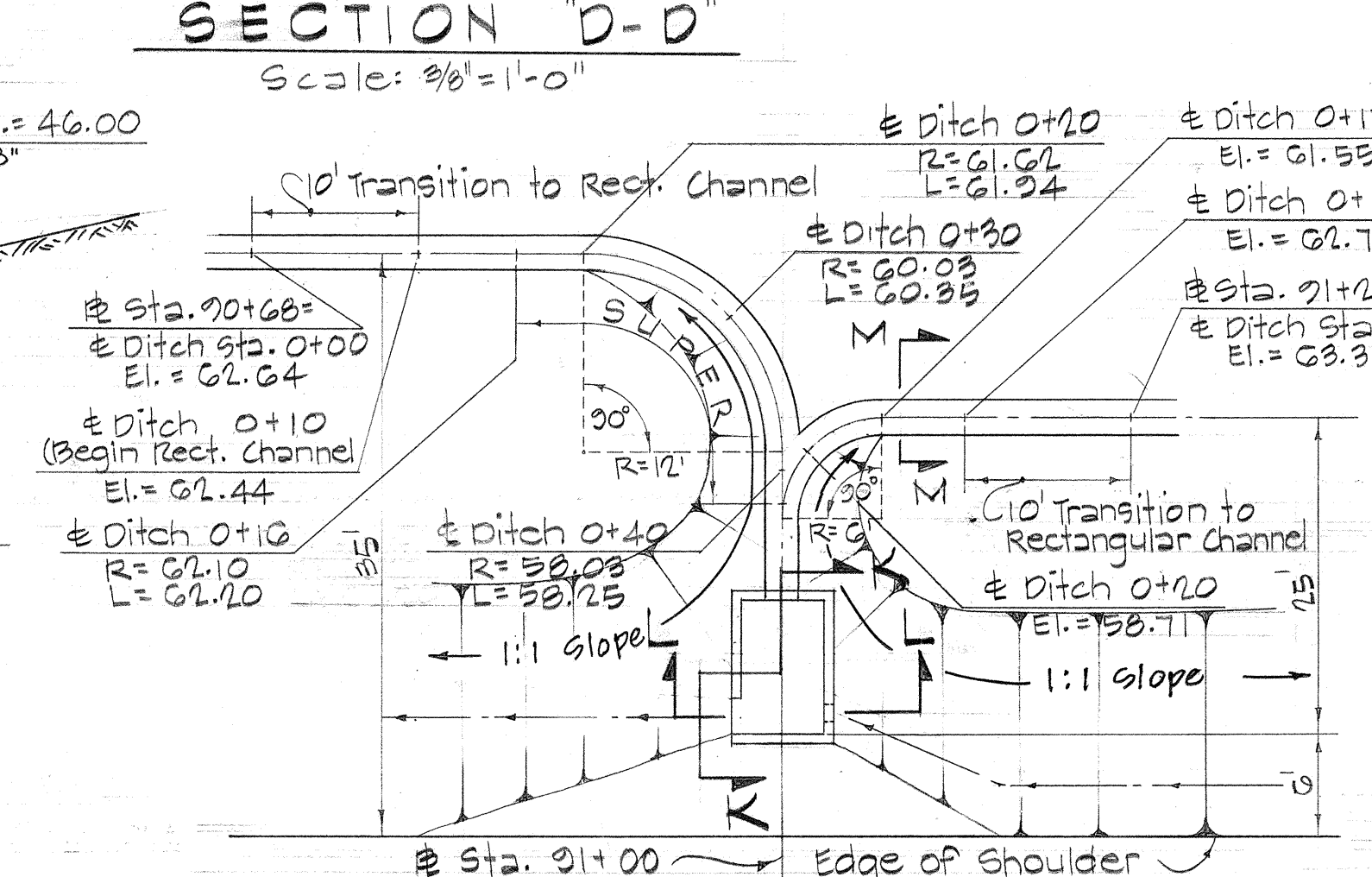
CONC. DROP INTAKE #4
STA. 84+00
 Scale: 3/8" = 1'-0"



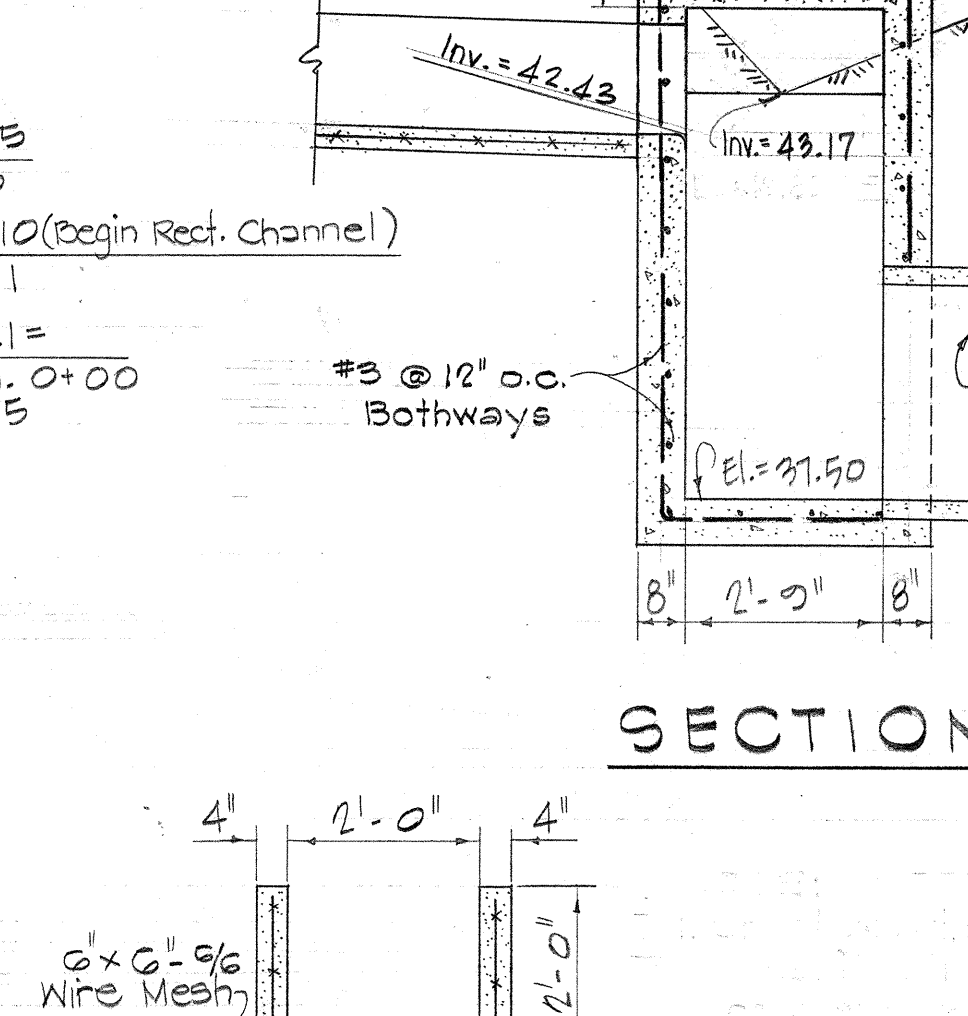
SECTION "H-H"
 Scale: 1/4" = 1'-0"



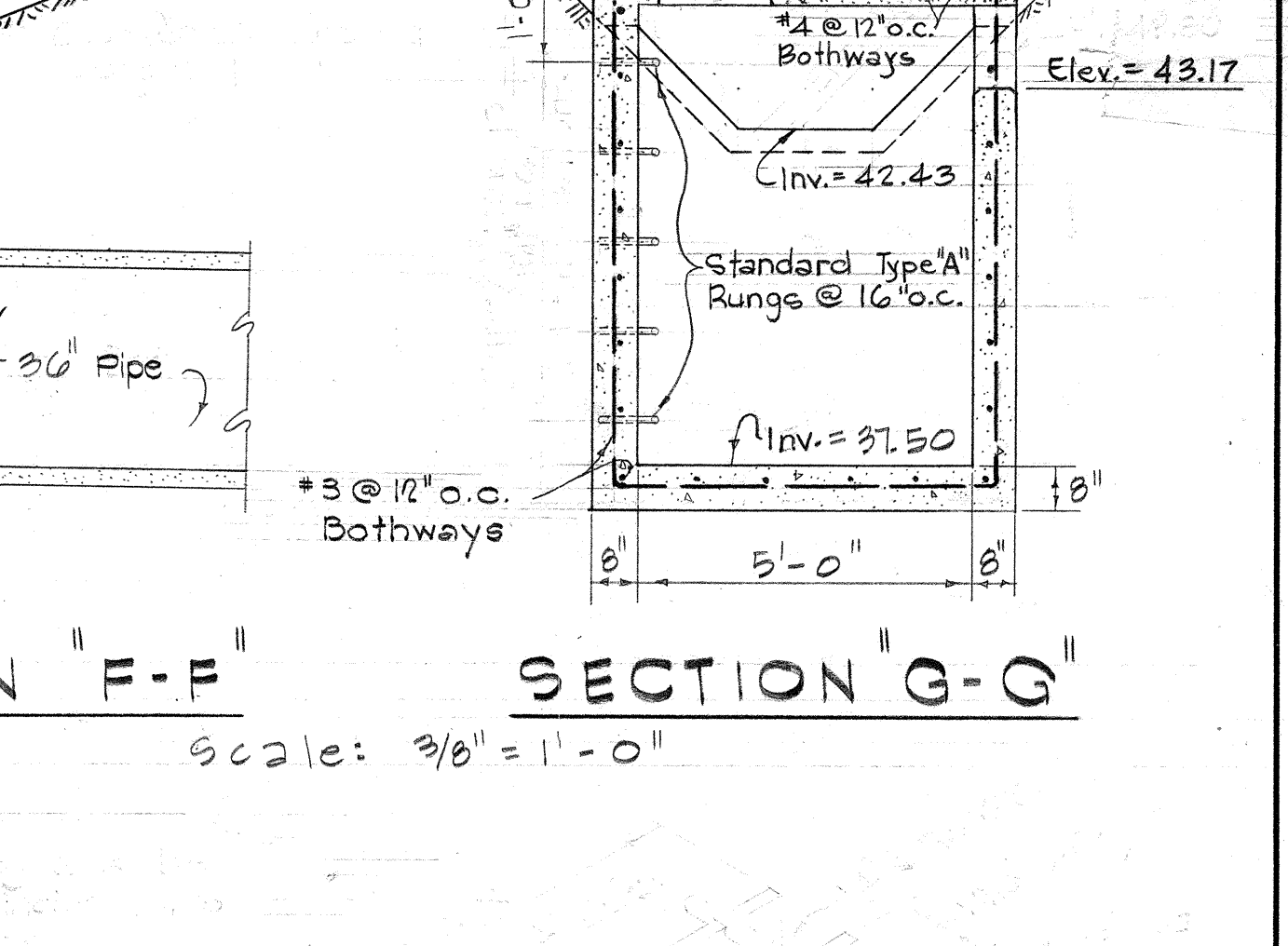
SECTION "J-J"
 Scale: 1/4" = 1'-0"



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



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



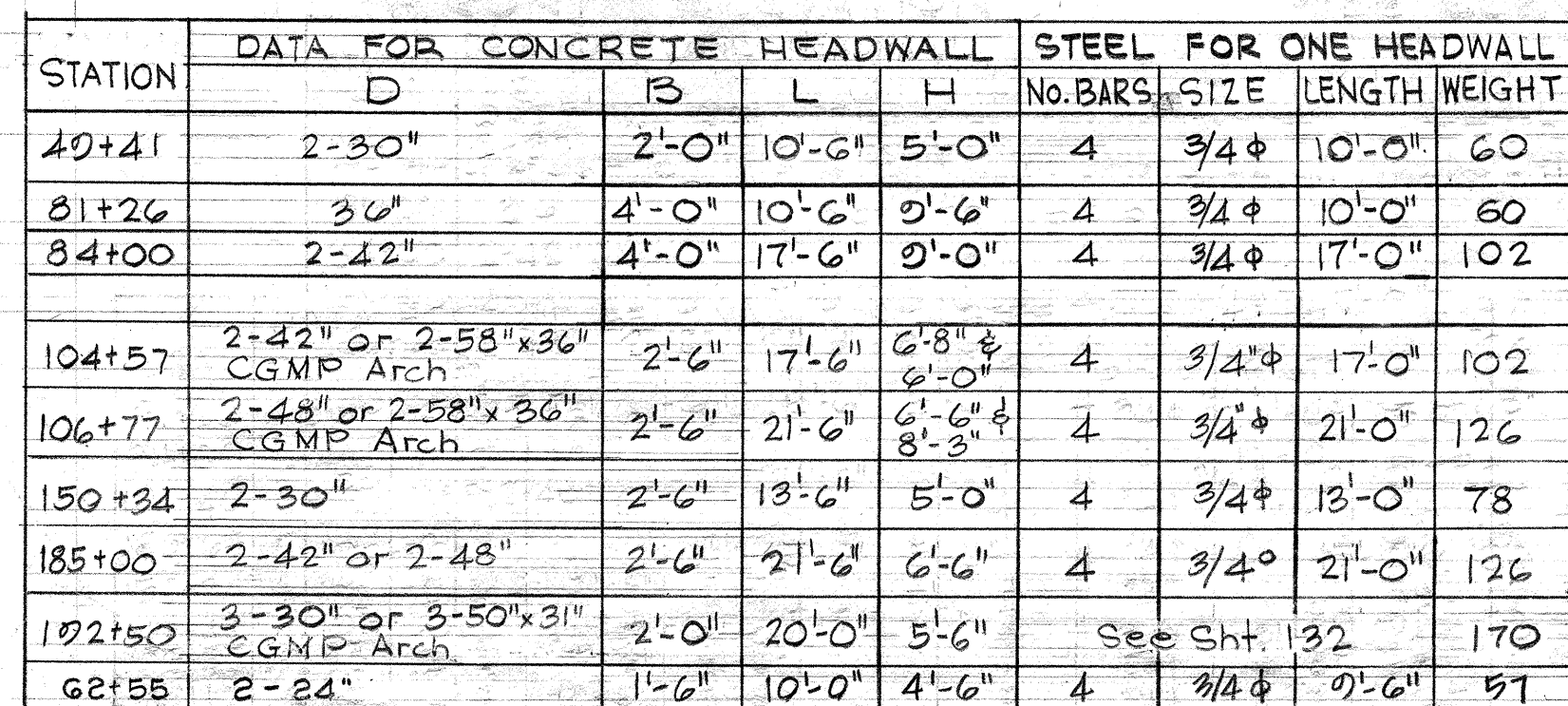
SECTION "M-M"
 Scale: 1/2" = 1'-0"

- NOTES:**
- 1- All exposed edges of structures shall be chamfered 1 inch.
 - 2- Slope all drop intakes & boxes so no standing water remains.
 - 3- All drop intakes & boxes will be class. B-1 concrete unless otherwise specified.

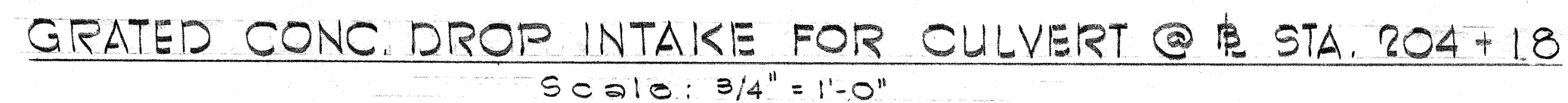
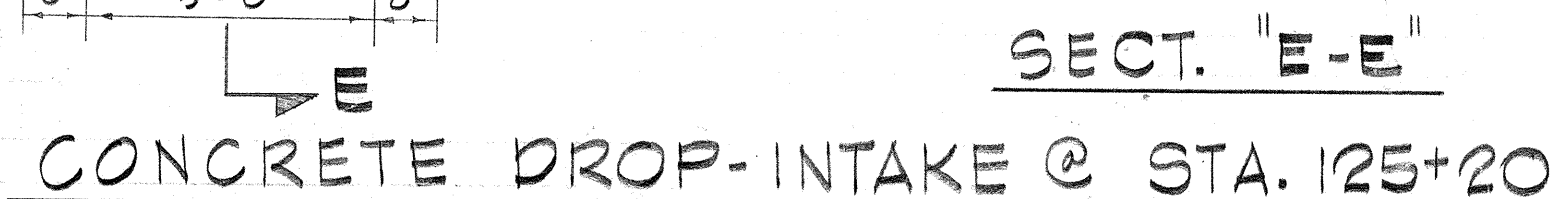
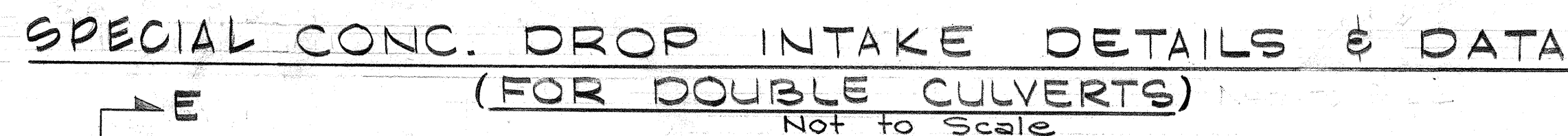
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

DRAINAGE DETAILS
SPECIAL CONCRETE DROP INTAKES

FARRINGTON HIGHWAY
 PROJECT No. S-0900(3)
 JUNE, 1964



42+80	2'-30" or 2'-36"	2'-6"	13'-6"	5'-0"	4	3/4φ	13'-0"	78
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STATION	LENGTH	PIPE SIZE		INLET	OUTLET	% SLOPE
	IN. FT.	RCCP	CGMP	ELEV.	ELEV.	
-1+64	5.4	30" III	30" 14ga.	10.60	18.05	0.010
4+00	10.7	30" III	30" 14ga.	27.10	26.35	0.007
13+25	105	—	30" 14ga.	25.00	23.05	0.010
12+50	110	24" IV	24" 14ga.	27.50	25.08	0.022
24+28	KEANANOI STREAM BRIDGE					0.006
28+00(R)	2.1	18" IV	18" 14ga.	10.00	9.90	0.005
28+12(L)	8.7	24" IV	24" 14ga.	8.64	8.20	0.005
30+15	70	72" III	84" 8ga.	10.70	10.00	0.010
49+41(L)	2(32)	2-30" III	2-30" 14ga.	24.13	24.00	0.004
57+82(L)	34.5	24" IV	24" 14ga.	27.63	27.30	0.010
60+43(L)	2.7	18" IV	18" 14ga.	31.68	30.90	0.023
A1+13	11.5	50 x 31" CGM Pipe - Arch, 12 ga.		31.18	30.70	0.004
62+55(L)	2(32)	2-24" IV	2-24" 14ga.	36.60	35.67	0.030
64+59(L)	3.4	24" IV	24" 14ga.	44.14	43.55	0.018
66+00(L)	30	24" IV	18" 14ga.	50.15	40.55	0.020
67+75	3(125)	3-30" III	3-30" 14ga.	46.00	45.13	0.007
73+85(4)	2.8	24" IV	24" 14ga.	55.07	54.16	0.035
81+06	106	30" III	30" 14ga.	37.50	34.74	0.076
84+00	2(112)	2-48" III	2-48" 14ga.	37.08	36.44	0.005
98+35	2.6	24" IV	24" 22" CGM Pipe Arch, 12 ga.	75.50	75.20	0.003
104+57	2(105)	2-42" IV	2-50" CGM Pipe Arch, 12 ga.	87.00	86.51	0.0047
106+77	2(100)	2-48" IV	2-50" CGM Pipe Arch, 12 ga.	92.50	91.00	0.015
110+43	2(140)	2-60" IV	18" 7" Sectional Plate Pipe Arch	98.34	97.90	0.01
121+70	2(151)	—	2-64" 8 ga.	141.00	128.95	0.079
125+20	13.4	24" III	24" 14ga.	143.50	135.20	0.061
136+34	30.5	30" III	60" 10ga.	139.50	139.68	0.063
146+85	2.9	30" IV	30" 14ga.	141.70	141.56	0.0048
151+09	1.4	10" Sectional Plate Pipe Culvert - 10 ga.	10" 10 ga.	141.50	141.02	0.016
162+75	2(130)	2-10" Sectional Plate Pipe Culvert - 10 ga.	10" 10 ga.	103.88	103.00	0.0064
185+00	2(170)	2-48" IV	2-48" 12 ga.	78.50	77.50	0.006
192+50	3(111)	3-30" IV	3-50" 31" CGM Pipe Arch	77.50	77.24	0.0045
	3(113)	—	—	77.24	77.00	0.0044
204+18	145	18" IV	—	77.49	77.28	0.005
204+20	156	18" IV	18" 14ga.	77.20	76.90	0.004
204+22	9.2	18" IV	18" 14ga.	77.20	76.90	0.004
113+70	163.6	24" IV	24" 14ga.	129.70	128.10	0.10
191+50	30	24" IV	24" 14ga.	148.60	148.30	0.010
14+63	12	18" III	—	18.84	18.68	0.010
42+80(L)	2-200	2-30" III	2-36" 12ga.	81.52	18.53	0.0073
				81.52	18.53	
IRIGATION	150+34	2(296.7)	2-30" III	122.45	122.22	0.001
	160+25(6)	2(299)	30" IV	122.22	122.15	0.0125
	167+29	4.0	24" IV	109.60	109.19	0.0126
	185+83(R)	12.2	18" IV	110.50	108.76	0.005
	186+00(L)	32.4	—	109.76	108.90	0.005
	186+74	3.2	—	84.54	84.38	0.003
	186+74	7.6	36" III	81.3 ±	81.2 ±	0.0028
	198+20	2(188)	2-30" IV	81.49	81.15	0.0049
	2(185.4)	—	—	81.15	80.90	
				79.10	78.80	

SHEET No. 3 OF 18 SHEETS

THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.

2157

SG

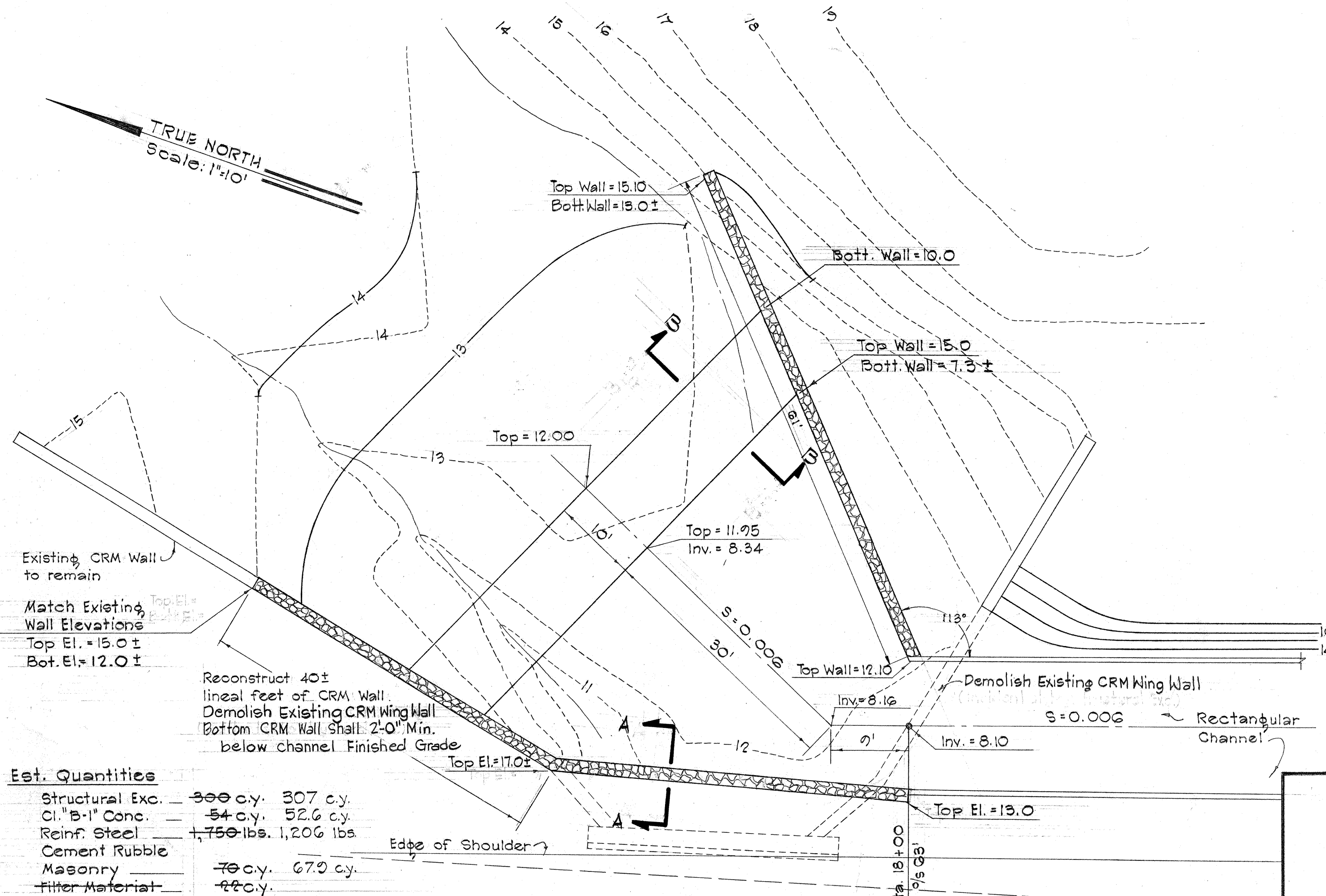
ORIGINAL	SURVEY PLOTTED BY.....	DATE.....
PLAN	DRAWN BY.....	
NOTE BOOK	TRACED BY.....	
	DESIGNED BY.....	
	QUANTITIES BY.....	
	CHECKED BY.....	
No.		

PRINTED ON CLEARPRINT 1000-1

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



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	5-0900(3)	1965	88	162



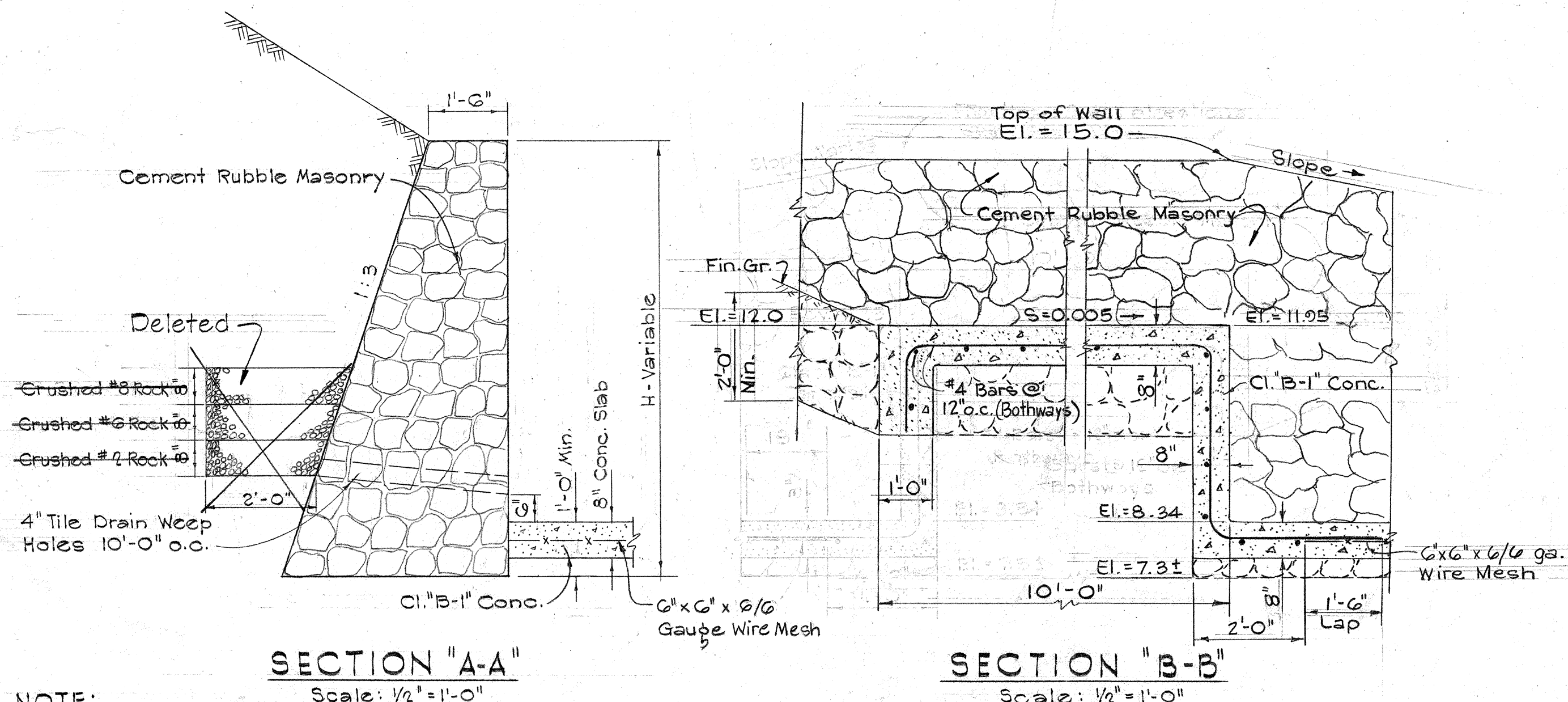
Est. Quantities

Structural Exc.	300 c.y.	307 c.y.
Cl. "B-1" Conc.	54 c.y.	52.6 c.y.
Reinf. Steel	1,750 lbs.	1,206 lbs.
Cement Rubble	70 c.y.	67.0 c.y.
Masonry	70 c.y.	67.0 c.y.
Filter Material	70 c.y.	67.0 c.y.

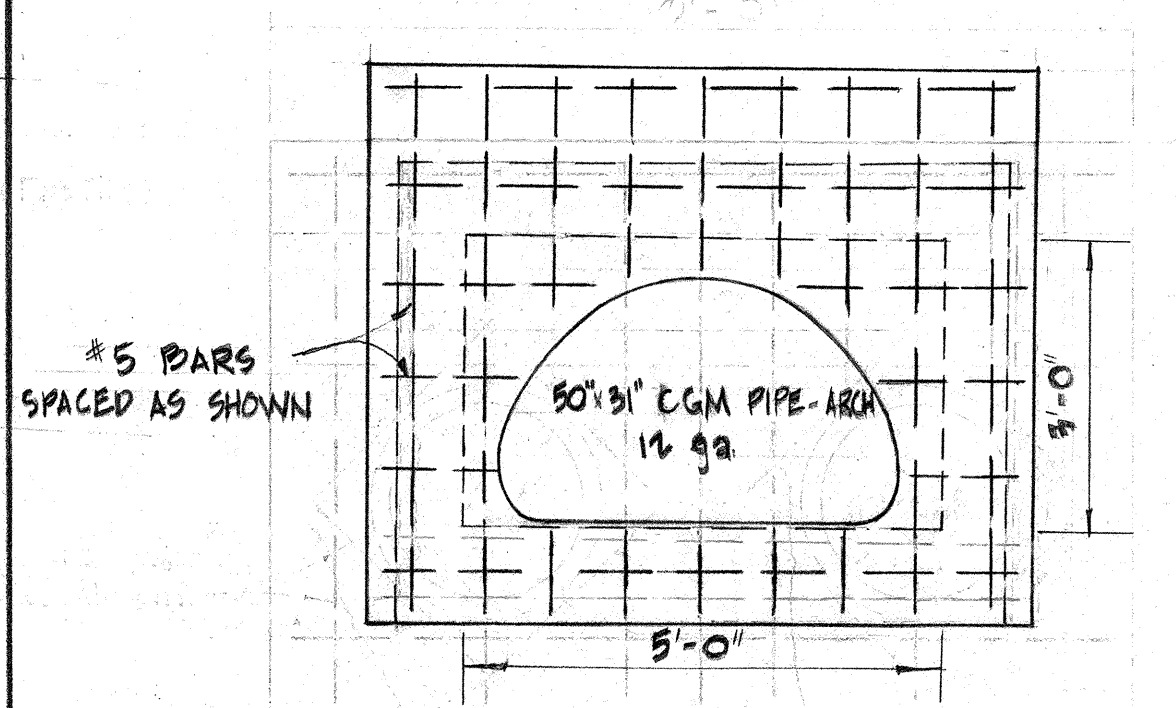
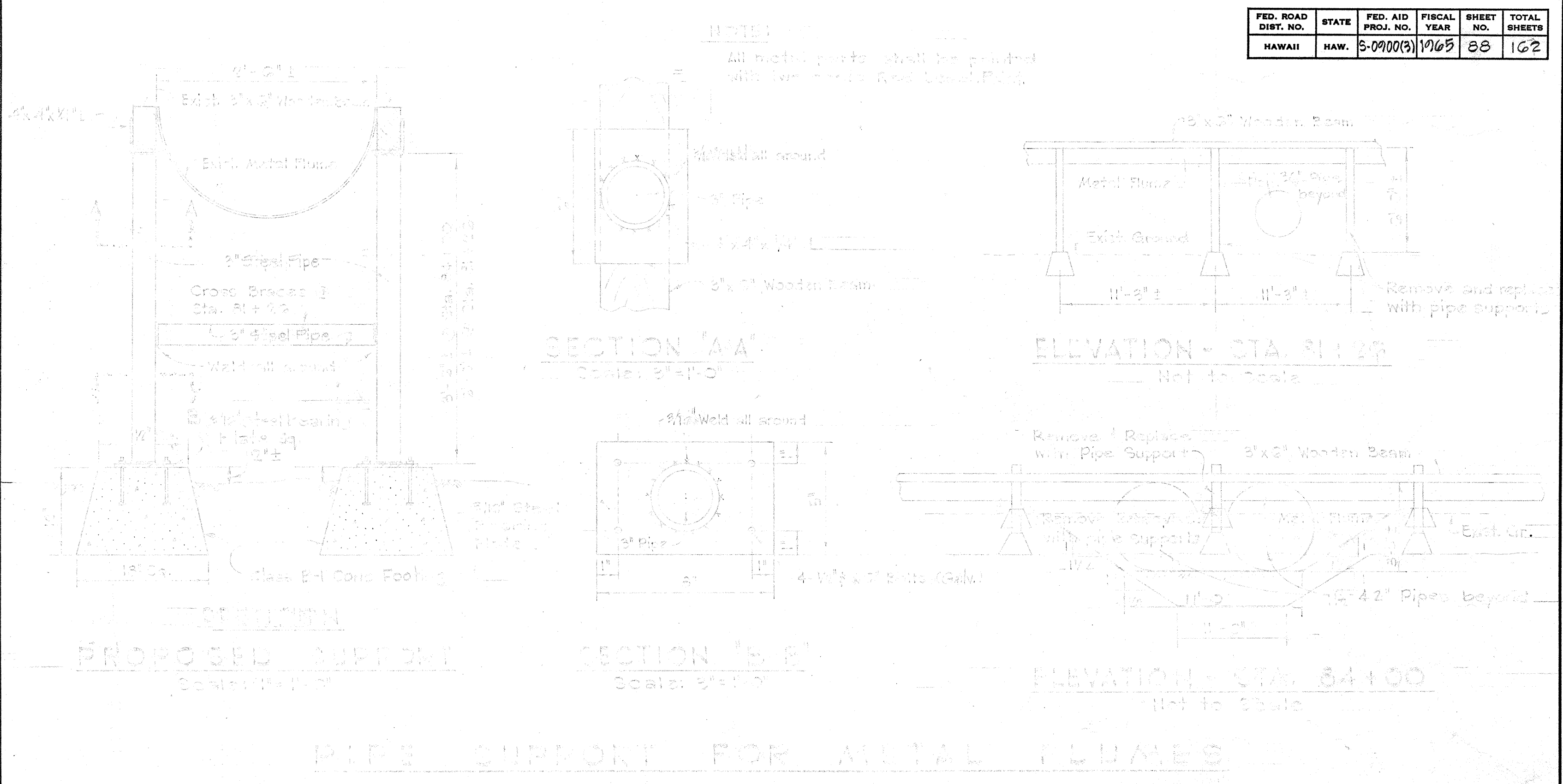
LIMALOA BRIDGE
(Exist. Structure including wingwalls to be Demolished)
(See Special Provisions)

- NOTES:**
1. See Sht. 84 for Channel Details
 2. See Cross Sections for Inverts

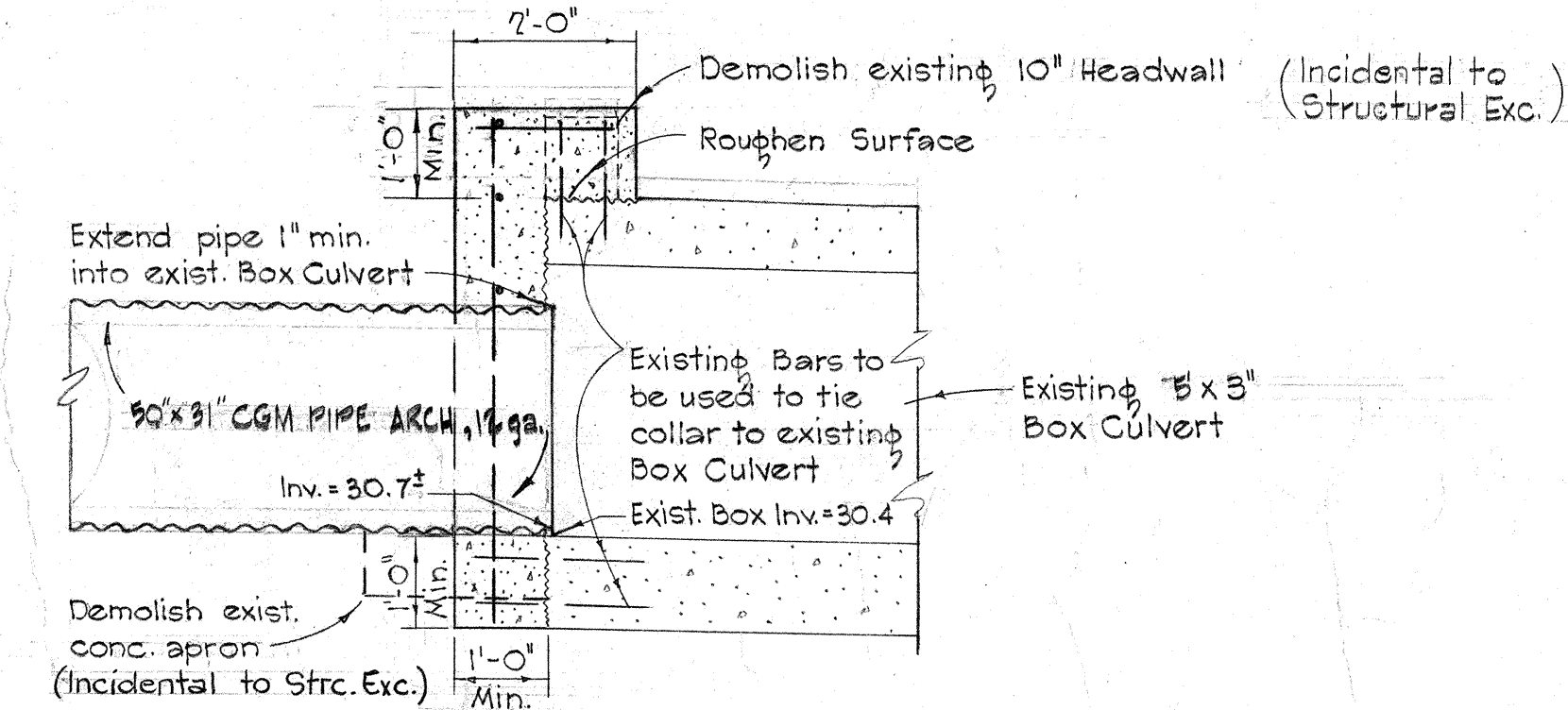
CHANNEL INLET STRUCTURE
Scale: 1" = 10'



NOTE:
4" Tile Drain Weep Holes shall be considered incidental to C.R.M. Wall.

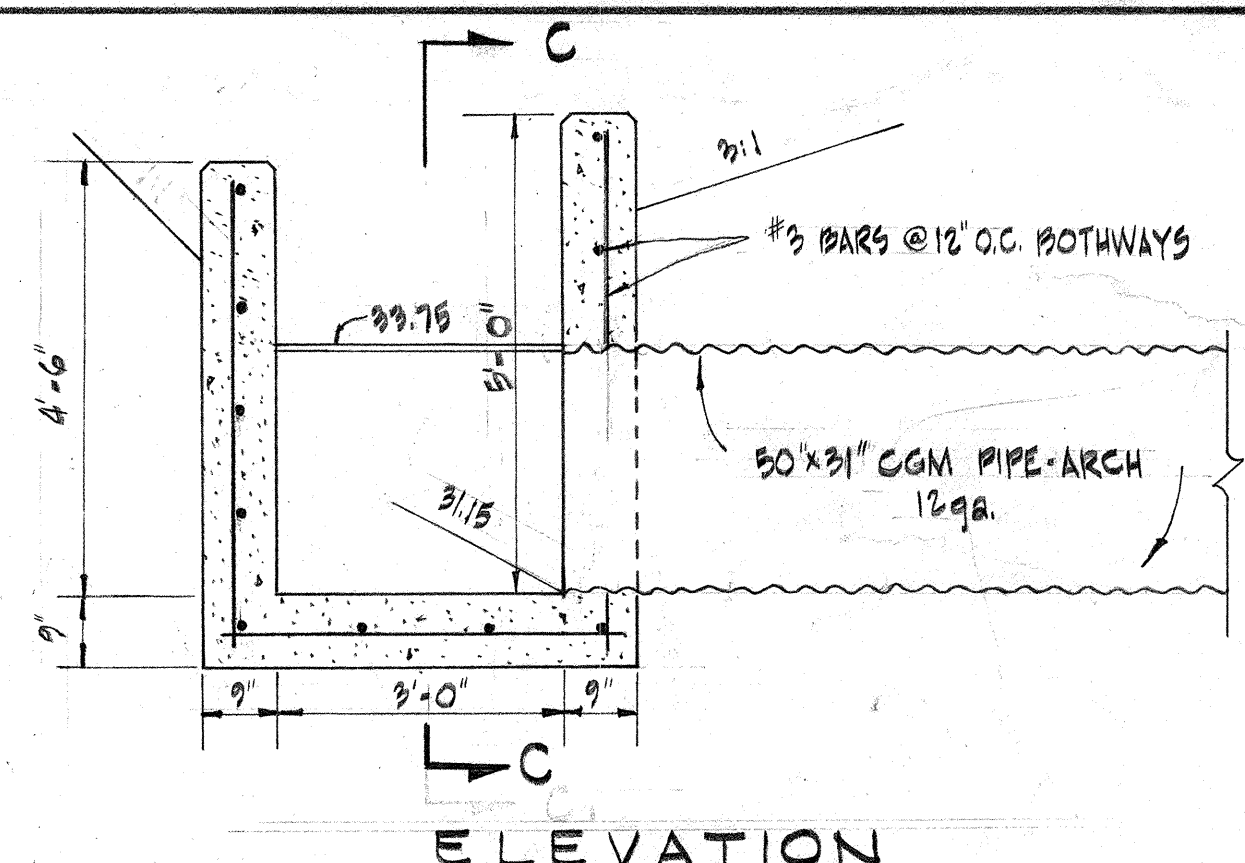


ELEVATION

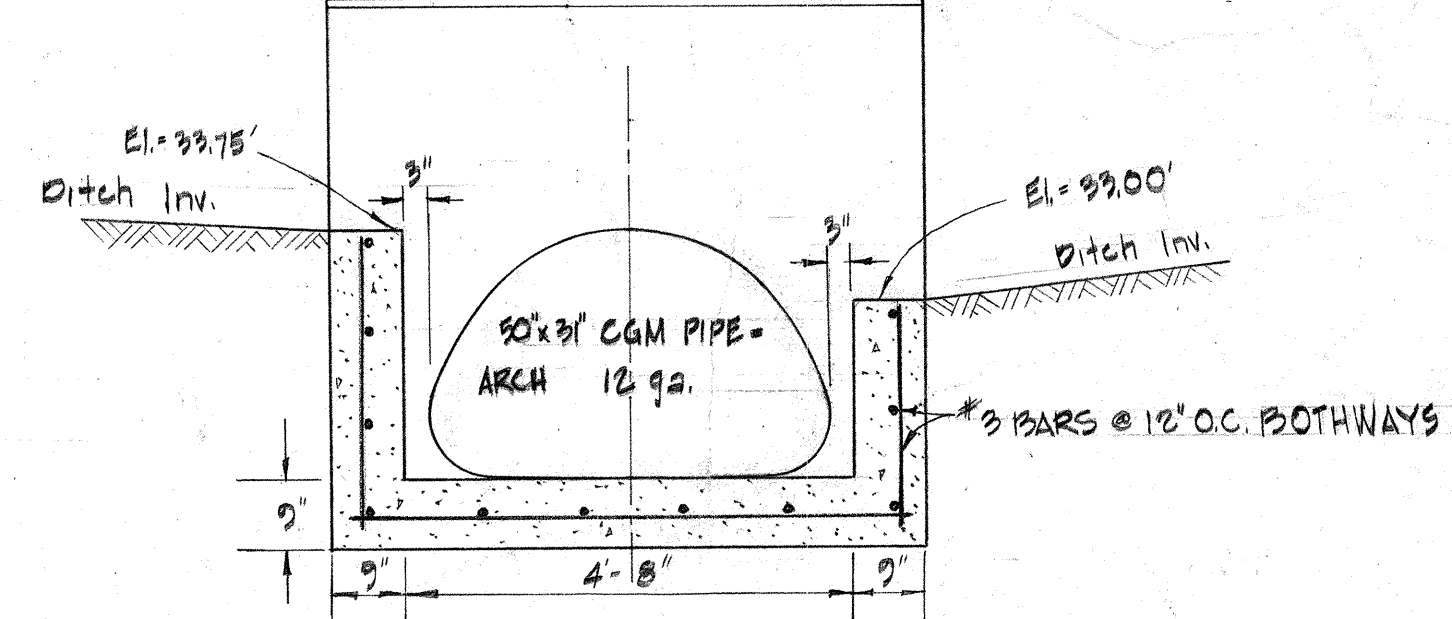


SECTION

CONNECTION TO EXIST. 5'x3' BOX CULVERT - STA. 61+13
Scale: 1/2" = 1'-0"



ELEVATION



SECTION C-C

CONCRETE DROP INTAKE @ STA. 61+50
Scale: 1/2" = 1'-0"

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

ORAINAGE DETAILS

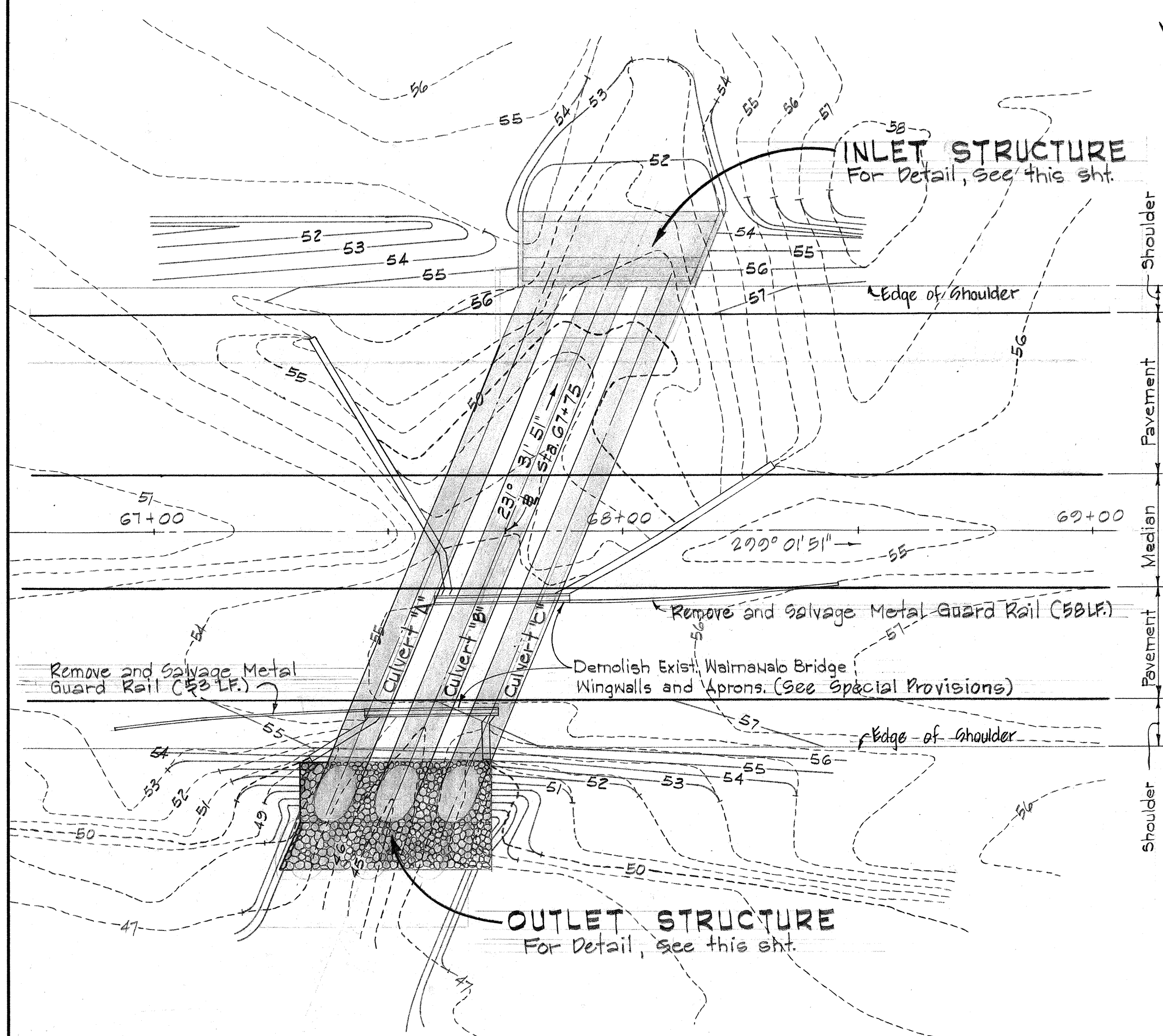
FARRINGTON HIGHWAY

PROJECT N^o S-0900(3)

