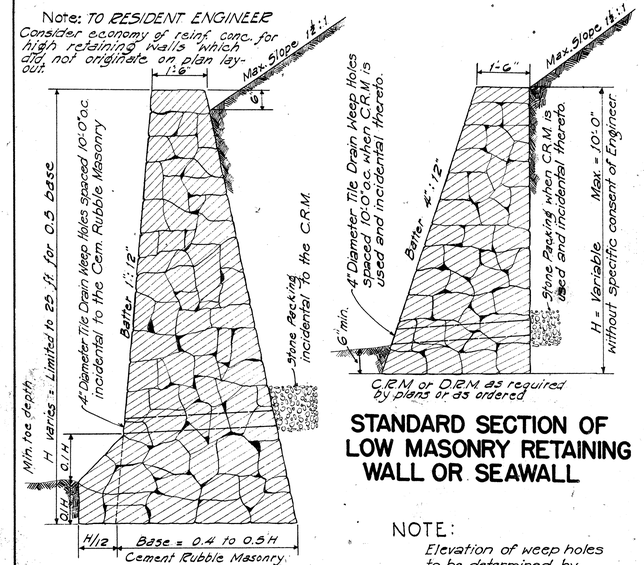
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	SDR 3(13)	1950	11	904

Note: TO RESIDENT ENGINEER
Consider economy of reinf. conc. for high retaining walls which did not originate on plan lay-out.



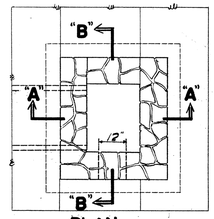
STANDARD SECTION OF HIGH CEMENT RUBBLE MASONRY RETAINING WALL OR SEAWALL

STANDARD SECTION OF LOW MASONRY RETAINING WALL OR SEAWALL

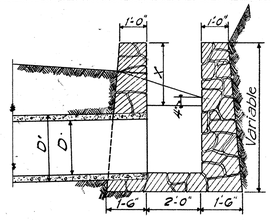
NOTE:
Elevation of weep holes to be determined by Resident Engineer. Holes to be placed as close to the existing ground line as local conditions permit.

Data Standard Masonry Drop Intake				Where Variable Equals
D'	D	L = D+6"	CU.YDS	
22½"	18"	2'-0"	2.41	4'-6"
29"	24"	2'-6"	2.89	5'-0"
35½"	30"	3'-0"	3.38	5'-6"
42"	36"	3'-6"	3.92	6'-0

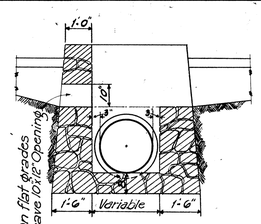
NOTE: Dimension "X" is assumed as 2'-4" in figuring the above quantities.



PLAN



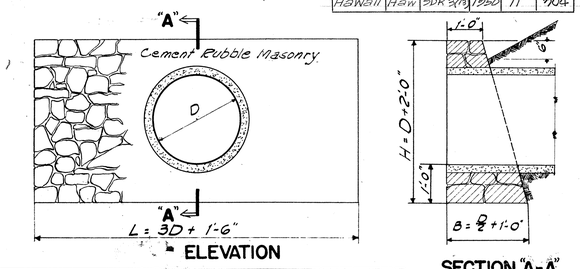
SECTION "A-A"



SECTION "B-B"

STANDARD MASONRY DROP INTAKE

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



ELEVATION

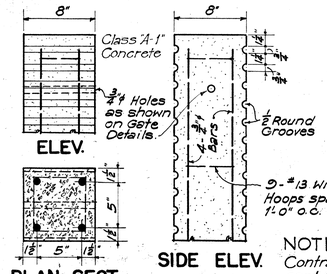
SECTION "A-A"

