

DATA FOR OUTLET DITCH				
D	W	H	T+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

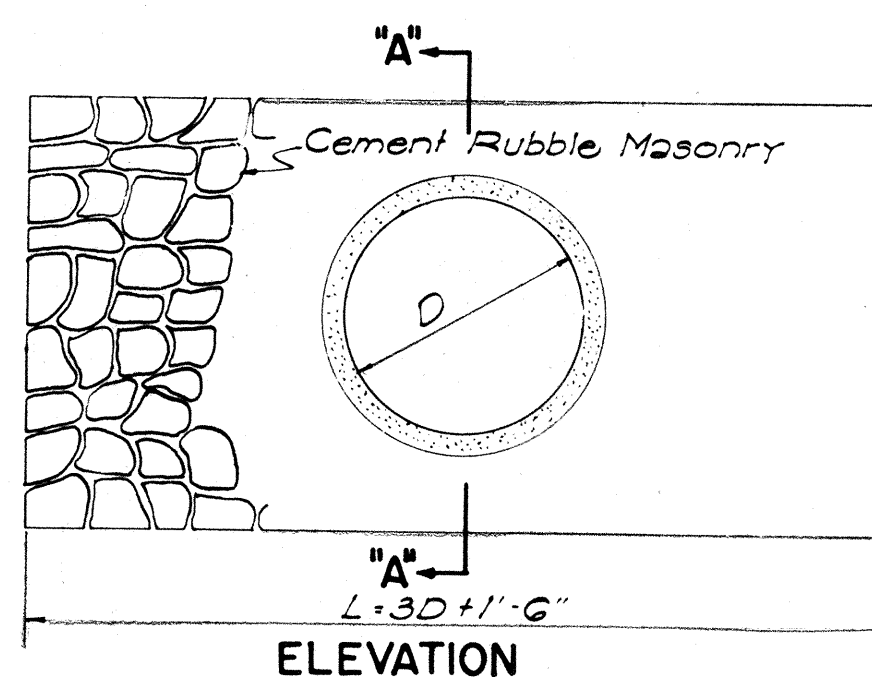
Scale: 1/2" = 1'-0"

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

NOTE:

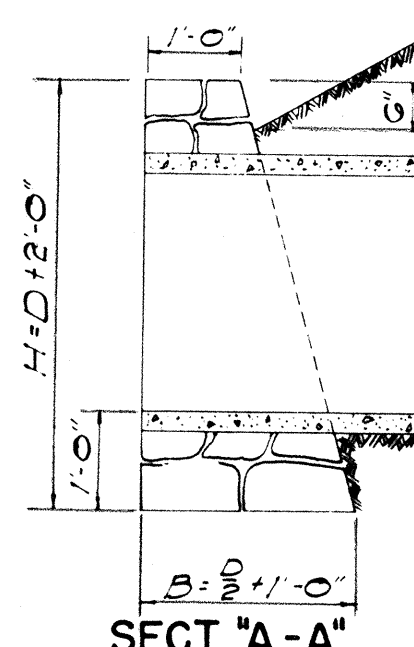
Dimension "X" is assumed as 2'-4" in figuring the above quantities.

DATA - MASONRY HEADWALL					Where Variables Equal
D	H	B	L	Cu Yds.	
18"	3'-6"	1'-0"	6'-0"	0.85	0.03
24"	4'-0"	2'-0"	7'-6"	1.28	1.41
30"	4'-6"	2'-6"	9'-0"	1.83	2.00
36"	5'-0"	3'-0"	10'-6"	2.40	2.72



DETAIL OF MASONRY HEADWALL

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

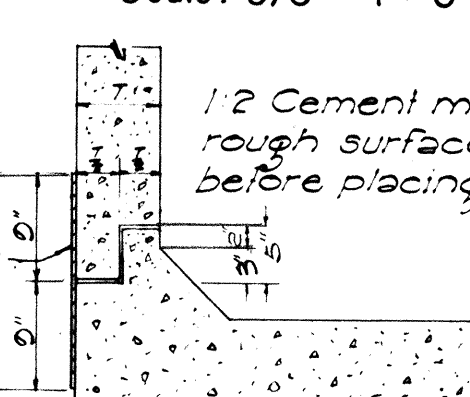


SECTION "A-A"