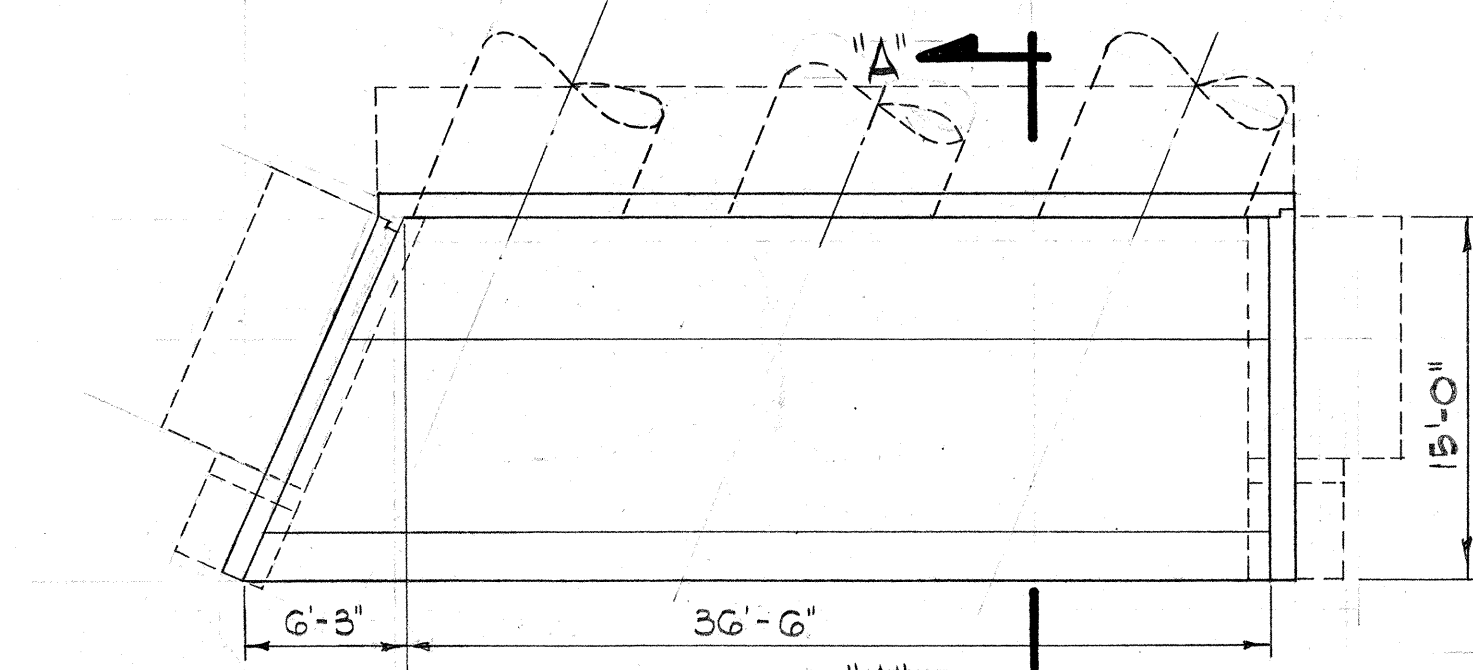
JUNE, 1964

SHEET No. 5 OF 18 SHEETS

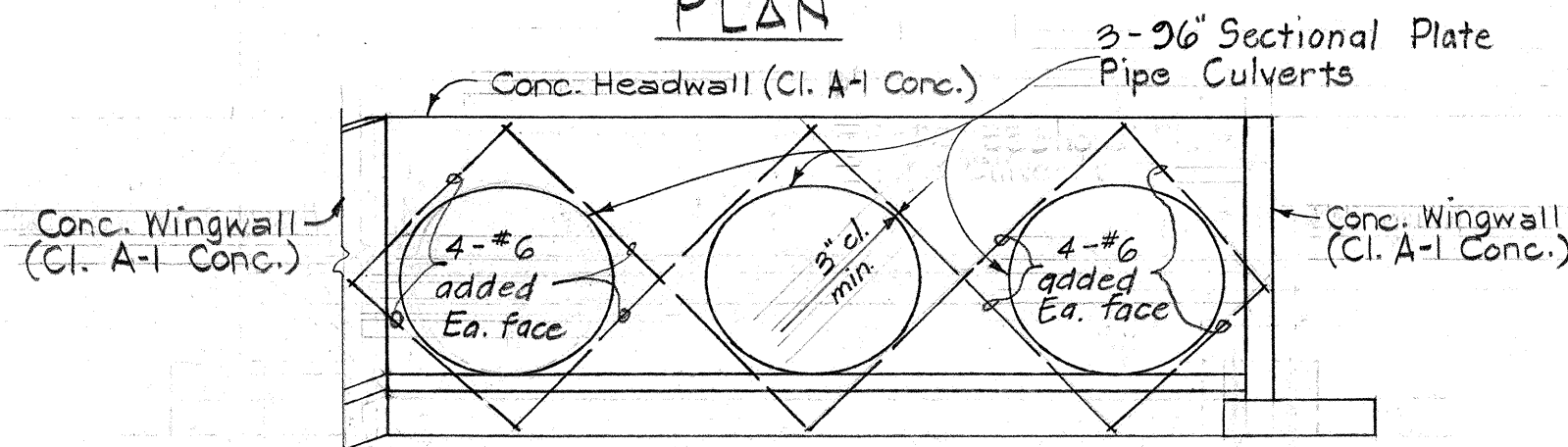
DATE	_____
SURVEY PLOTTED BY	_____
DRAWN BY	_____
CHECKED BY	_____
DESIGNED BY	_____
NOTED BY	_____
QUANTITIES BY	_____
CHECKED BY	_____



PLAN - 3 36" SECTIONAL PLATE PIPE CULVERTS (12 GAGE) @ STA. 67+75

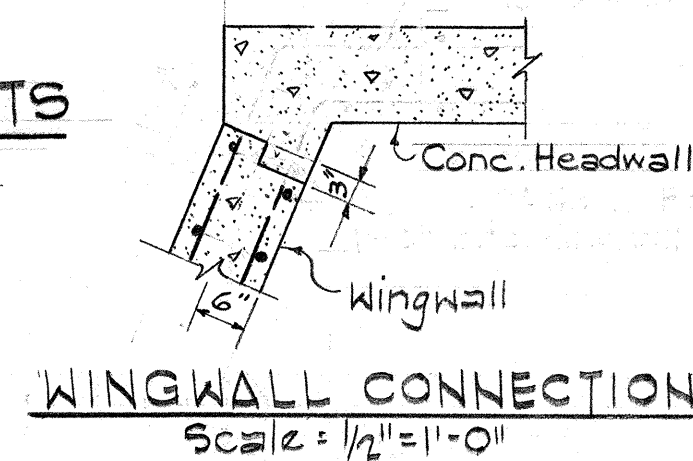


PLAN

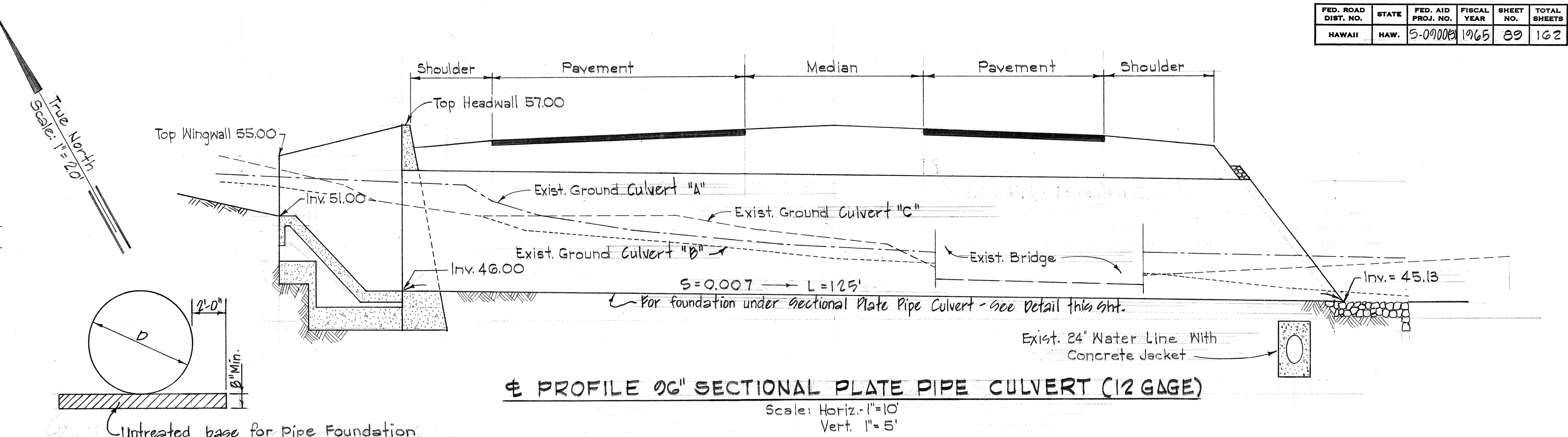


ELEVATION

INLET STRUCTURE
Not To Scale



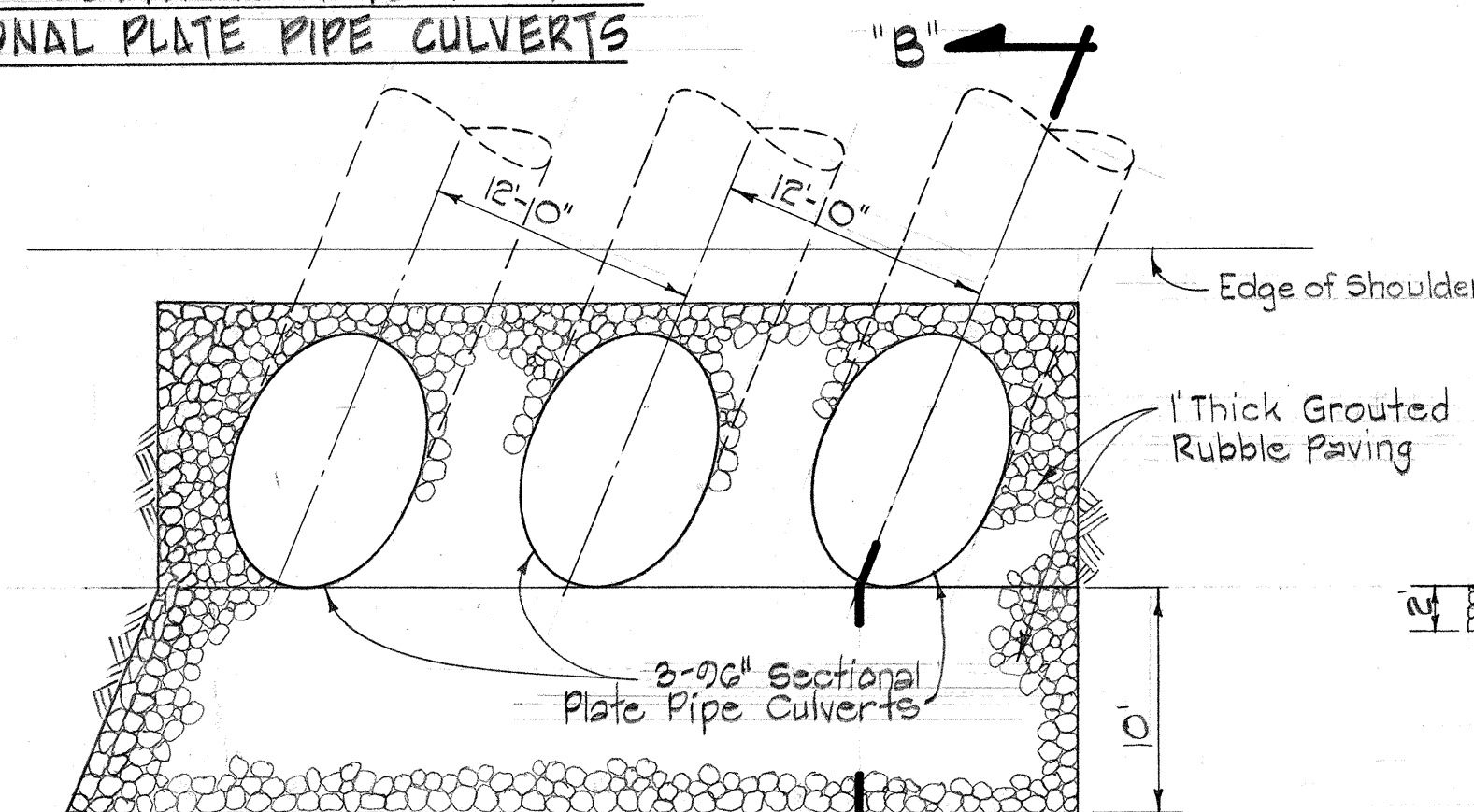
WINGWALL CONNECTION
Scale: 1/2" = 1'-0"



PROFILE 36" SECTIONAL PLATE PIPE CULVERT (12 GAGE)

Scale: Horiz. 1" = 10'
Vert. 1" = 5'

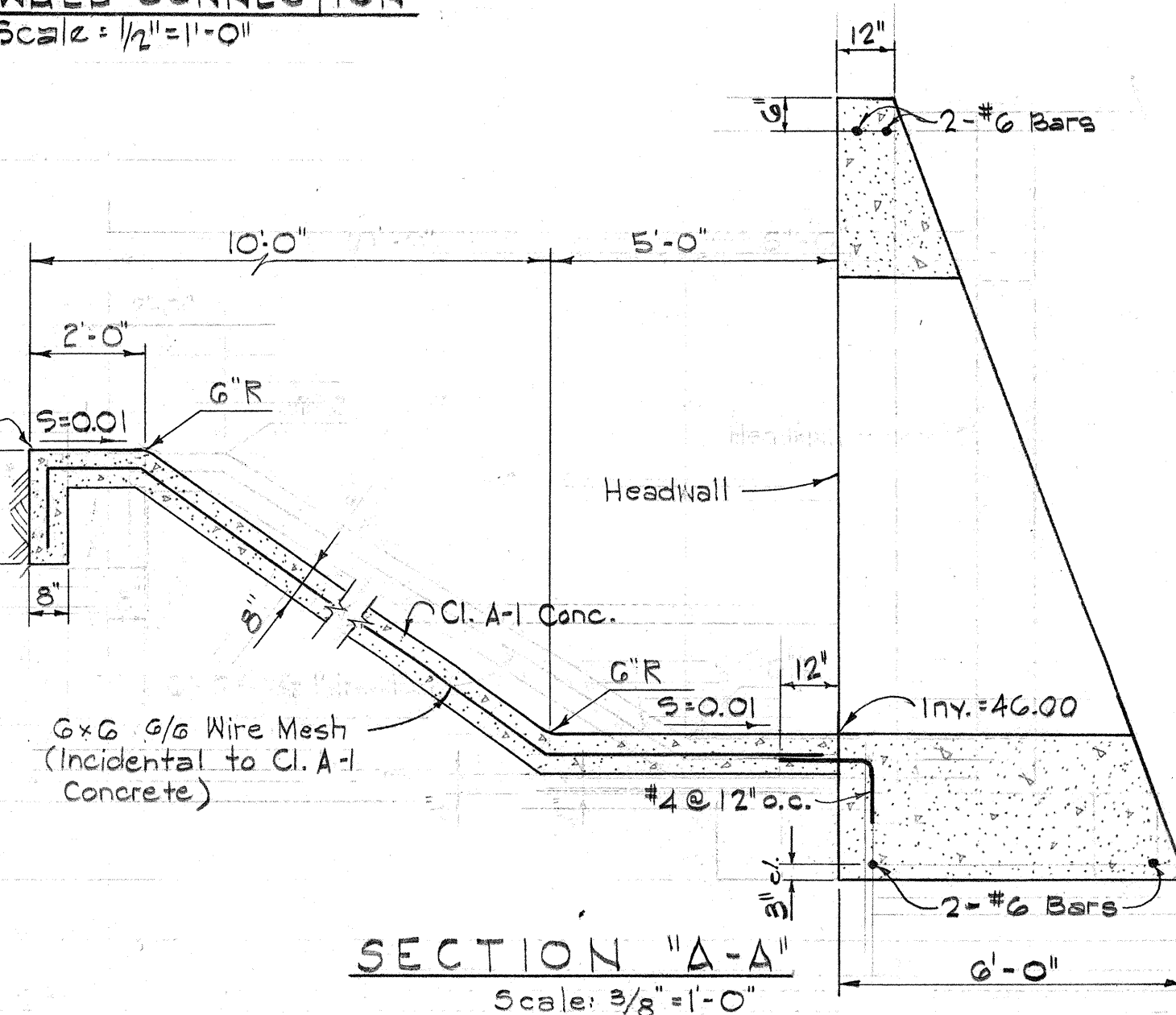
DETAIL - CUSHION MATERIAL FOR SECTIONAL PLATE PIPE CULVERTS



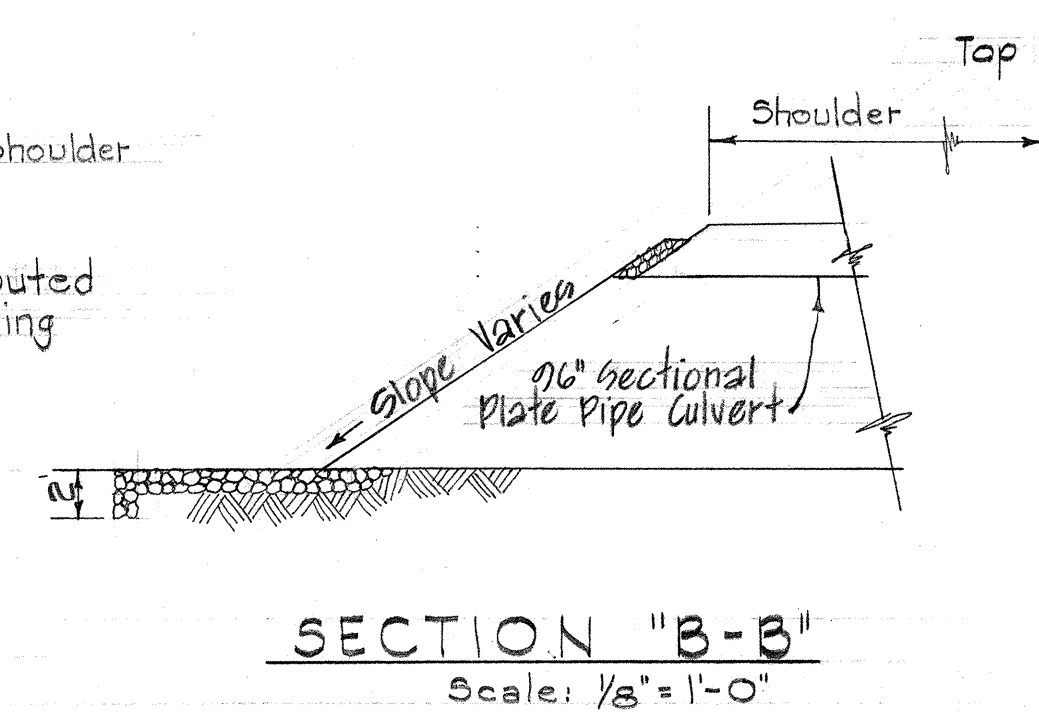
NOTE
Lay Grouted Rubble Paving a minimum of 3' around each culvert, with the exception of 1' above the top of each pipe.

OUTLET STRUCTURE

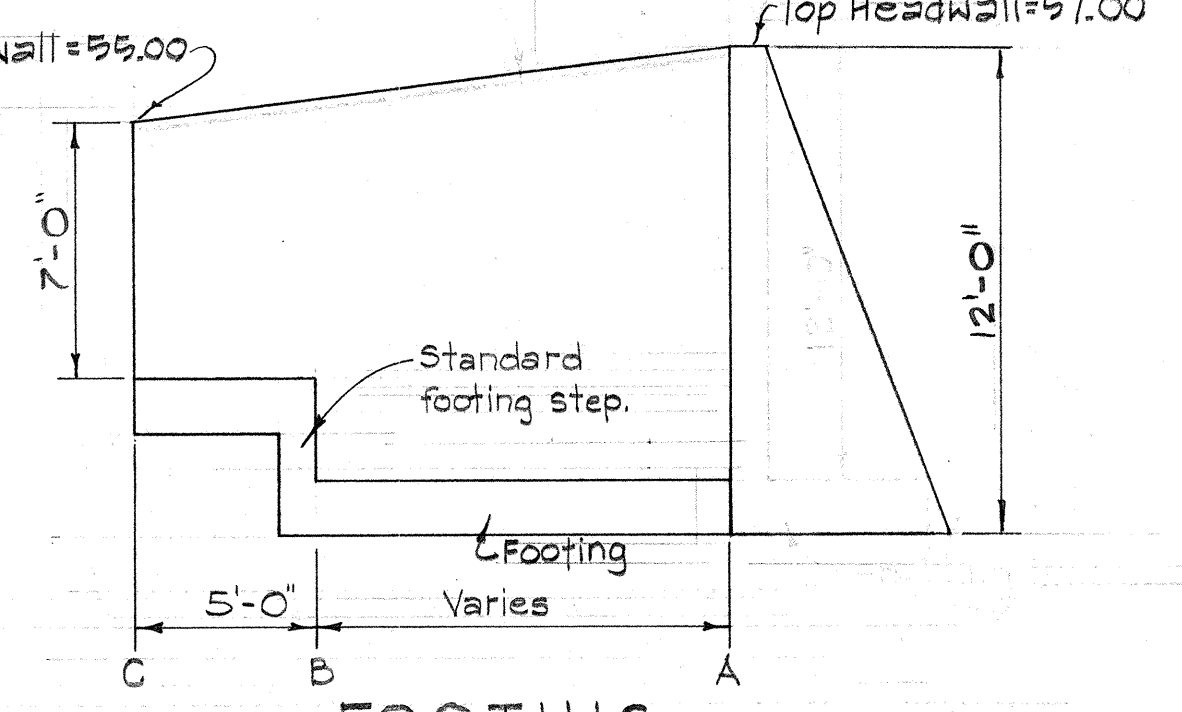
Scale: 1/8" = 1'-0"



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



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



NOTE:
Sectional Plate Pipe Culverts shall have their vertical diameters elongated 5% by shaping the plates at the factory.

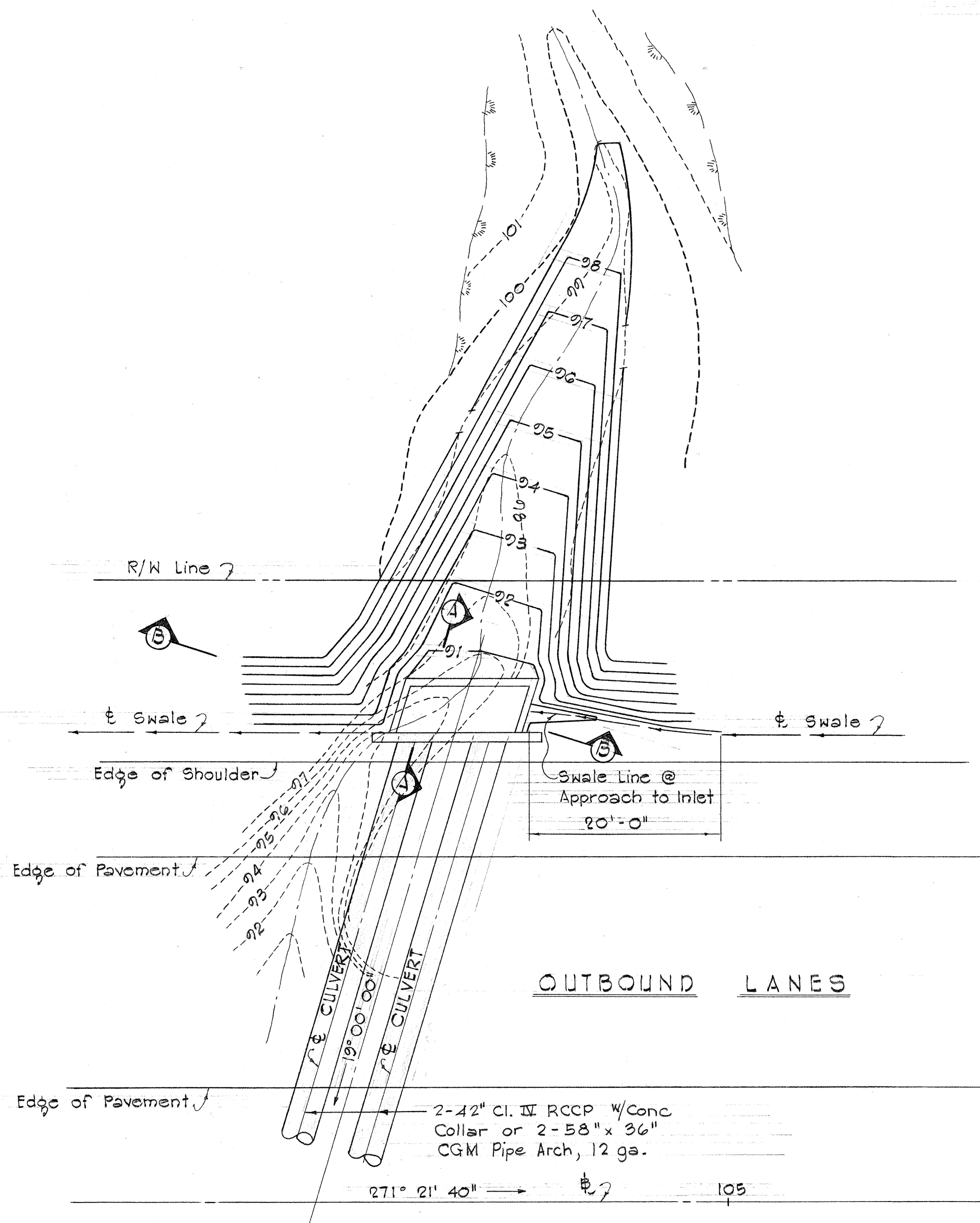
ESTIMATED QUANTITIES

36" Sectional Plate Pipe Culvert (12 Gage)	375 L.F.
Class A-1 Conc. other than in Bridges (Lump Sum)	85 cy.
Reinforcing Steel other than at Bridges (Lump Sum)	1,700 lbs.
Structure Excavation other than at Bridges	1,650 cu. y.
Untreated Base for Pipe Foundation	142 cu. y.
Grouted Rubble Paving	22.3 cu. y.
Ditch & Channel Exc.	120 cu. y.

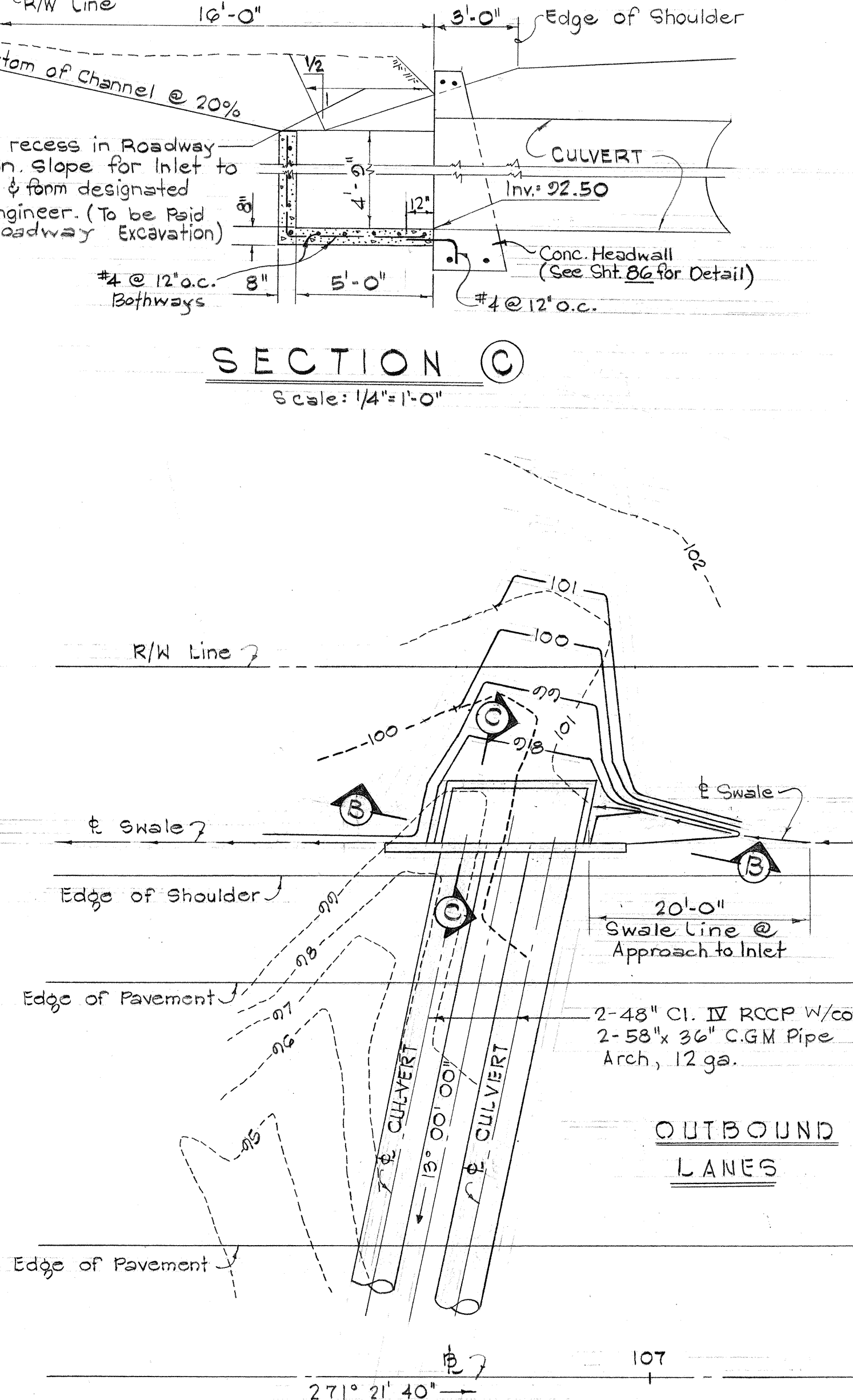
Belt, Collins & Associates Ltd.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
3-36" SECTIONAL PLATE PIPE CULVERT (12 GAGE)
@ STA. 67+75
FARRINGTON HWY. PROJ. NO. 5-0900(3)
JUNE, 1964

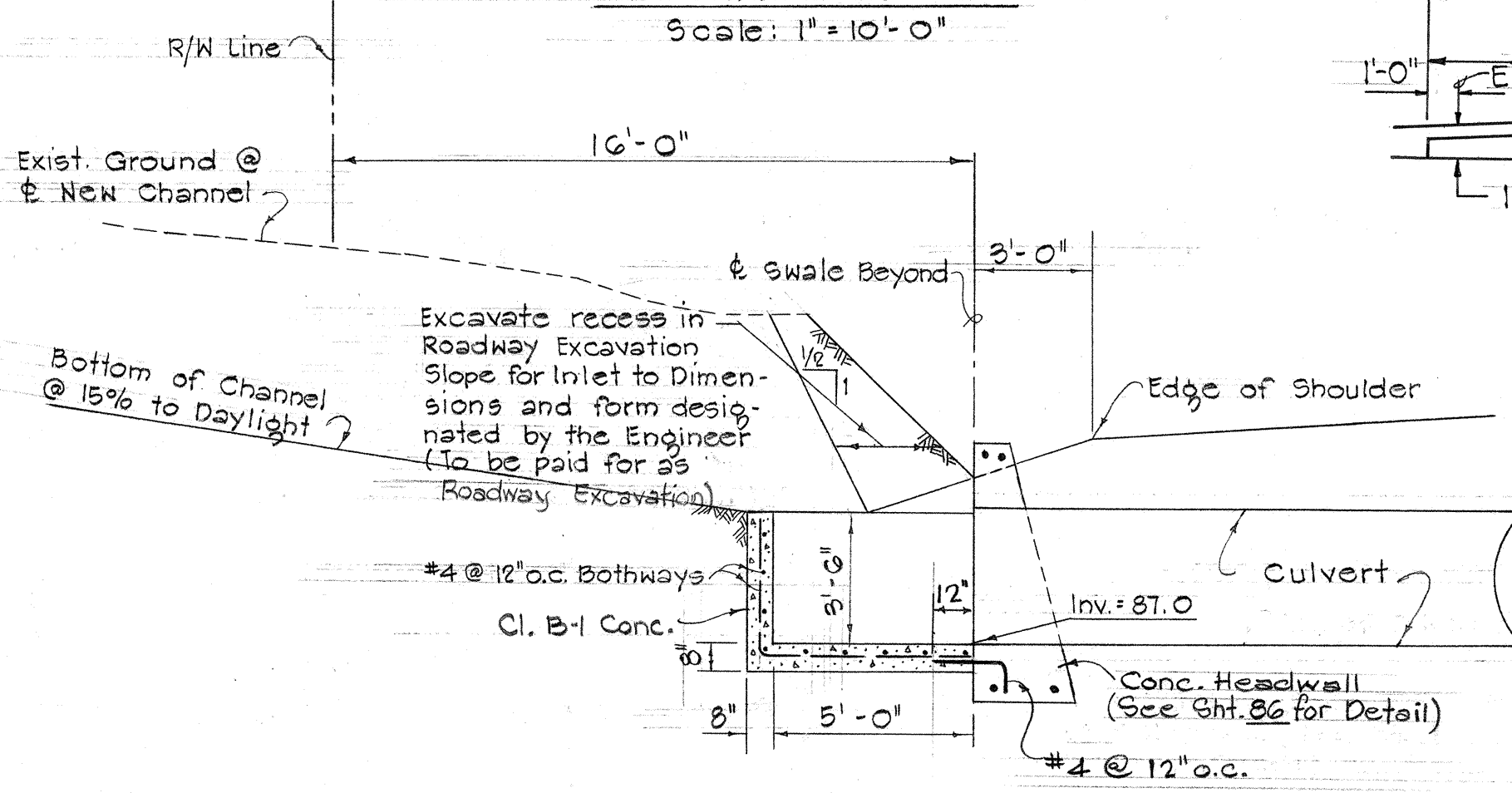
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	5-0900(3)	1965	20	162



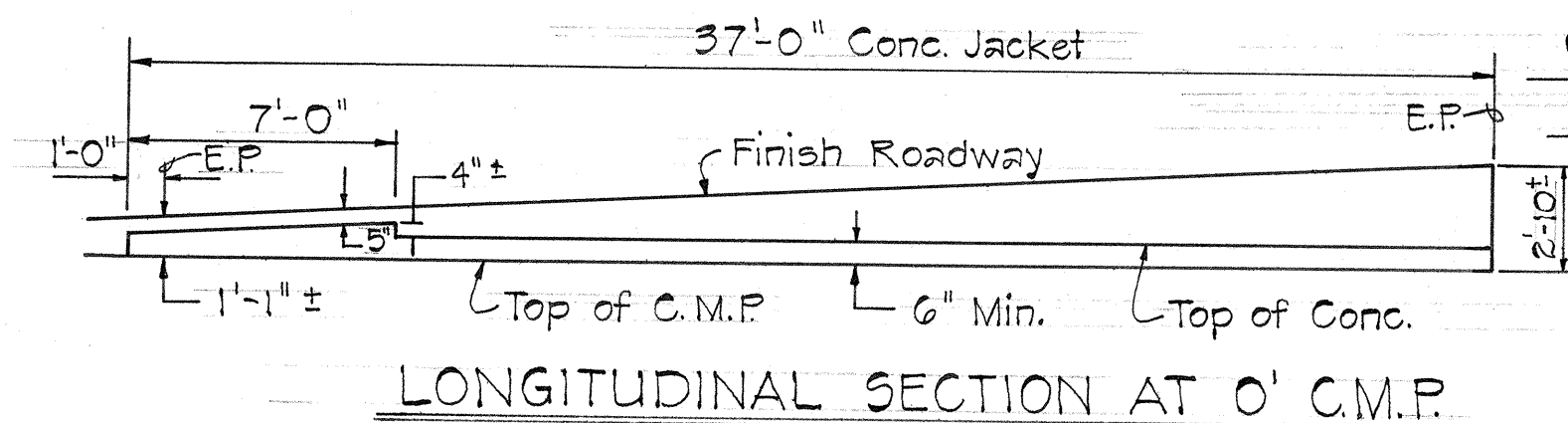
PLAN
2 CULVERTS @
STA. 104+57
Scale: 1"=10'-0"



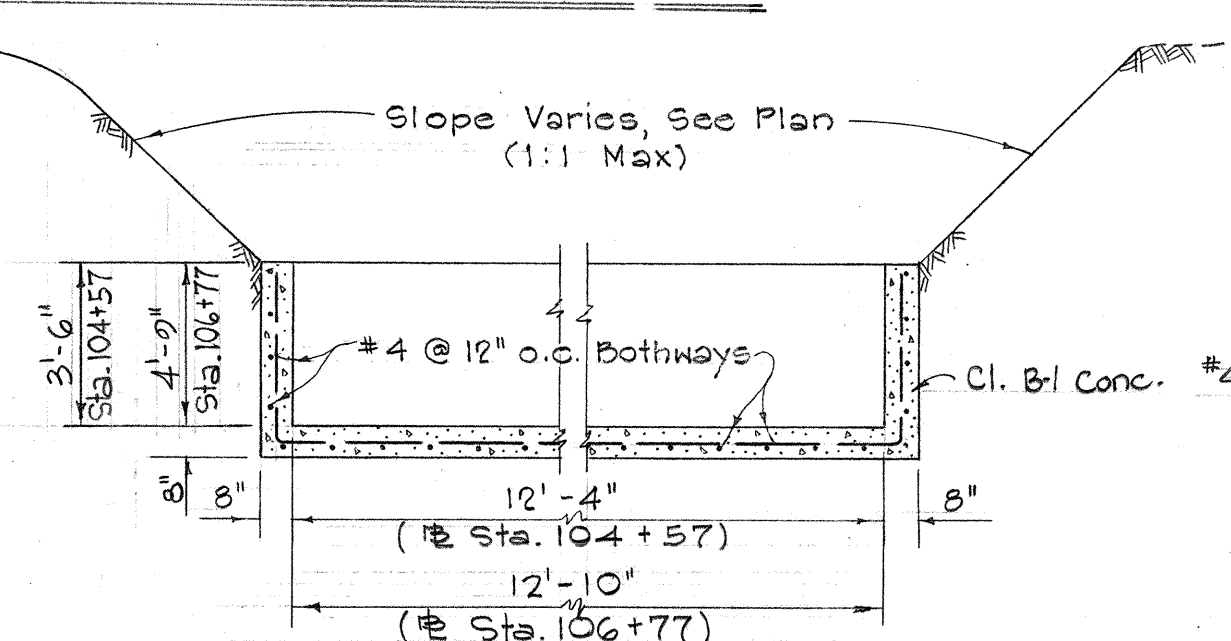
PLAN
2 CULVERTS @
STA. 106+77
Scale: 1"=10'-0"



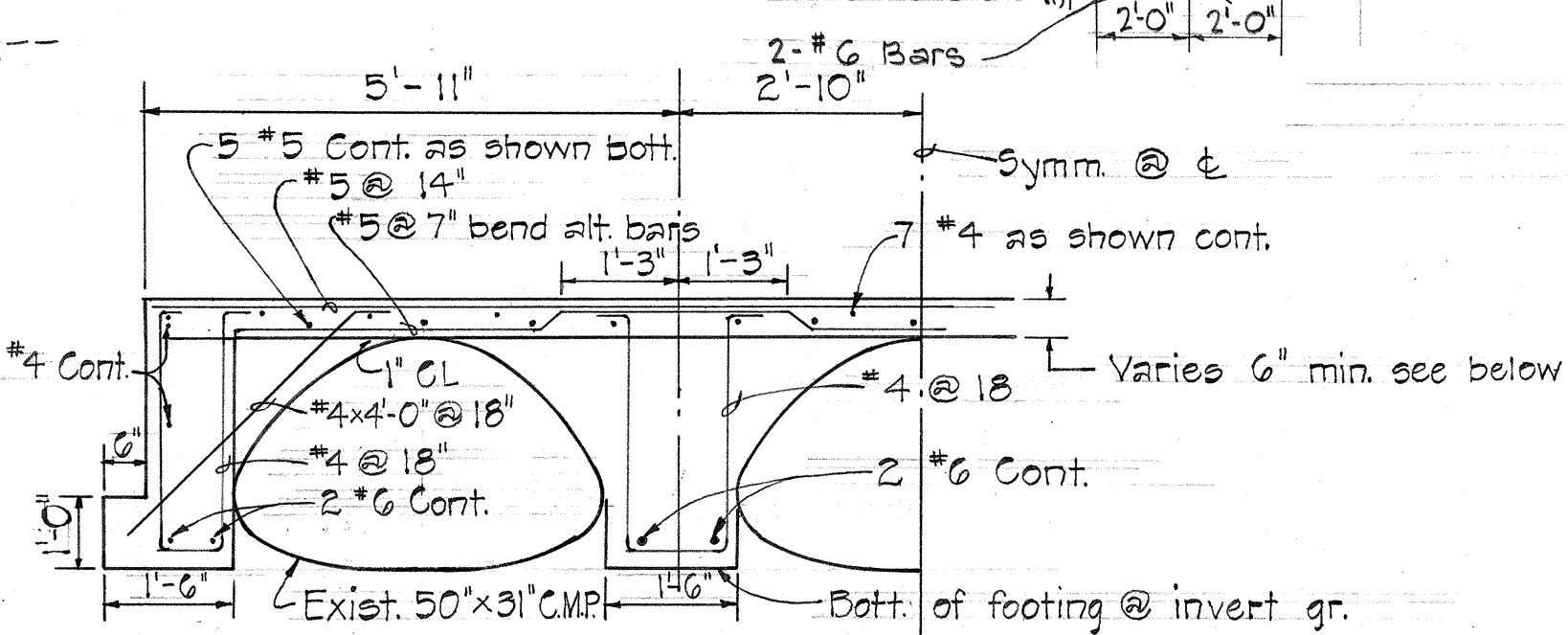
SECTION A
Scale: 1/4"=1'-0"



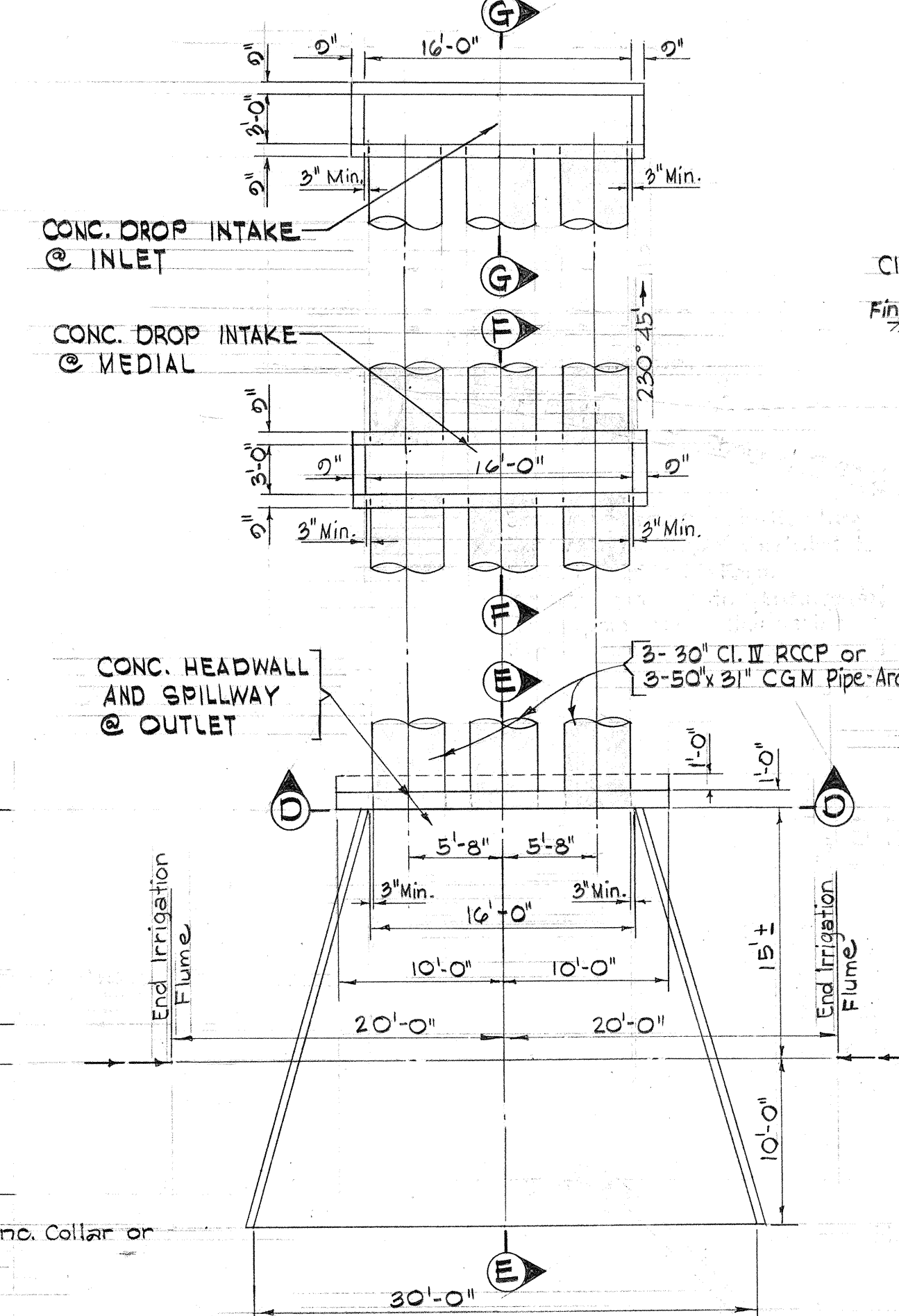
LONGITUDINAL SECTION AT C.M.P.