Cast-in-Place Cu. Yds.	Precast Cu. Yds.	Data-Standard Rubble Masonry H.W. D	H	B	L	CY. one HW.
0.85	0.95	18"	3'-6"	1'-0"	6'-0"	0.93
1.28	1.45	24"	4'-0"	2'-0"	7'-6"	1.41
1.83	2.06	30"	4'-6"	2'-3"	9'-0"	2.00
2.40	2.84	36"	5'-0"	2'-6"	10'-6"	2.72

NOTE: Volume for one head wall is for corrugated pipe culvert

STANDARD MASONRY HEADWALL

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



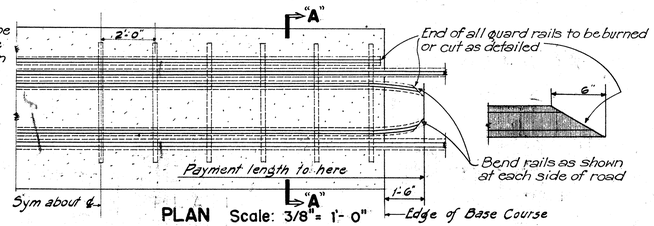
PLAN SECT. SIDE ELEV.

NOTE:
Contractor may either cast holes for fastening fence wire or cast post with ¾"-½" round grooves on 2 sides.

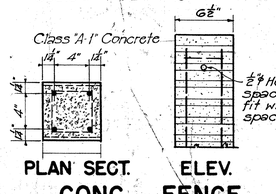
CONC. GATE POST

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

NOTE:
Guard rails are to be of the same shape and weight as Main rails. Details may be varied to suit conditions in field.



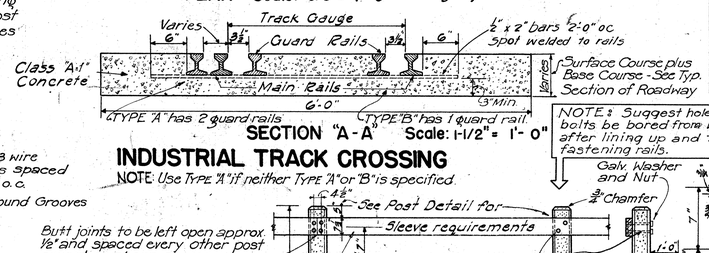
PLAN Scale: 3/8" = 1'-0"



PLAN SECT. ELEV. SIDE ELEV.

CONC. FENCE POST

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



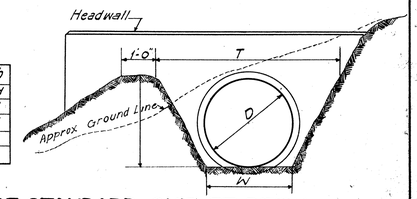
SECTION "A-A" Scale: 1-1/2" = 1'-0"

INDUSTRIAL TRACK CROSSING

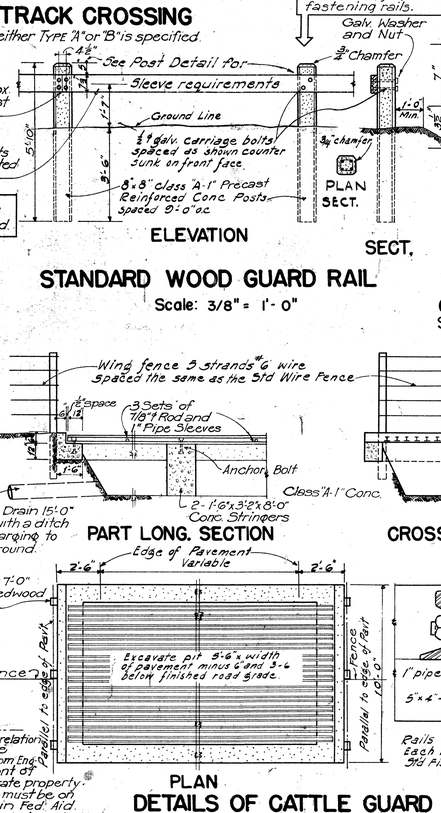
NOTE: Use TYPE "A" if neither TYPE "A" or "B" is specified.