DETAIL OF MASONRY DROP INTAKE

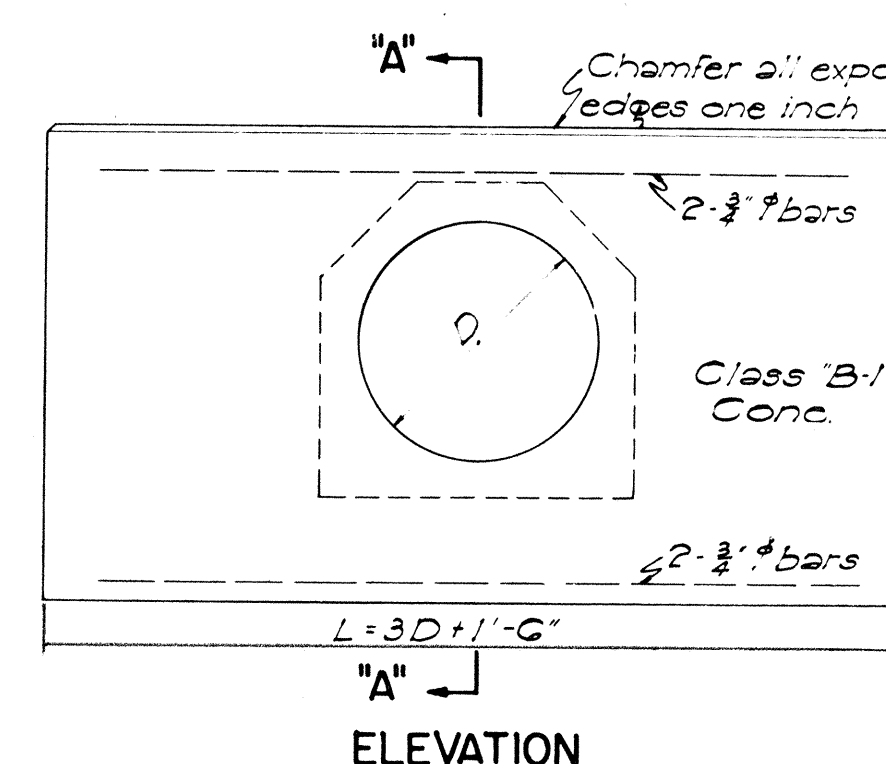
Scale: 3/8" = 1'-0"



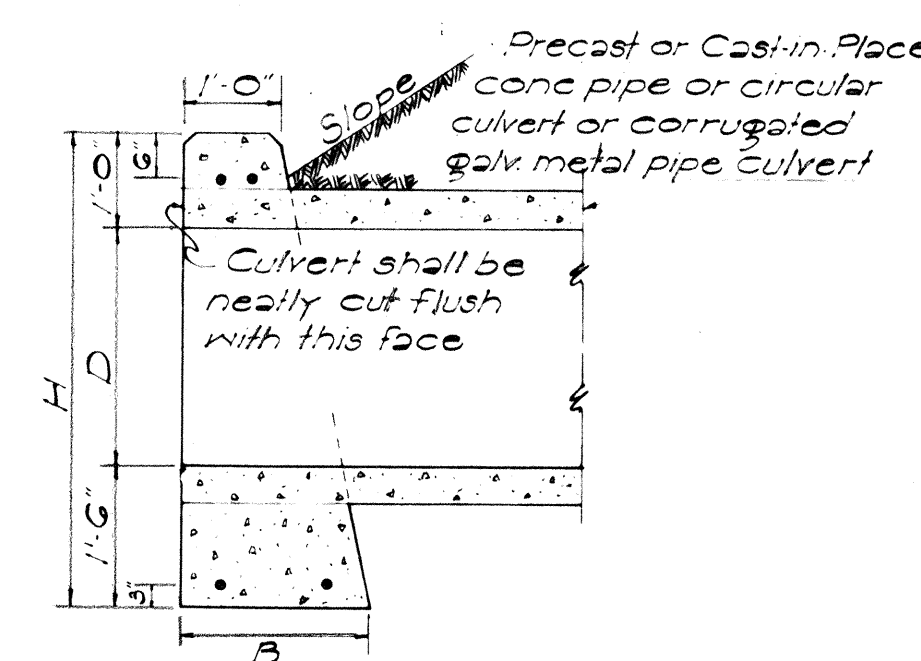
CONSTR. JOINT DETAILS

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

Note: When subgrade is below top of jacket, it shall be fully compacted to this line and then re-excavated (struck) to proper subgrade. This surface shall be rolled again.