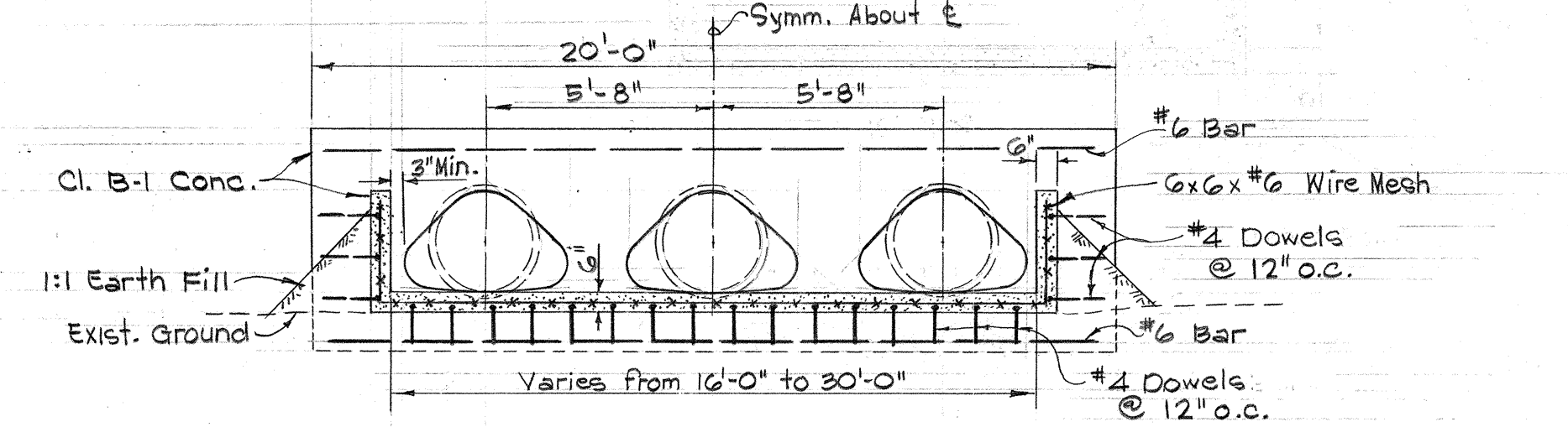
SECTION B
Scale: 1/4"=1'-0"



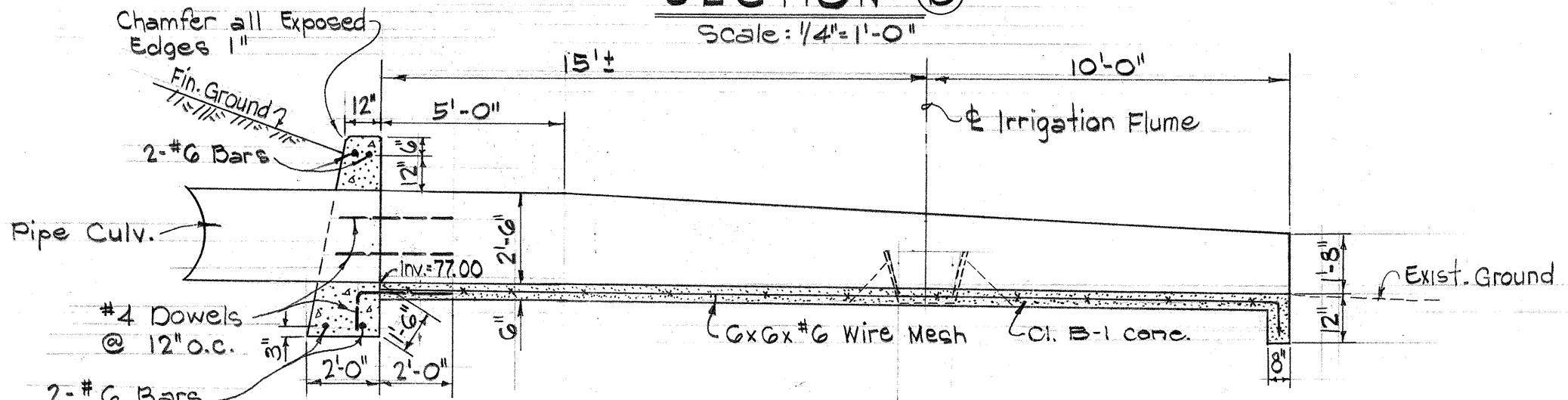
**C.C.O. #2, Nov. 17, 1966
REINF. CONC. JACKET**



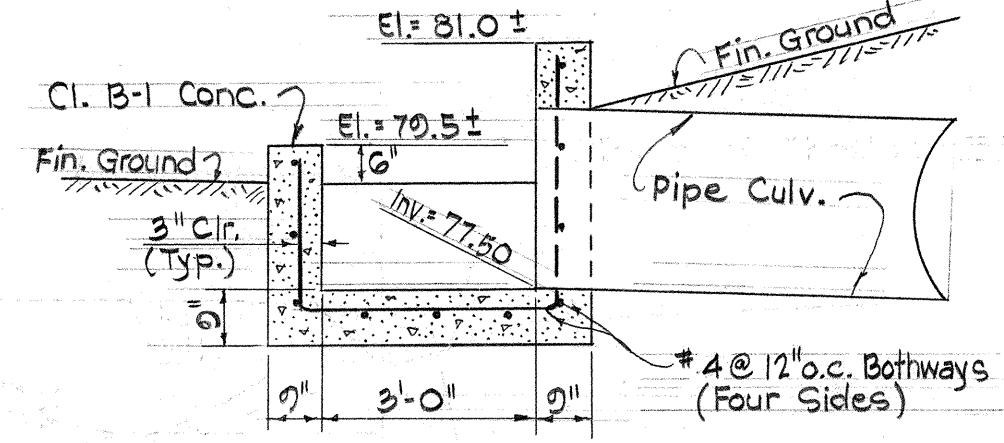
PLAN - 3 CULVERTS @ STA. 102+50 See C.C.O. #2 Below
Scale: 1/8"=1'-0"



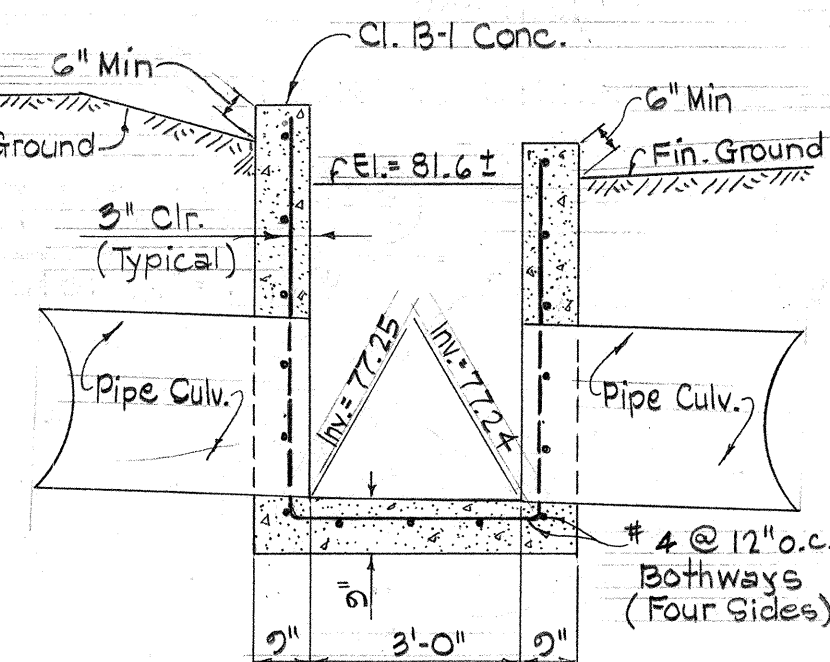
SECTION D
Scale: 1/4"=1'-0"



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



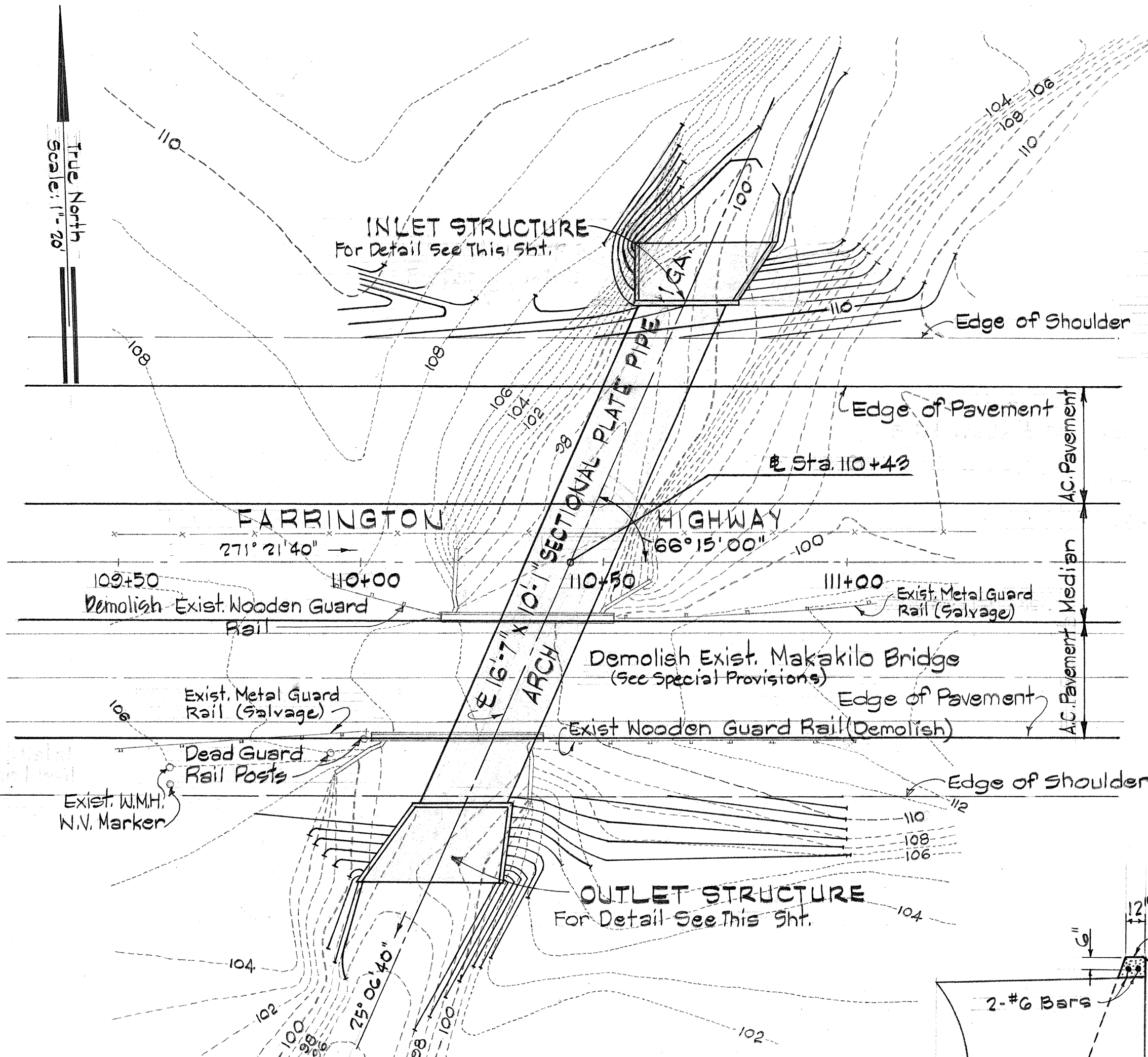
SECTION G
Scale: 3/8"=1'-0"



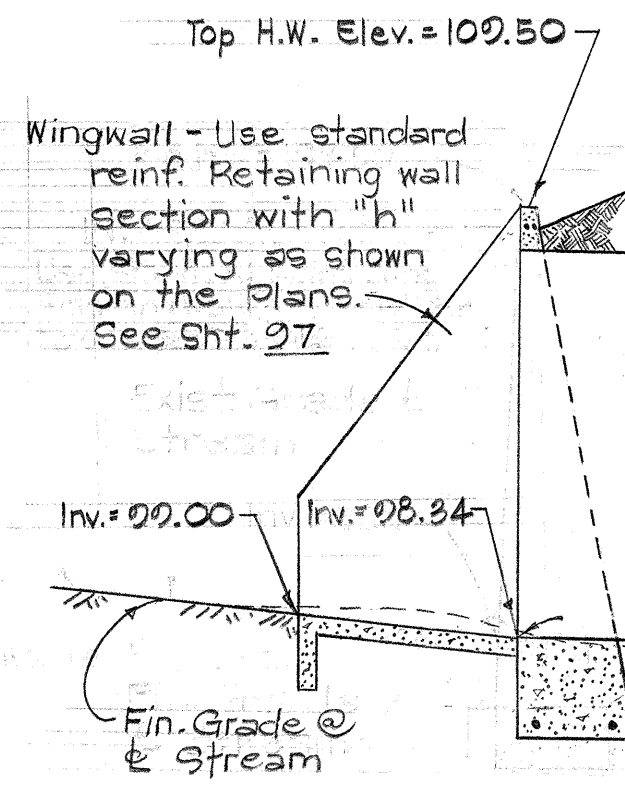
SECTION F
Scale: 3/8"=1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

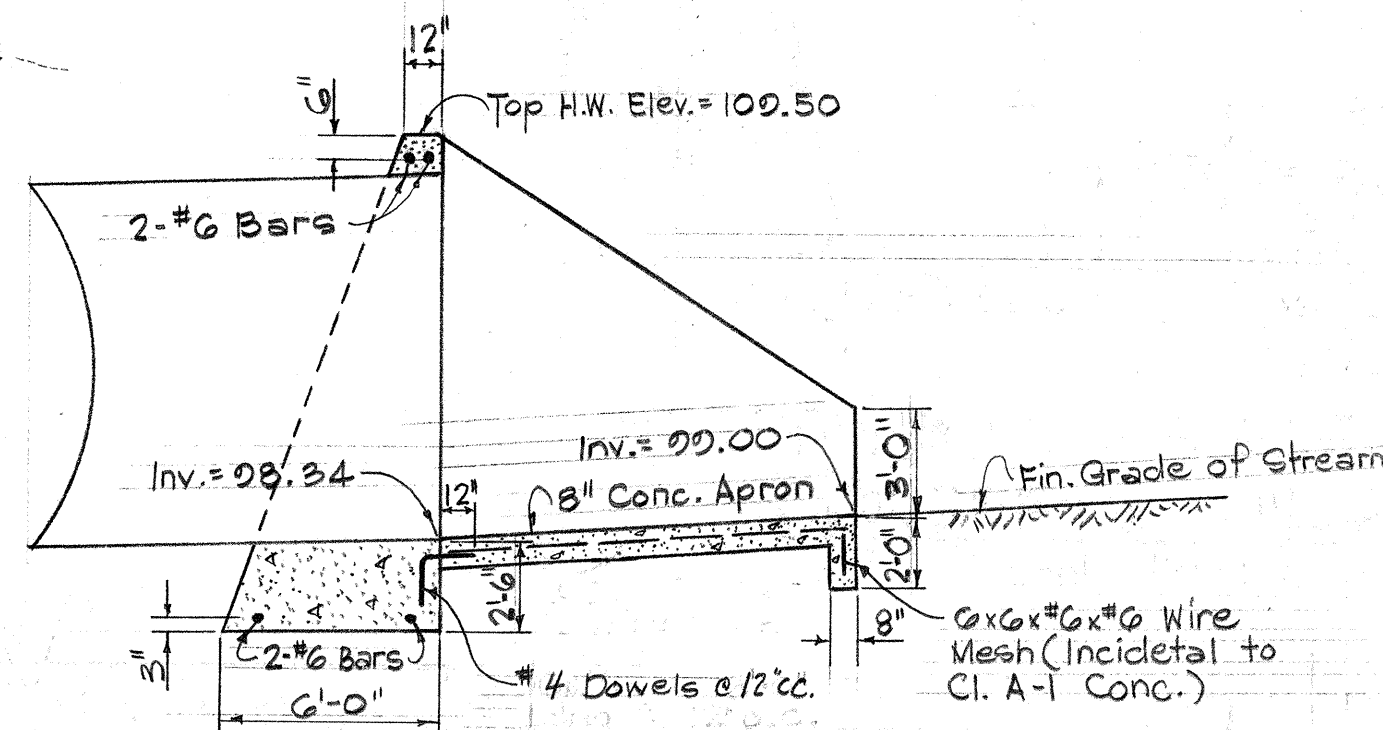
CULVERTS DETAILS
AT STATIONS
104+57, 106+77 & 102+50
FARRINGTON HWY. PROJ. NO. S-0900(3)
APRIL, 1965
SHEET No. 7 OF 18 SHEETS



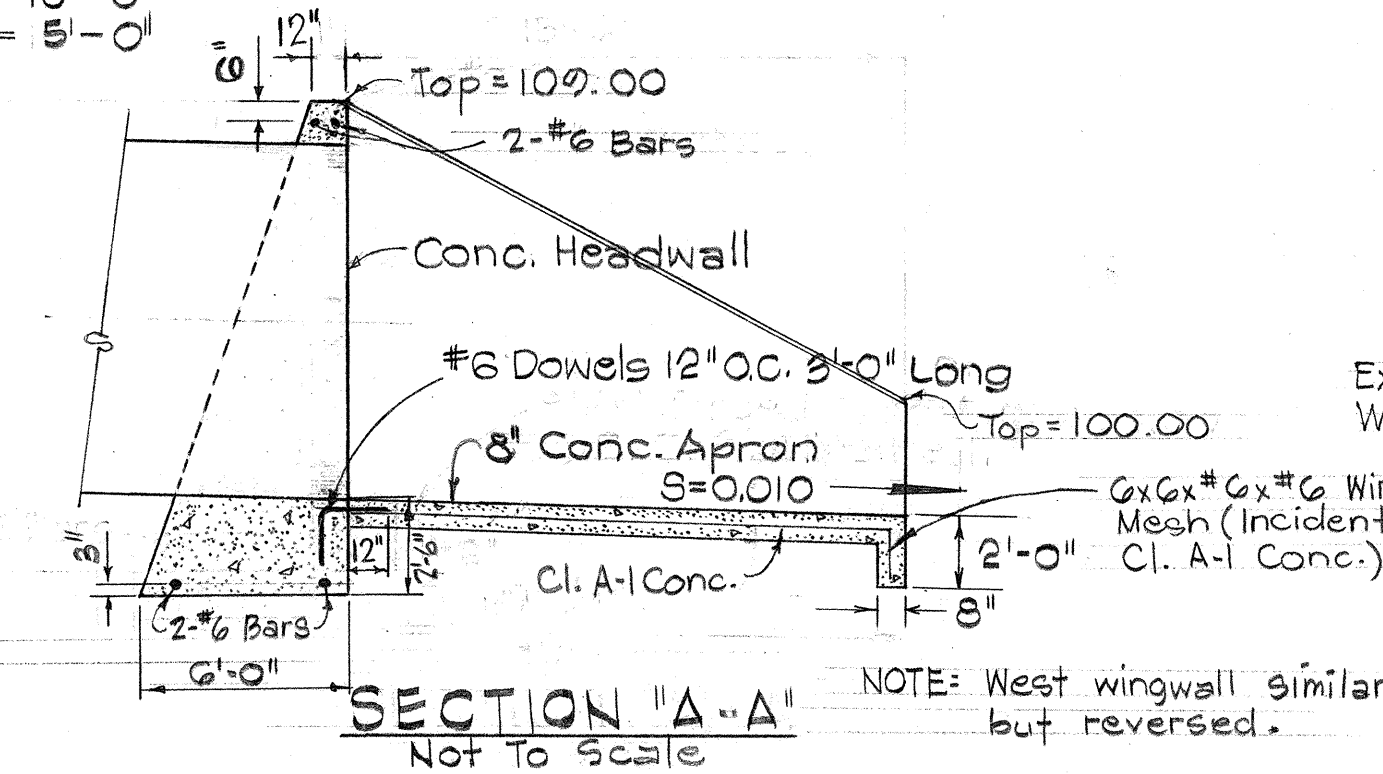
PLAN - 16'-7" x 10'-1" SECTIONAL PLATE PIPE ARCH @ STA. 110+43
Scale: 1" = 20'



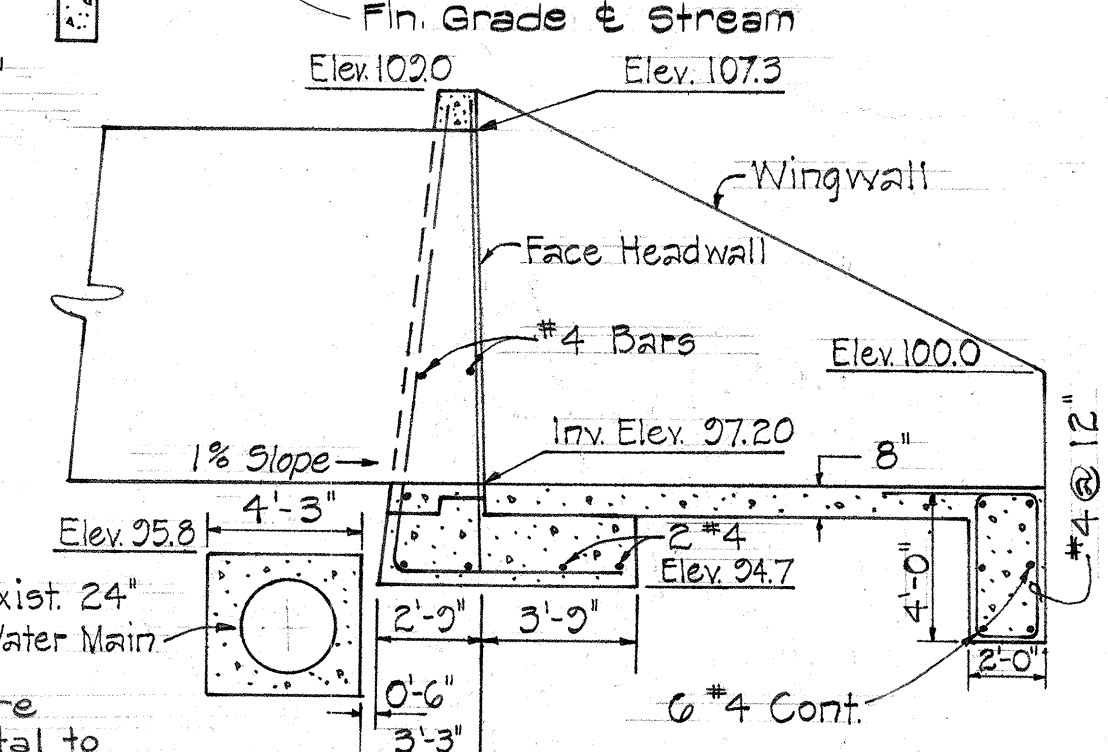
PROFILE - 16'-7" x 10'-1" SECTIONAL PLATE PIPE ARCH @ STA. 110+43
Scale: Horiz. 1" = 10'-0"
Vert. 1" = 5'-0"



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



SECTION "A-A"
Not to Scale

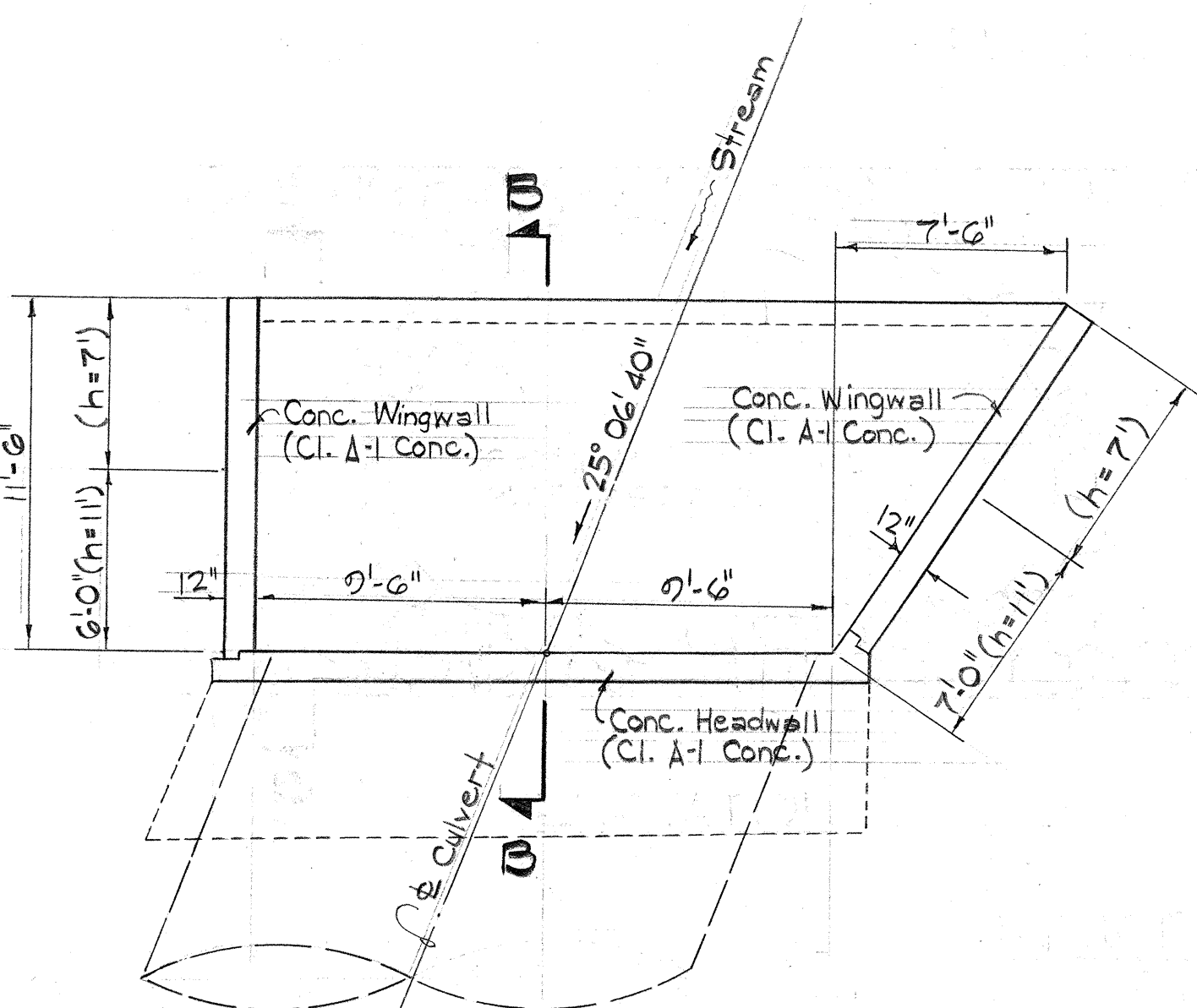


SECTION "A-A" (REVISED)
Not to Scale
CCO #20, June 20, 1967
REVISED CONC. HEADWALL

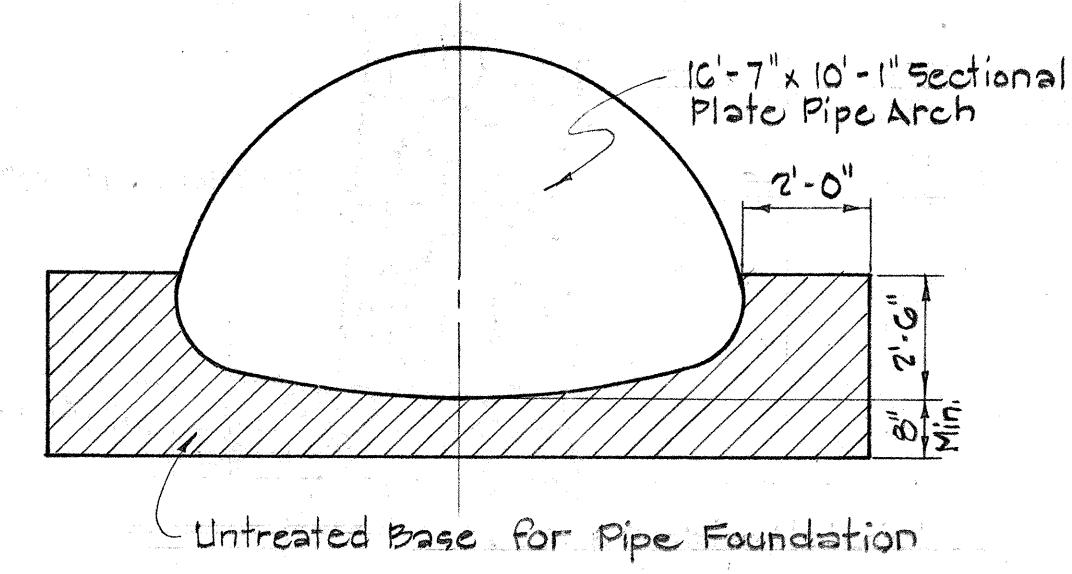
ESTIMATED QUANTITIES

16'-7" x 10'-1" Sectional Plate Pipe Arch (1 Gage)	114 L.F.
Class A-1 Concrete other than in Bridges (Lump Sum)	102 cy.
Reinforcing Steel other than in Bridges (Lump Sum)	2620 lbs.
Untreated Base for Pipe Foundation	53.7 +16 c.y.
Structure Excavation other than @ Bridges	245.2 99 c.y.
Ditch & Channel Exc.	65 c.y.

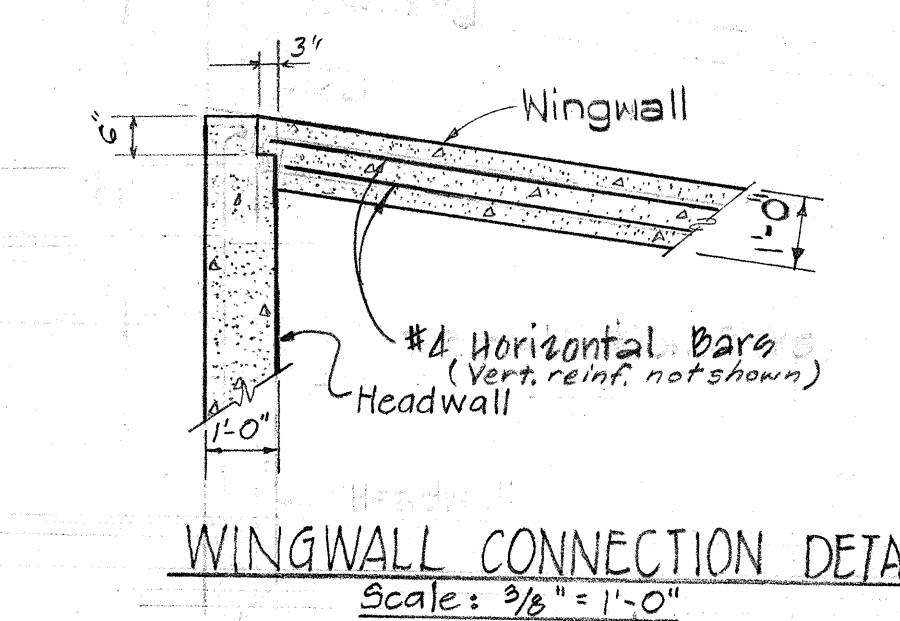
NOTE: Bot. of W/W fig. elev. to be same as bot. of headwall elev.



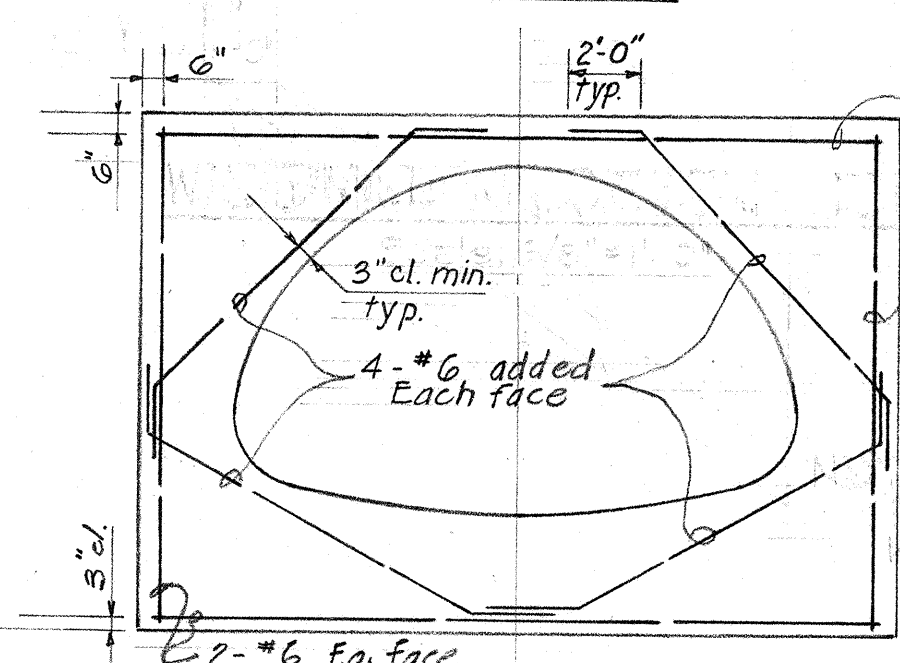
PLAN - INLET STRUCTURE
Scale: 3/16" = 1'-0"



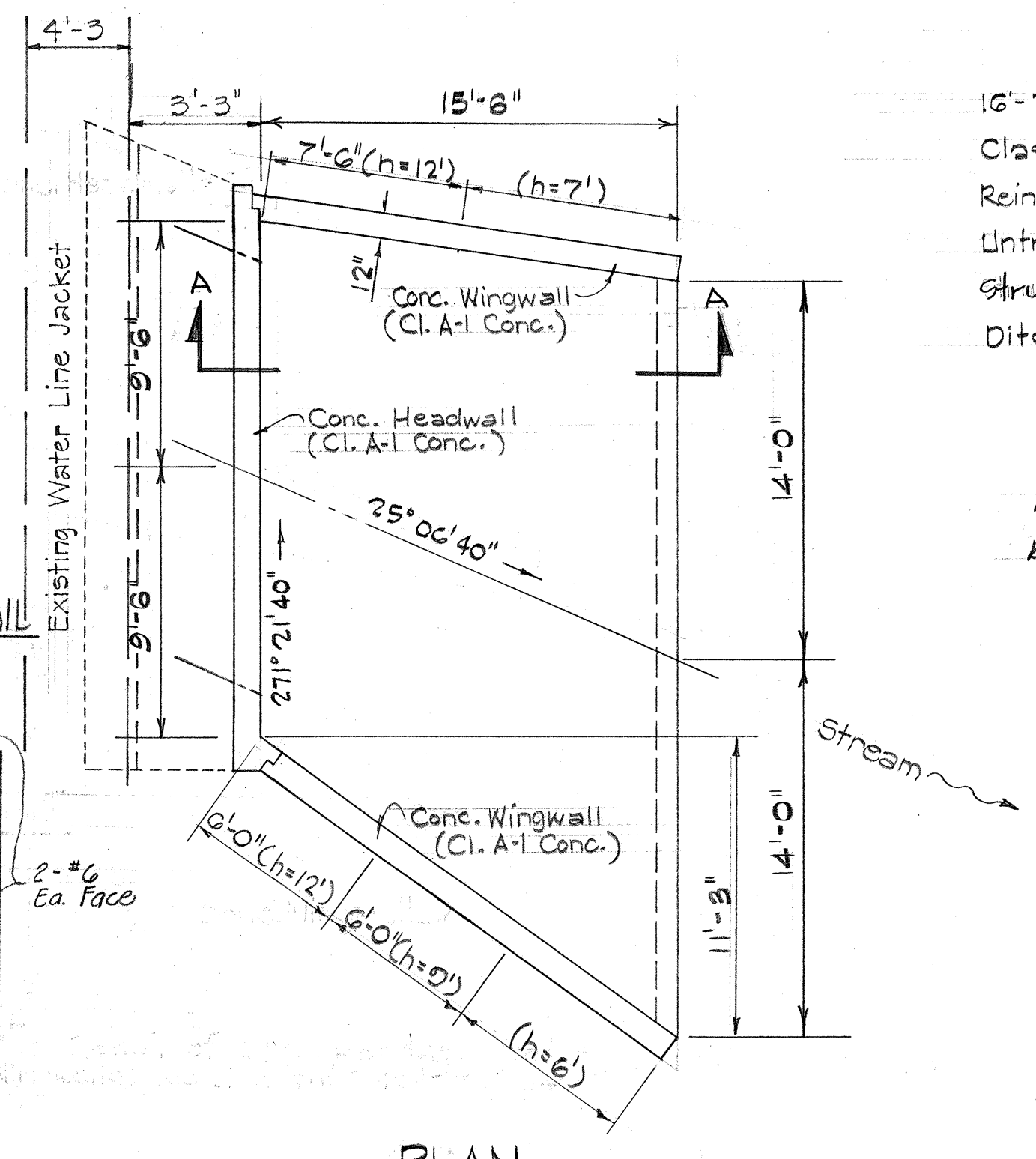
TYPICAL SECTION - PIPE ARCH
Not to Scale



WINGWALL CONNECTION DETAIL
Scale: 3/16" = 1'-0"



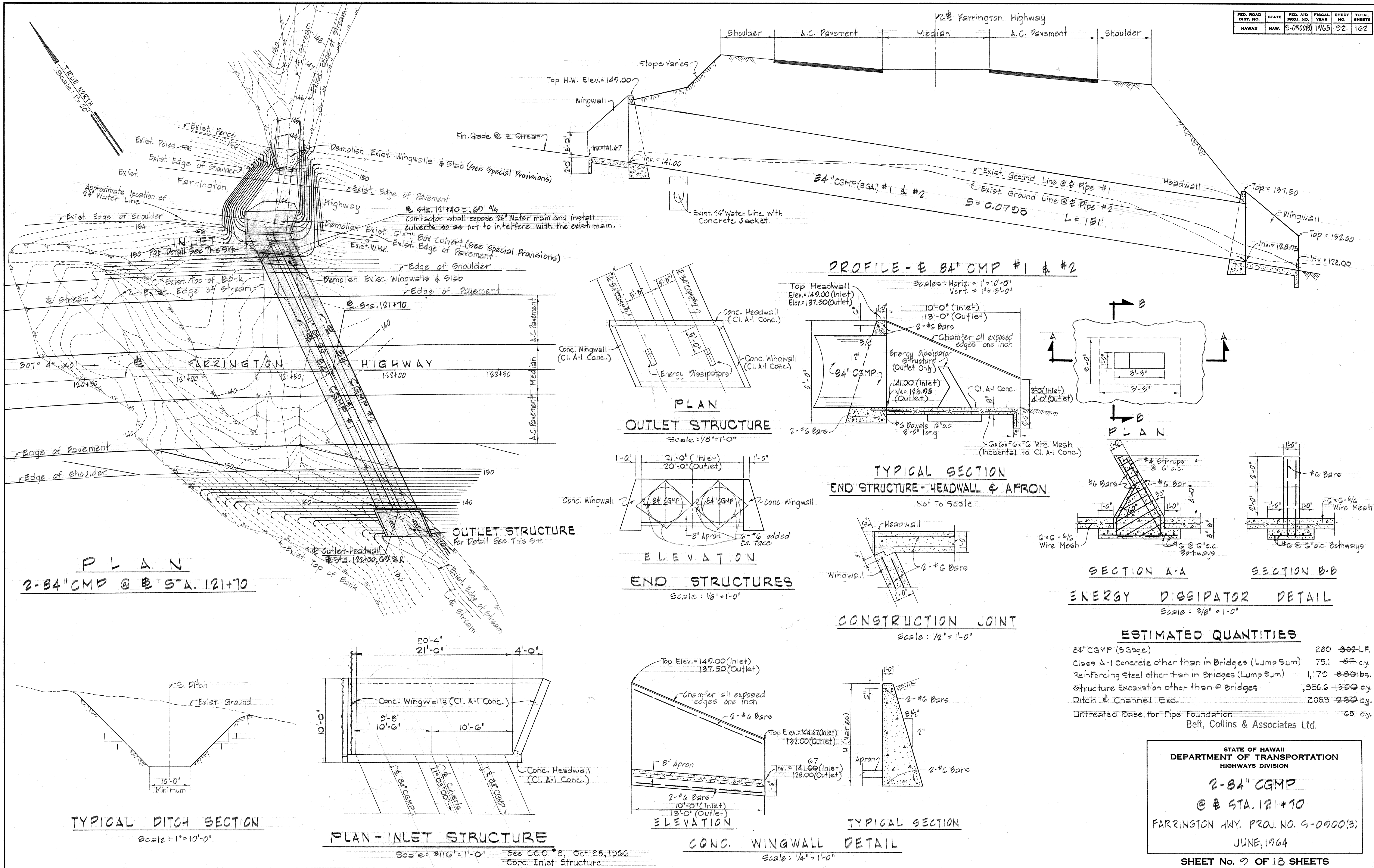
TYPICAL HEADWALL SECTION
Not to Scale



PLAN - OUTLET STRUCTURE
Scale: 3/16" = 1'-0"

Belt, Collins & Associates Ltd.

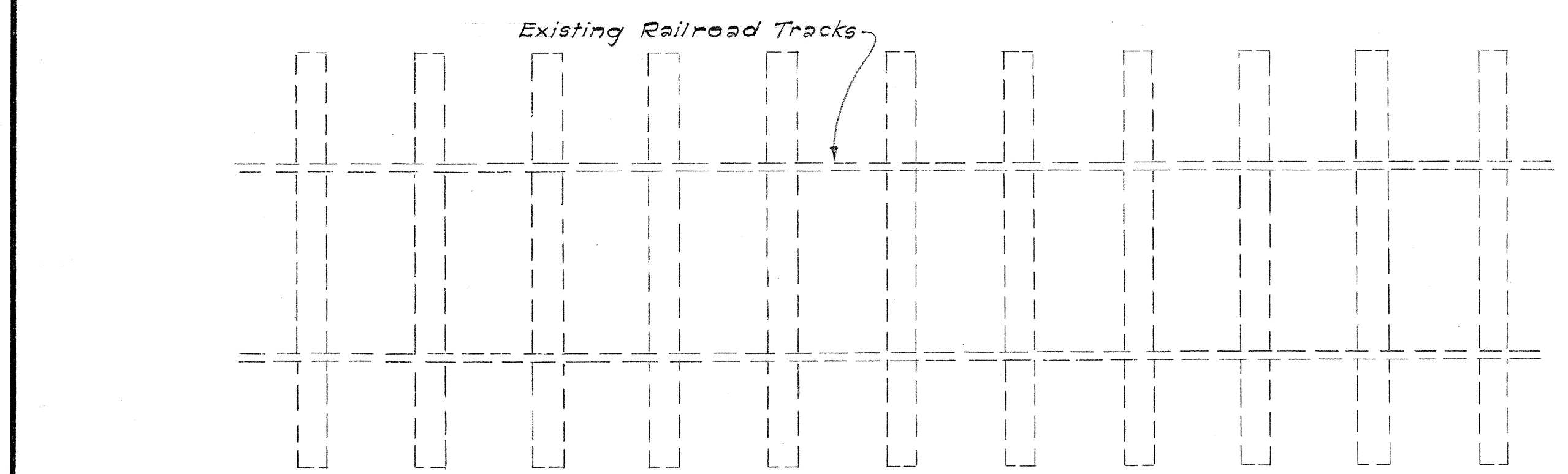
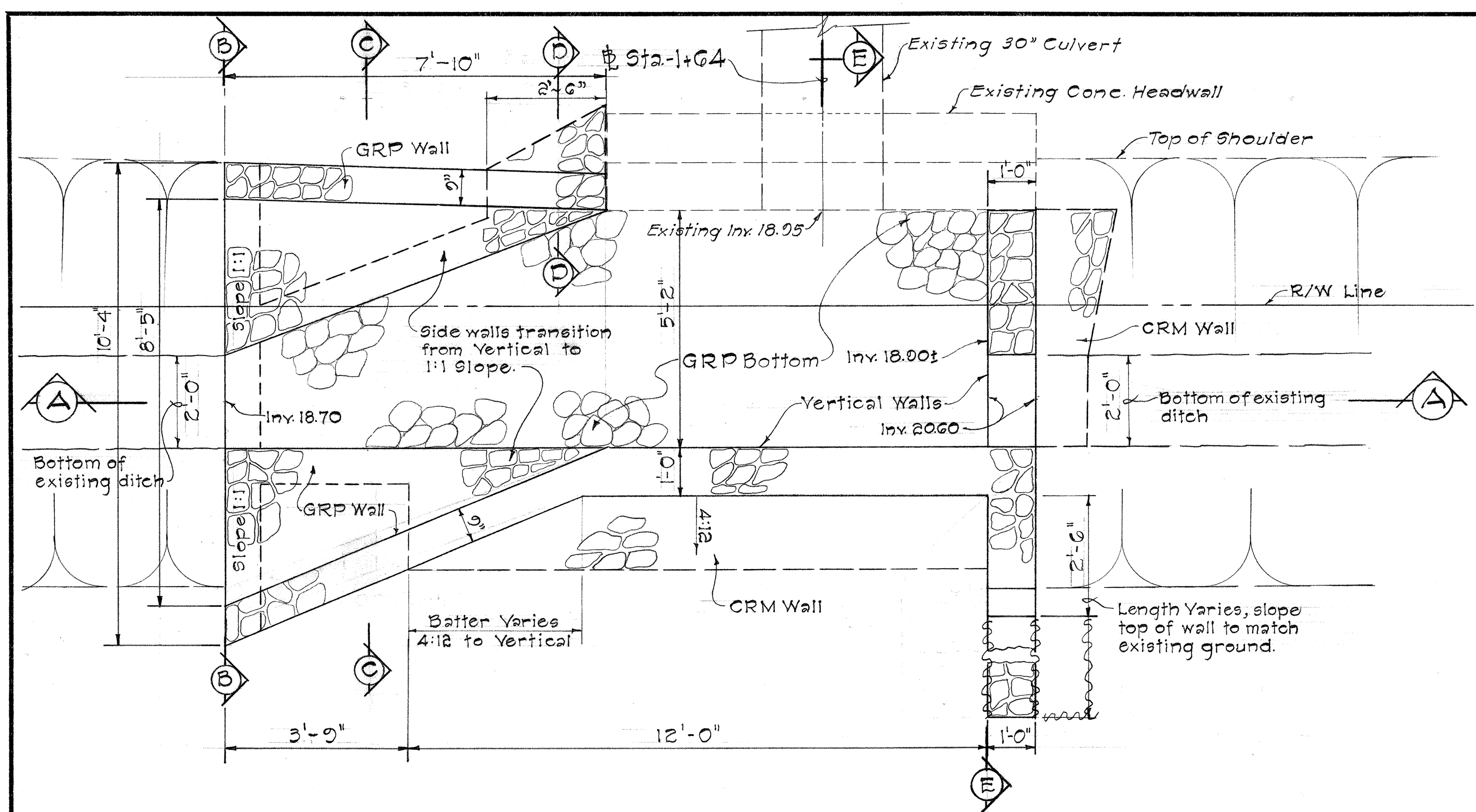
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
16'-7" x 10'-1" SECTIONAL PLATE PIPE ARCH @ STA. 110+43
FARRINGTON HWY. PROJ. NO. 5-0900(3)
JUNE, 1964
SHEET No. 8 OF 18 SHEETS



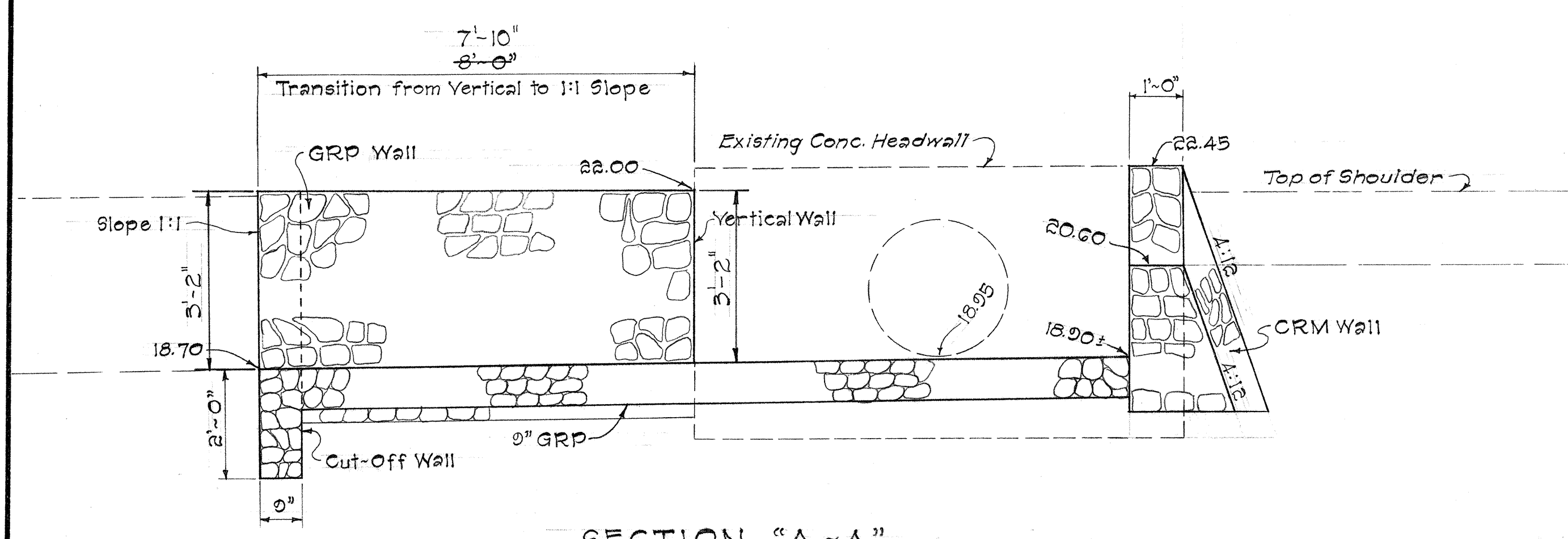
ORIGINAL PLAN
DESIGNED BY
NOTED BOOK
QUANTITIES BY
CHECKED BY

SURVEY PLOTTED BY
DATE

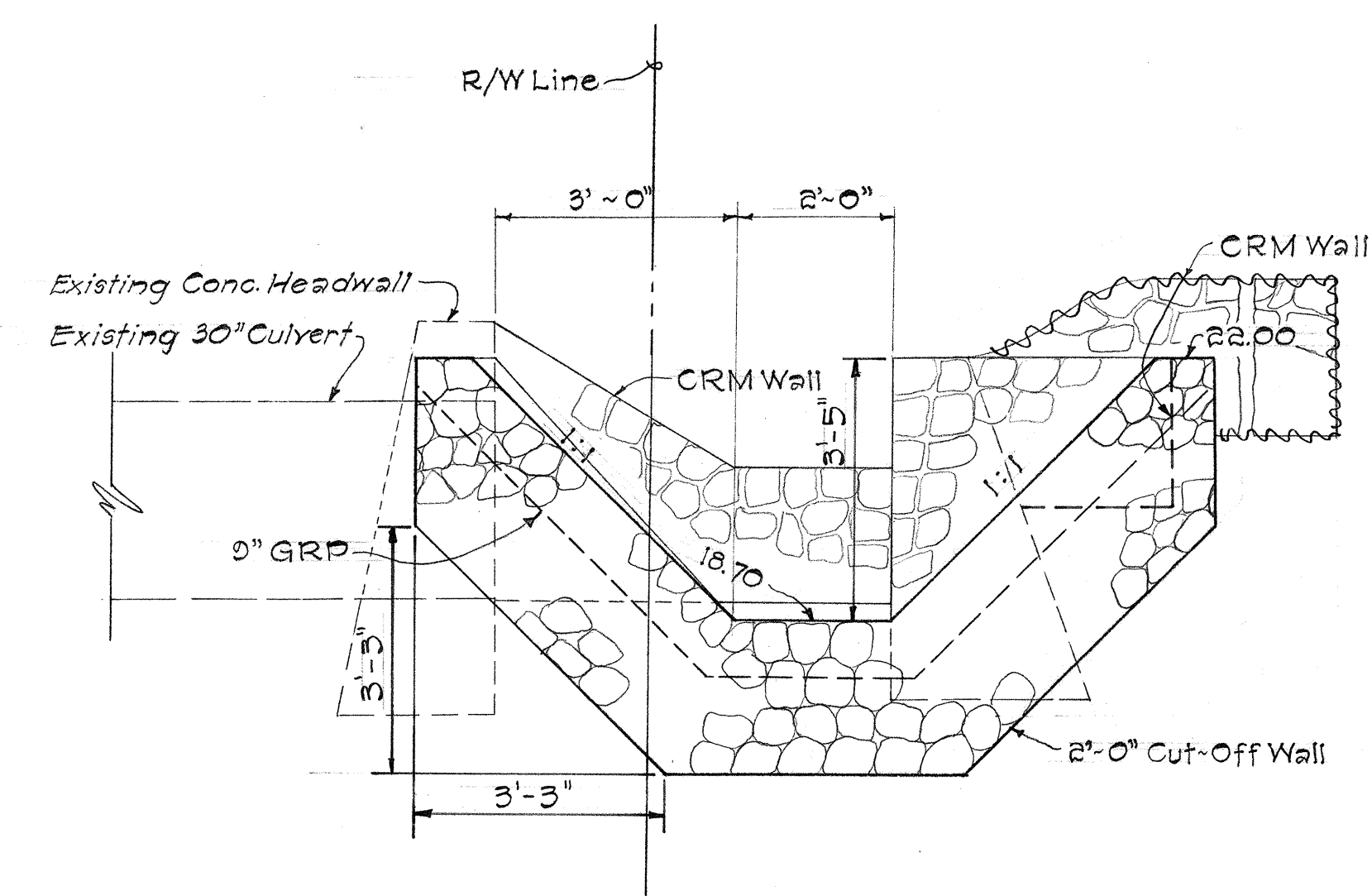
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	S-0900(3)	1968	C0945-1	162



