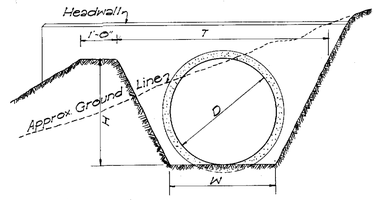
2/17/59

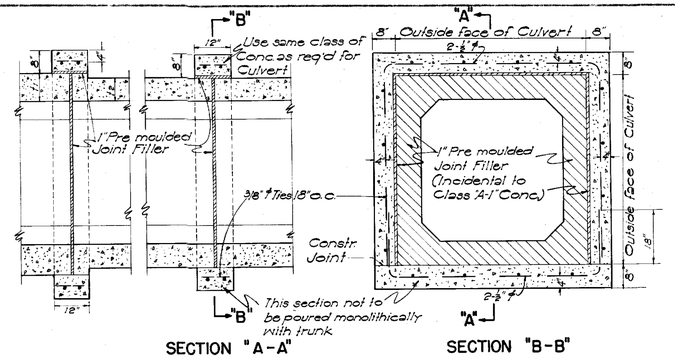
FED ROAD DIST. NO. | STATE | FED AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS

AUG. 1957

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



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

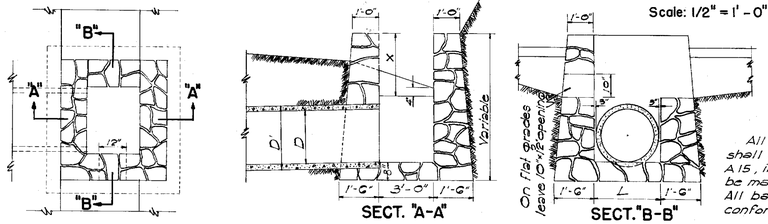


SECTION "A-A" SECTION "B-B"

CONC. COLLAR FOR CONC. BOX CULVERT
Scale: 1/2" = 1'-0"

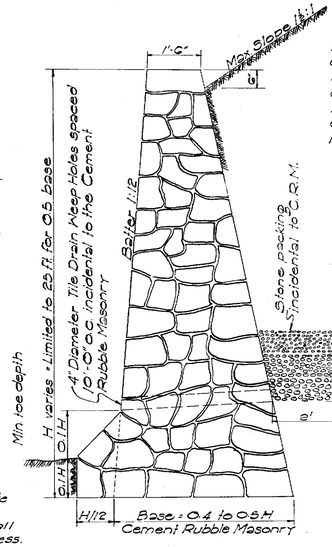
DATA FOR MASONRY DROP INTAKE				Where Variables Equal
D'	D	L=D'+6"	Cu Yds.	
23"	18"	2'-5"	3.02	4'-6"
30"	24"	3'-0"	3.61	5'-0"
37"	30"	3'-7"	4.21	5'-6"
44"	36"	4'-2"	4.85	6'-0"

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



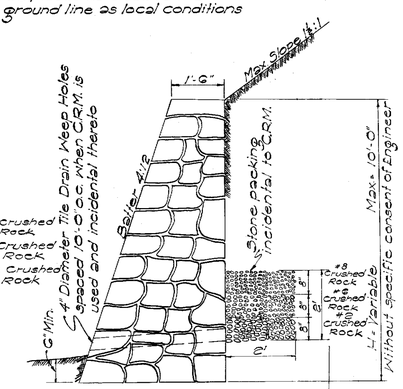
DETAIL OF MASONRY DROP INTAKE
Scale: 3/8" = 1'-0"

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.

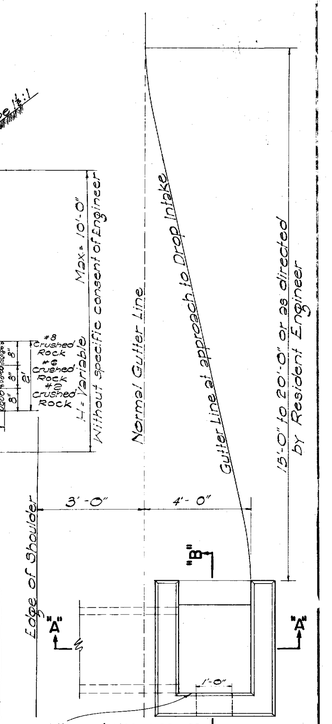


C.R.M. or D.R.M. as required by plans or as ordered

SECTION OF LOW MASONRY RETAINING WALL OR SEAWALL

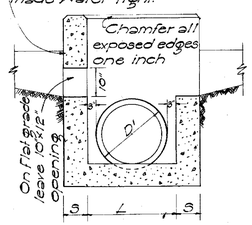
DATA - CONC. DROP INTAKE					Where Variable Equals
D'	D	L=D'+6"	S	Cu Yds	
23"	18"	2'-5"	8"	1.41	4'-6"
30"	24"	3'-0"	8"	1.72	5'-0"
37"	30"	3'-7"	0"	2.32	5'-6"
44"	36"	4'-2"	0"	2.73	6'-0"
51"	42"	4'-0"	10"	3.54	6'-6"
58"	48"	5'-4"	10"	4.01	7'-0"

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



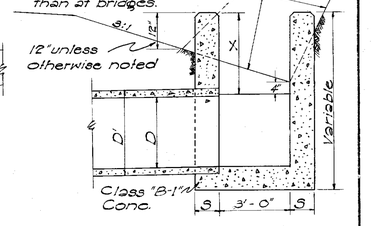
PLAN

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



SECTION "B-B"

Excavate recess in roadway excavation slope for inlet to dimensions and form designated by Engineer. This is "Unclassified Excavation."
Top limits of structure excavation other than at bridges.