ELEVATION



SECTION "A-A"

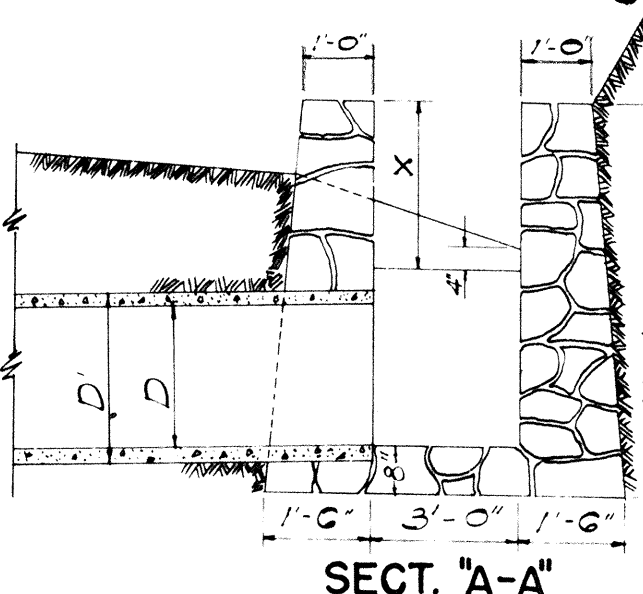
DATA FOR CONC. HEADWALL					Steel For One Headwall
D	B	L	H	Cu Yds.	No. of Bars Size Length Lbs.
18"	1'-6"	6'-0"	4'-0"	0.02	4 #4 2'-0" 33
24"	1'-6"	7'-6"	4'-6"	1.25	4 #4 2'-0" 42
30"	2'-0"	9'-0"	5'-0"	1.95	4 #4 2'-0" 51
36"	2'-0"	10'-6"	5'-6"	2.45	4 #4 2'-0" 60
42"	2'-6"	12'-0"	6'-0"	3.87	4 #4 2'-0" 69
48"	2'-6"	13'-6"	6'-6"	4.66	4 #4 2'-0" 78

DETAIL OF CONCRETE HEADWALL

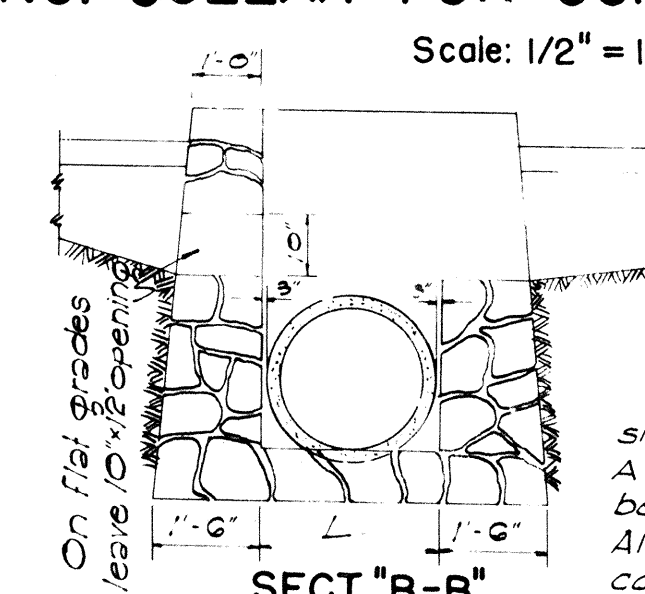
Scale: 1/2" = 1'-0"

SECTION "A-A" SECTION "B-B" CONC. COLLAR FOR CONC. BOX CULVERT

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



SECT. "A-A"