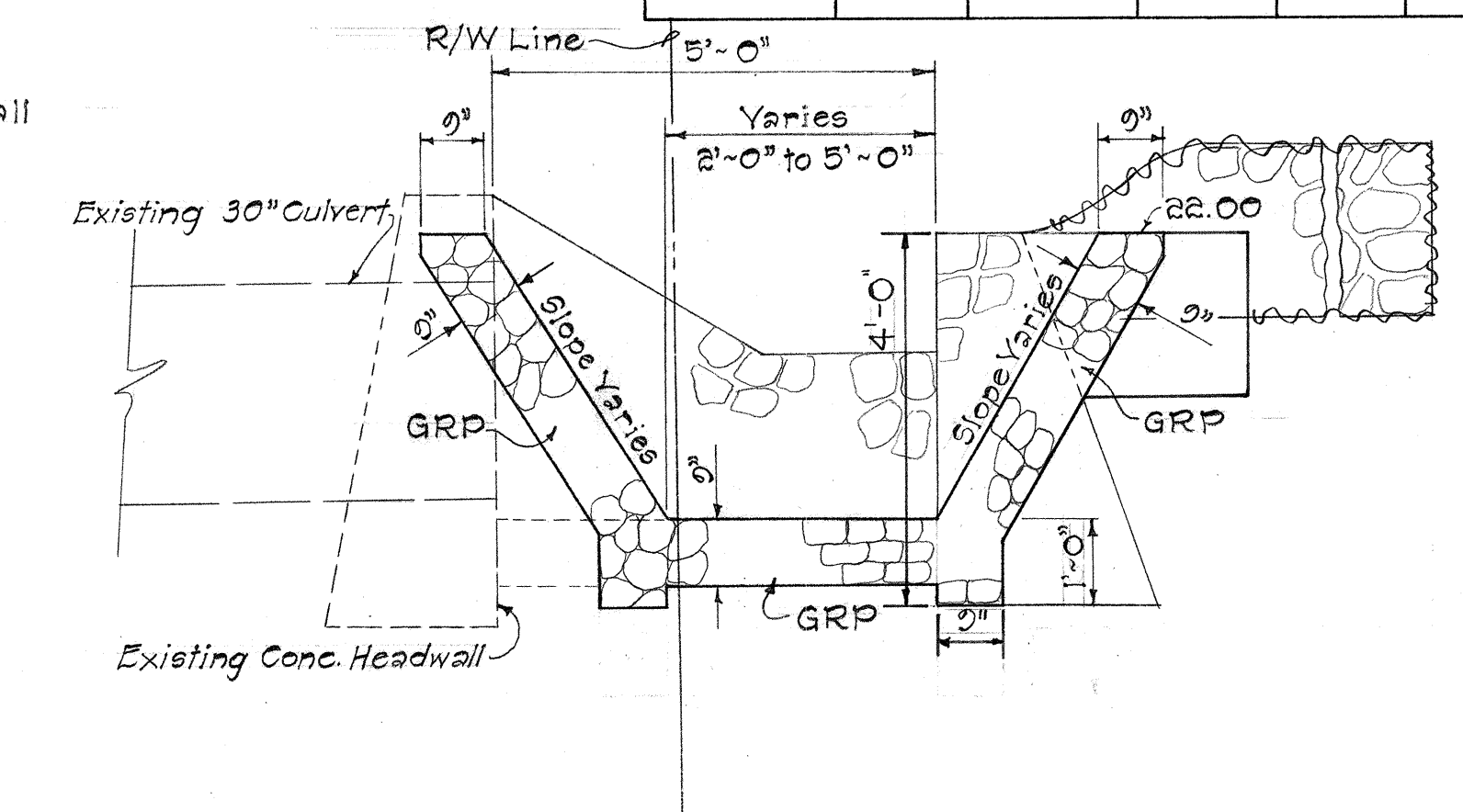
PLAN



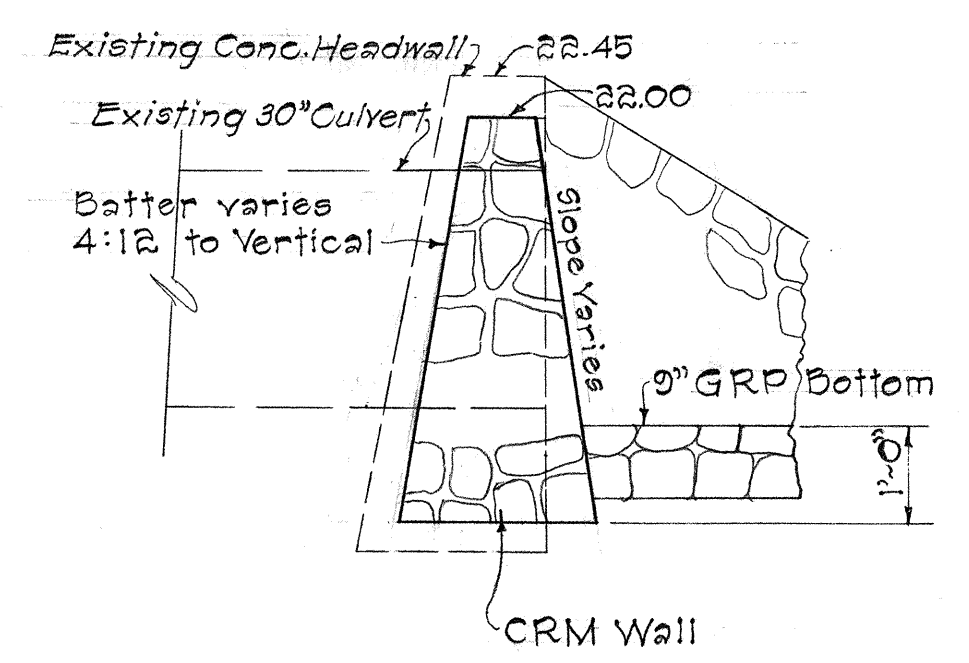
SECTION "A-A"



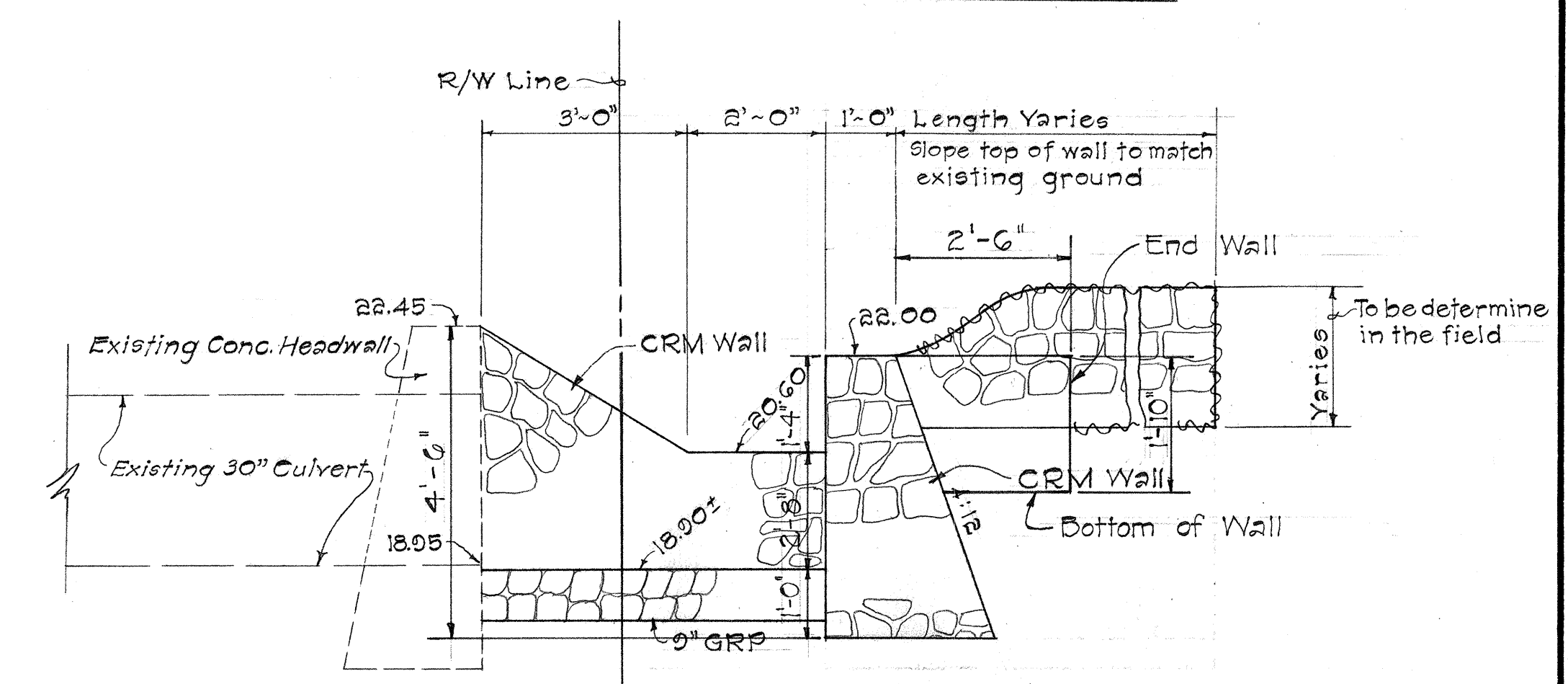
SECTION "B-B"



SECTION "C-C"

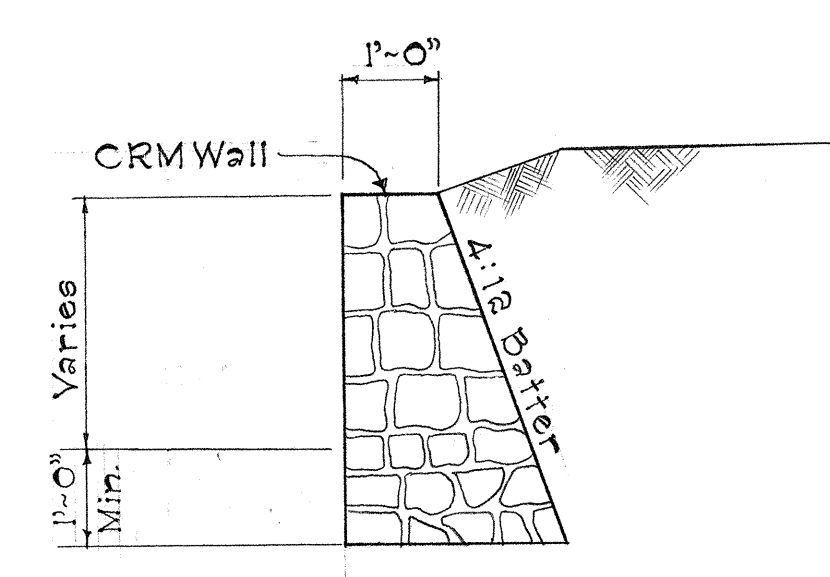


SECTION "D-D"



SECTION "E-E"

QUANTITIES		
ESTIMATED		A5-BUILT
GRP	3.7 cy	3.5 cy
CRM	6.0 cy	4.7 cy
Structural Exc.	13.0 cy	11.9 cy



TYPICAL SECTION OF CRM WALL

CONTRACT CHANGE ORDER NO. 29
DATED: APRIL 30, 1968

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

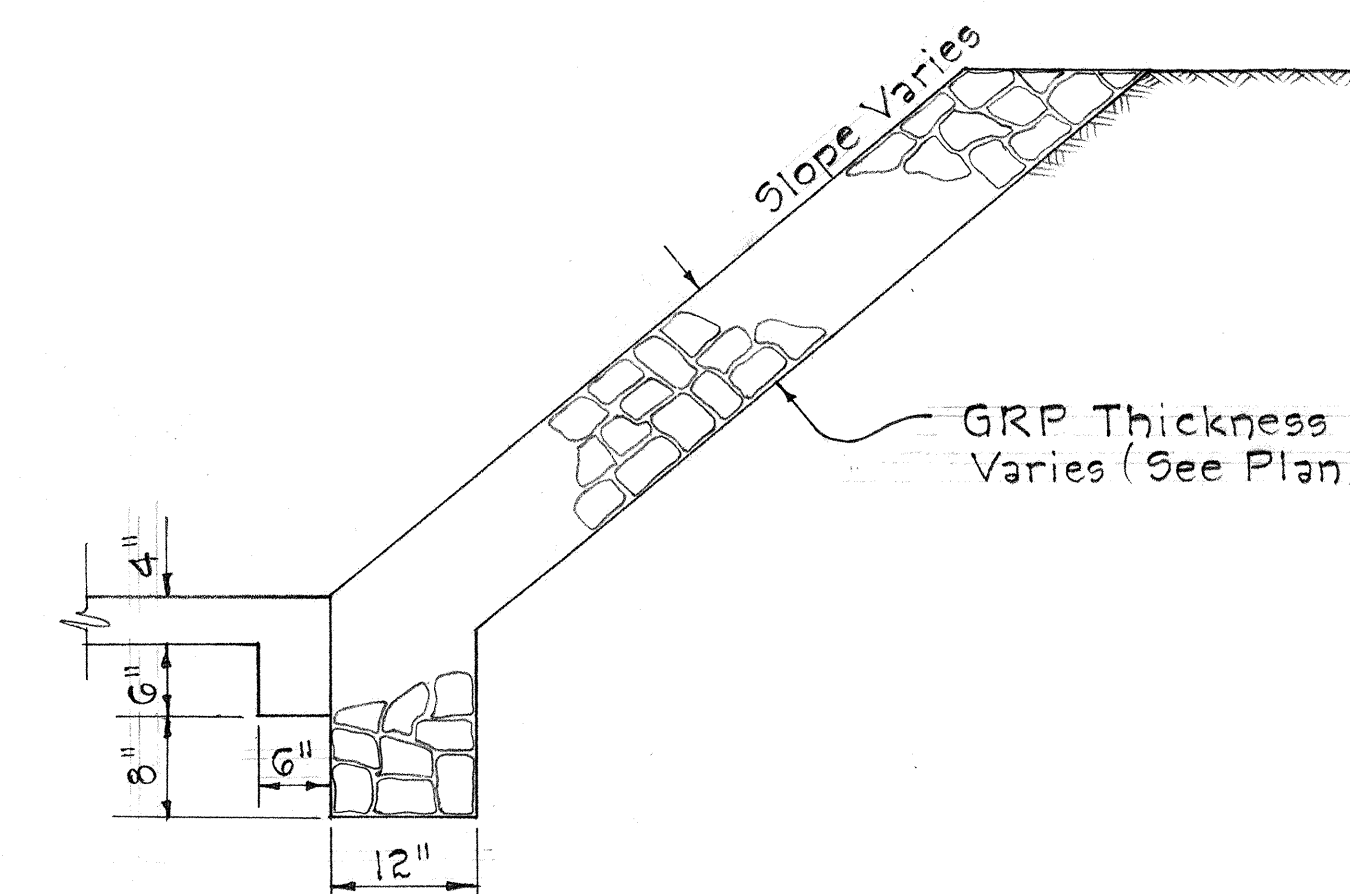
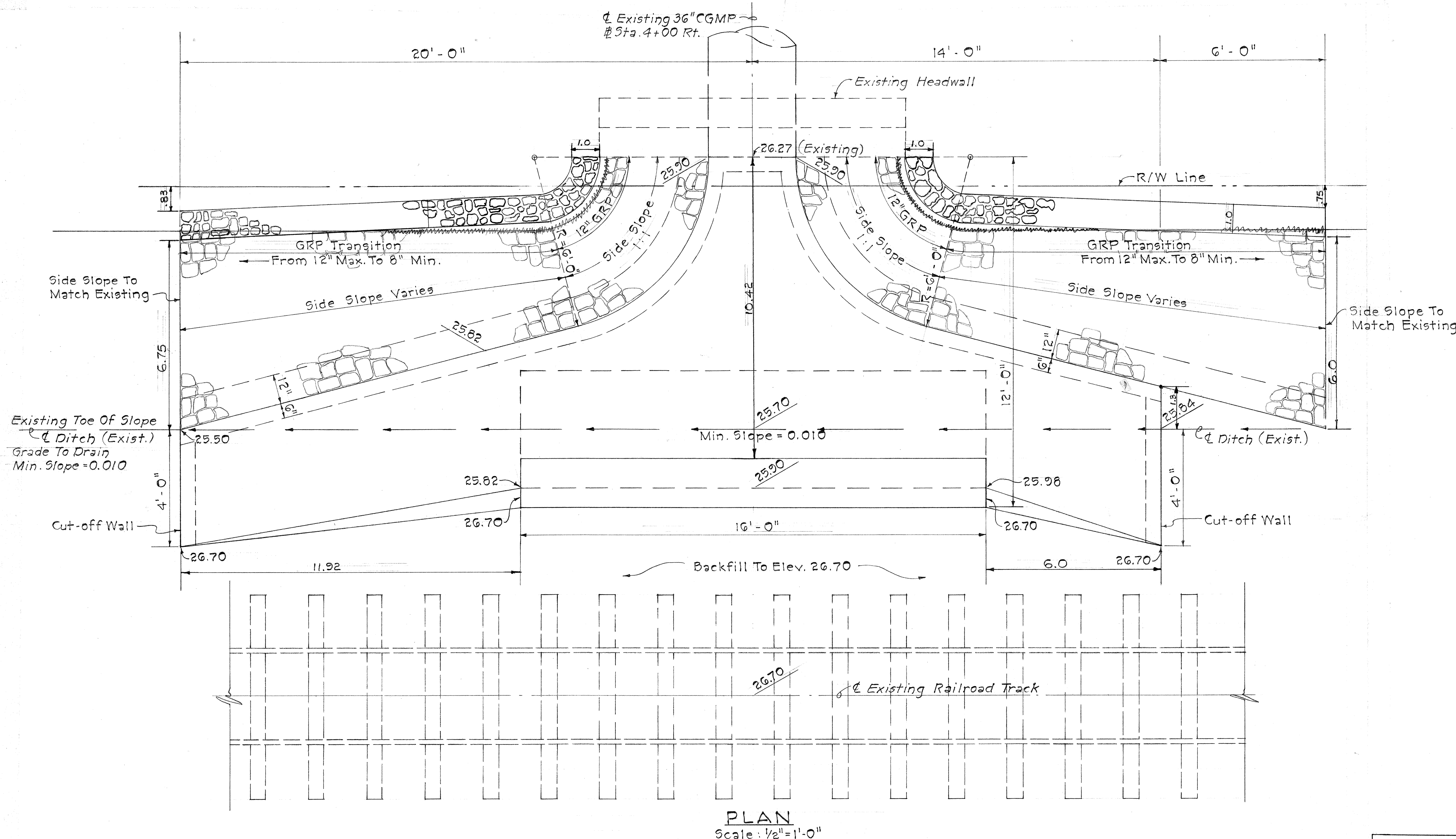
DRAINAGE DETAILS
@ STA. -1+64 RT.
FARRINGTON HIGHWAY
BARBERS POINT TO PILIOKOI GULCH
Proj. No. S-0900 (3)

Scale: 1/2" = 1'-0"
Date: April, 1968

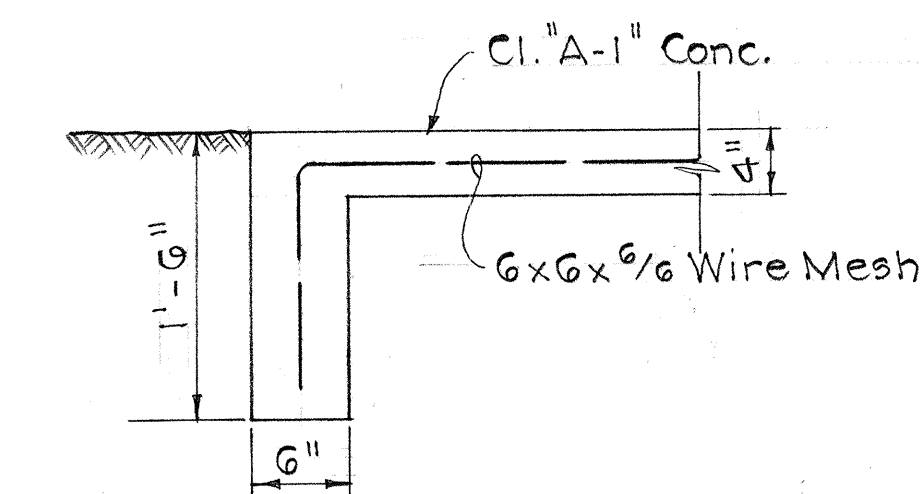
SHEET NO. OF SHEETS

C0945-1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	5-0900(3)	1968	C0945-2	162

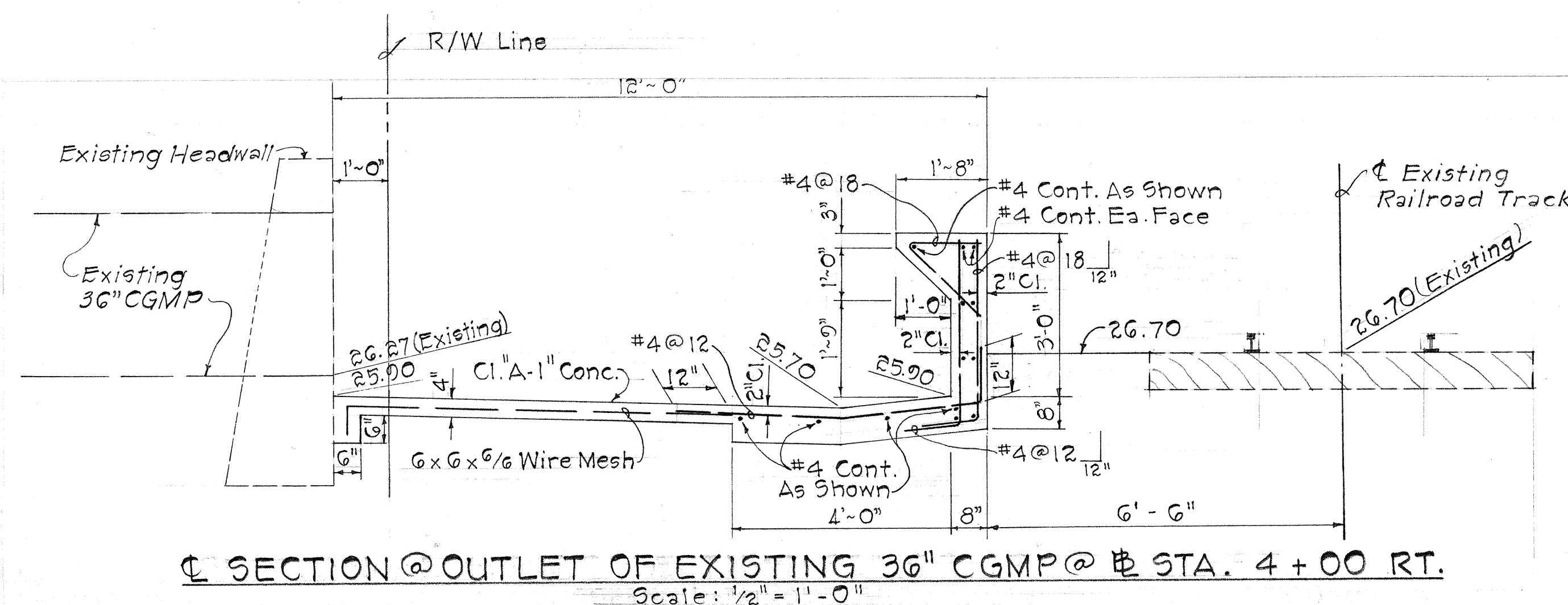


TYPICAL GRP SECTION
Scale: 3/4" = 1'-0"



TYPICAL SECTION OF CUT-OFF WALL
Scale: 1" = 1'-0"

ESTIMATED QUANTITIES	AS BUILT QUANTITIES
Class "A-1" Concrete = 6 C.Y.	6.3 C.Y.
Reinforcing Steel = 420 Lbs.	304.84 Lbs.
GRP = 11 C.Y.	10.6 C.Y.
Structure Exc. = 7 C.Y.	13.3 C.Y.

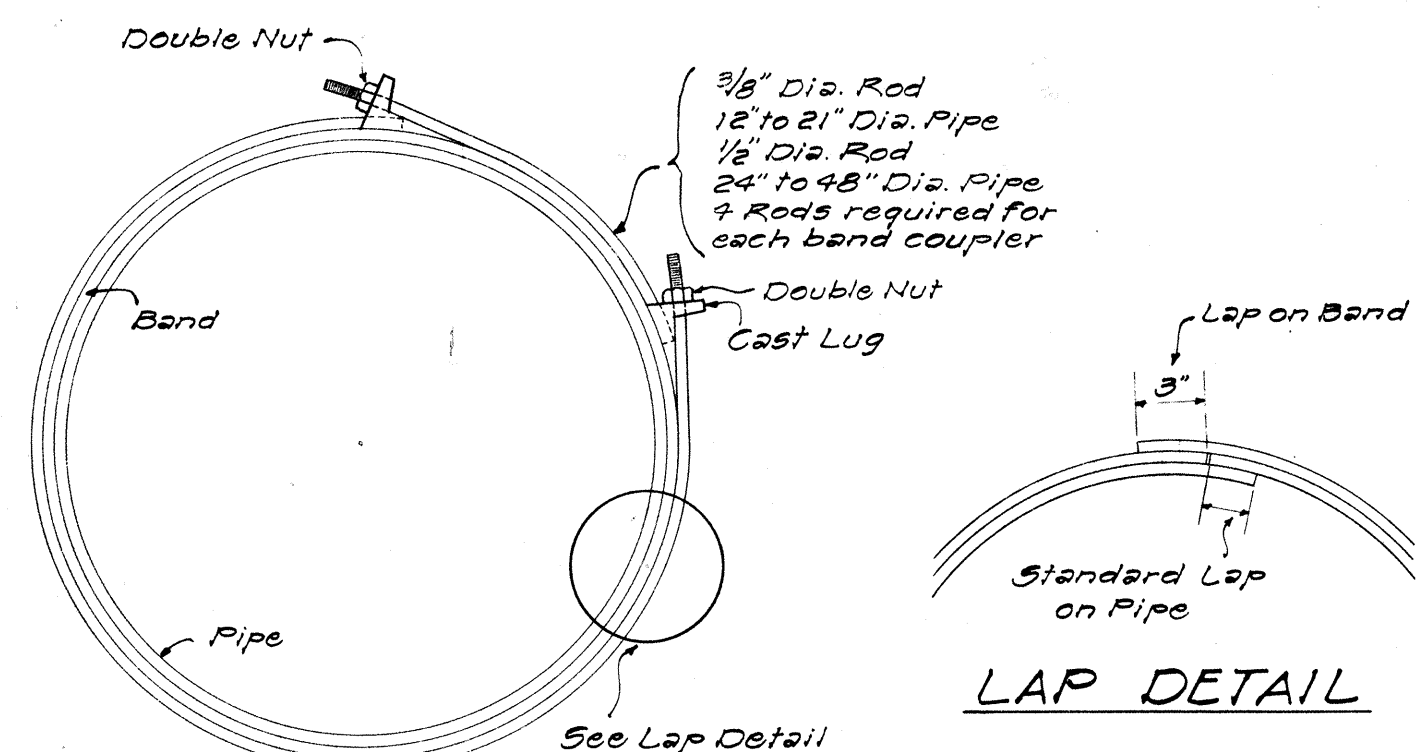


CONTRACT CHANGE ORDER NO 28
DATED APRIL 5, 1968

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
FARRINGTON HIGHWAY
BARBERS POINT TO PILIOKOI GULCH
Proj. No. 5-0900 (3)
Scale: As Shown Date: Feb., 1968
SHEET NO. OF SHEETS

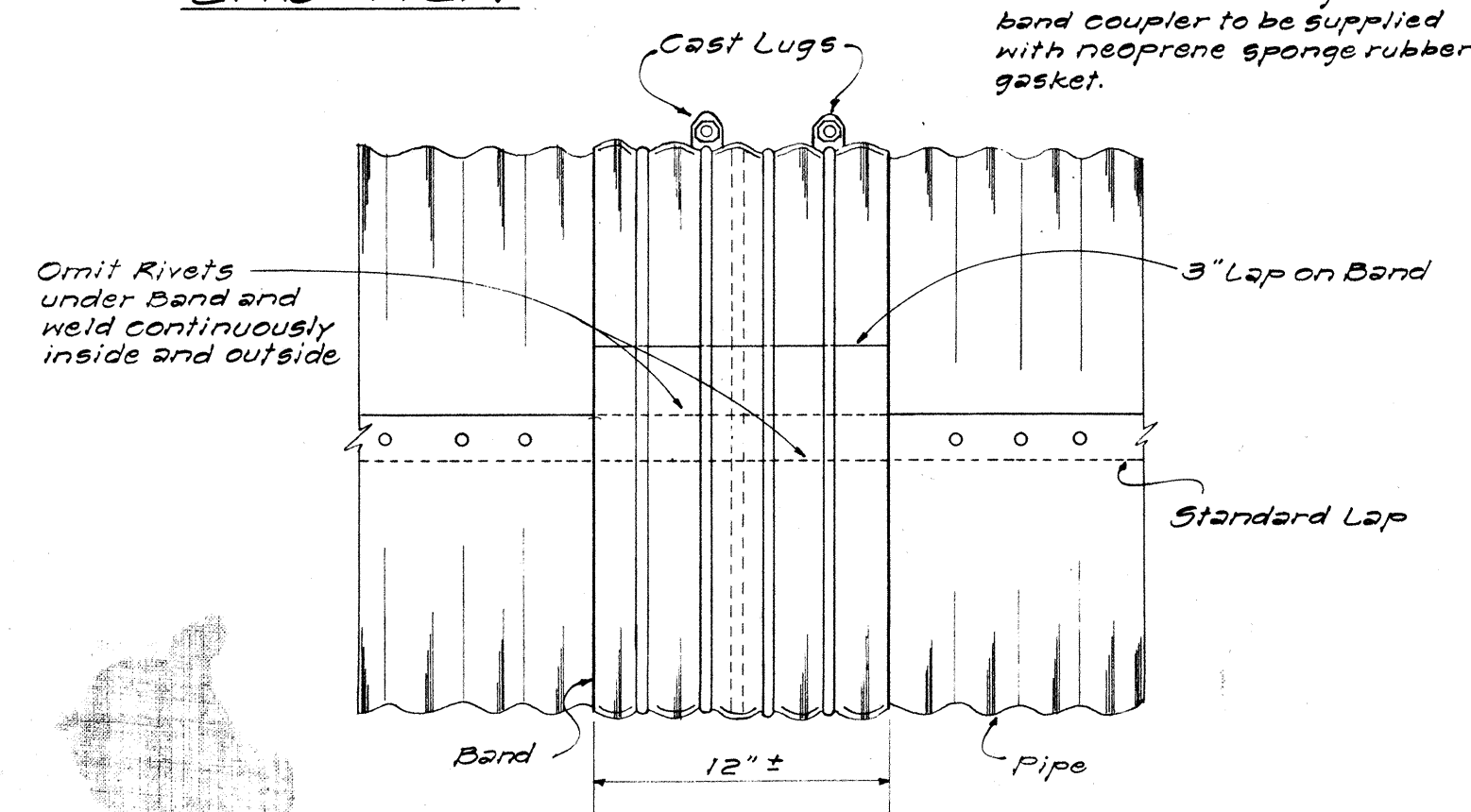
C0945-2

DATE	_____
DESIGNED BY	_____
CHECKED BY	_____
NO.	_____



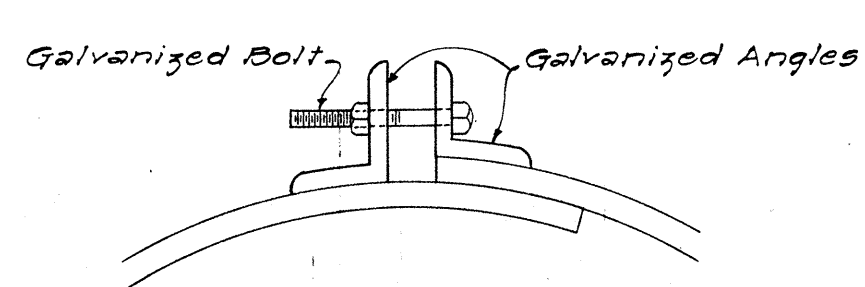
END VIEW

LAP DETAIL

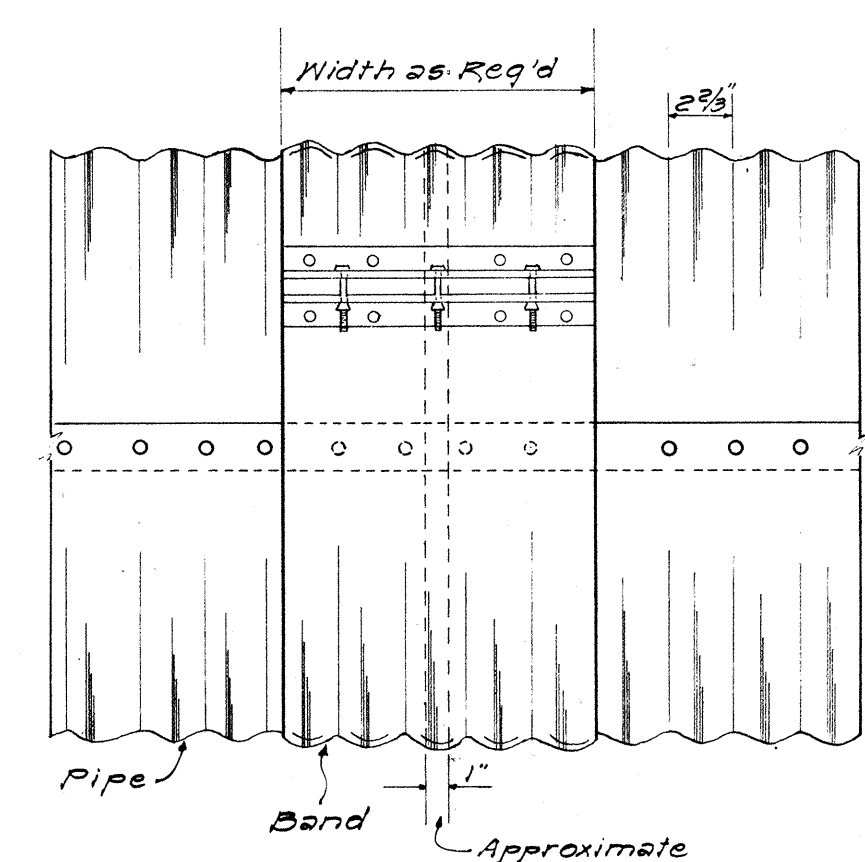


SIDE VIEW

DETAIL OF WATERTIGHT BAND COUPLER
NOT TO SCALE

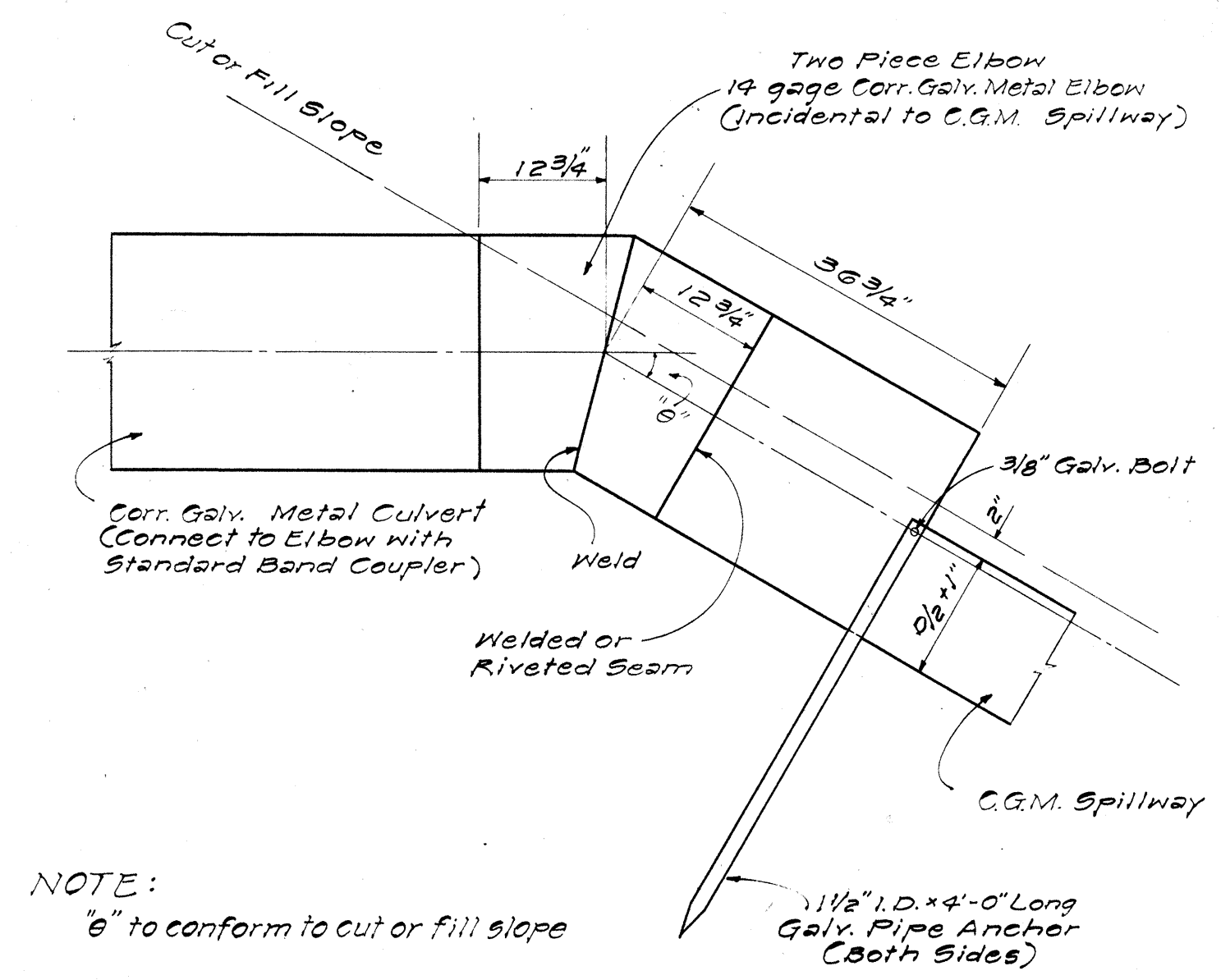


BAND DETAIL



SIDE VIEW

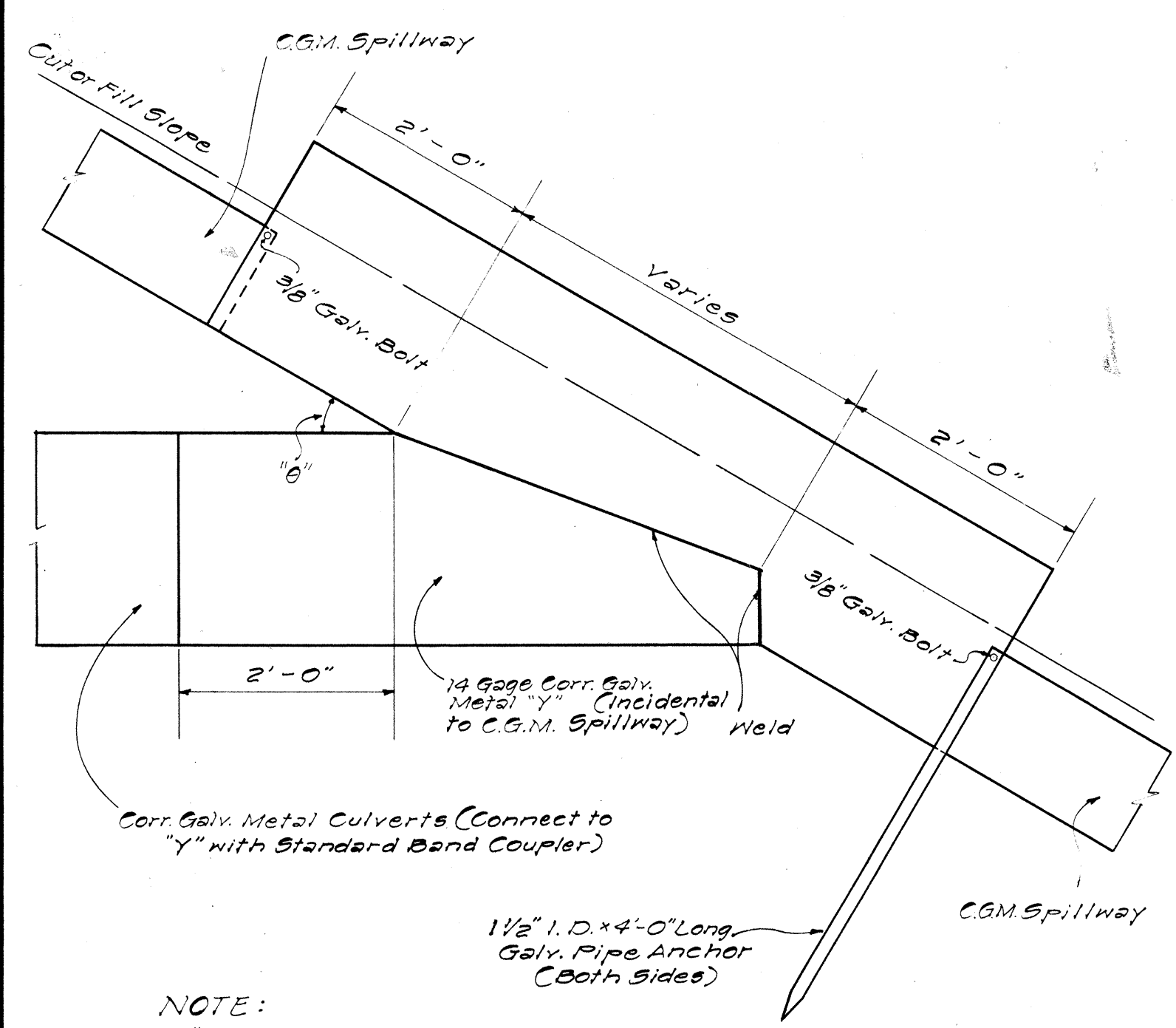
DETAIL OF STANDARD BAND COUPLER
NOT TO SCALE



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

DETAIL OF CULVERT
TO SPILLWAY CONNECTION

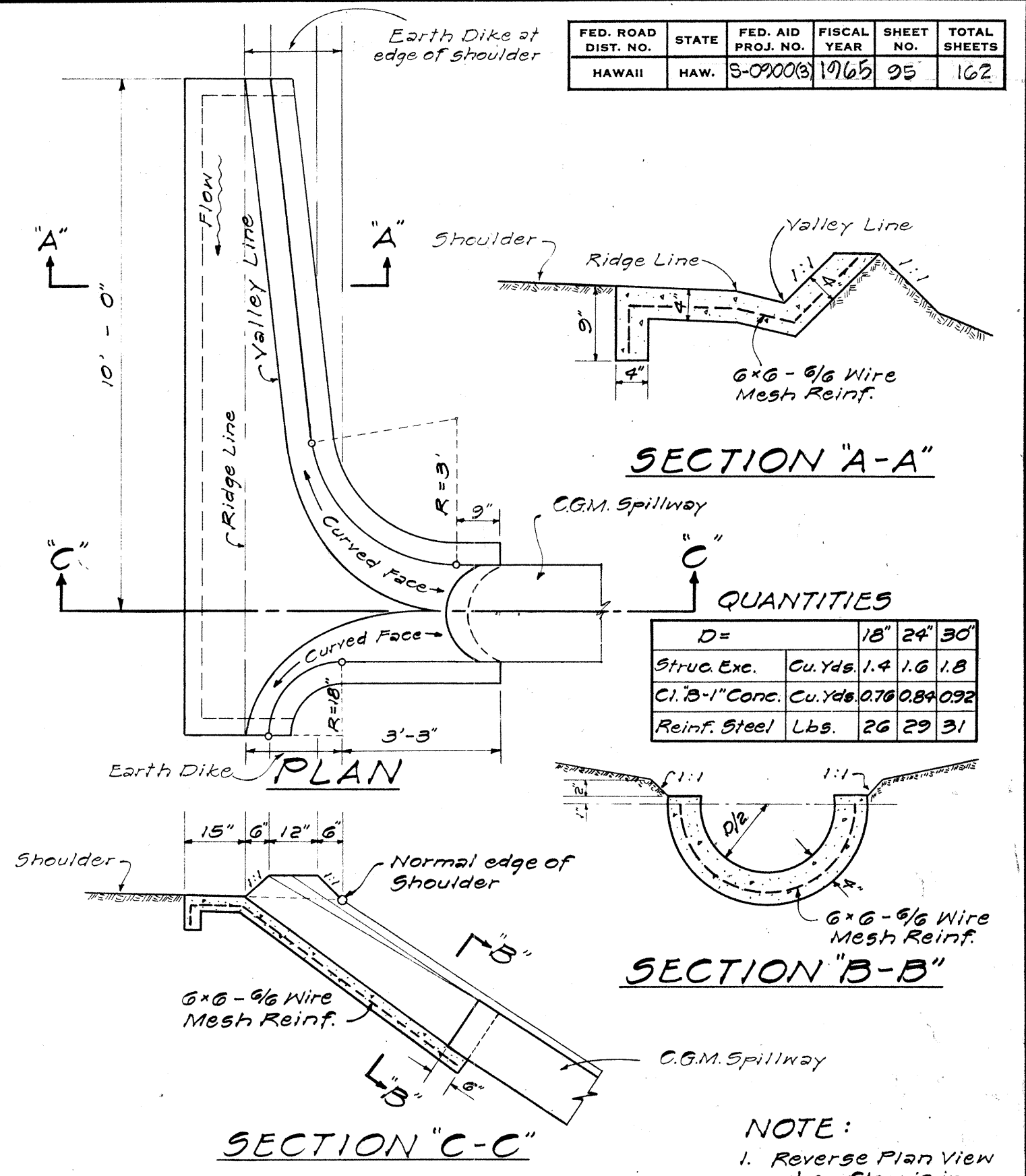
NOT TO SCALE



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

DETAIL OF CULVERT
TO SPILLWAY "Y" CONNECTION

NOT TO SCALE



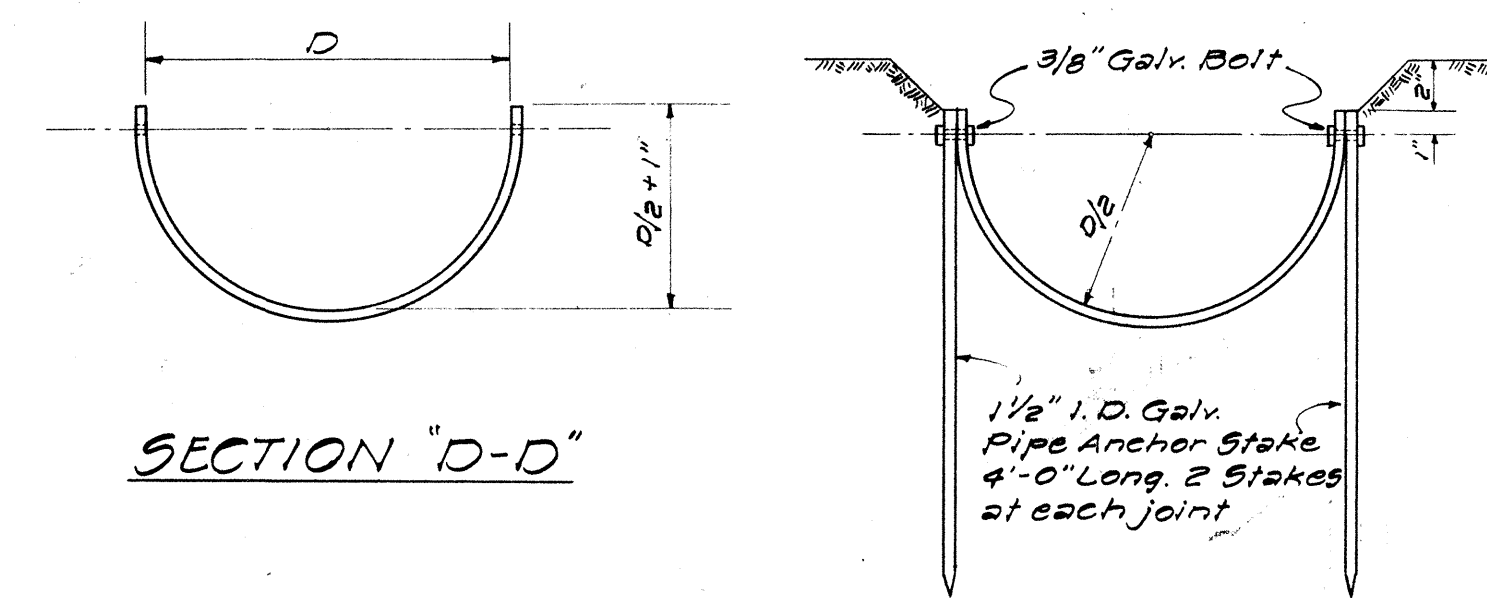
SECTION "A-A"