NOTE: Suggest holes in rail for bolts be bored from back of post after lining up and temporarily fastening rails.

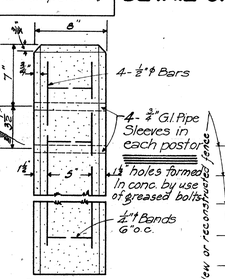
Data-Standard Outlet Ditch D	W	H	T = W + H
18"	24"	2'-0"	4'-0"
24"	24"	2'-0"	4'-0"
30"	30"	2'-0"	5'-0"
36"	36"	3'-0"	6'-0"



DETAIL OF STANDARD OUTLET DITCH



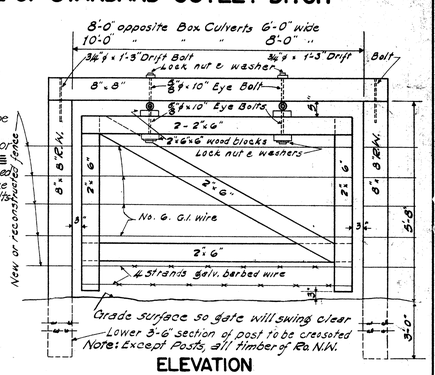
ELEVATION



SECT.

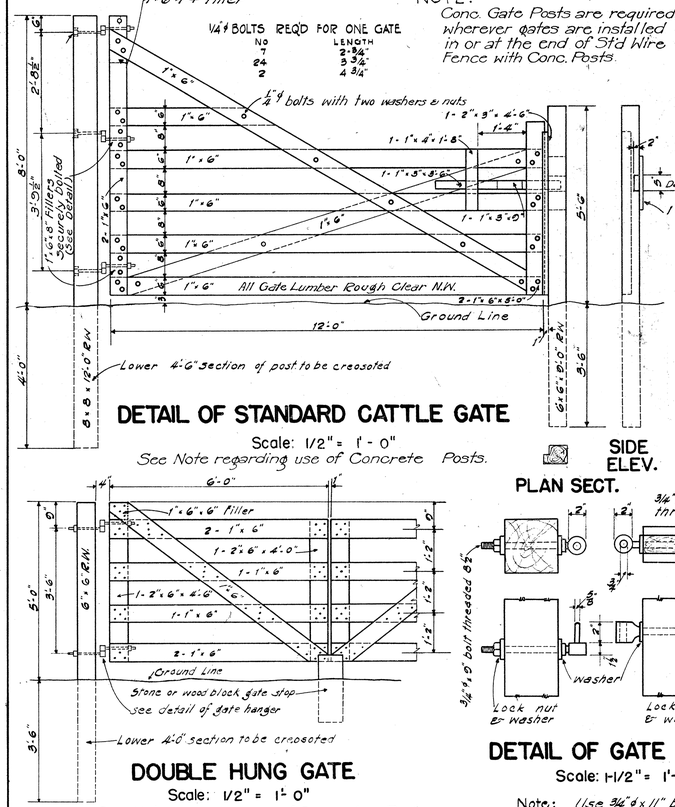
STANDARD WOOD GUARD RAIL

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



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

DET. OF CONC. POST Scale: 1-1/2" = 1'-0"



DETAIL OF STANDARD CATTLE GATE

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

See Note regarding use of Concrete Posts.

SIDE ELEV.

PLAN SECT.

DOUBLE HUNG GATE

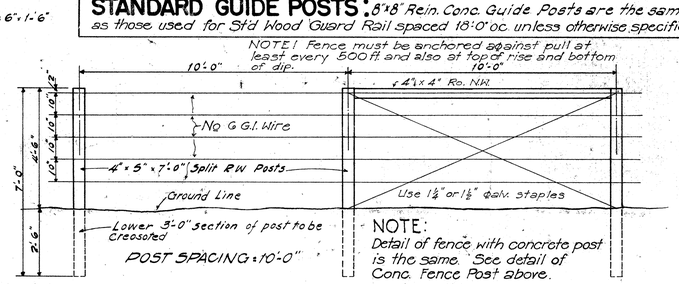
Scale: 1/2" = 1'-0"

See Note regarding use of Concrete Posts.