SECTION "A-A"

DETAIL OF CONCRETE DROP INTAKE
Scale: 1/2" = 1'-0"

Job No. 12-63

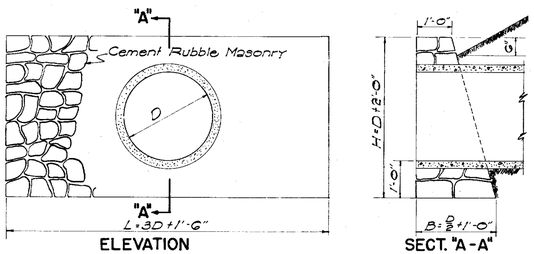
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STATE OF HAWAII

STANDARD DETAILS

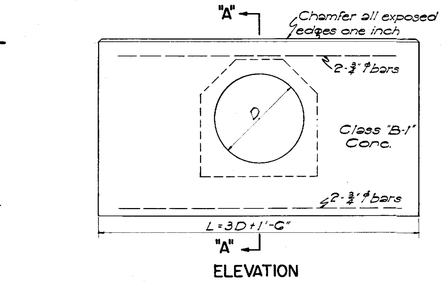
DROP INTAKES, RETAINING WALLS, HEADWALLS, CONSTRUCTION JOINTS

SCALES AS NOTED

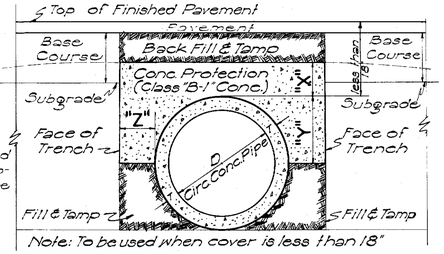
DATA - MASONRY HEADWALL				Cast-in-Place Conc. Culv't	Conc. Pipe Culvert	Corrugated Pipe Culv't
D	H	B	L	Cu. Yds.	Cu. Yds.	Cu. Yds.
18"	3'-6"	1'-0"	6'-0"	0.85	0.95	0.93
24"	4'-0"	2'-0"	7'-6"	1.28	1.45	1.41
30"	4'-6"	2'-3"	9'-0"	1.83	2.06	2.00
36"	5'-0"	2'-6"	10'-6"	2.40	2.84	2.72



DETAIL OF MASONRY HEADWALL
Scale: 1/2" = 1'-0"



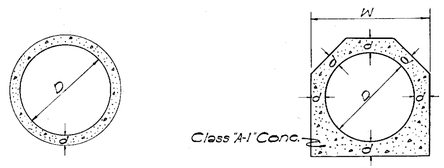
DATA FOR CONCRETE PROTECTION OVER CULVERTS		
X	Y	Z
6" for 18" D	D/2 + T	Z must be from pipe to face of trench. Minimum = X. Maximum pay quantity will be Z = 12"
7" " 24" D		
8" " 30" D		
9" " 36" D		
10" " 42" D		
11" " 48" D		
12" " 54" D		



Note: To be used when cover is less than 18"

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

SECT. OF CULVERT WITH CONC. PROTECTION
Scale: 1" = 1'-0"



SECTION

CONC. PIPE CULVERT

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

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

CAST-IN-PLACE CONC. CULVERT

DATA FOR CONC. HEADWALL				Cast-in-Place Conc. Culvert	Conc. Pipe Culvert	Steel For One Headwall			
D	B	L	H	Cu. Yd.	Cu. Yd.	No. of Bars	Size	Length	Lbs.
18"	1'-0"	6'-0"	4'-0"	0.02	1.00	4	¾" ϕ	5'-6"	33
24"	1'-0"	7'-6"	4'-6"	1.25	1.38	4	¾" ϕ	7'-0"	42
30"	2'-0"	9'-0"	5'-0"	1.05	2.17	4	¾" ϕ	8'-6"	51
36"	2'-0"	10'-6"	5'-6"	2.45	2.74	4	¾" ϕ	10'-0"	60
42"	2'-6"	12'-0"	6'-0"		3.87	4	¾" ϕ	11'-6"	69
48"	2'-6"	13'-6"	6'-6"		4.66	4	¾" ϕ	13'-0"	78

DETAIL OF CONCRETE HEADWALL
Scale: 1/2" = 1'-0"

PROPERTY OF DIVISION OF ENGINEERING

APPROVED: DATE Aug. 26, 1959

STATE HIGHWAY ENGINEER

DRAWN BY	TRACED BY	DESIGNED BY	CHECKED BY	QUANTITIES BY	CHECKED BY
L. Calisto					

FILE	POCKET	FOLDER	NO.
12	5	3	53

SHEET 53 OF 62 SHEETS