SECTION "B-B"

SECTION "C-C"

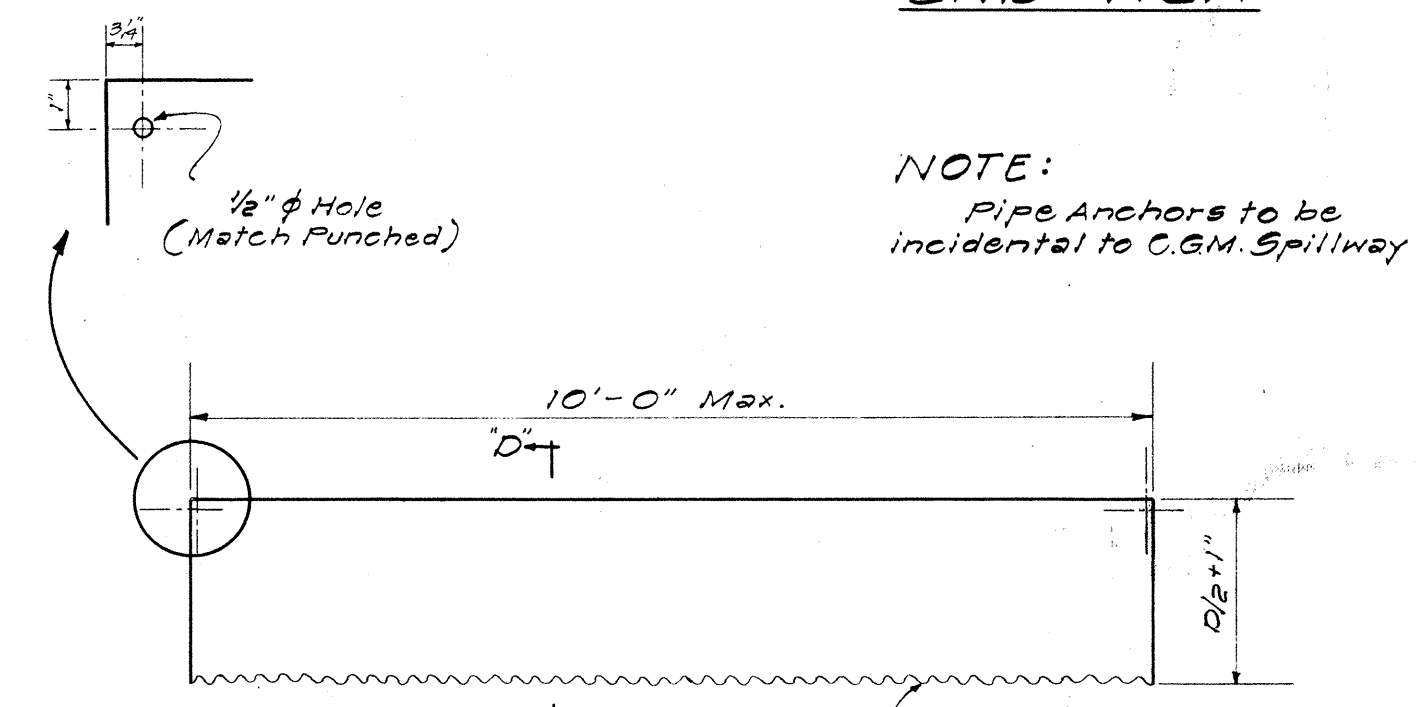
DETAIL OF SPILLWAY INLET

NOT TO SCALE



SECTION "D-D"

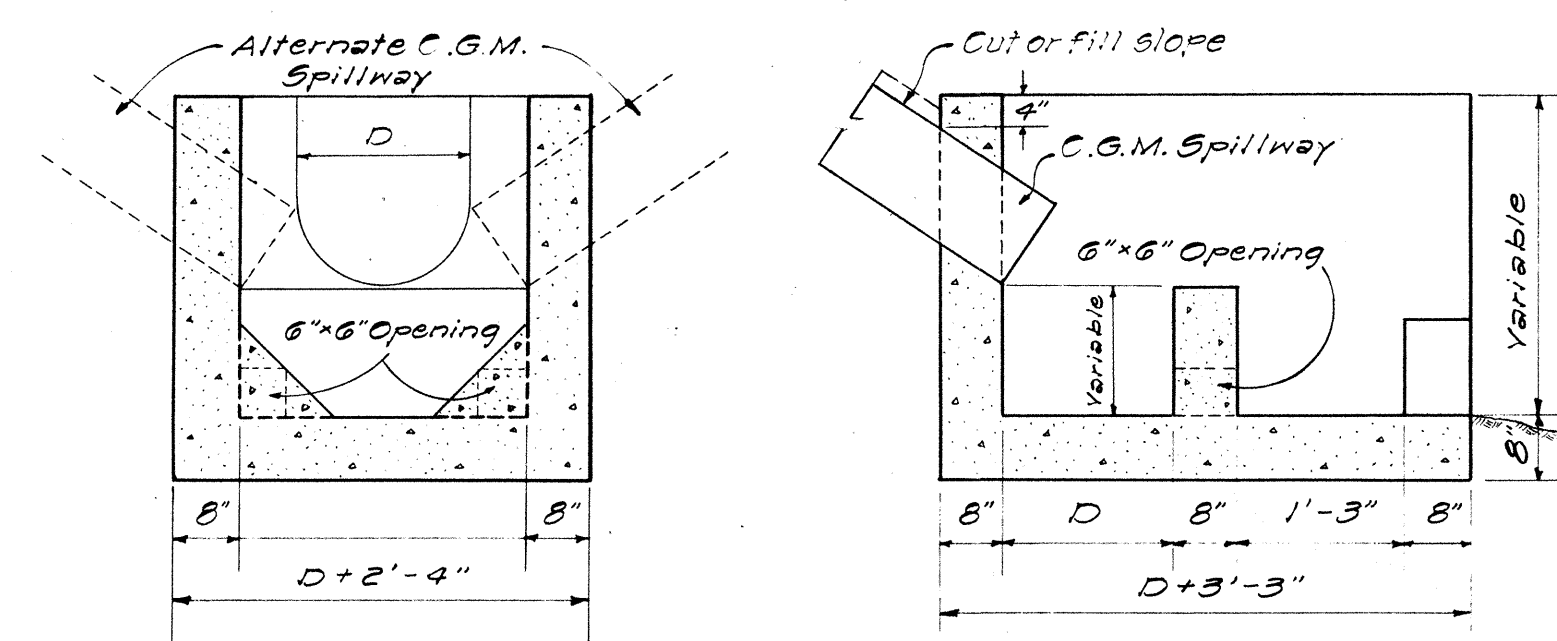
END VIEW



SIDE VIEW

C G.M. SPILLWAY

NOT TO SCALE



SECTION "H-H"

SECTION "G-G"

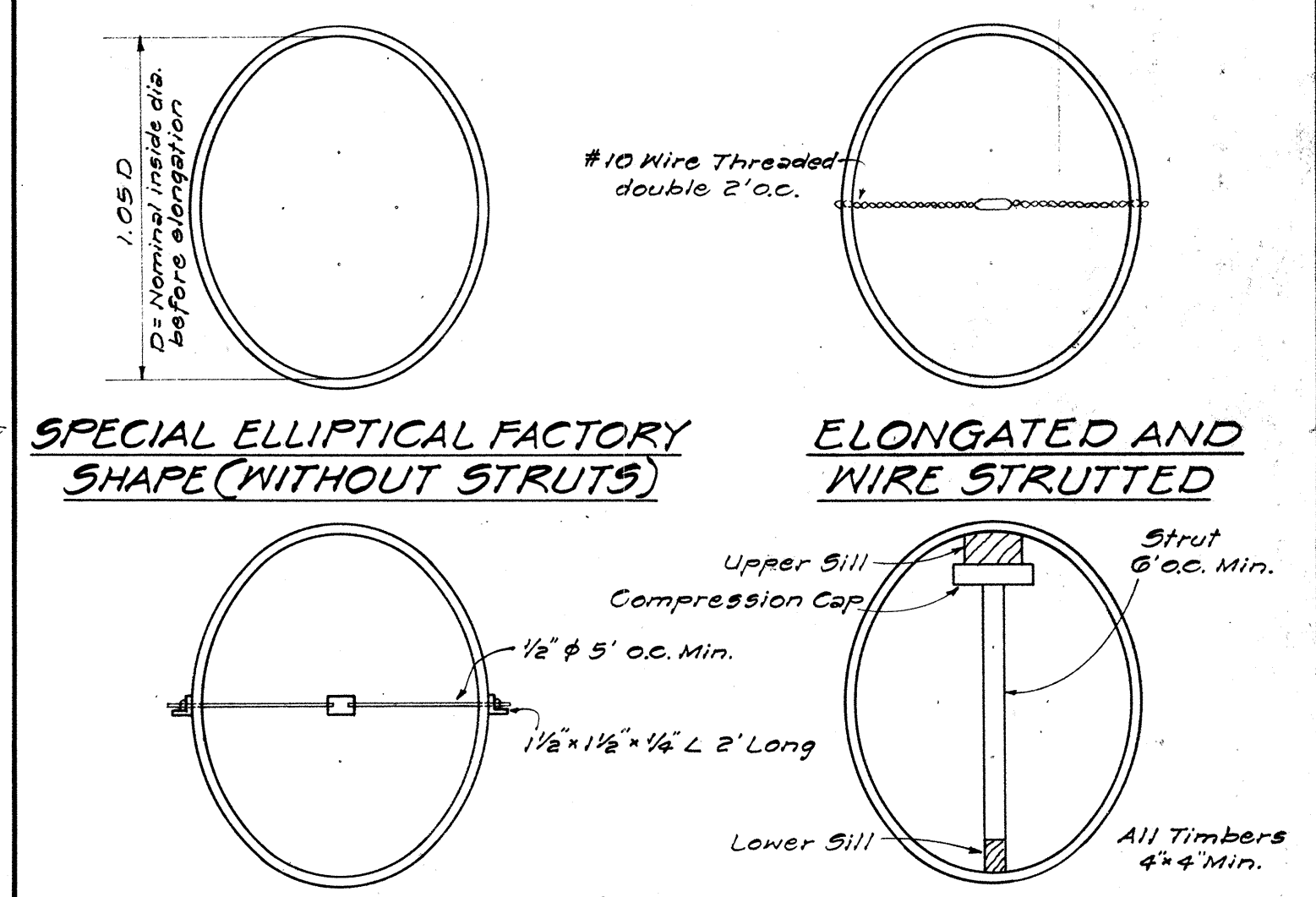
QUANTITIES

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. 12 OF 18 SHEETS

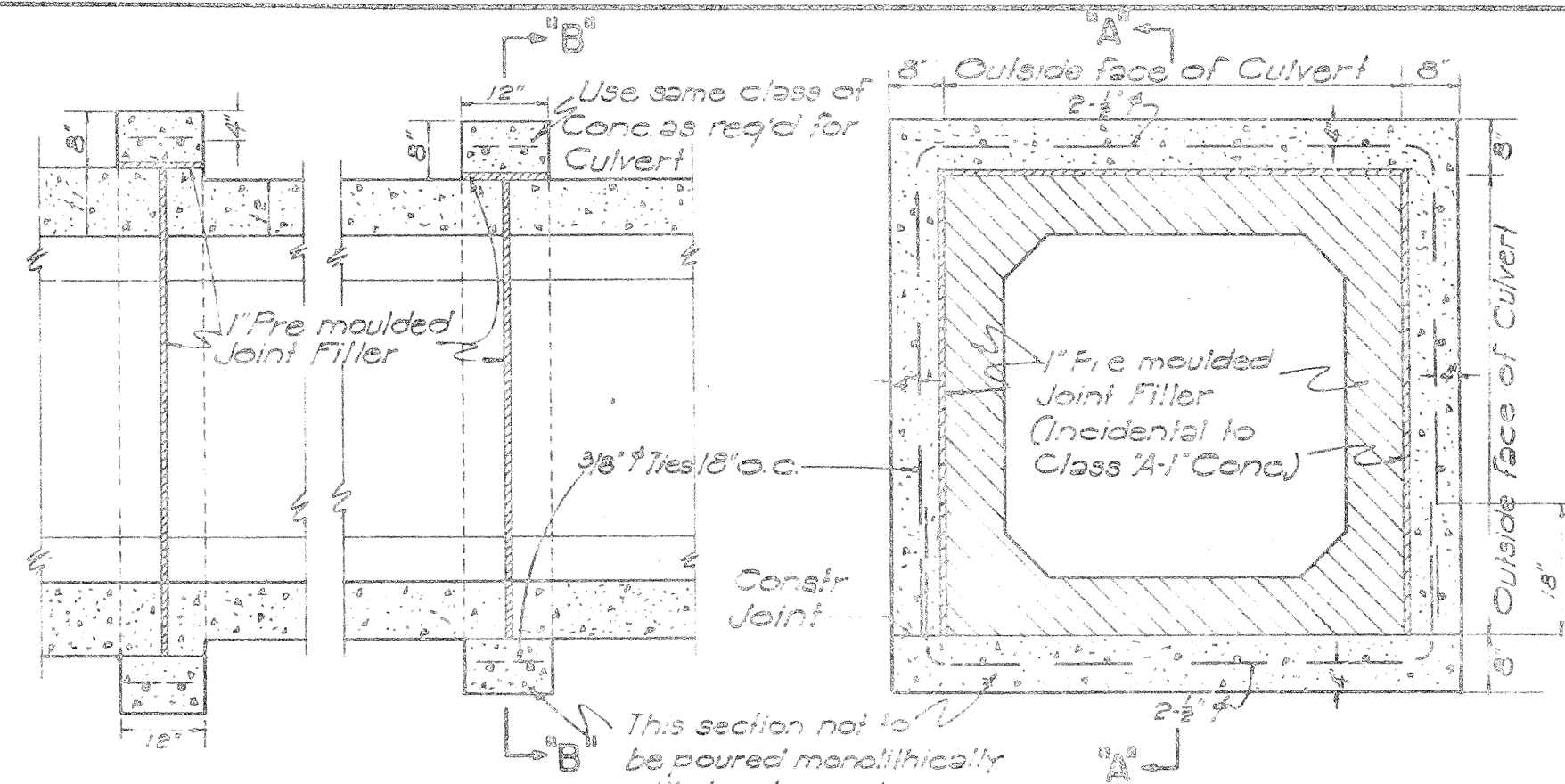
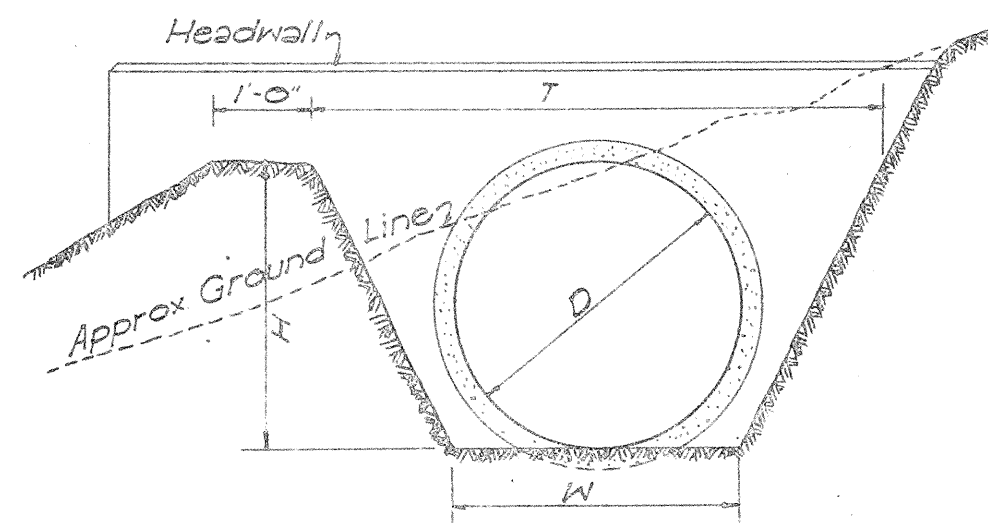
APPROVED: DATE: 8-14-61
DIRECTOR OF TRANSPORTATION

ORIGINAL PLAN
DESIGNED BY: O.M.
CHECKED BY: S.S.G.
DATE: 5-22-66
SURVEYED BY: R.Y.
DRAWN BY: S.S.G.
NOTE BOOK
No.

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"



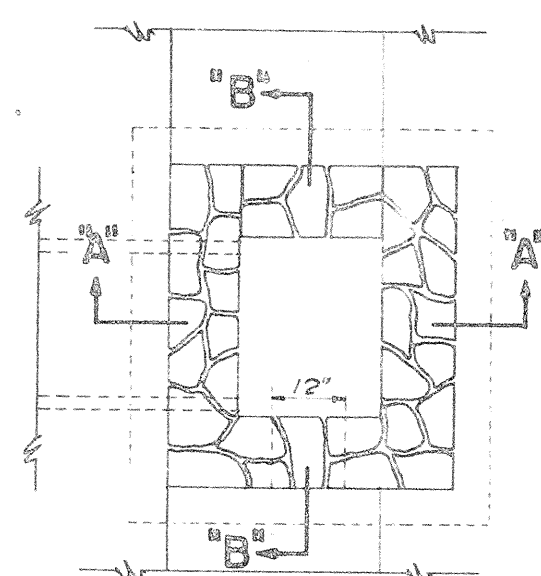
SECTION "A-A" CONCR. COLLAR FOR CONCR. BOX CULVERT

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

D	D	L=D+6"	Cu Yds.	Where Variables Equal
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"

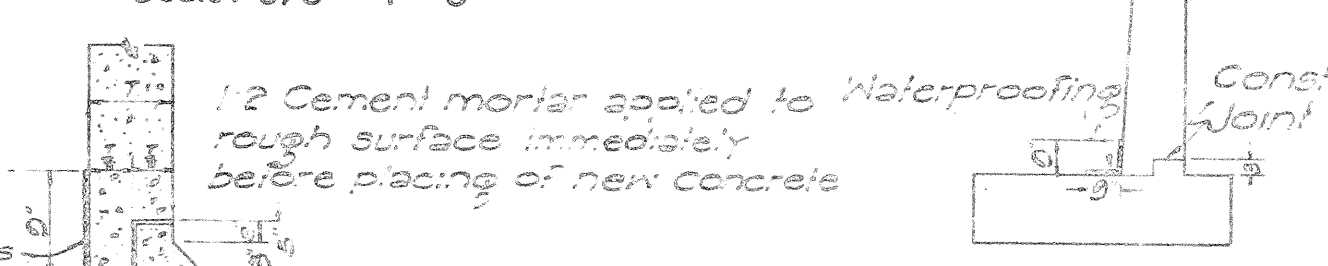
NOTE:

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



DETAIL OF MASONRY DROP INTAKE

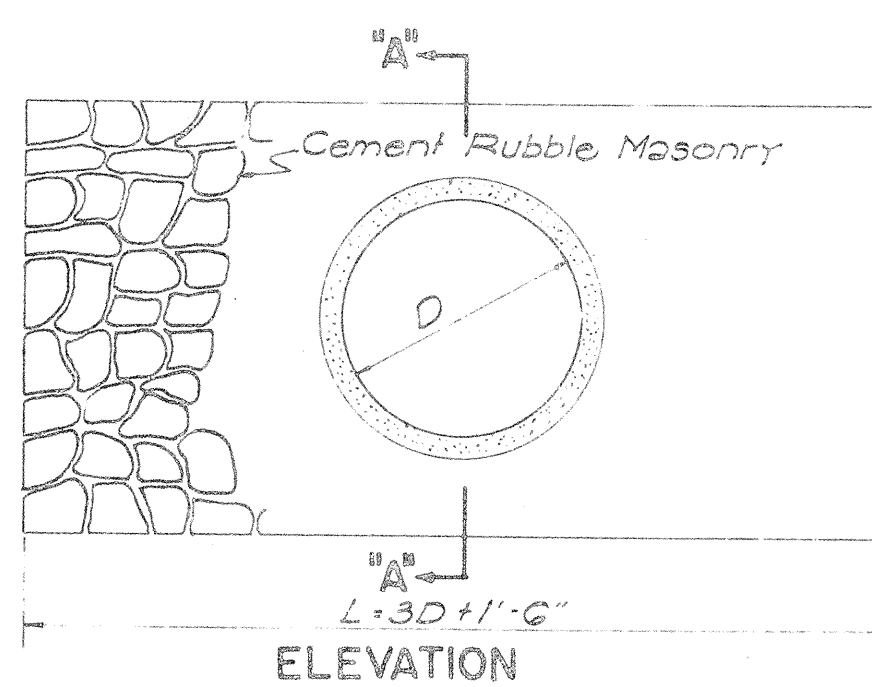
Scale: 3/8" = 1'-0"



CONSTR. JOINT DETAILS

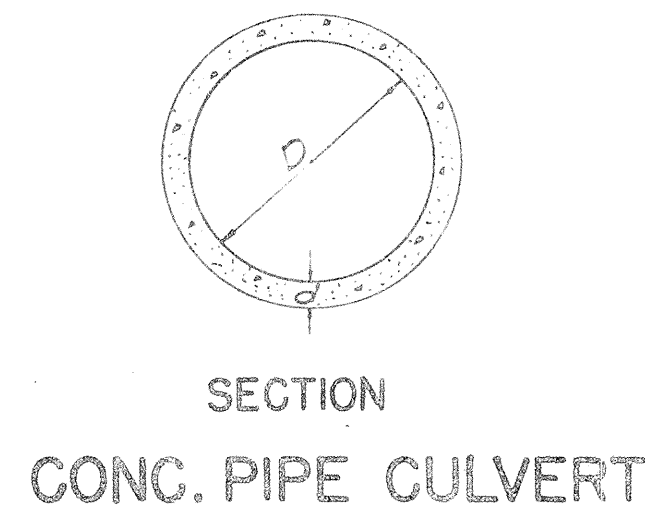
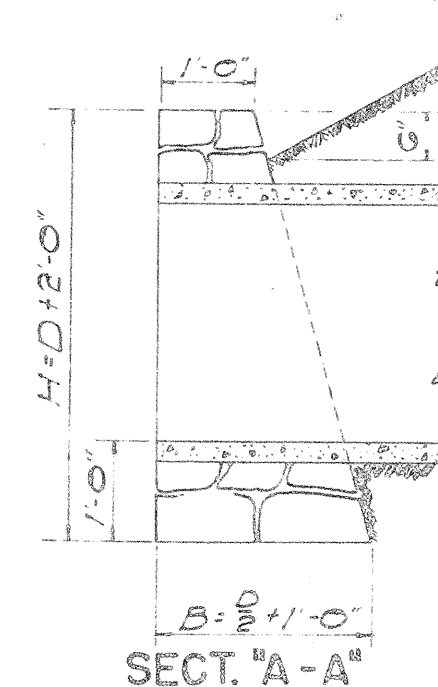
NOTE: Construction joints may only be used where indicated by the plans or permitted in writing by the Engineer.

D	H	B	L	Cu Yds.	Cu Yds.	Cu Yds.
18"	3'-6"	1'-0"	6'-0"	0.85	0.05	0.05
24"	4'-0"	2'-0"	7'-6"	1.28	1.45	1.41
30"	4'-6"	2'-6"	9'-0"	1.85	2.06	2.00
36"	5'-0"	3'-0"	10'-6"	2.40	2.84	2.72



DETAIL OF MASONRY HEADWALL

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

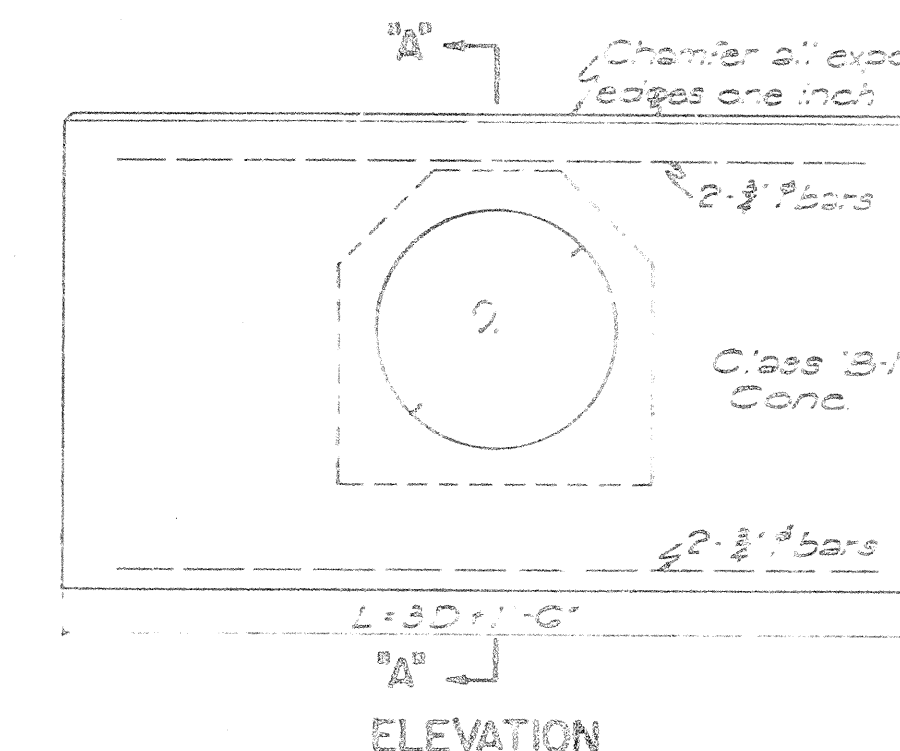


SECTION CONCR. PIPE CULVERT

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

D	d	W	Cu Yds. per Ft.
18"	4"	2'-2"	0.11
24"	4 1/2"	2'-0"	0.14
30"	5"	3'-4"	0.19
36"	5 1/2"	3'-11"	0.26

CAST-IN-PLACE CONCR. CULVERT



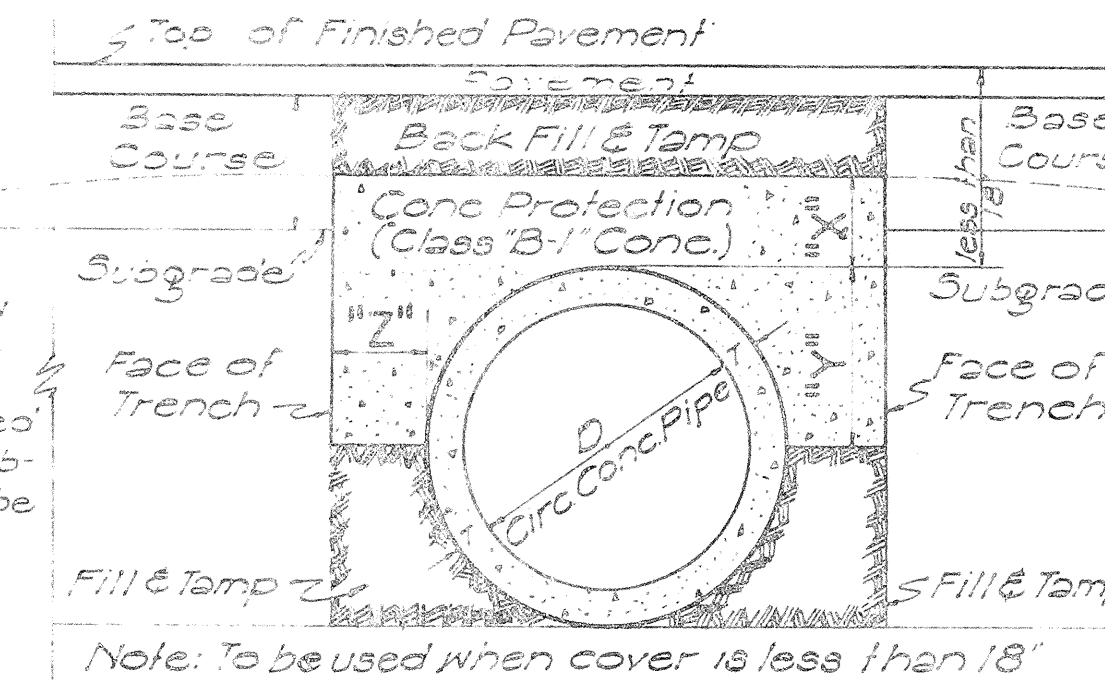
DETAIL OF CONCRETE HEADWALL

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

D	B	H	Cu Yds.	Cu Yds.	Steel For One Headwall
18"	1'-0"	2'-0"	0.22	1.00	4 #4 2'-6"
24"	1'-0"	2'-6"	0.29	1.38	4 #4 3'-0"
30"	2'-0"	3'-0"	0.99	2.17	4 #4 3'-6"
36"	2'-0"	3'-6"	2.45	2.74	4 #4 4'-0"
42"	2'-6"	4'-0"	3.87	3.87	4 #4 4'-6"
48"	2'-6"	4'-6"	4.66	4.66	4 #4 5'-0"

SECT. OF CULVERT WITH CONCR. PROTECTION

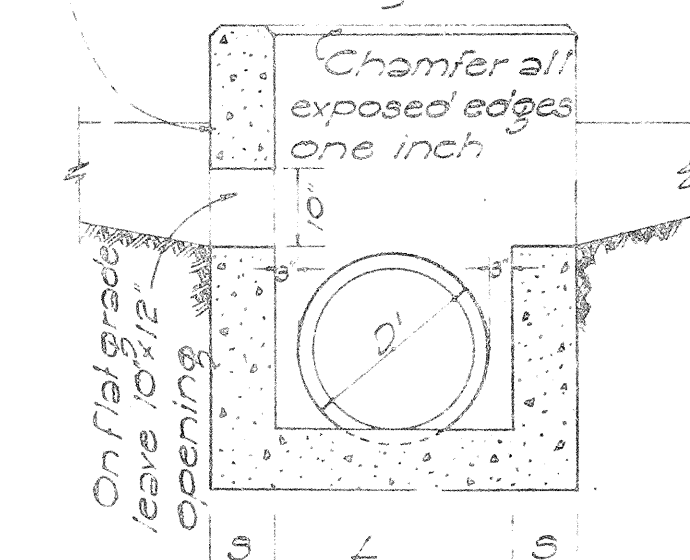
Scale: 1" = 1'-0"



X	Y	Z
6" for 18" D		Z must be from pipe to face of trench
7" " 24" D		
8" " 30" D		
9" " 36" D		
10" " 42" D		
11" " 48" D		
12" " 54" D		

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

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"