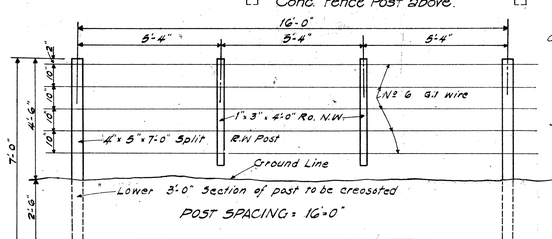
DETAIL OF GATE HANGER

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

Note: Use ¾"ø x 11" bolts for cattle gate



NOTE:
Detail of fence with concrete post is the same. See detail of Conc. Fence Post above.



NOTE: This Project requires Std. Wire Fence with 16 ft. post spacing. (If spacing is not indicated above, use 10 ft.)

DETAILS OF STANDARD WIRE FENCE WITH WOODEN POSTS

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

STANDARD GUIDE POSTS: 8"x8" Rein. Conc. Guide Posts are the same as those used for Std Wood Guard Rail spaced 18'-0" oc. unless otherwise specified.

NOTE: Fence must be anchored against pull at least every 500 ft and also at top of rise and bottom of dip.

Butt joints to be left open approx. ½" and spaced every other post except on sharp curves.

4"x 8"x 18'-0" S4S Railing painted 3 coats of white paint. Contact surfaces between posts and rails and all butt joints shall be painted 3 coats before assembly.

PART LONG. SECTION

CROSS SECTION

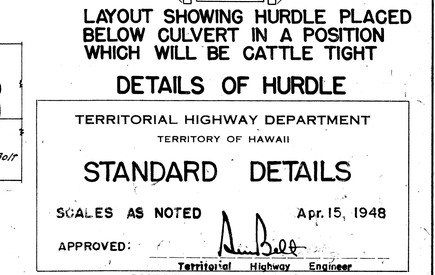
PLAN

DETAILS OF CATTLE GUARD

Rails need not be one piece each. Each rail may be spliced once with 3/9 Fish plate.

NOTE TO ENGINEER: Fence must be on road R/W to participate in Fed. Aid. Consult office if uncertain what to do.

(Position in relation to ft. must be secured from Engineer in front of each separate property.