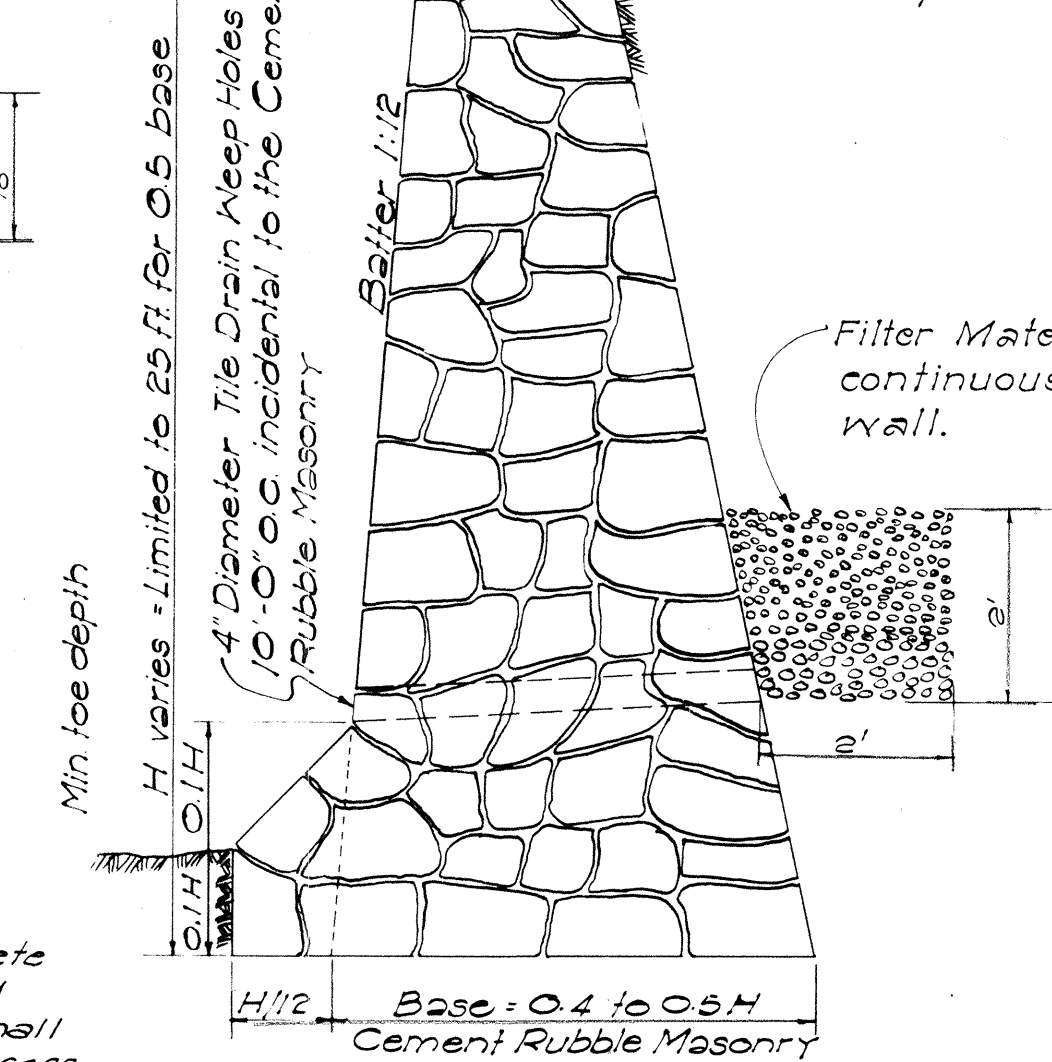
SECT. "B-B"

REINFORCING BARS

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

SECTION OF HIGH CEMENT RUBBLE MASONRY RETAINING WALL OR SEAWALL

Note: To Resident Engineer
1) Consider economy of reinf. conc for high retaining walls which did not originate on plan layout.
2) Elevation of weep holes to be determined by Resident Engineer. Holes to be placed as close to the existing ground line as local conditions permit.