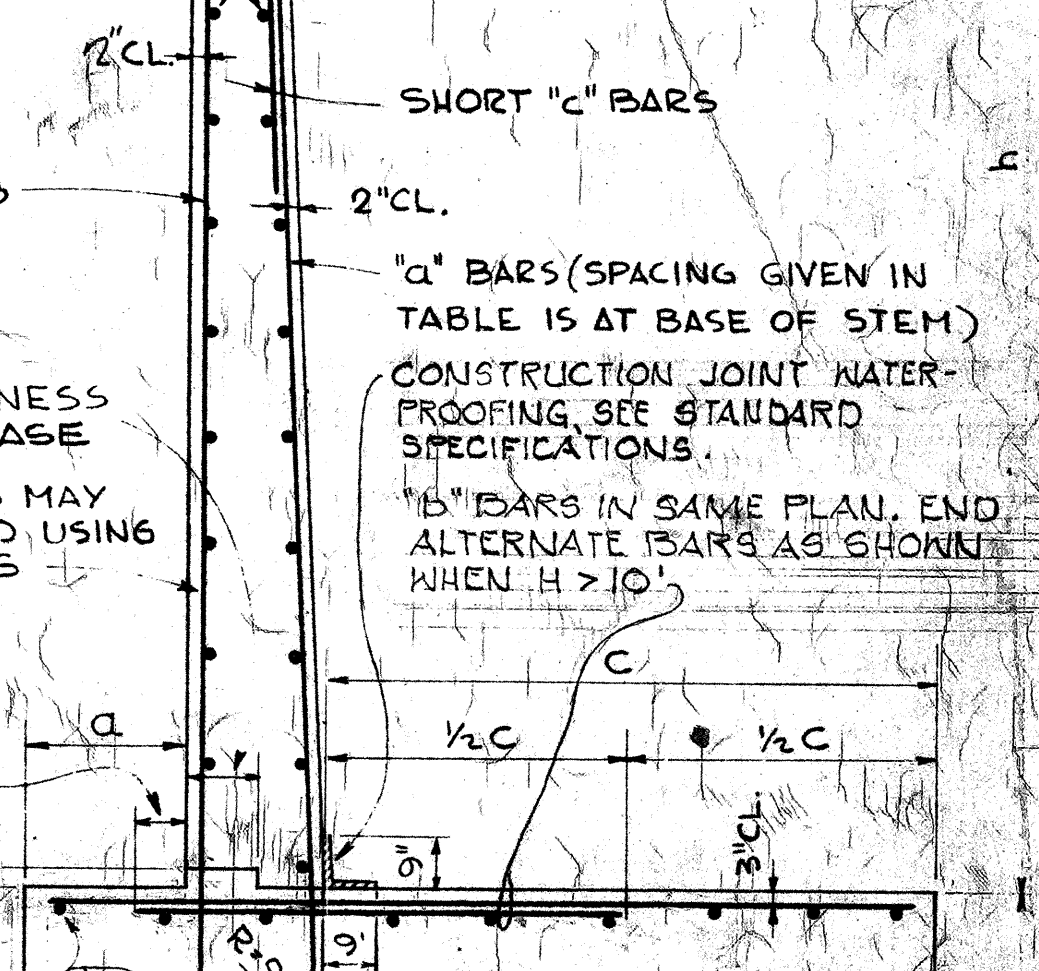
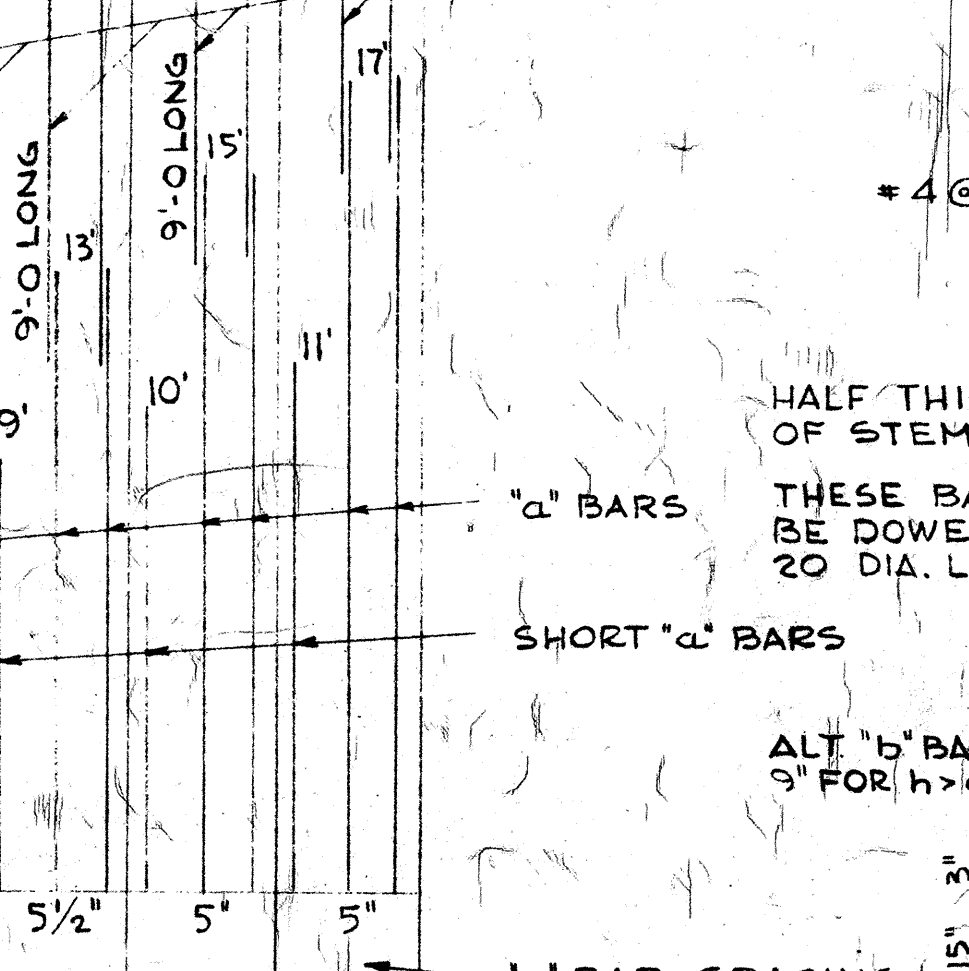
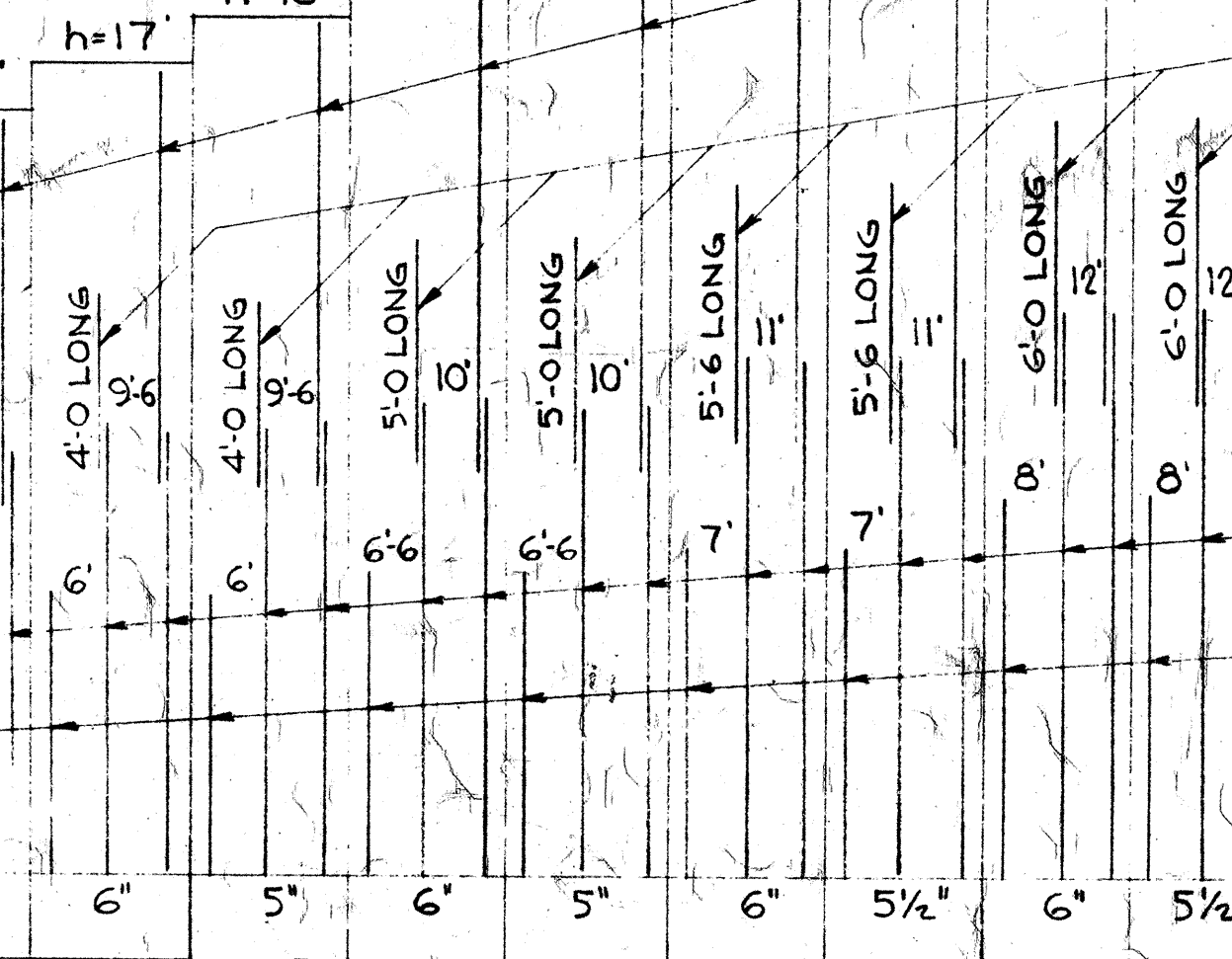
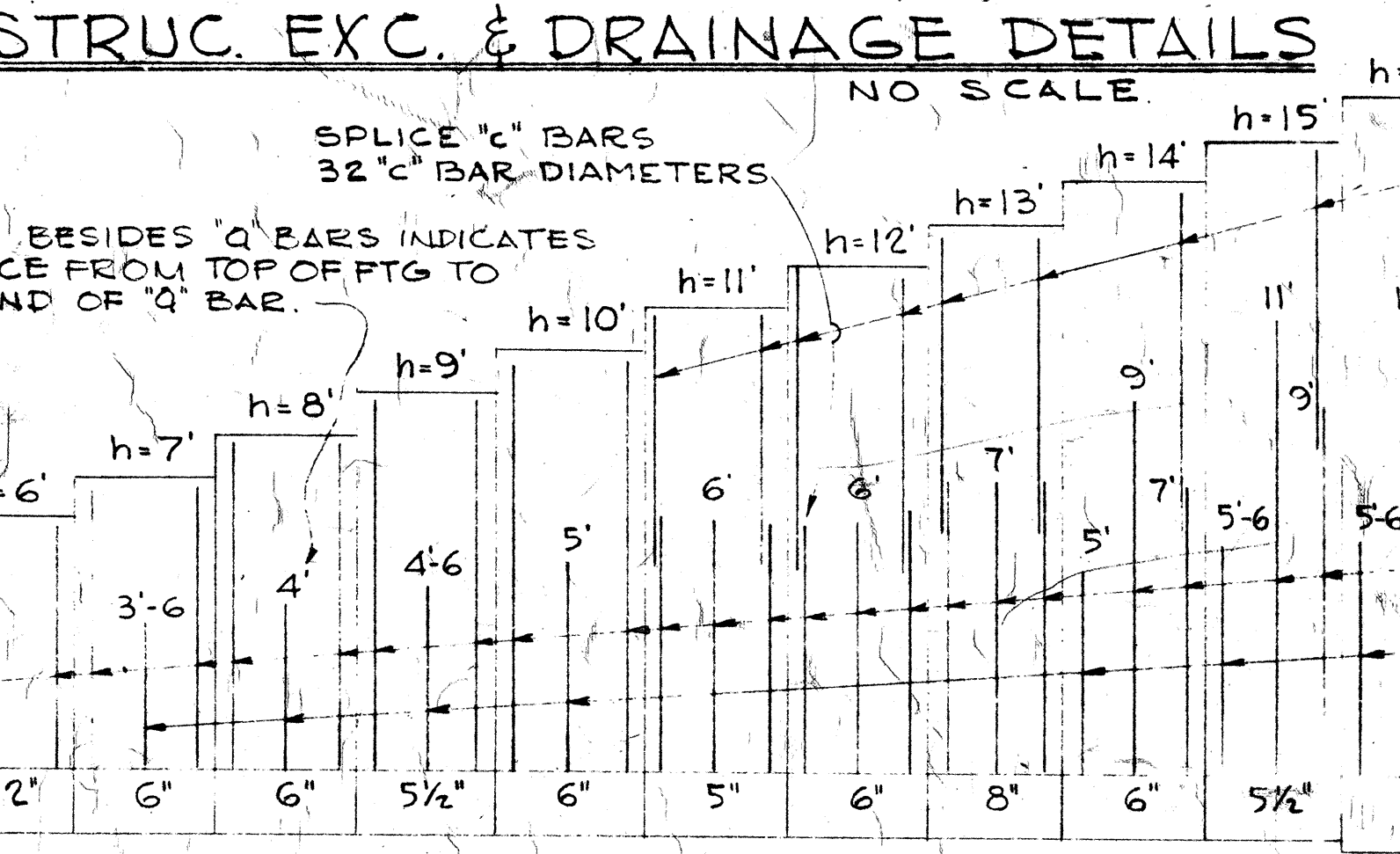
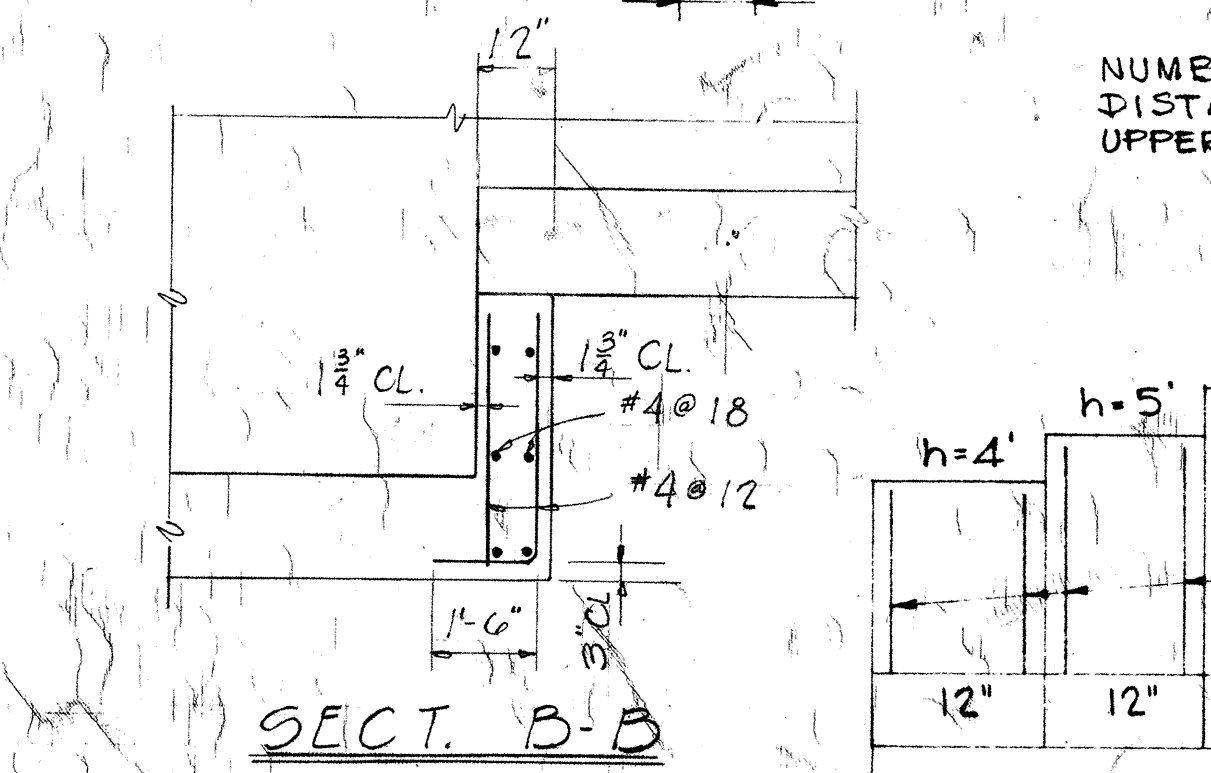
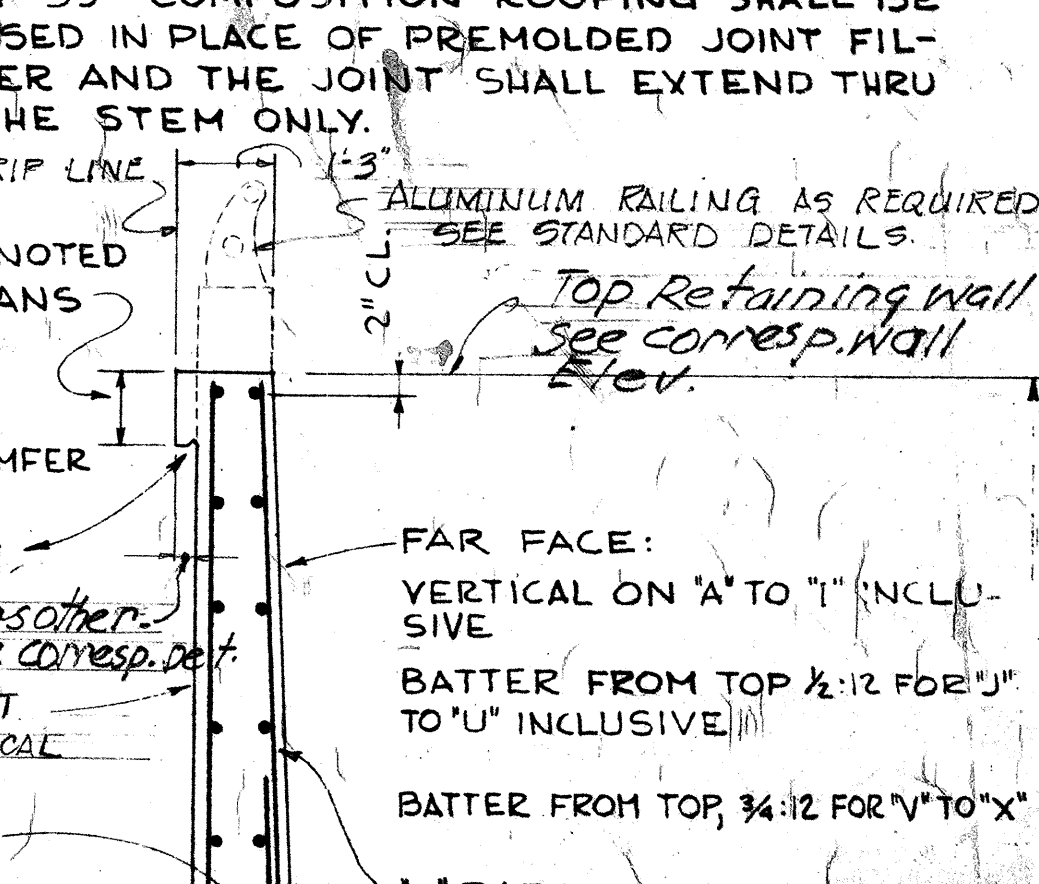
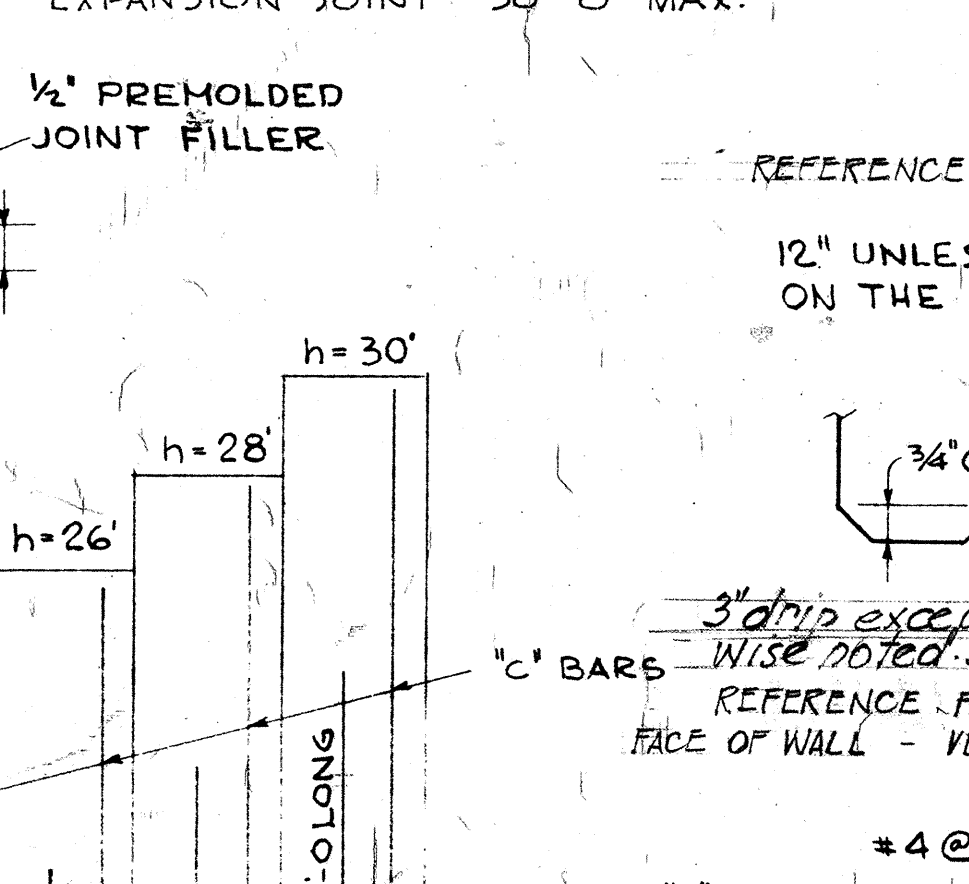
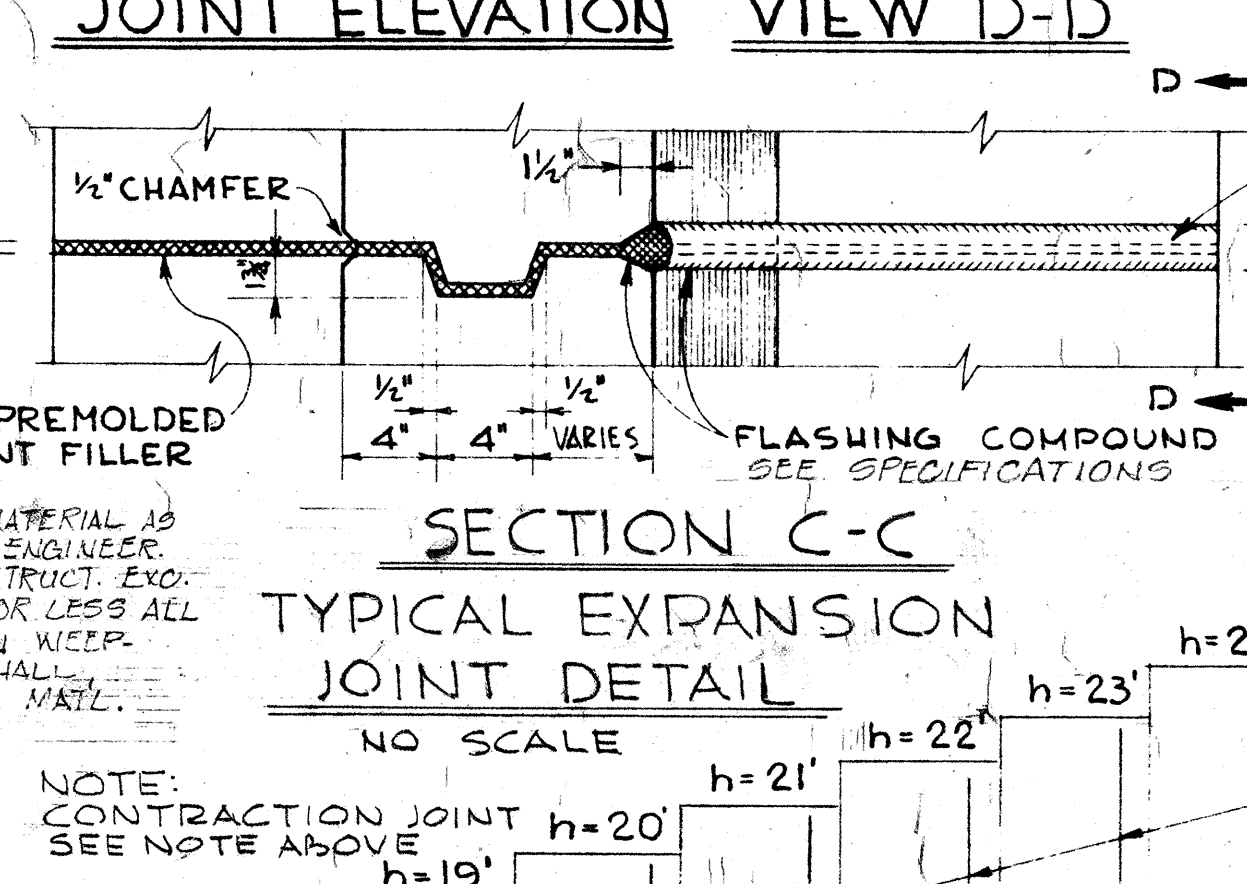
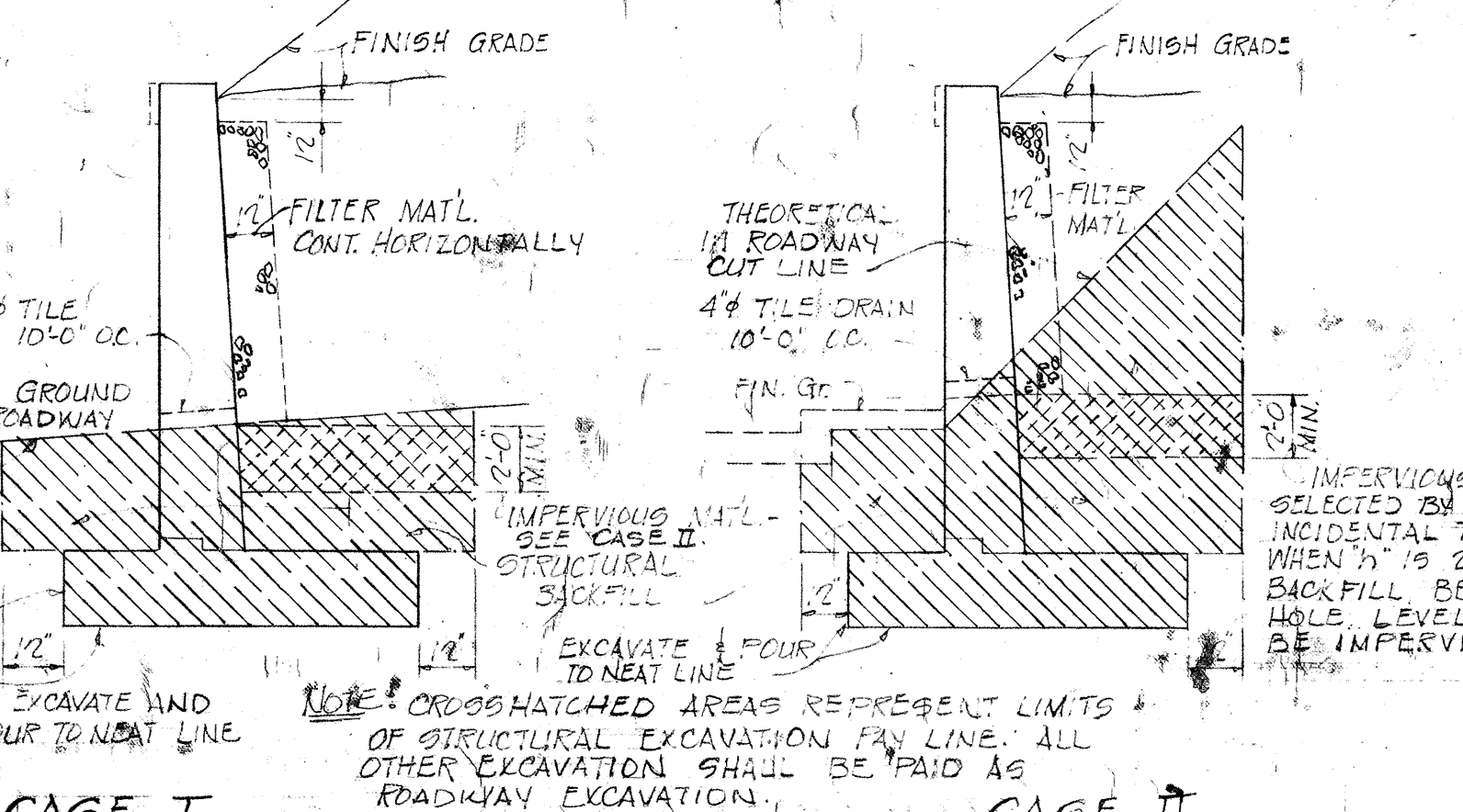
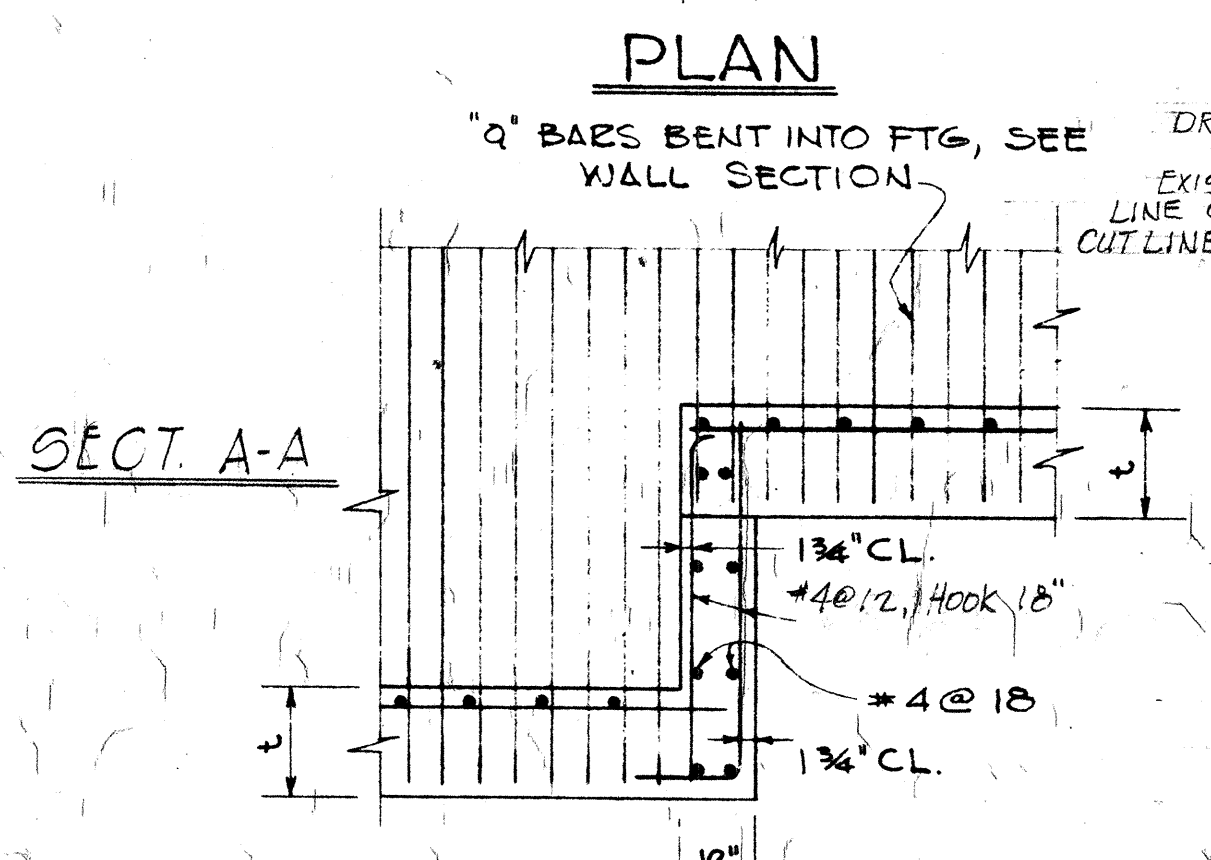
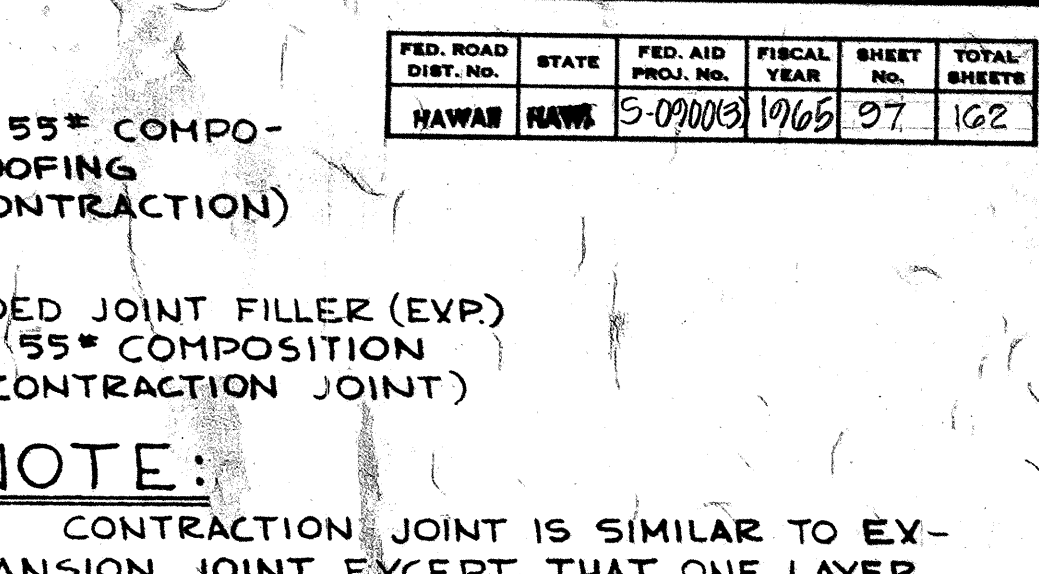
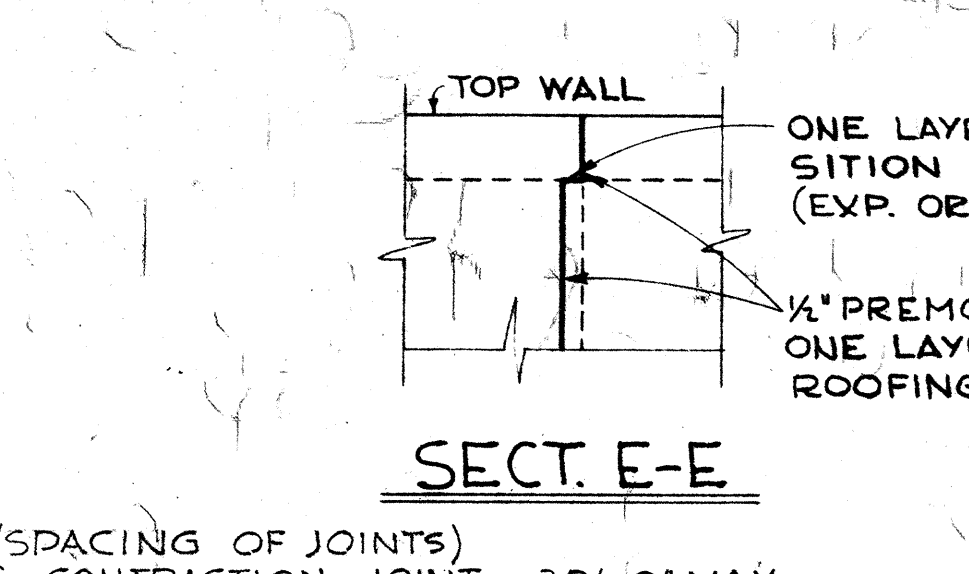
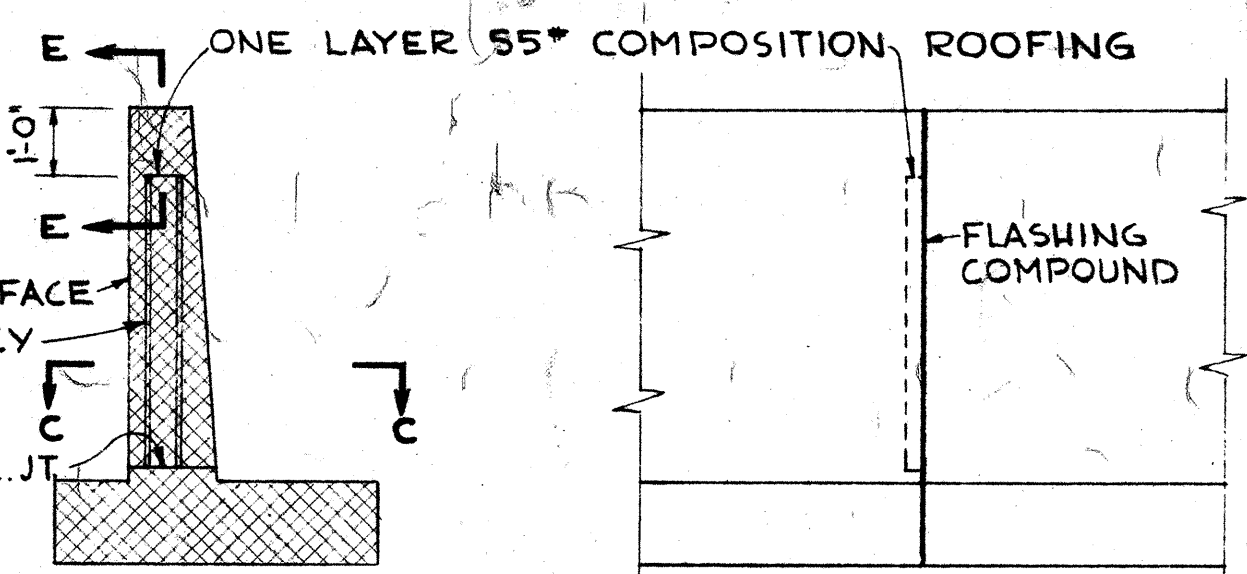
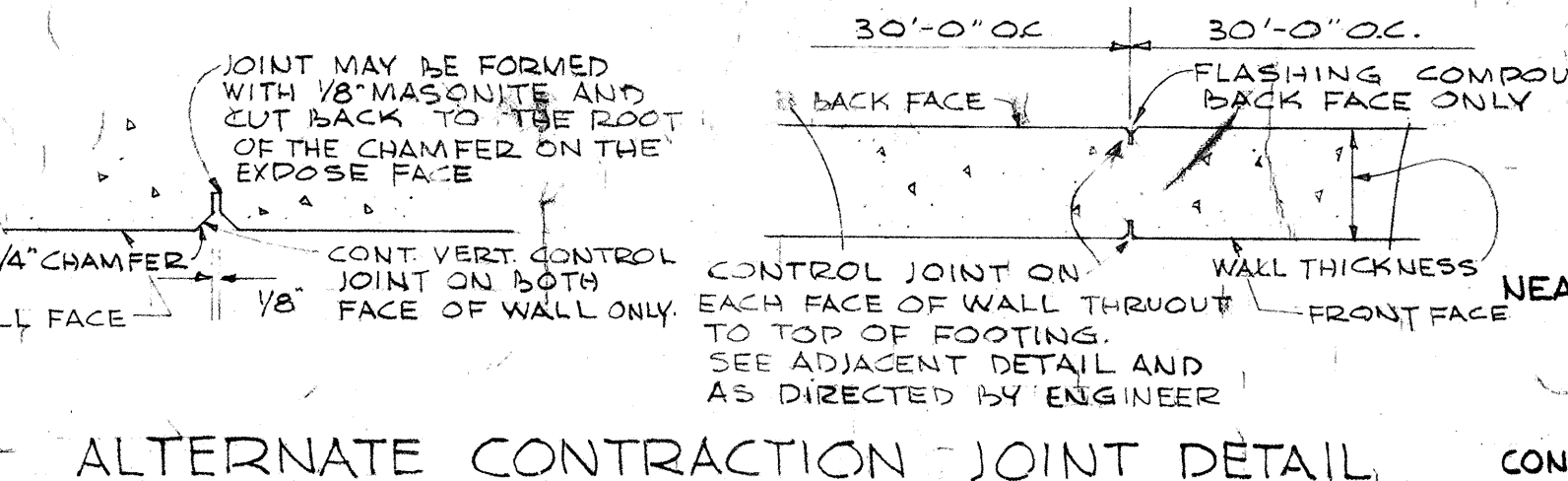
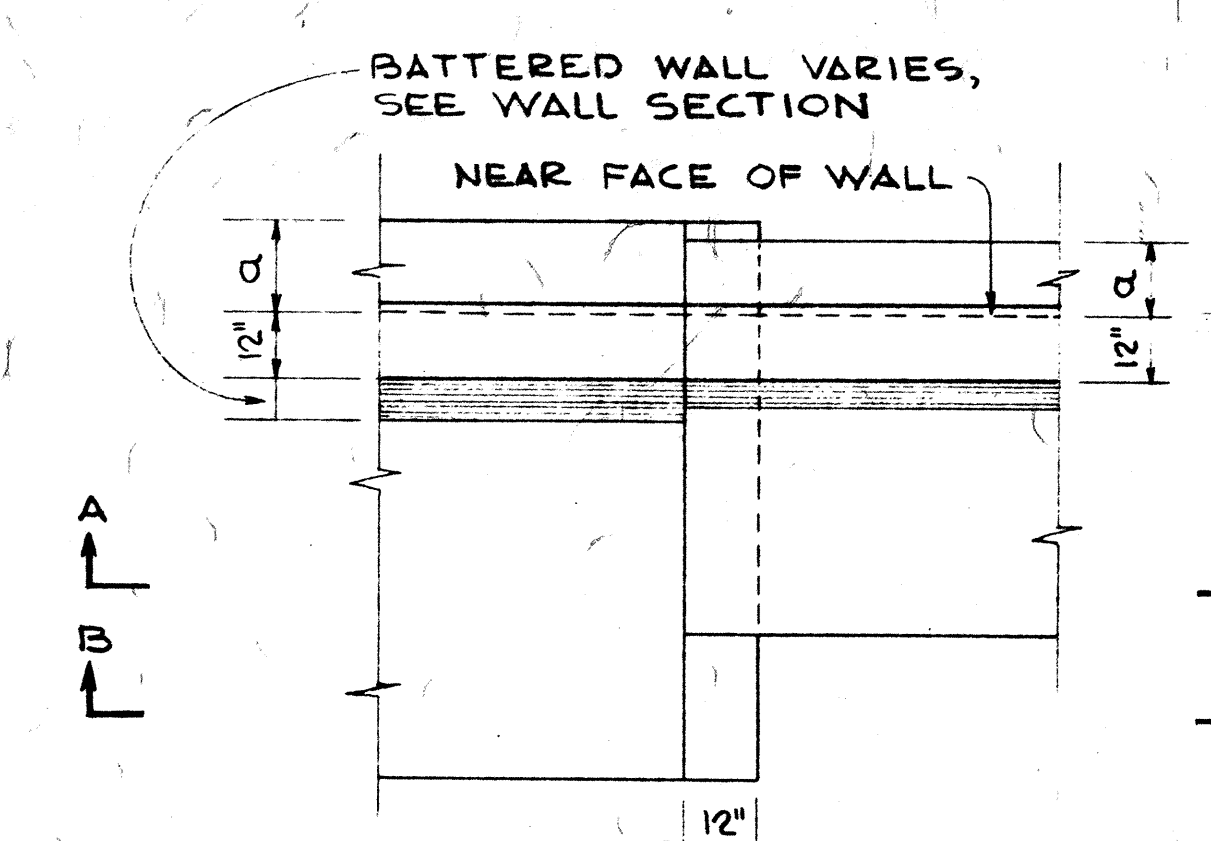
DETAIL OF CONCRETE DROP INTAKE

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 13 OF 18 SHEETS



STEPPED FIG. DET.
SCALE: 3/8" = 1'-0"

VERTICAL REINFORCING STEEL ARRANGEMENT
NO SCALE.

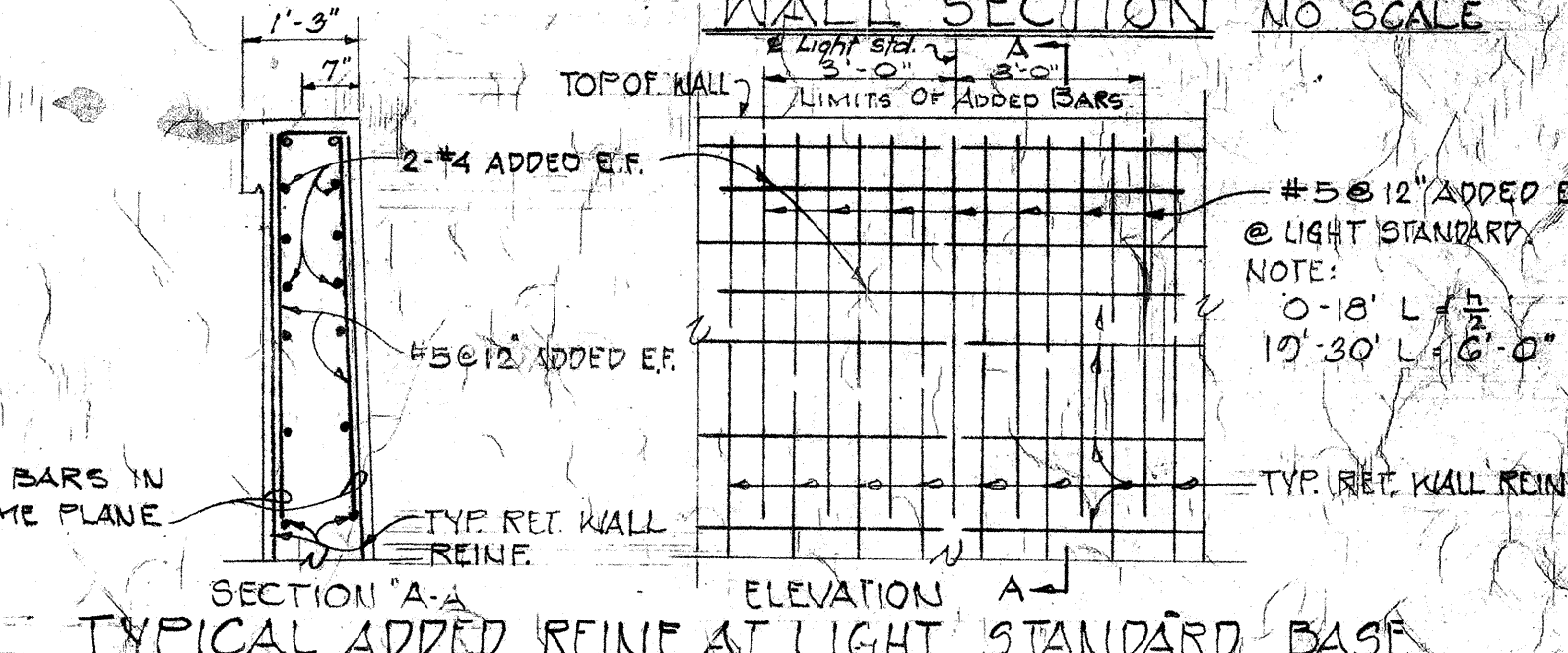
TABLE OF DIMENSIONS AND REINFORCING STEEL

TABLE OF DIMENSIONS AND REINFORCING STEEL

TABLE OF DIMENSIONS AND REINFORCING STEEL

MAXIMUM h	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	26'	28'	30'
"a" BARS	*3@12	*3@12	*4@12	*3@6	*4@6	*4@5 1/2	*5@6	*5@5	*6@6	*6@8	*6@6	*6@5 1/2	*6@5	*7@6	*7@5	*8@6	*8@5	*9@6	*9@5 1/2	*10@6	*10@5 1/2	*10@5 1/2	*10@5	*11@5
"c" BARS	—	—	—	—	—	—	—	*4	*4	*4	*4	*4	*4	*4	*4	*5	*5	*6	*6	*7	*7	*7	*7	*7
TYPE (FTG. ON EARTH)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
a	6"	6"	6"	12"	12"	12"	12"	12"	12"	12"	15"	18"	21"	24"	24"	24"	27"	30"	33"	36"	39"	54"	60"	72"
L	2.5'	3.0'	3.5'	4.0'	4.5'	5.0'	5.5'	6.0'	6.5'	7.0'	7.75'	8.25'	9.0'	9.75'	10.5'	11.5'	12.5'	13.5'	14.5'	15.25'	16.0'	18.0'	20.0'	21.0'
t	14"	14"	14"	14"	14"	14"	14"	18"	18"	18"	18"	18"	21"	21"	24"	24"	24"	27"	30"	31"	33"	36"	39"	42"
"b" BARS	*3@12	*3@12	*3@12	*3@12	*3@12	*4@11	*5@11	*5@10	*5@6	*6@8	*6@6	*6@5 1/2	*6@5	*7@6	*7@5	*9@6	*9@5	*10@6	*10@5 1/2	*11@6	*11@5 1/2	*11@5 1/2	*11@5	*11@5

TYPE (FTG. ON ROCK)	A	B	C	D	E	F	G	H	I	J-R	K-R	L-R	M-R	N-R	O-R	P-R	Q-R	R-R	S-R	T-R	U-R	V-R	W-R	X-R
a	6"	6"	6"	12"	12"	12"	12"	12"	12"	12"	15"	18"	21"	21"	21"	24"	27"	30"	33"	36"	42"	48"	54"	
L	2.5'	3.0'	3.5'	4.0'	4.5'	5.0'	5.5'	6.0'	6.5'	6.75'	7.25'	7.75'	8.50'	9.25'	10.00'	10.50'	11.00'	11.50'	12.00'	12.50'	13.00'	15.00'	16.00'	
t	14"	14"	14"	14"	14"	14"	14"	18"	18"	18"	18"	18"	18"	18"	18"	21"	21"	21"	24"	24"	24"	27"	30"	36"
"b" BARS	*3@12	*3@12	*3@12	*3@12	*3@12	*4@11	*5@9	*5@10	*5@6	*6@8	*6@6	*6@5 1/2	*6@5	*7@6	*7@5	*9@6	*9@5	*10@6	*10@5 1/2	*11@6	*11@5 1/2	*11@5 1/2	*11@5	*11@5



DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII

STANDARD RETAINING WALL
DETAIL TYPE "T-1"

FARRINGTON HIGHWAY
PROJECT NO. 5-09003
JUNE 1964

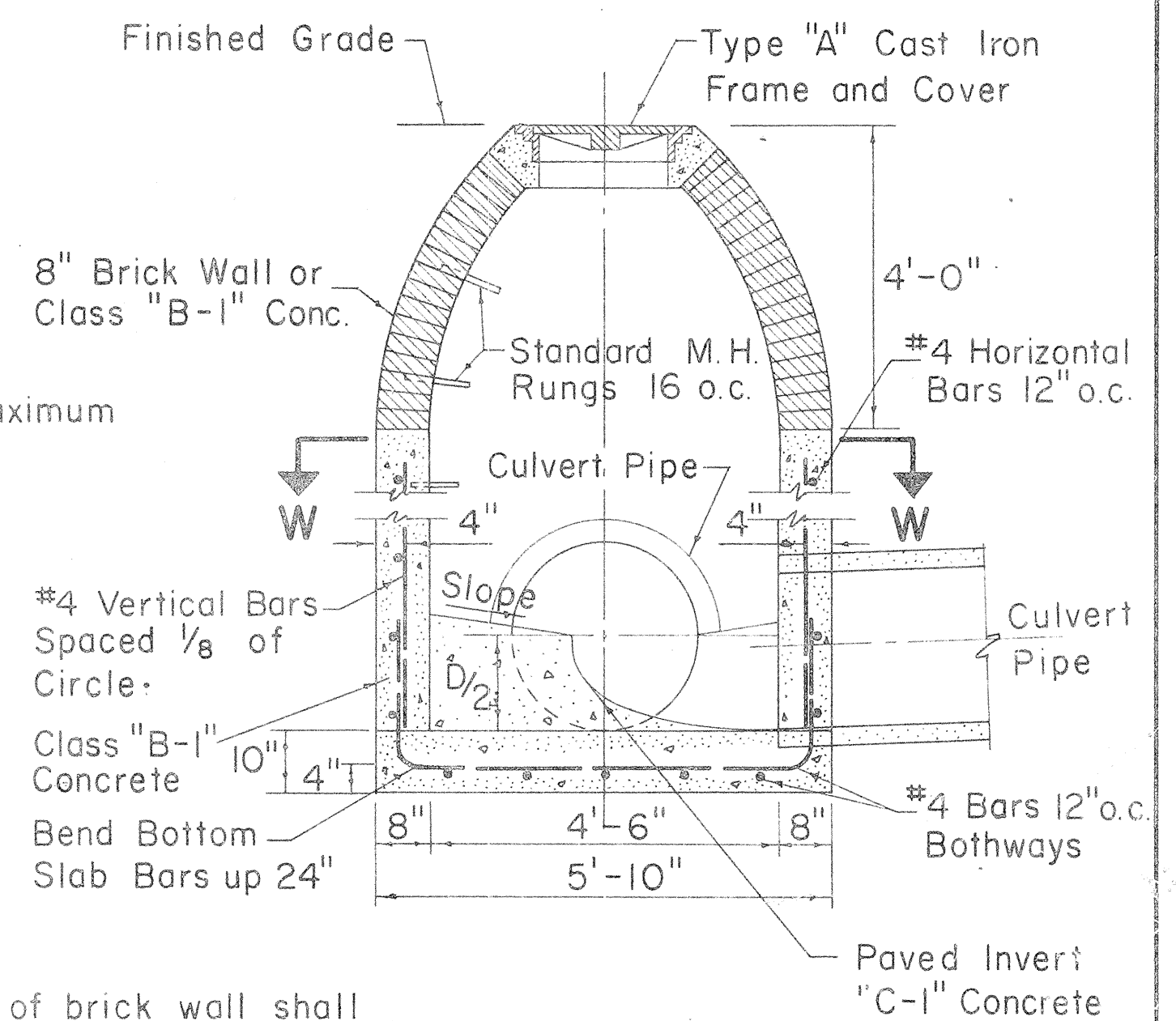
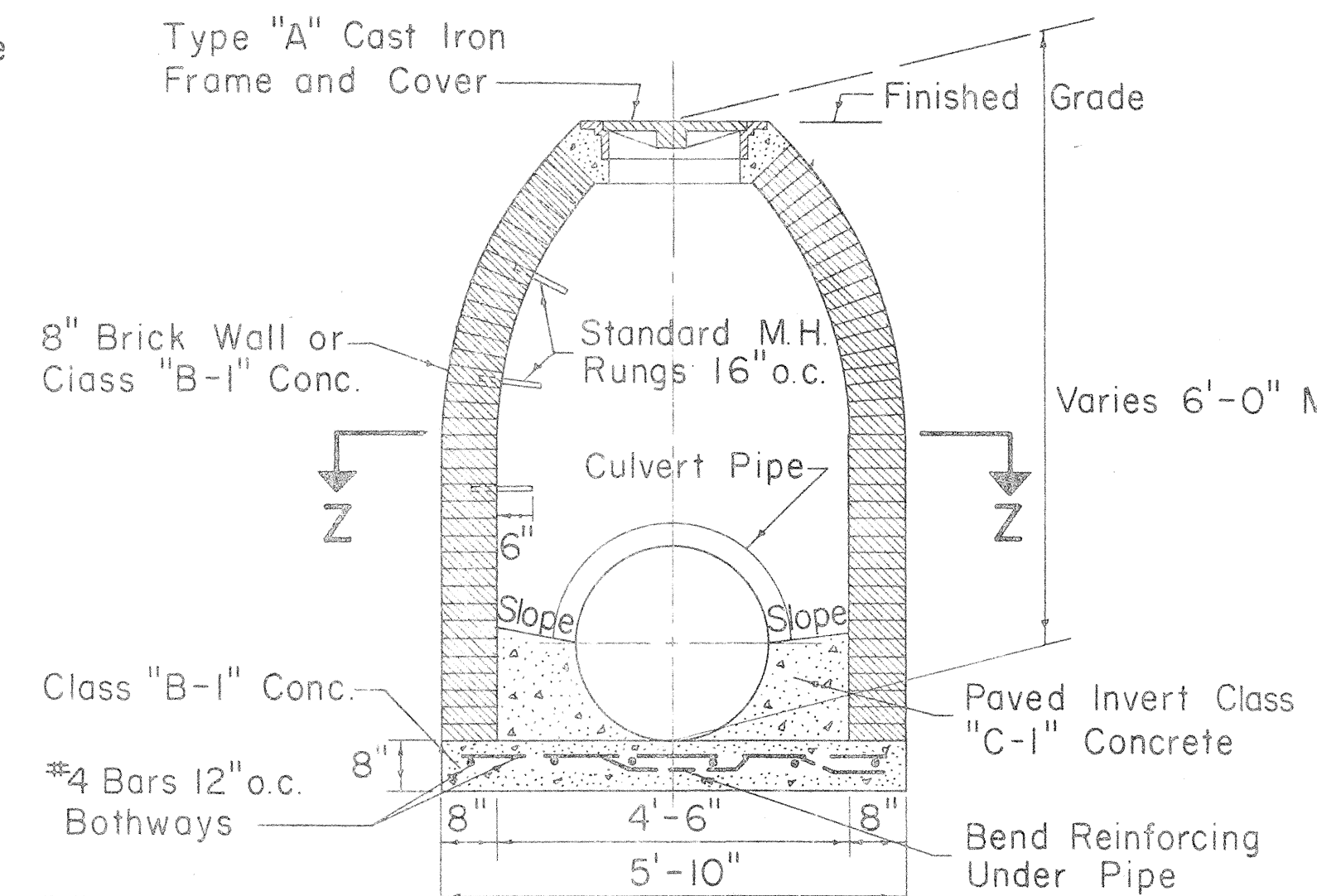
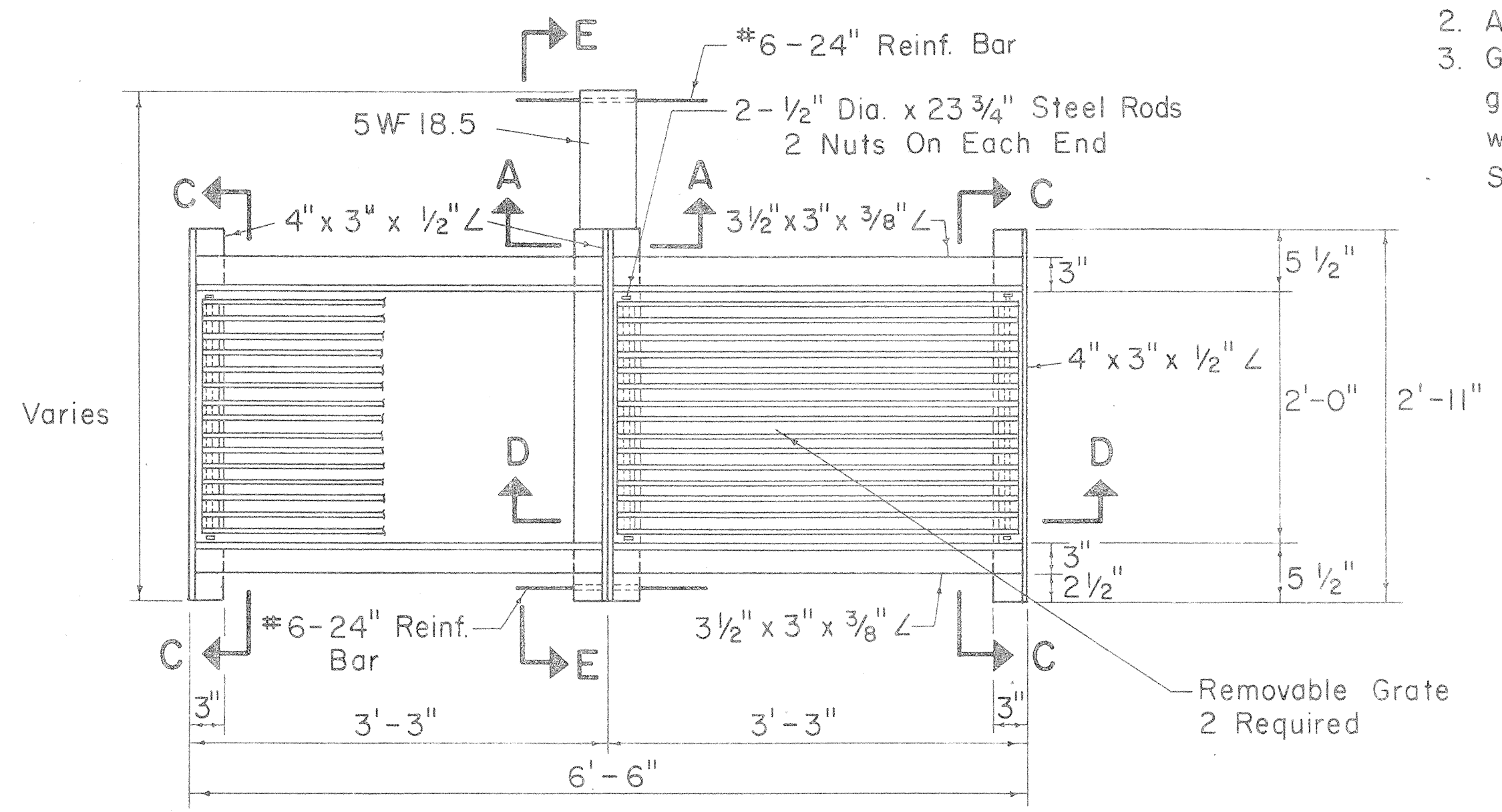
SHEET NO. 14 OF 18 SHEETS

DATE: 5/15/65
DRAWN BY: M.Q.
CHECKED BY: M.Q.
ORIGINAL PLAN
NOTE BOOK
NO.