LAYOUT SHOWING HURDLE PLACED BELOW CULVERT IN A POSITION WHICH WILL BE CATTLE TIGHT

DETAILS OF HURDLE

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

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

STANDARD DETAILS

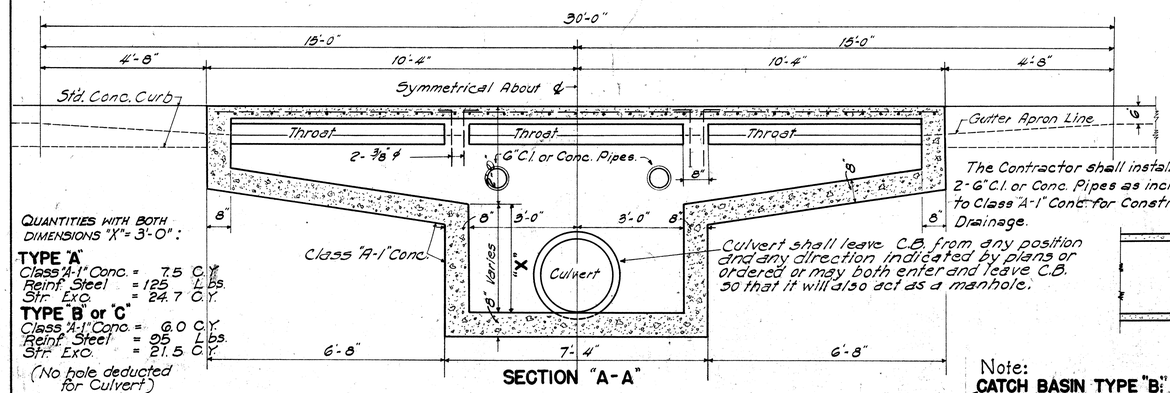
SCALES AS NOTED Apr. 15, 1948

APPROVED: Territorial Highway Engineer

SHEET No 1 OF 2 SHEETS

5468.11

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ODR 303(1)	1950	12	304

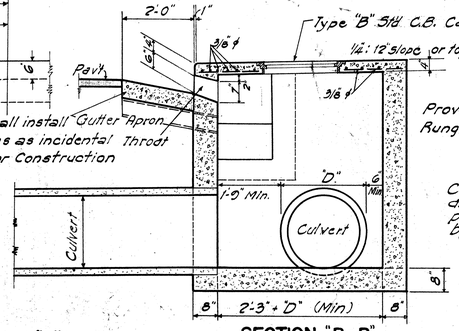


QUANTITIES WITH BOTH DIMENSIONS "X" = 3'-0":

TYPE "A"
Class "A-1" Conc. = 7.5 C.Y.
Reinf. Steel = 125 Lbs.
Str. Exc. = 24.7 C.Y.

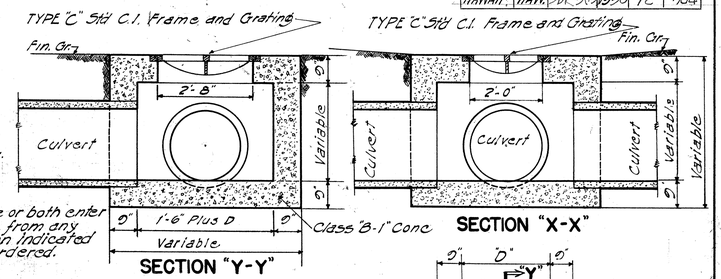
TYPE "B" or "C"
Class "A-1" Conc. = 6.0 C.Y.
Reinf. Steel = 95 Lbs.
Str. Exc. = 21.5 C.Y.

(No hole deducted for Culvert)



The Contractor shall install Gutter Apron, 2-6" C.I. or Conc. Pipes as incidental to Class "A-1" Conc. for Construction Drainage.

Provide Std. Ladder Rungs where necessary.

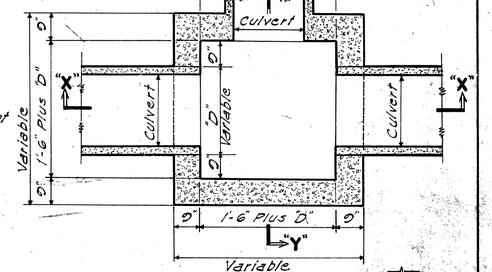


Culvert shall leave or both enter and leave this box from any position or direction indicated by the plans or ordered.

CONC. DROP INTAKE IN MEDIAL STRIPS

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

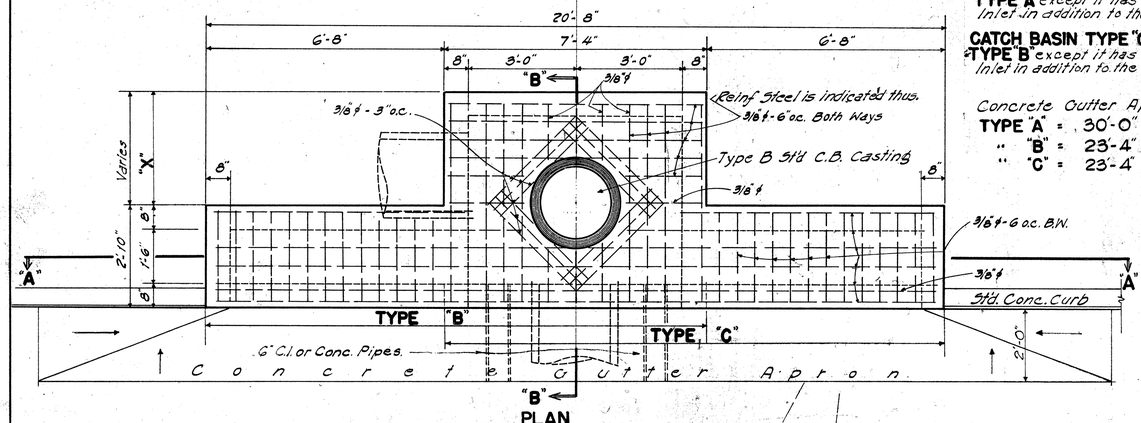
Note: May also be used in pavement and at other places.