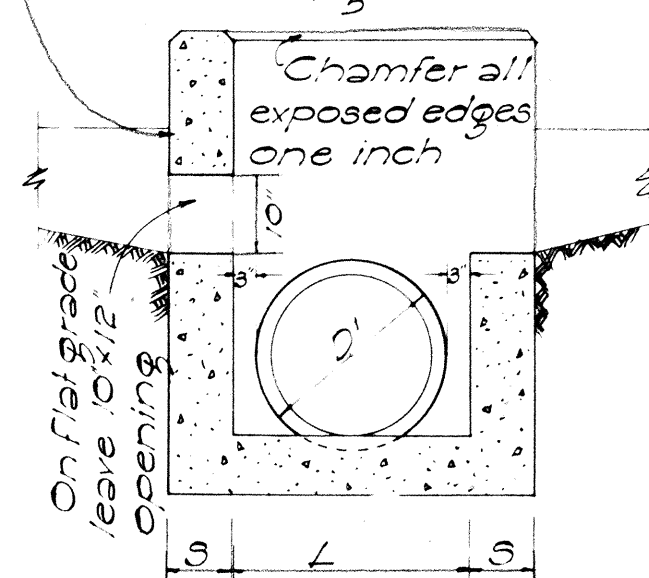


SECTION OF LOW MASONRY RETAINING WALL OR SEAWALL

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

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

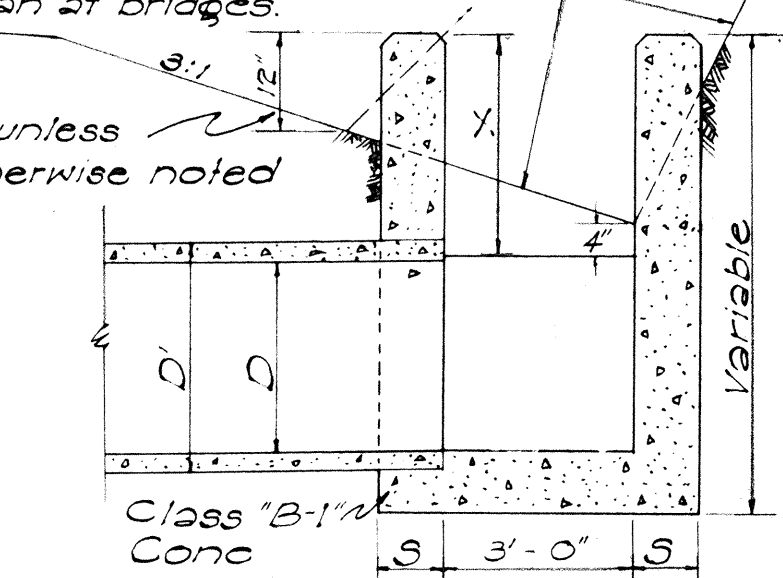
Note: This type of structure shall also be used for the Drop Intakes of Syphons connected with Irrigation Ditches or Flumes with appropriate changes to dimensions. In this case all joints must be made water tight.



SECTION "B-B"

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

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



SECTION "A-A"

DETAIL OF CONCRETE DROP INTAKE

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

SECT. OF CULVERT WITH CONC. PROTECTION

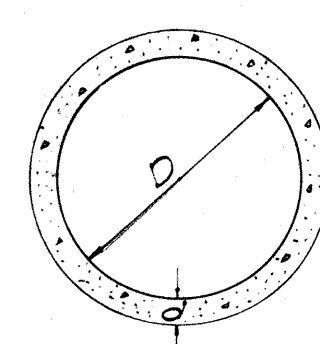
Scale: 1" = 1'-0"

DATA FOR CONCRETE PROTECTION OVER CULVERTS		
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		
	D/2 + T	Minimum = X
		Maximum pay quantity will be Z = 12"

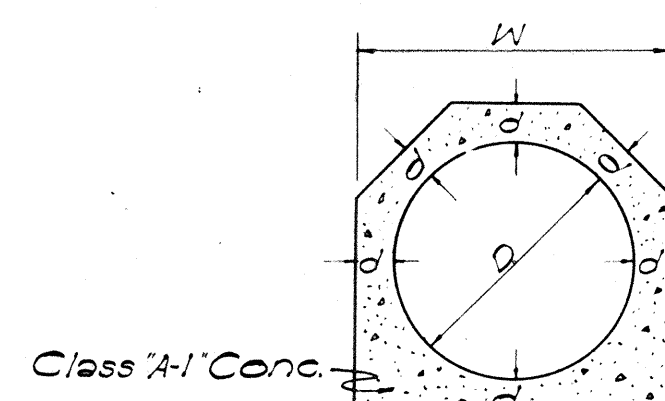
DESIGNED BY
DRAWN BY
CHECKED BY
DATE

CONC. PIPE CULVERT

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



SECTION



SECTION

DATA - CAST-IN-PLACE CONC. CULVERT			
D	d	W	Cu Yd per Ft
18"	4"	2'-2"	0.11
24"	4 1/2"	2'-5"	0.14
30"	5"	3'-4"	0.19
36"	5 1/2"	3'-11"	0.26

CAST-IN-PLACE CONC. CULVERT

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
DROP INTAKES, RETAINING WALLS,
HEADWALLS, CONSTRUCTION JOINTS
SCALES AS NOTED