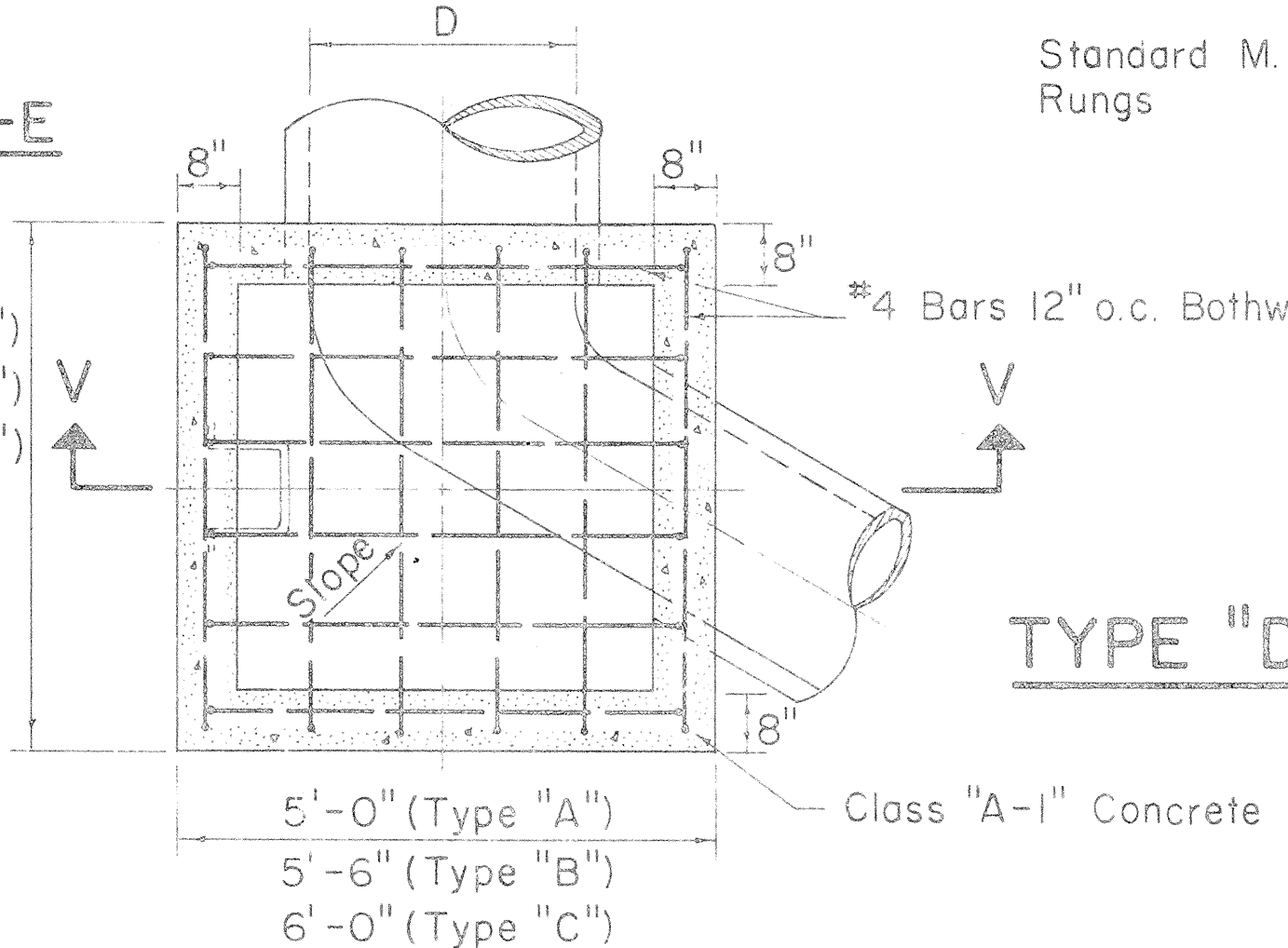
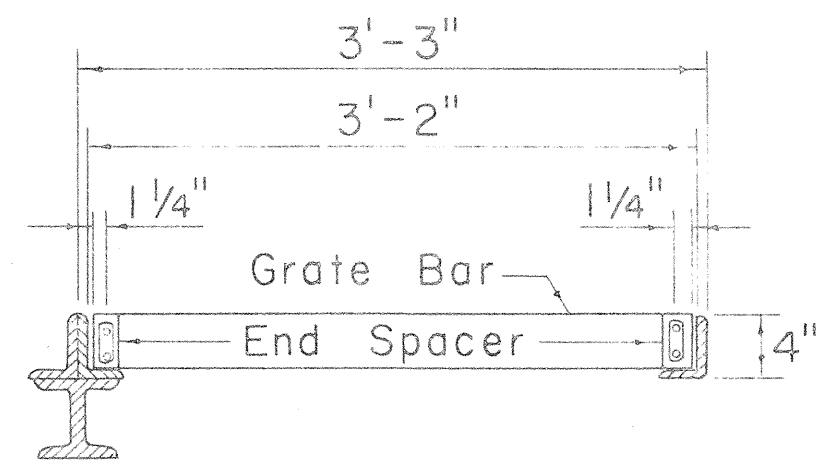
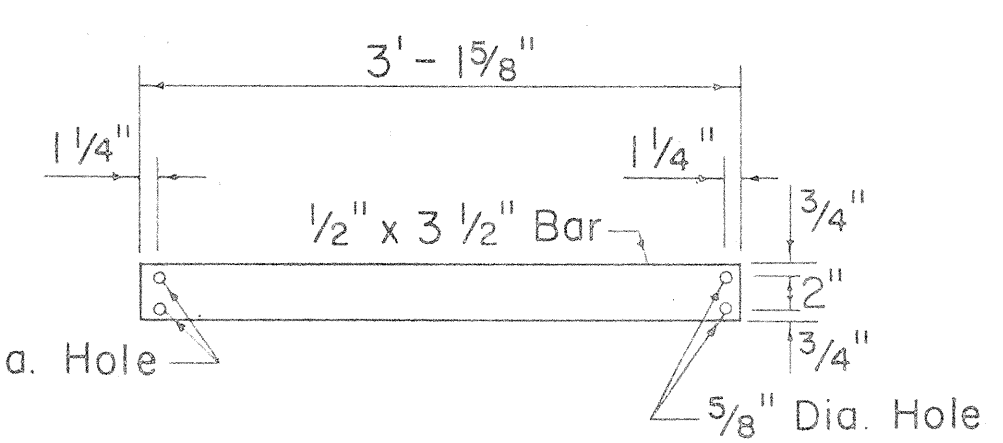
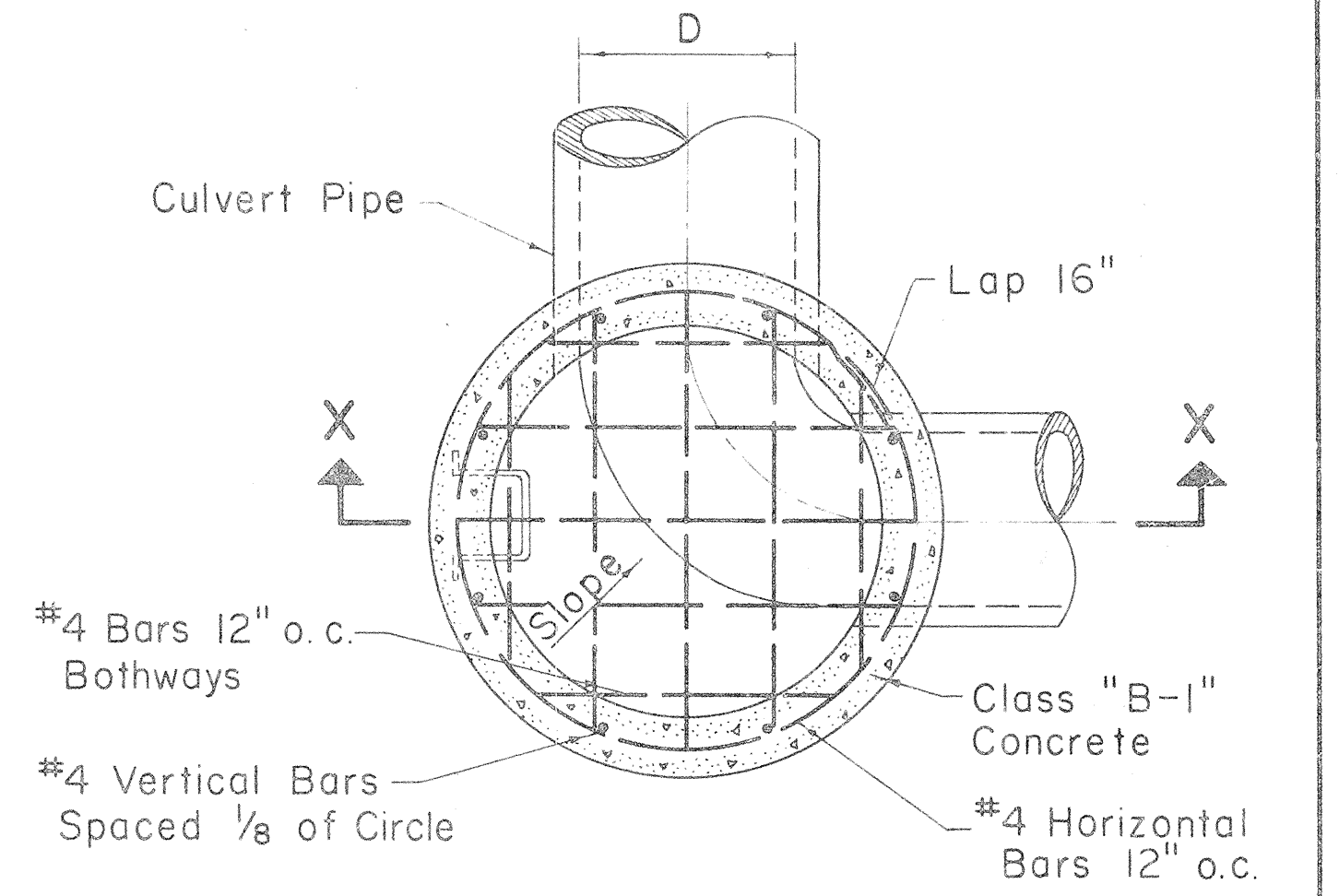
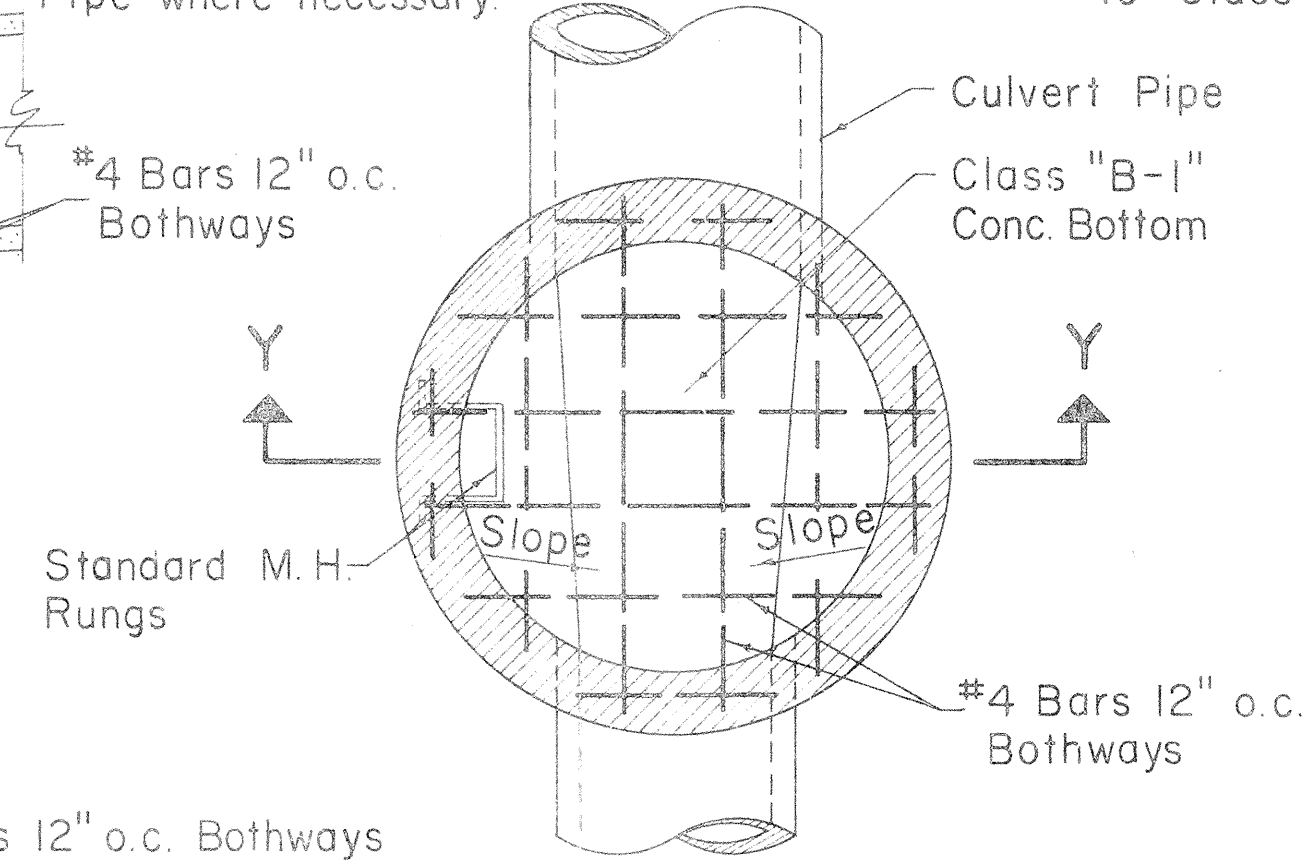
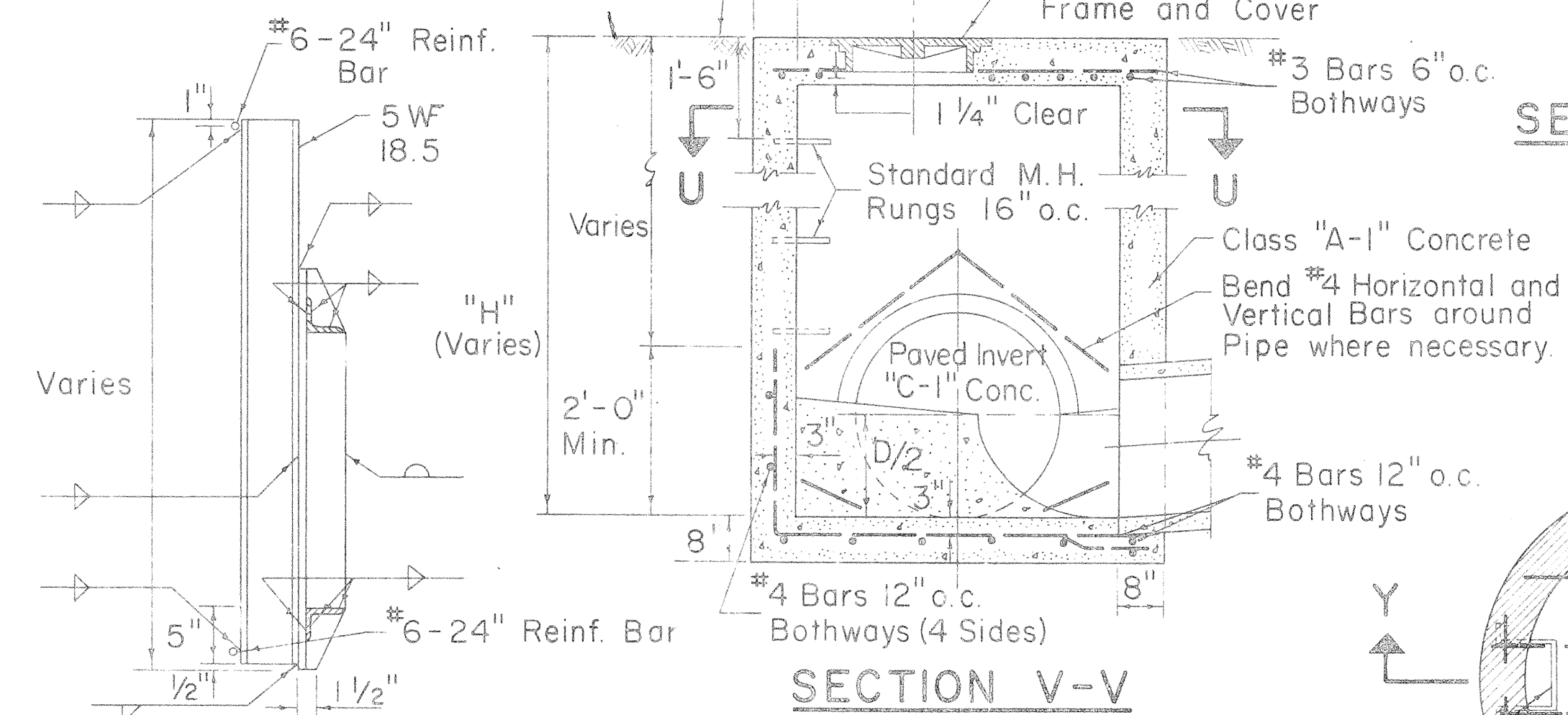
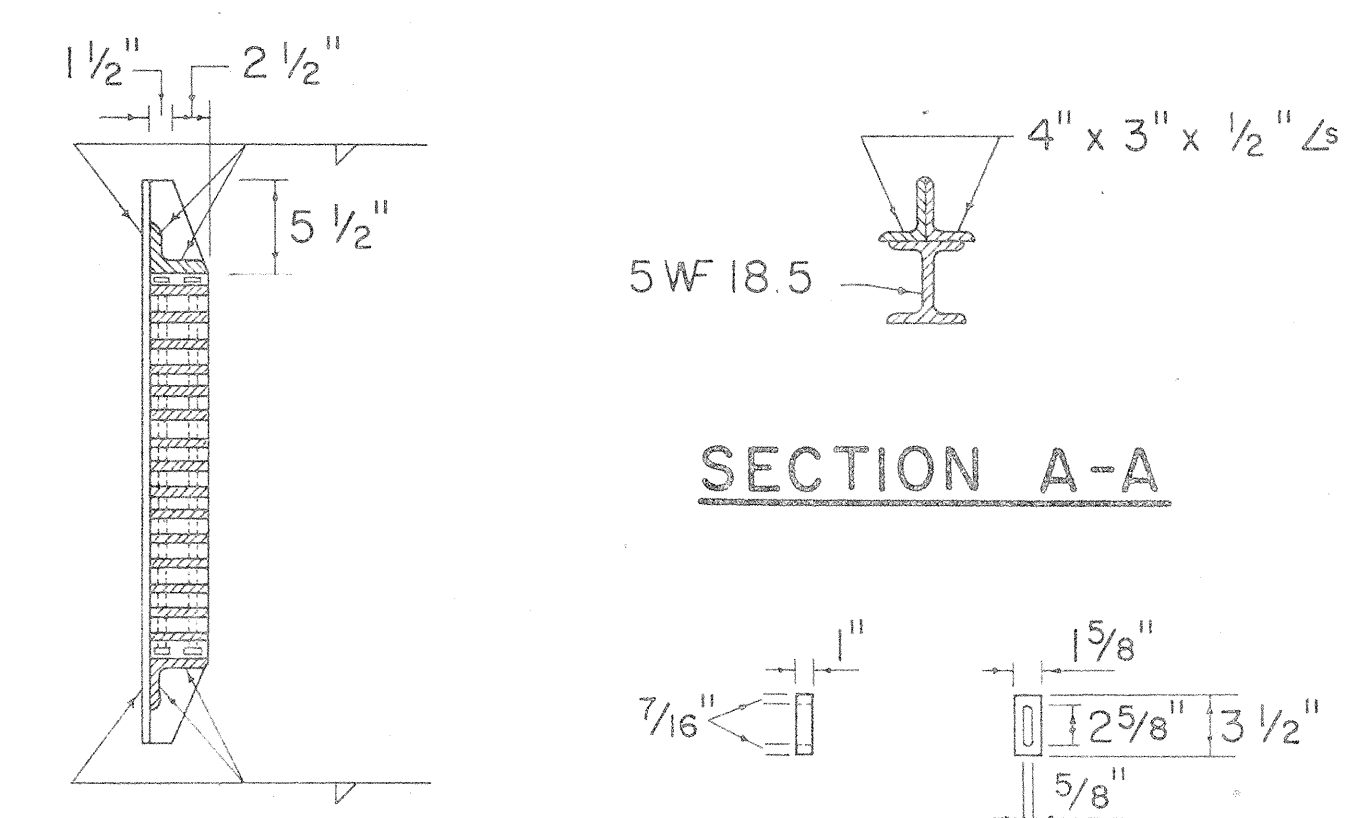
GENERAL NOTES
FENCE POST INSERT-DETAIL TO BE SAME AS SHOWN
ON "L" TYPE WALL DETAILS.
EXCEPT WHERE DETAILED OTHERWISE IN THE PLANS
ALL DETAIL ON THIS SHEET GOVERN.

FED. AID DIST. NO.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	5-0900(3)	1965	28	162

- 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.



- 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.



TYPE "D" STORM DRAIN MANHOLE

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

TYPE "E" STORM DRAIN MANHOLE

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

DETAIL OF TYPE "A" STEEL FRAME AND GRATES

Scale: 1" = 1'-0"

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

S.D.M.H.

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

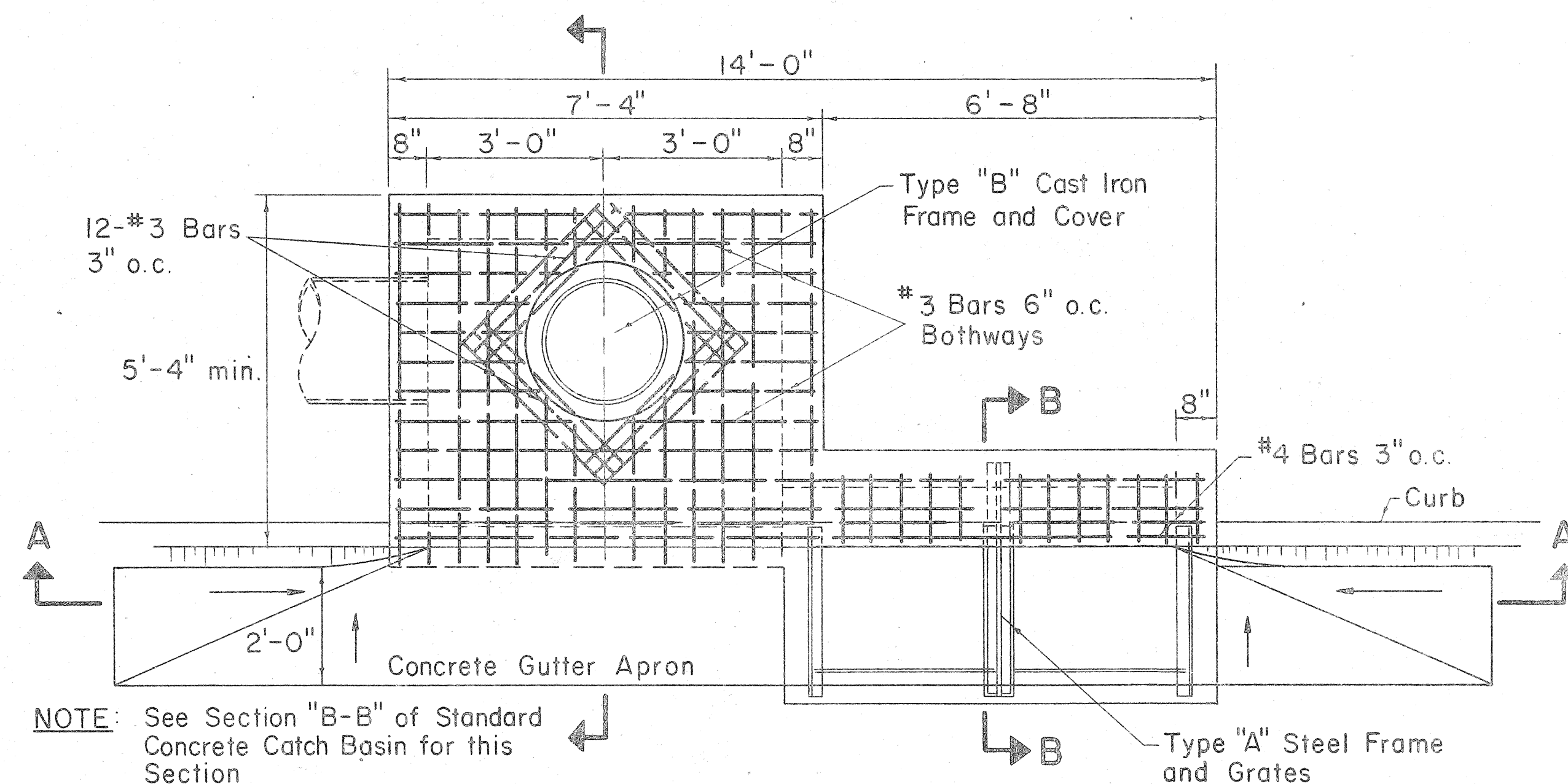
STANDARD DETAILS

STEEL FRAME AND GRATES
AND STORM DRAIN MANHOLES

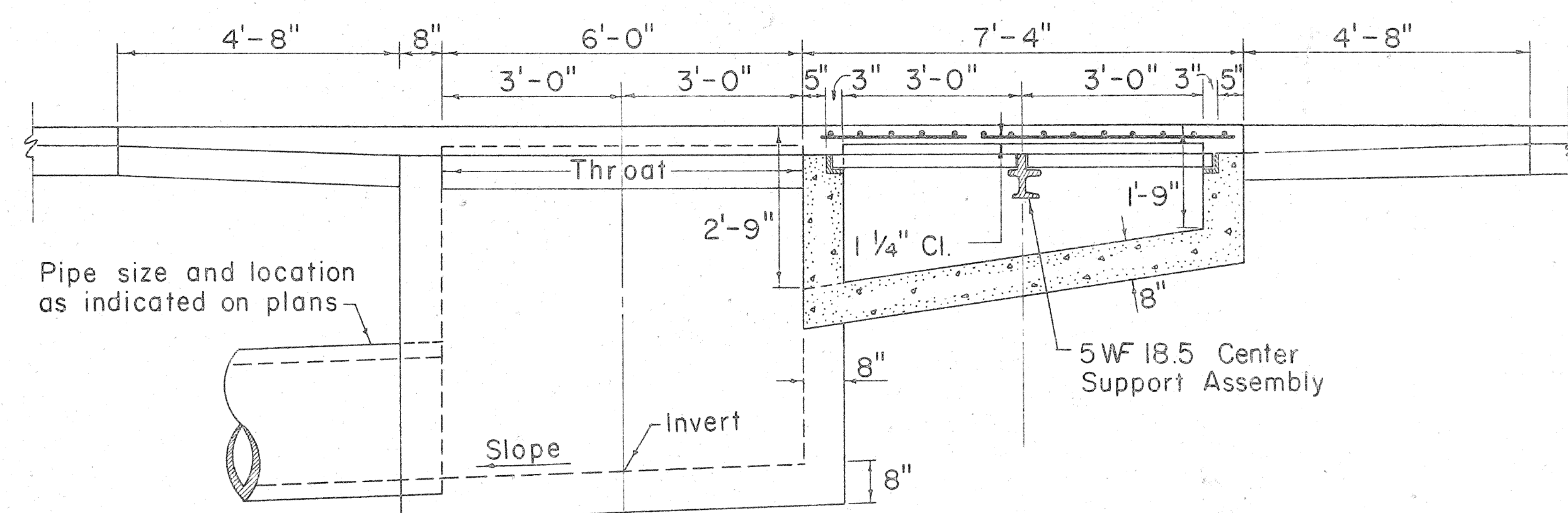
Scales: As Noted Date

SHEET NO. 15 OF 18 SHEETS

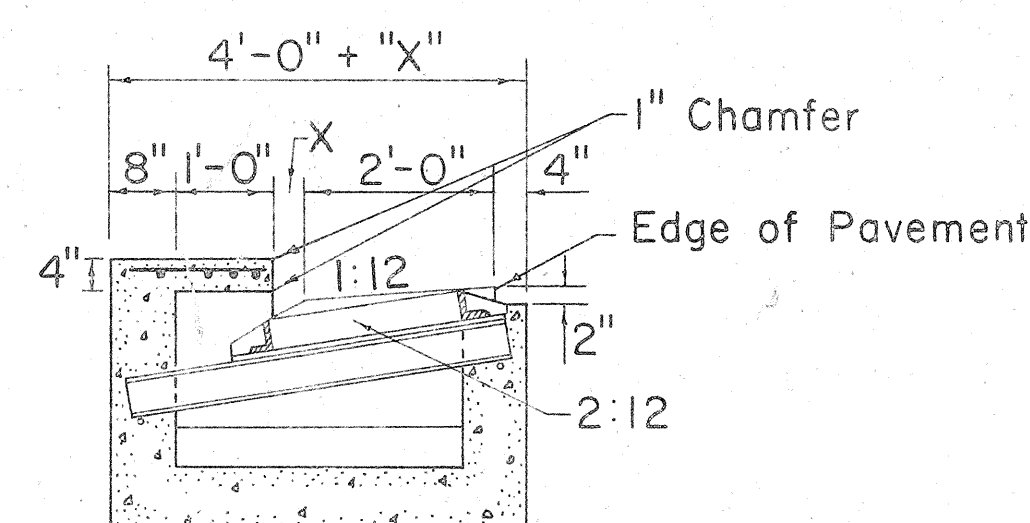
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	5-0900(3)	1965	99	102



PLAN



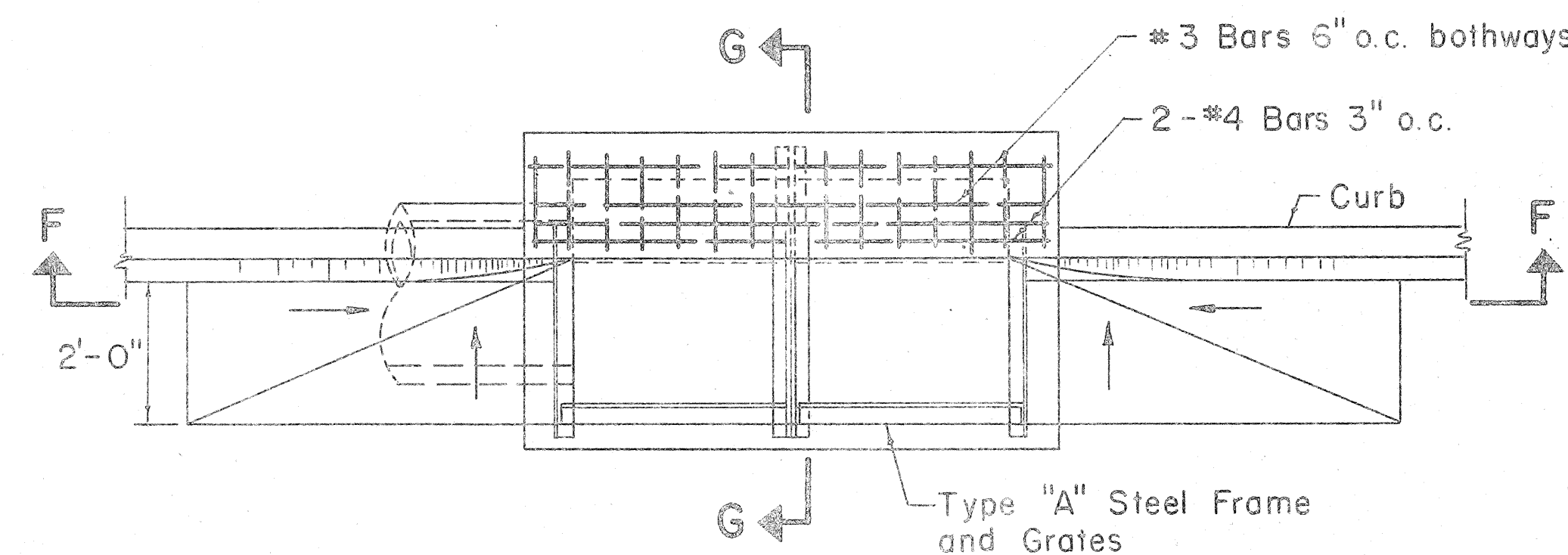
SECTION A-A



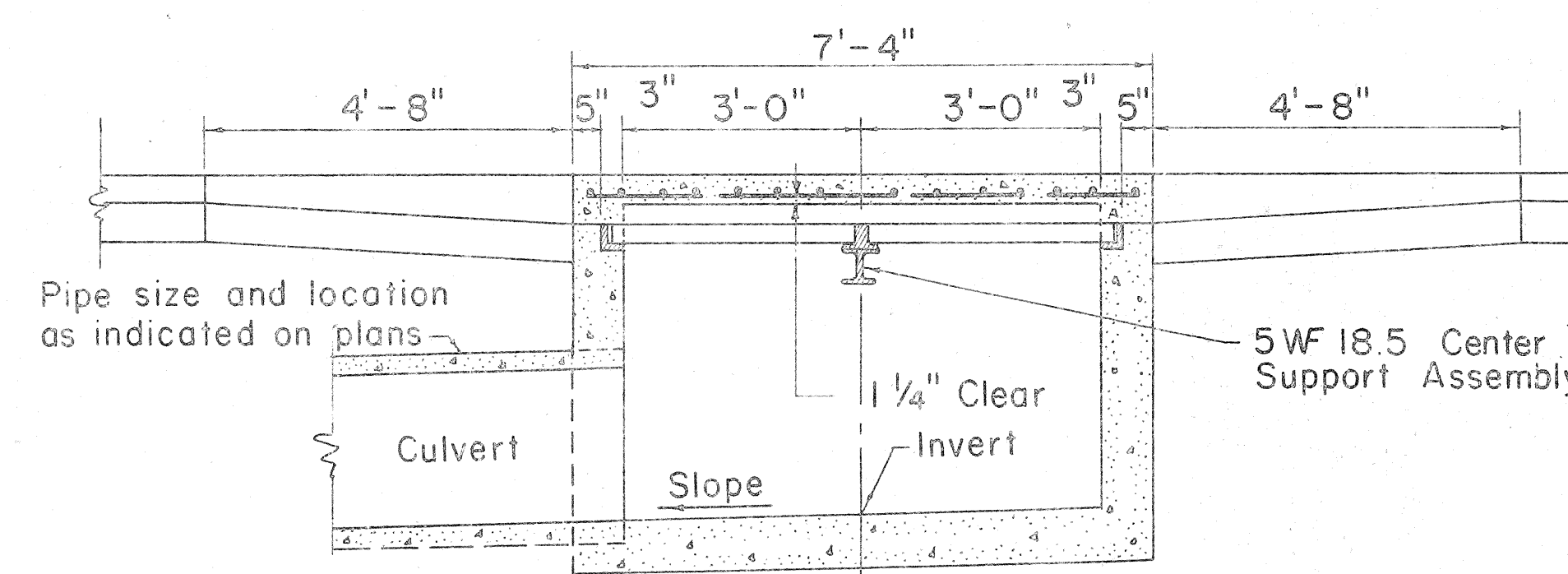
SECTION B-B

DETAIL OF TYPE "CG" CATCH BASIN

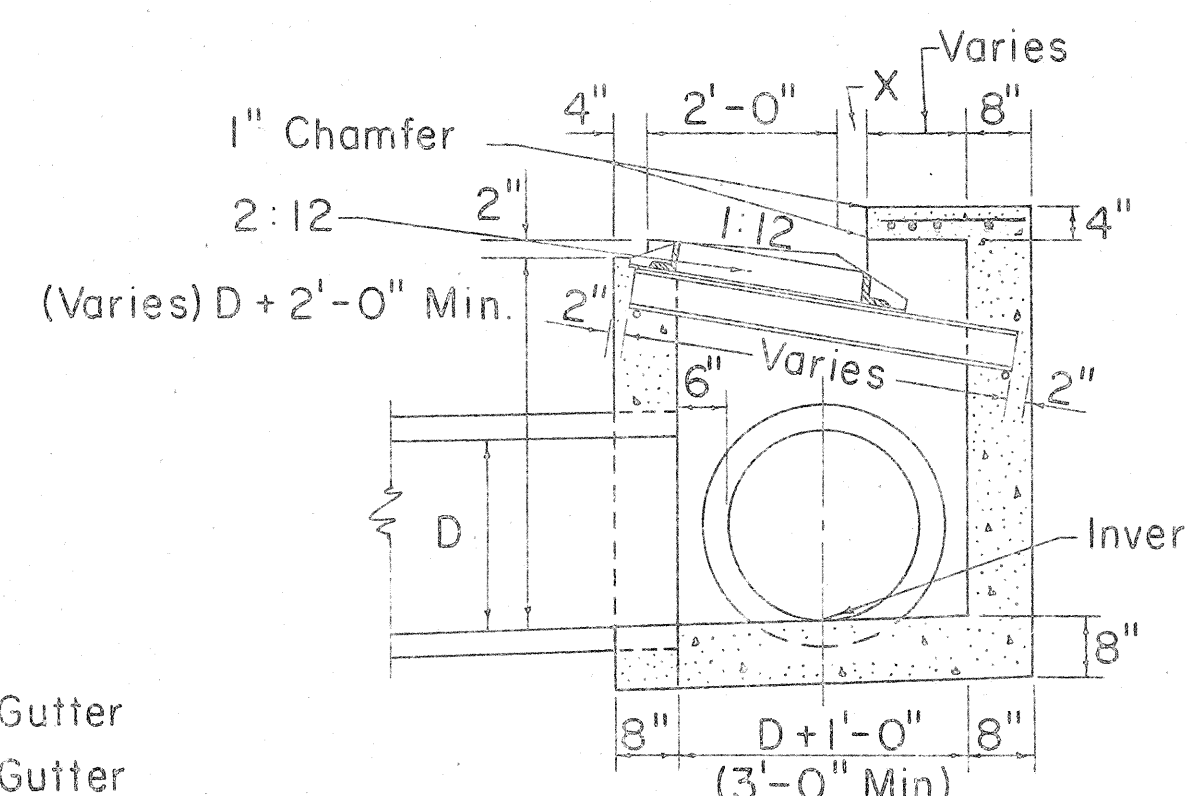
Scale: 1/2" = 1'-0"



PLAN



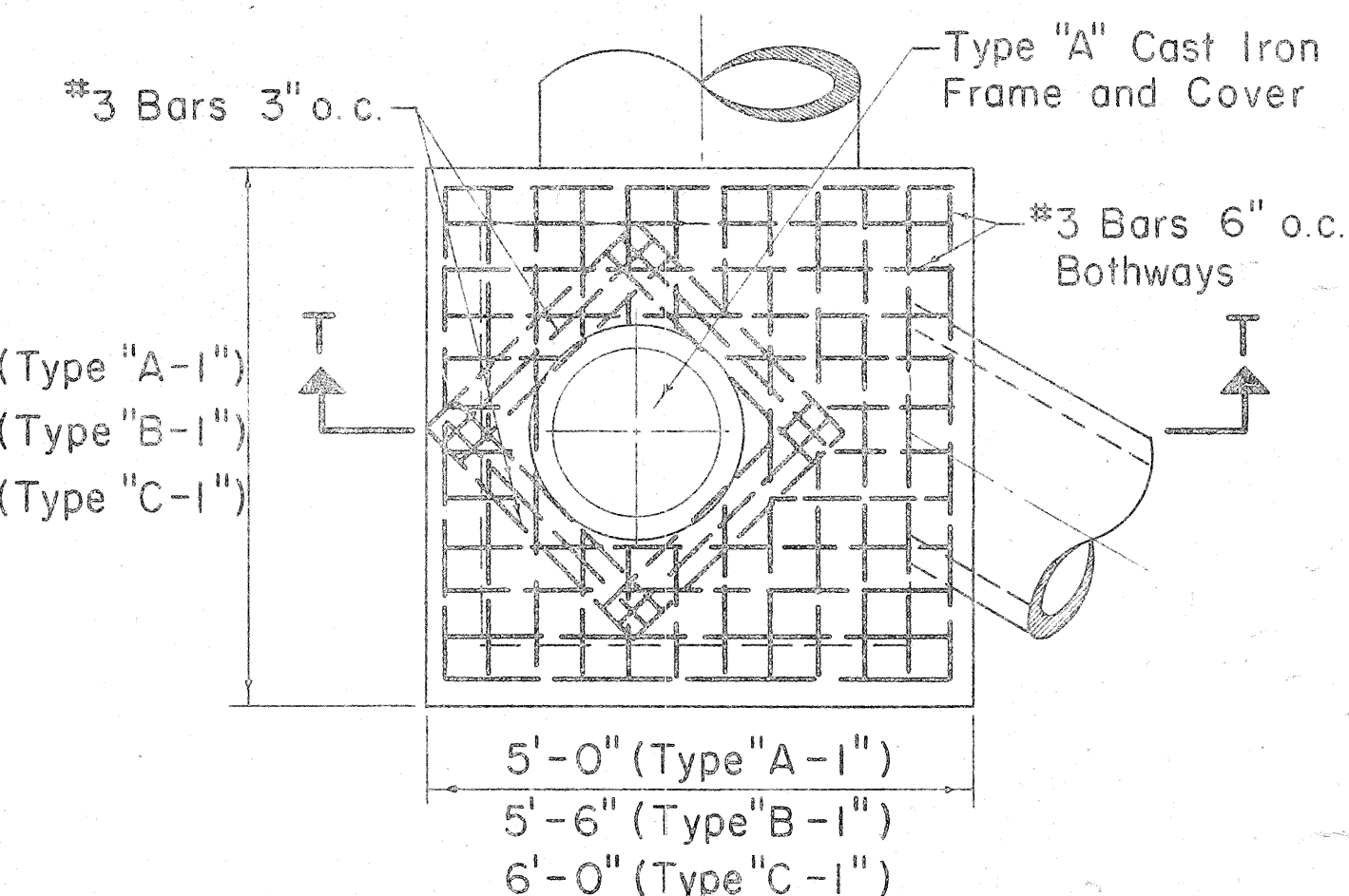
SECTION F-F



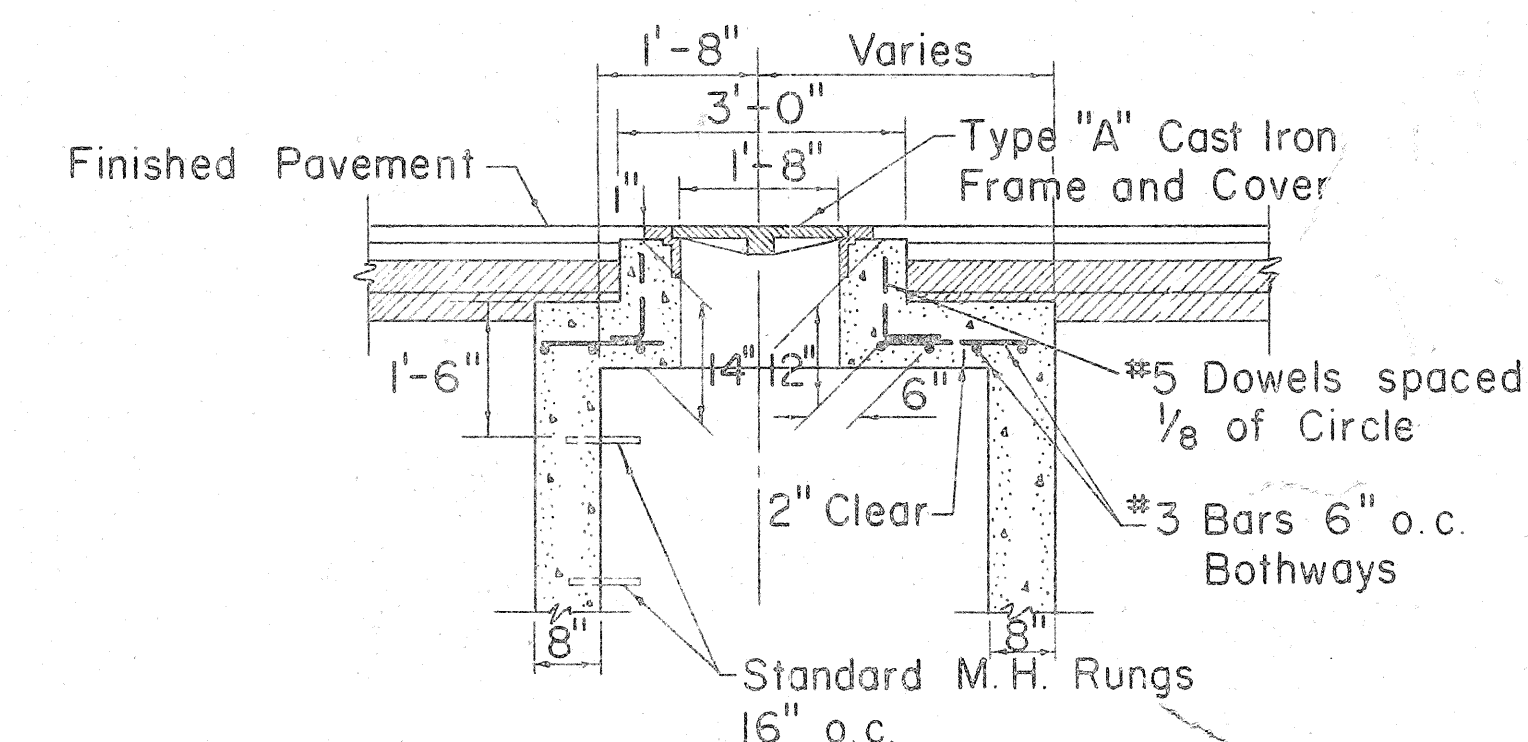
SECTION G-G

DETAIL OF TYPE "DG" CATCH BASIN

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



PLAN



SECTION T-T

TYPE "A-1", "B-1", & "C-1" STORM DRAIN MANHOLE TOP DETAIL UNDER PAVEMENT (BOTTOM DETAIL SIMILAR TO TYPE "A", "B", & "C")

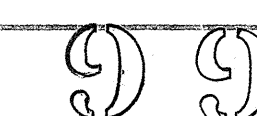
Scale: 1/2" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
CATCH BASINS AND
STORM DRAIN MANHOLES

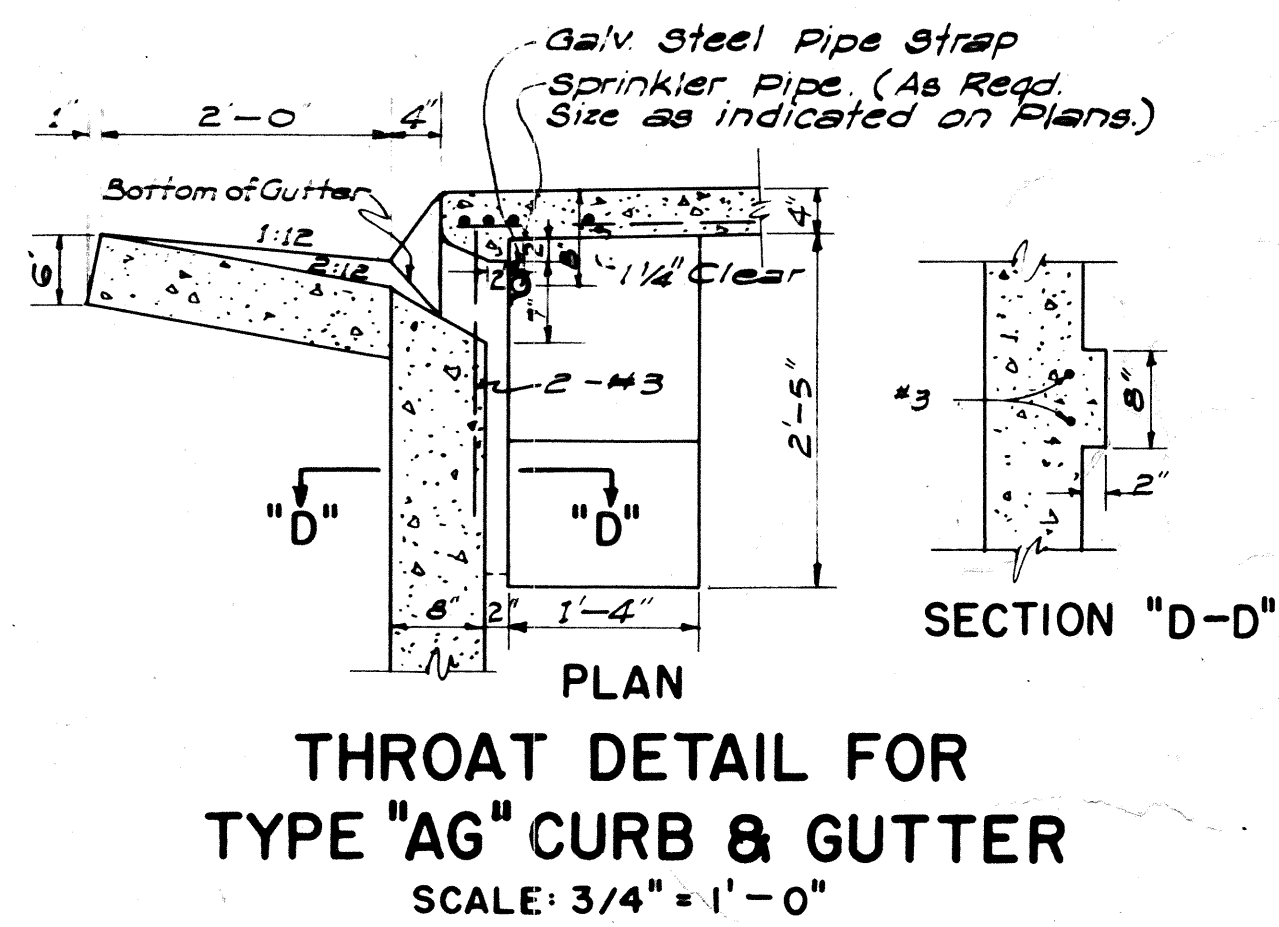
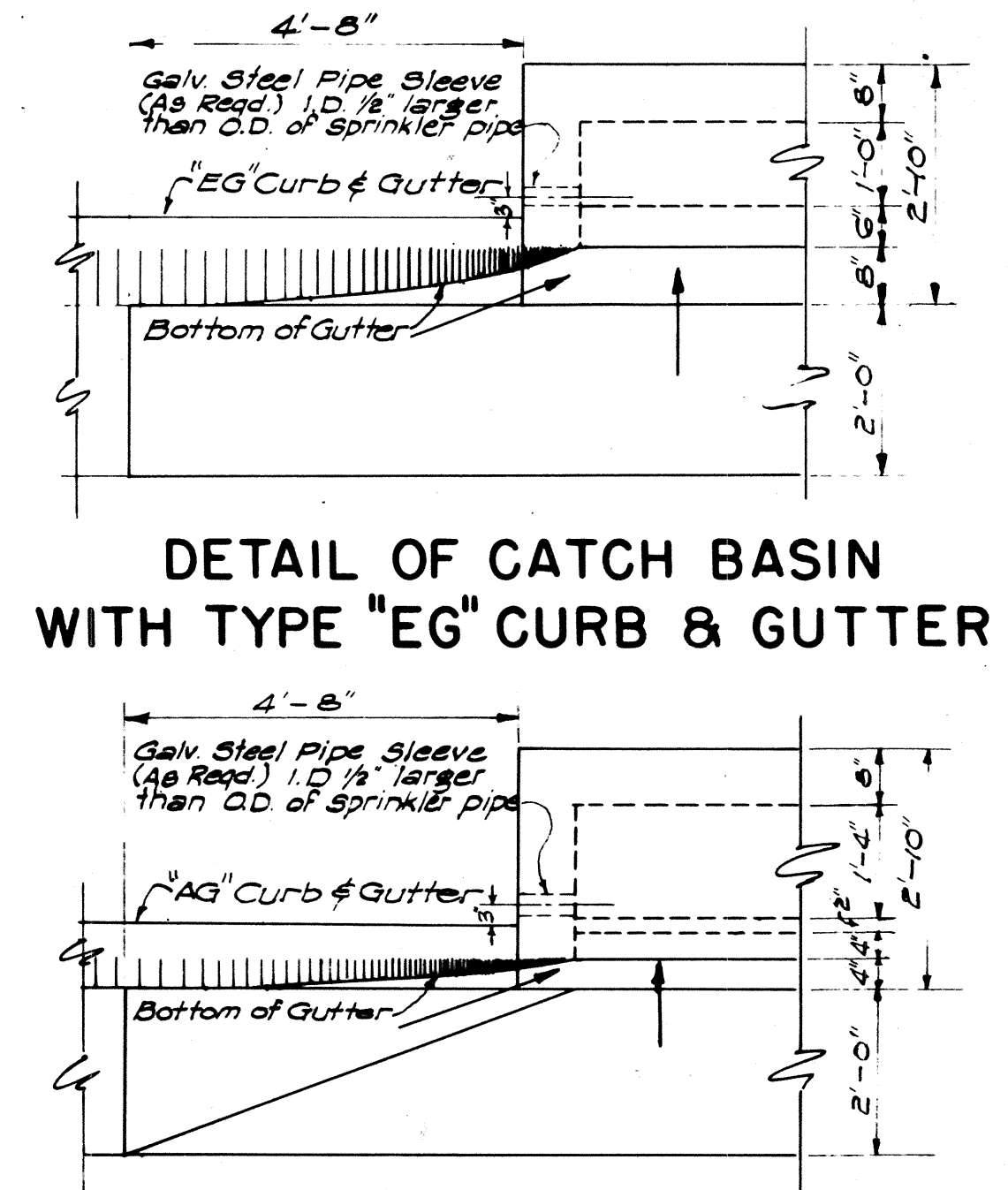
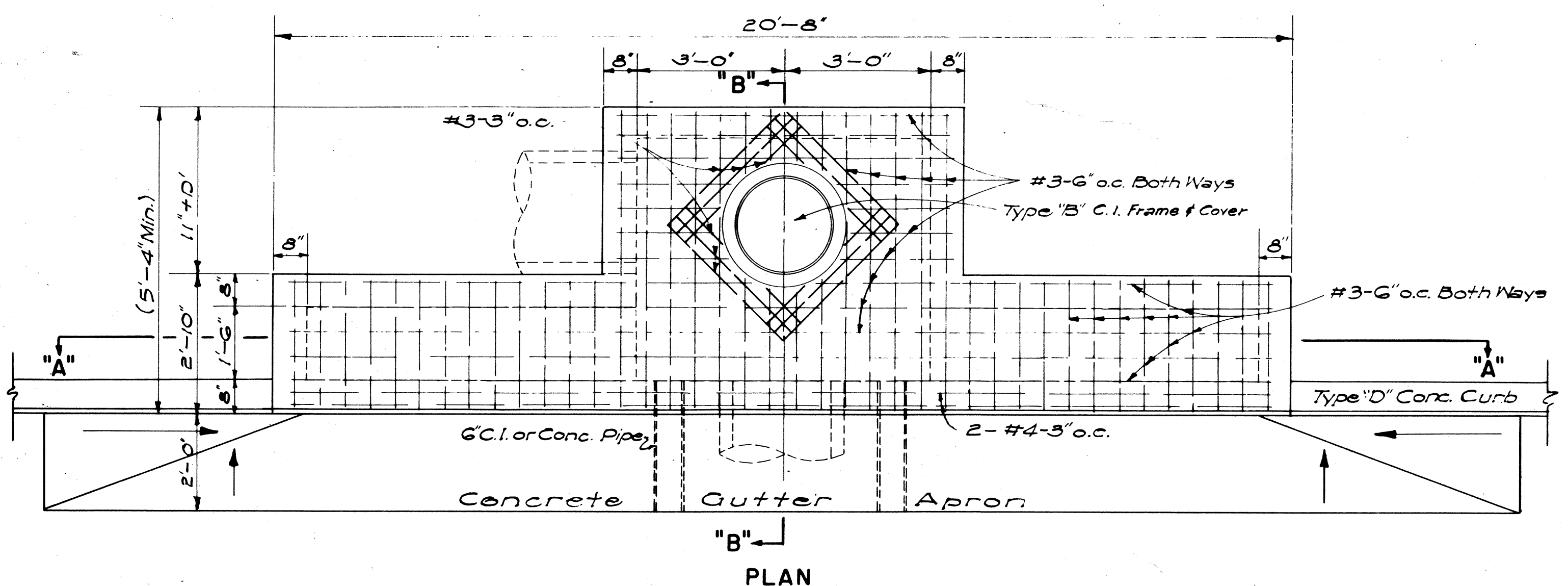
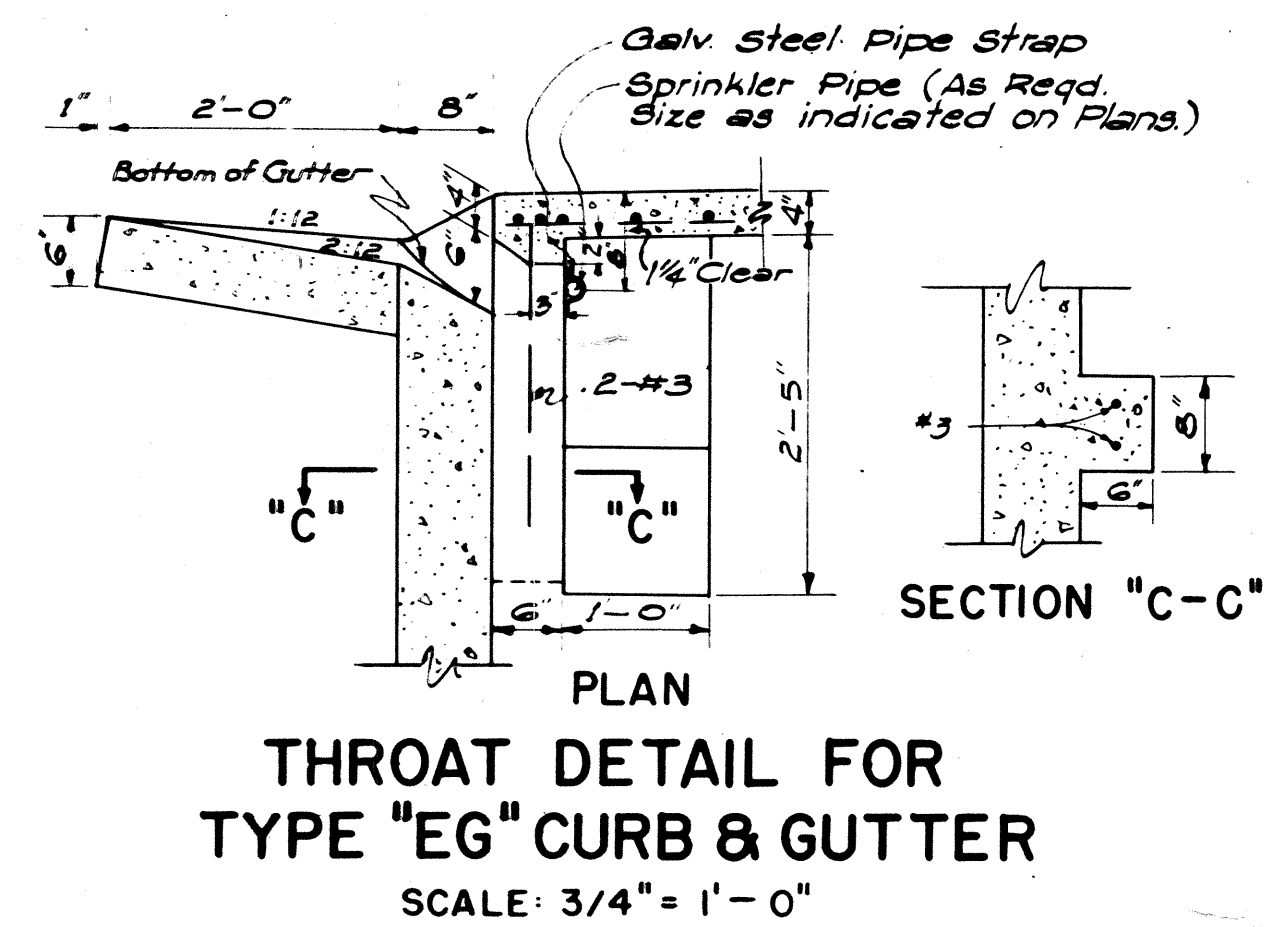
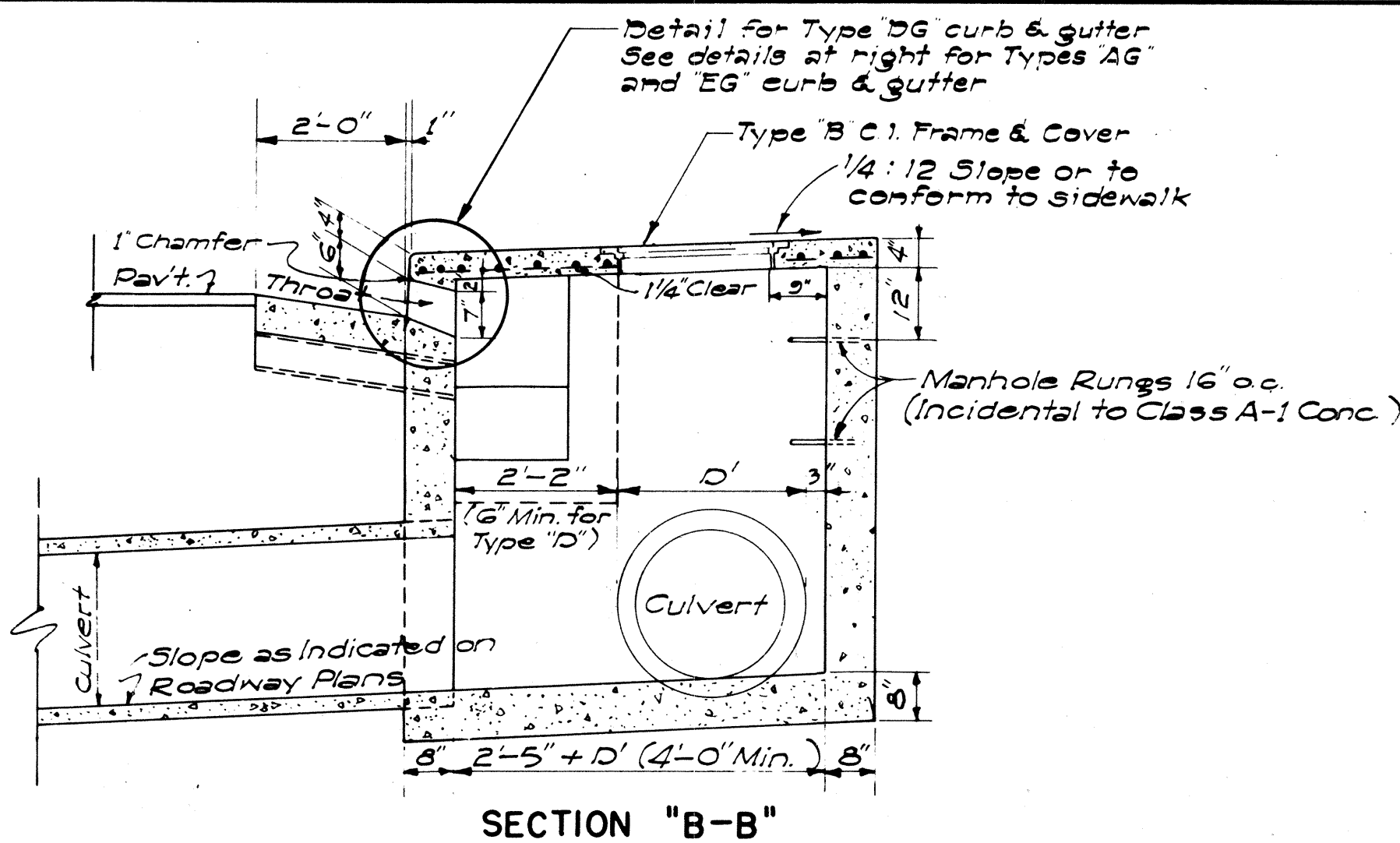
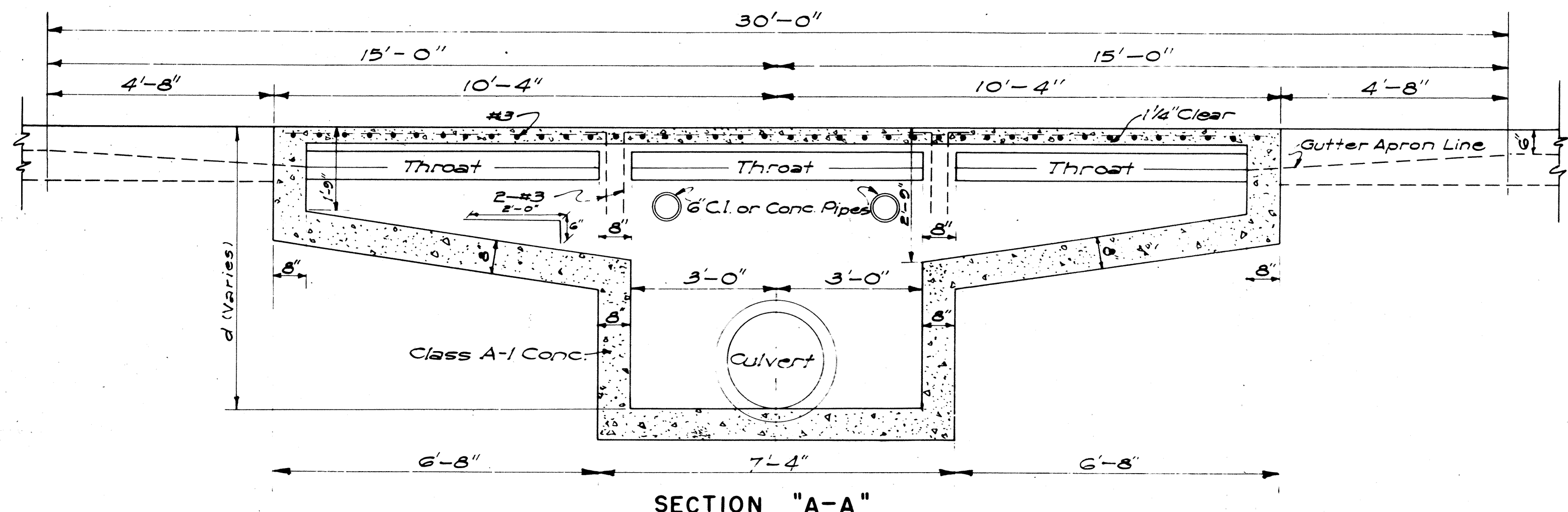
Scales: As Noted Date

SHEET NO. 10 OF 18 SHEETS



2/17/59

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	5-09002	1965	100	102

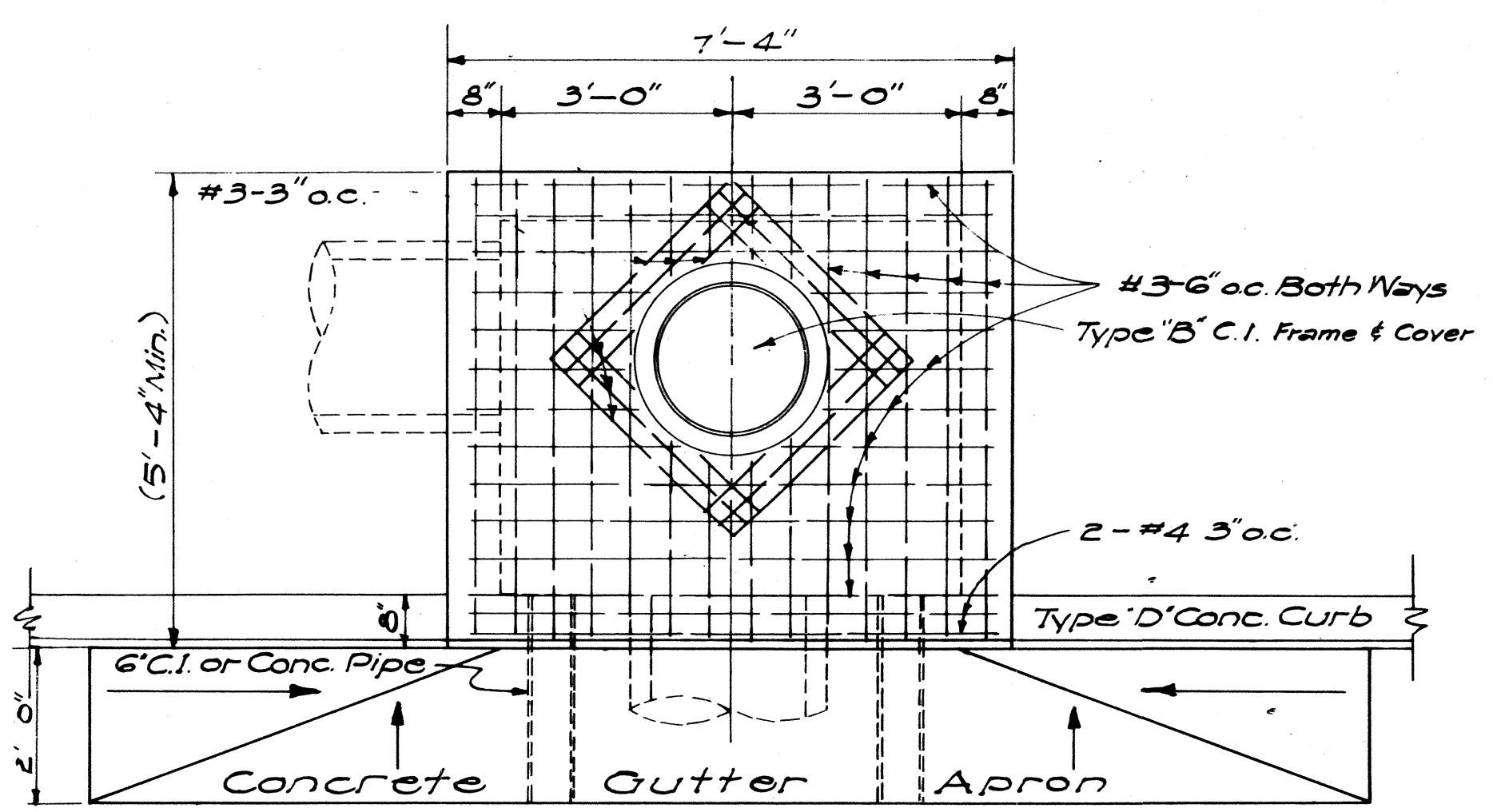
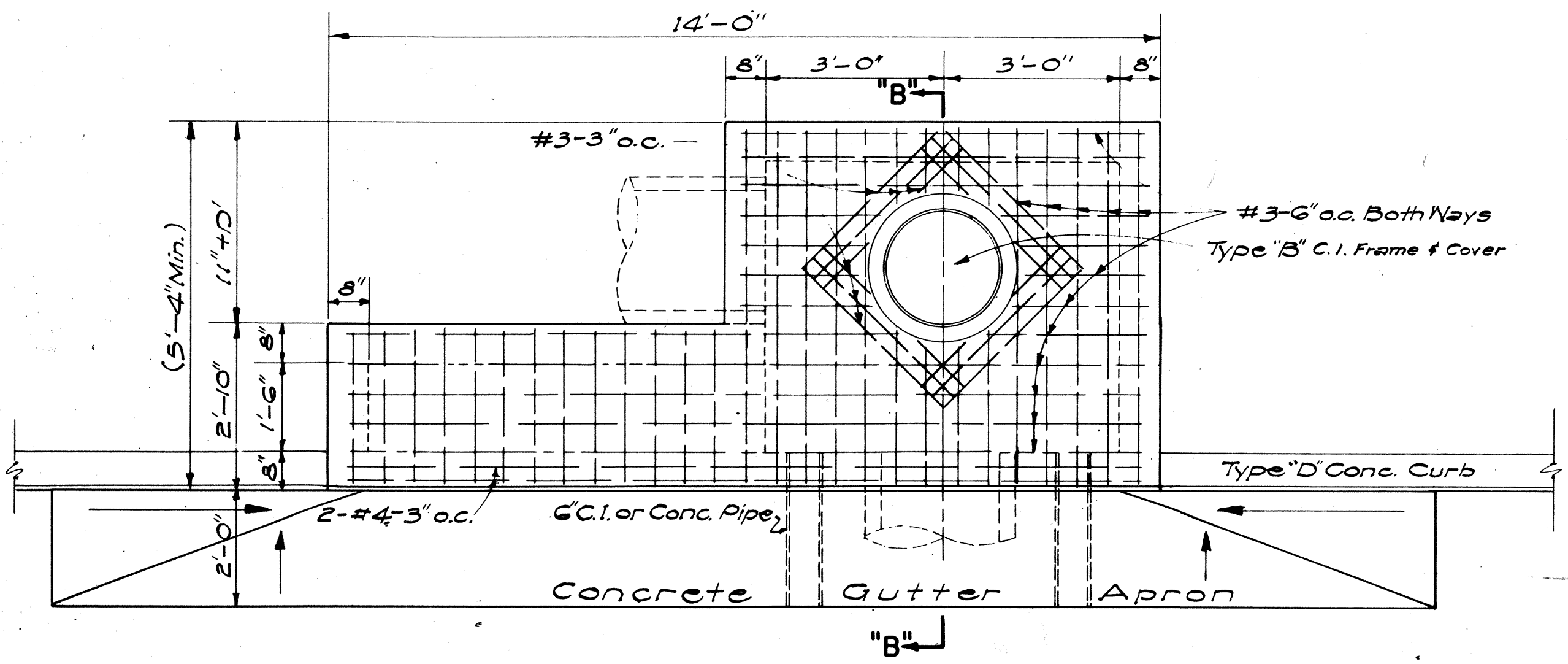


ESTIMATED QUANTITIES

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"	4.0 c.y.	16.5 c.y.	77 lb.	16'-8"

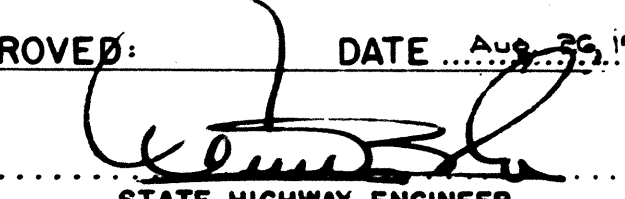
NOTES:

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.



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"

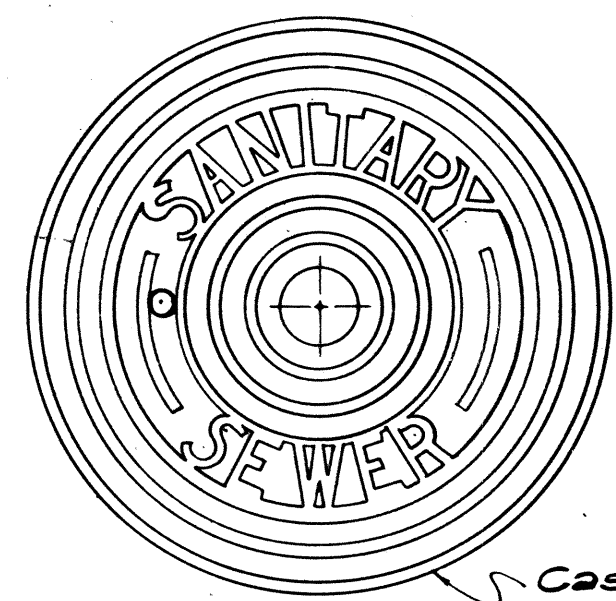
APPROVED:  DATE: AUG 25, 1959
STATE HIGHWAY ENGINEER

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
CATCH BASINS
SCALES AS NOTED
SHEET NO 17 OF 18 SHEETS

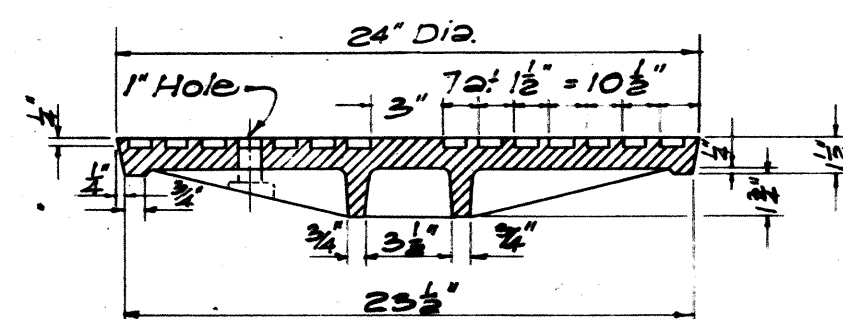
ORIGINAL PLAN
DESIGNED BY
DRAWN BY
CHECKED BY
DATE

2/17/57
8:45:50

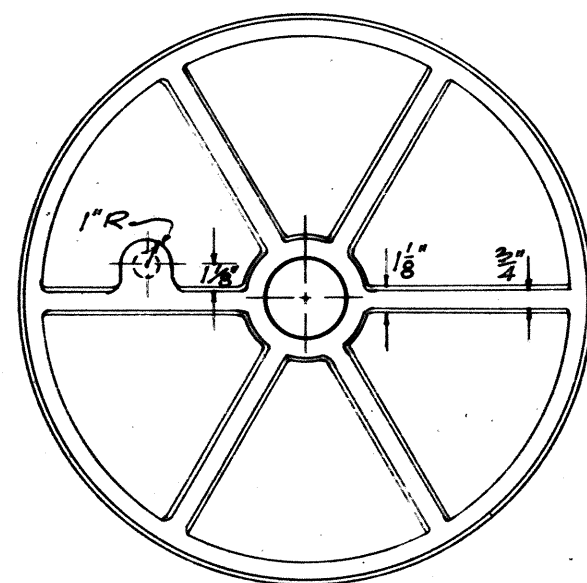
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	5-0900(3)	1965	101	
August 1957					



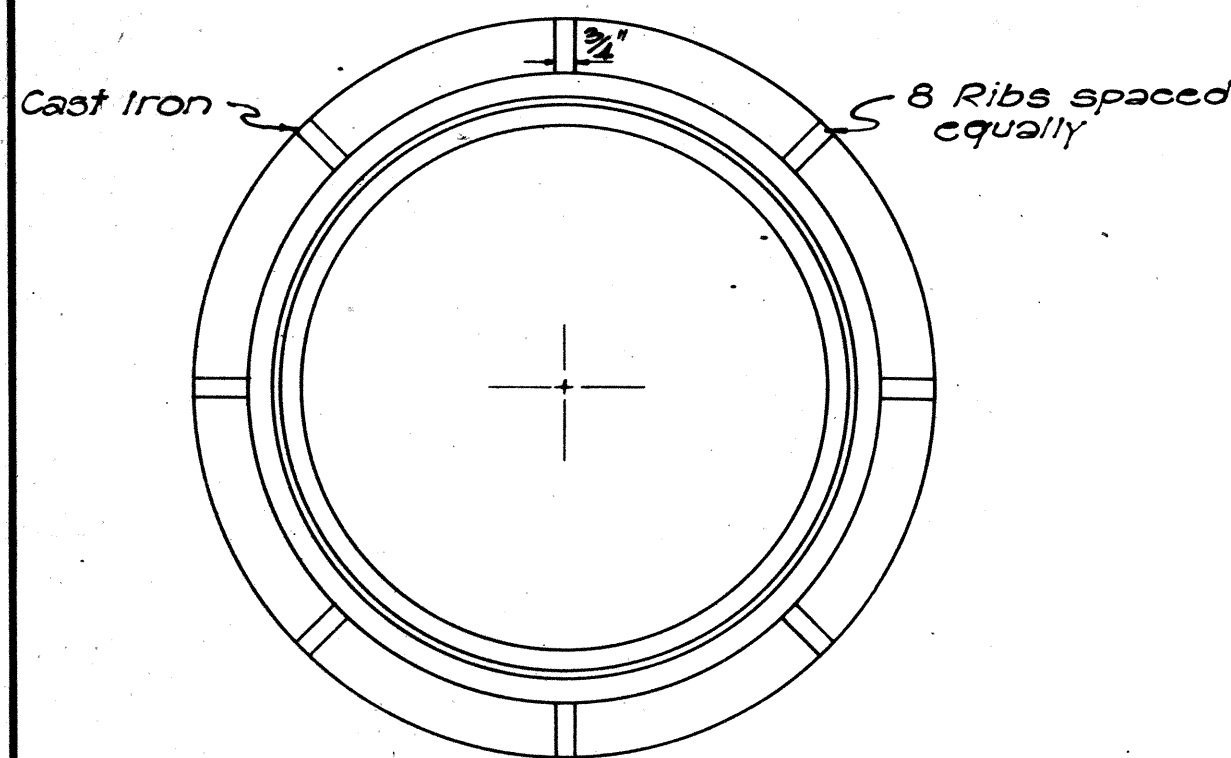
TOP VIEW OF COVER



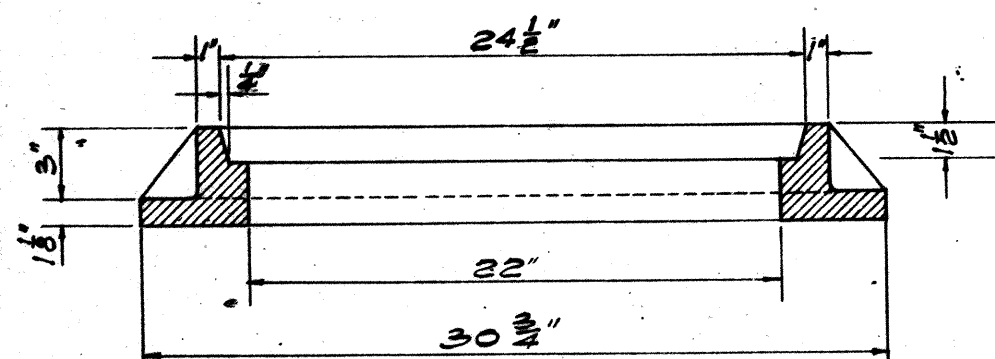
SECTION



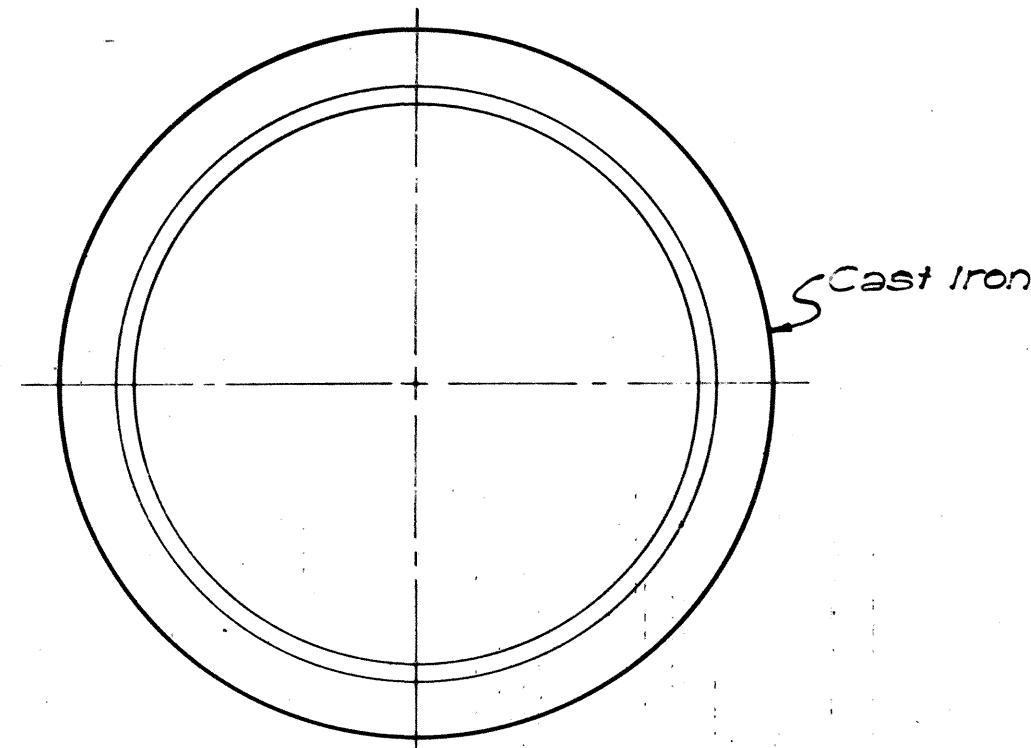
BOTTOM VIEW OF COVER



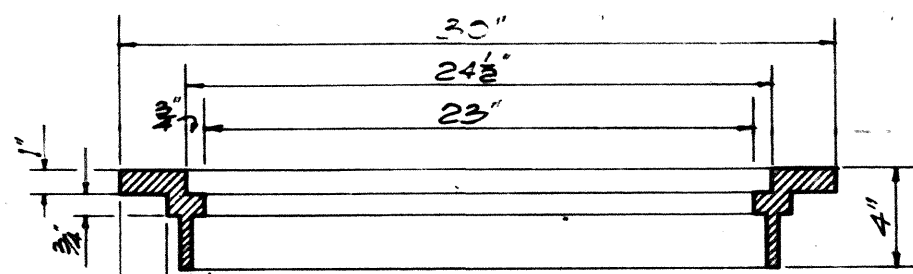
PLAN OF RIM



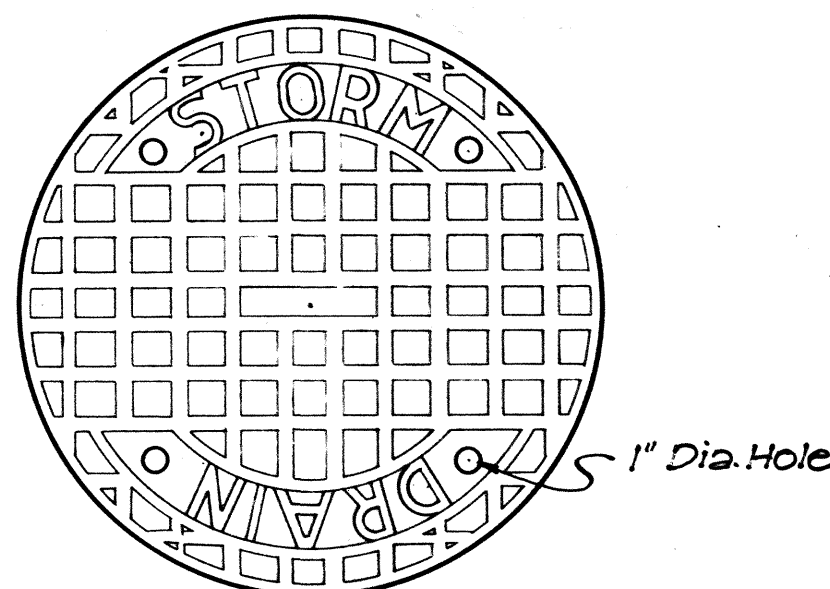
SECTION OF RIM
DETAILS OF TYPE "S"
CAST IRON FRAME AND COVER
SCALE: 1-1/2" = 1'-0"



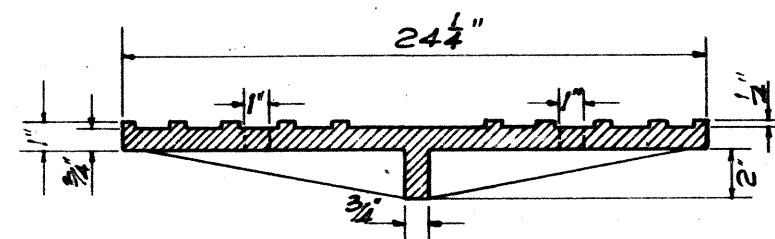
PLAN OF RIM



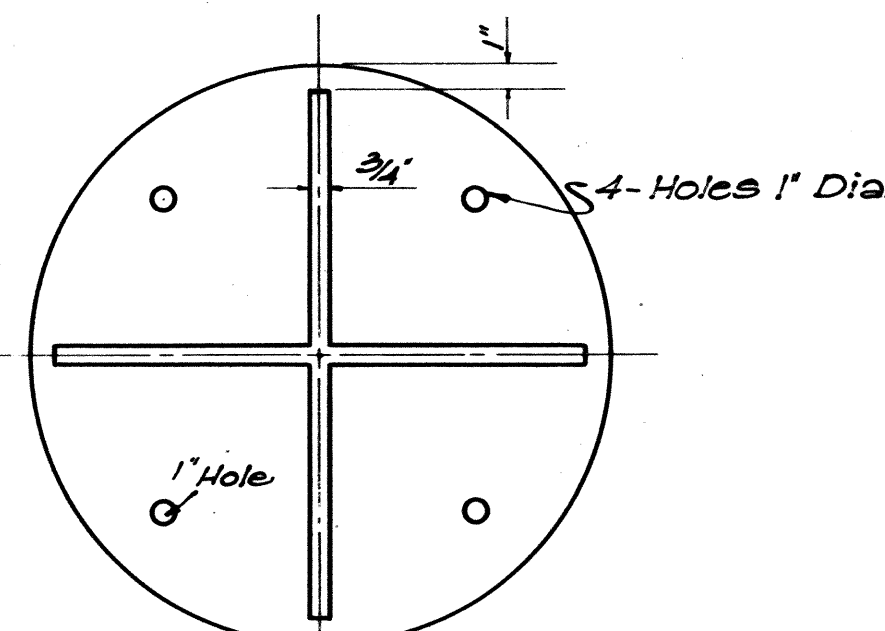
SECTION OF RIM



TOP VIEW OF COVER

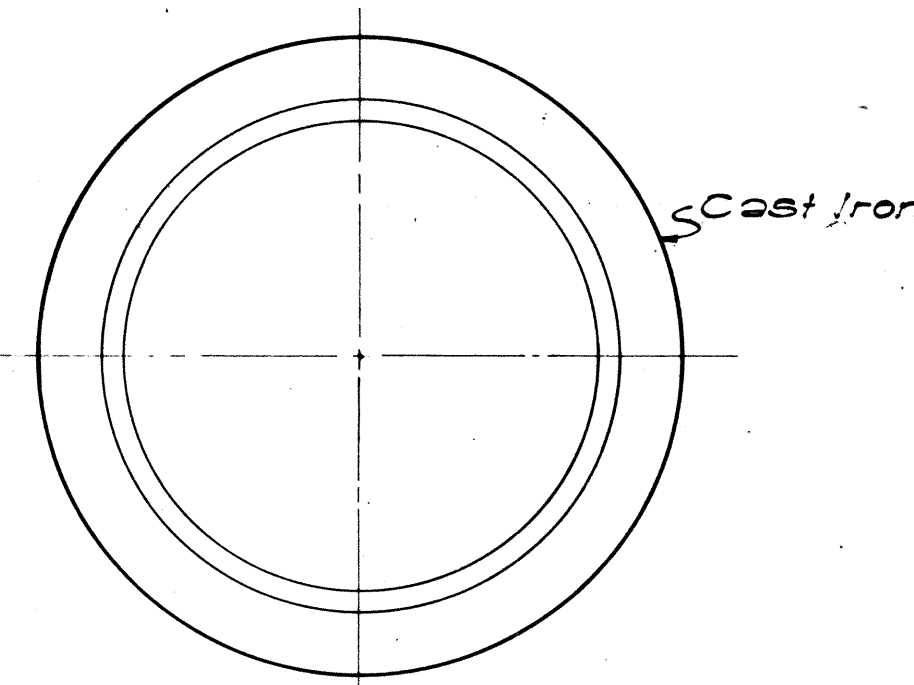


SECTION

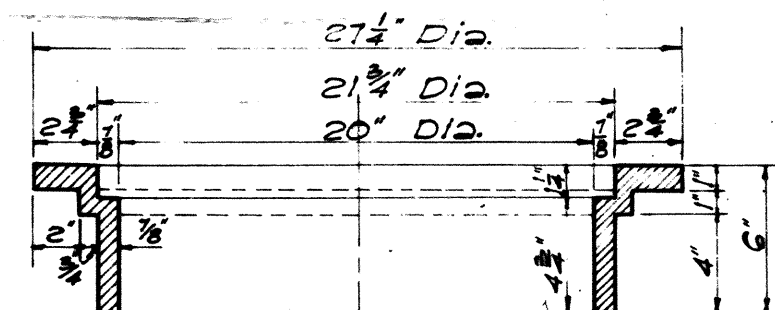


BOTTOM VIEW OF COVER

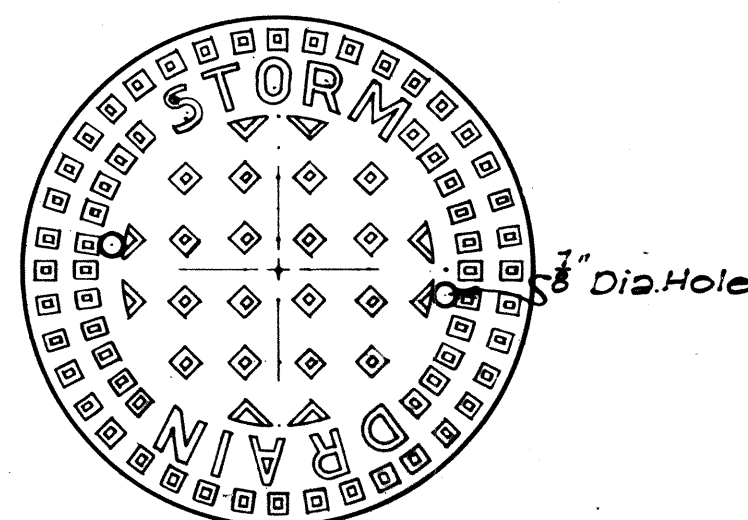
DETAILS OF TYPE "B"
CAST IRON FRAME AND COVER
SCALE: 1-1/2" = 1'-0"



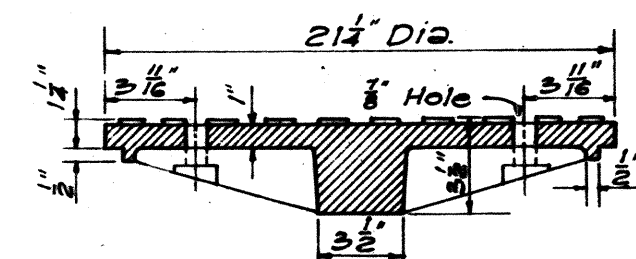
PLAN OF RIM



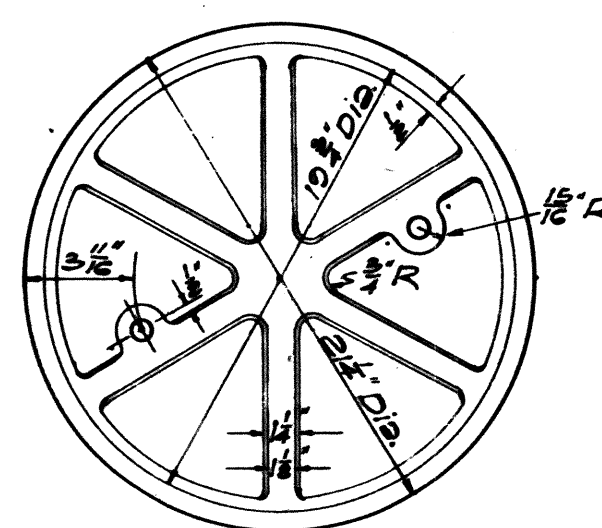
SECTION OF RIM



TOP VIEW OF COVER



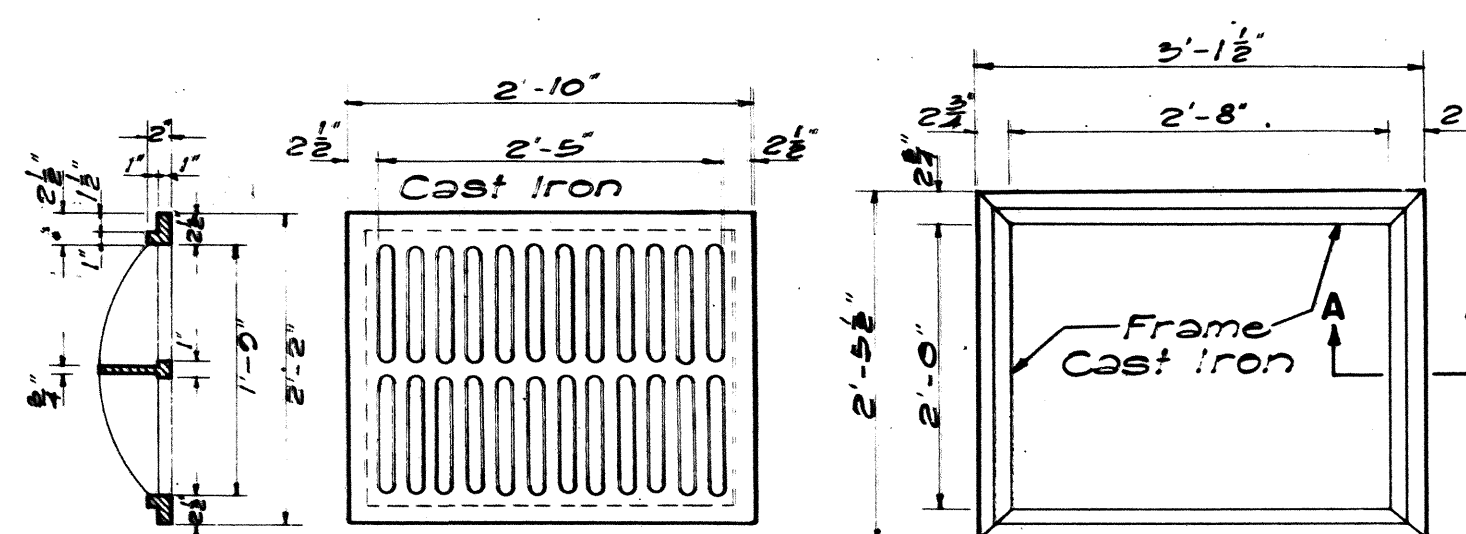
SECTION



BOTTOM VIEW OF COVER

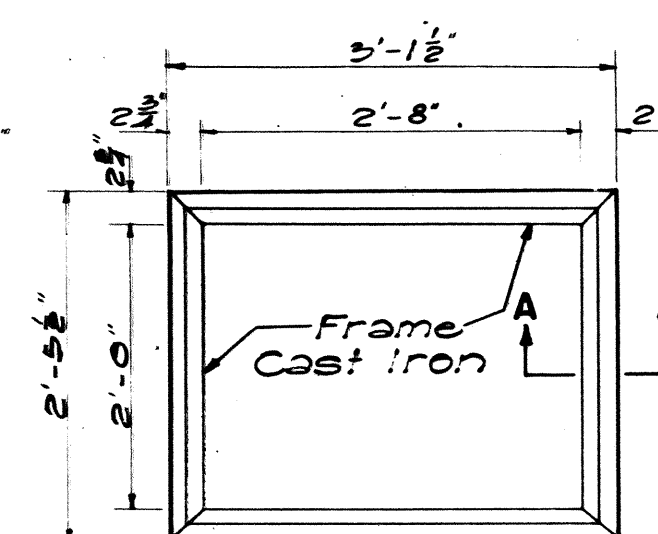
DETAILS OF TYPE "A"
CAST IRON FRAME AND COVER
SCALE: 1-1/2" = 1'-0"

NOTE: Stock Pattern From Novelty Foundry ~ Honolulu



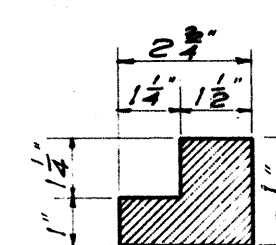
SECTION

TOP VIEW

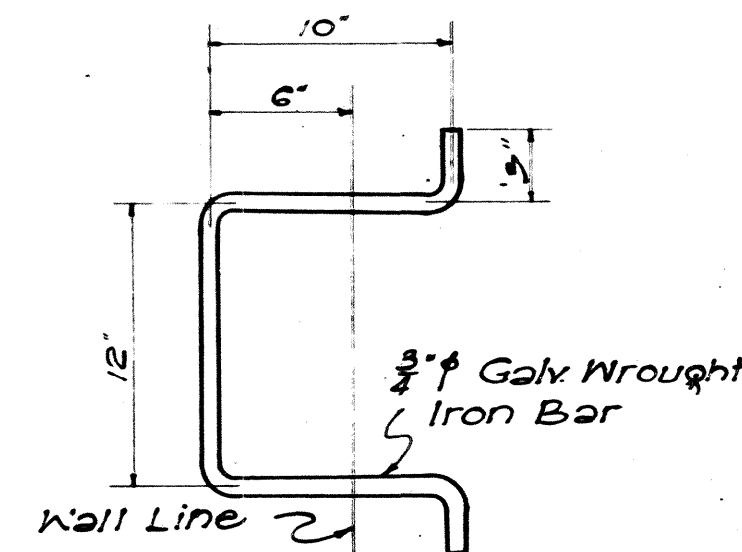


TOP VIEW

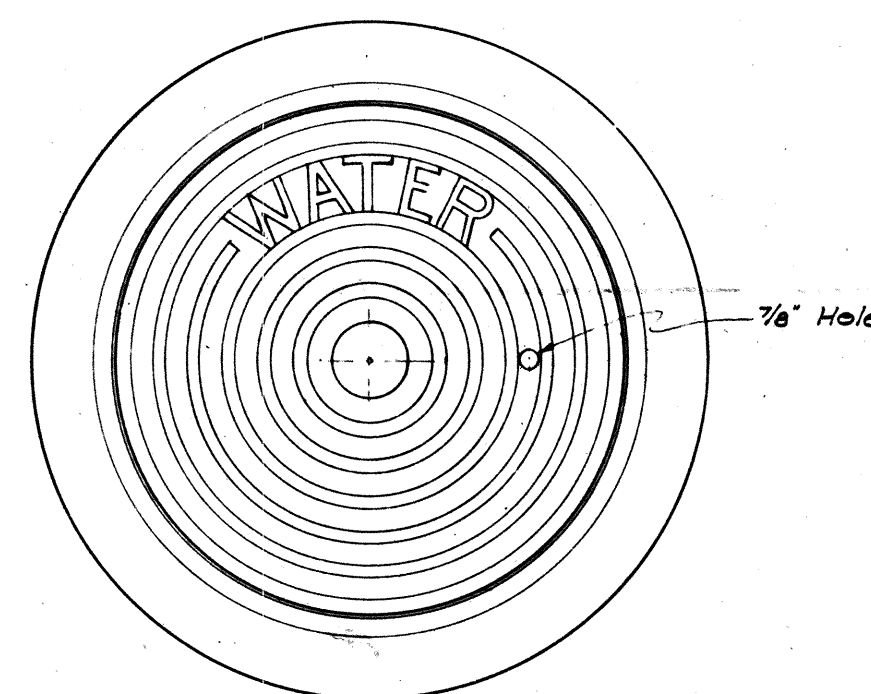
TYPE C C.I. FRAME AND GRATING
SCALE: 3/4" = 1'-0"



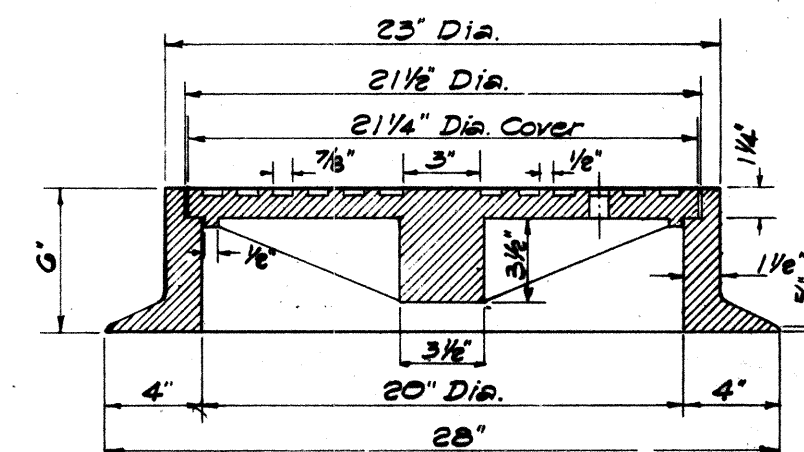
SECTION "A-A"
SCALE 3" = 1'-0"



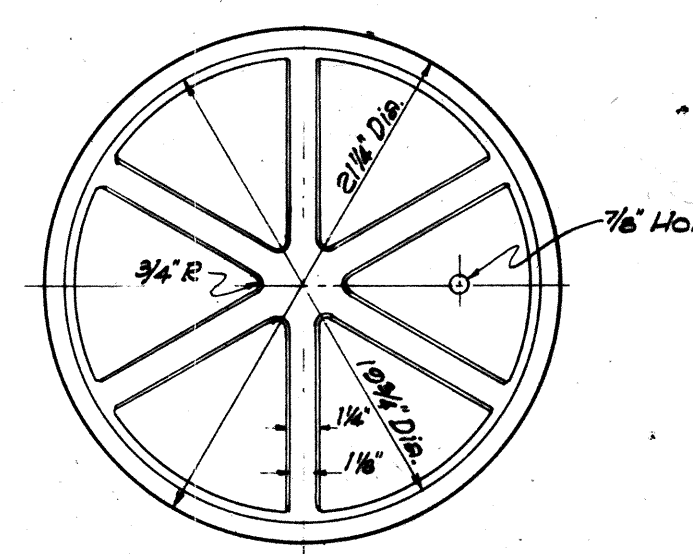
MANHOLE RUNG
SCALE: 1-1/2" = 1'-0"



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. 18 OF 18 SHEETS

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SURVEY PLOTTED BY	DATE
PLAN	
DRAWN BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	

ORIGINAL	NO.
PLAN	
NOTE BOOK	
NO.	