Note:
CATCH BASIN TYPE "B" similar to **TYPE "A"** except it has only Left Side Inlet in addition to the Main Box.

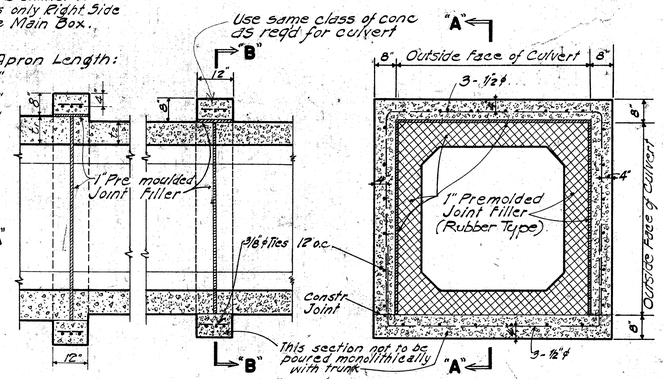
CATCH BASIN TYPE "C" similar to **TYPE "B"** except it has only Right Side Inlet in addition to the Main Box.

Concrete Gutter Apron Length:
TYPE "A" = 30'-0"
" "B" = 23'-4"
" "C" = 23'-4"



STANDARD CONCRETE CATCHBASIN TYPE "A"

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

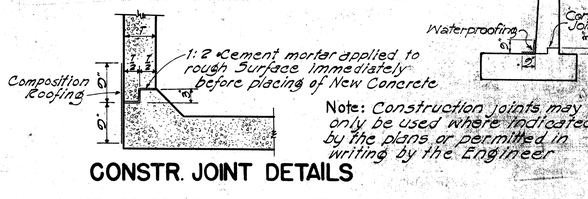


CONC. COLLAR FOR CONC. BOX CULVERT

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

Note: Collars of this type shall be used to divide culverts into approximately 30ft lengths.

CONSTR. JOINT DETAILS



Note: Construction Joints may only be used where indicated by the plans or permitted in writing by the Engineer

METHOD OF APPLYING CONSTR. JOINT WATERPROOFING

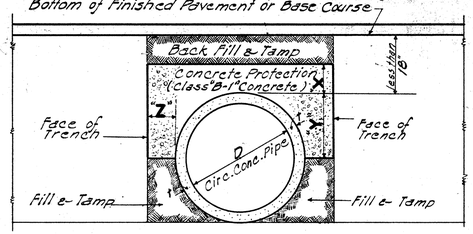
(1.) Mop surface either side of joint as required with asphalt 50-100 penetration (A.S.T.M. Desig. D 5-25) applied at 200° F.

(2.) Apply one layer of 55-lb composition roofing to hot asphalt.

(3.) Mop surface of composition roofing and 3" beyond all around with thick coat of asphalt as specified under (1)

TYP. SECT. OF CULVERT WITH CONC PROTECTION

(To be used when cover is less than 18")



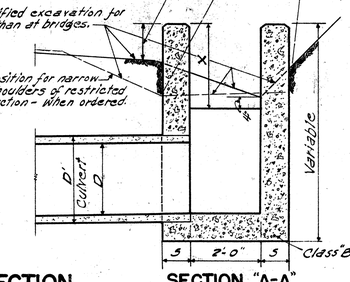
DATA: CONCRETE PROTECTION OVER CULVERTS		
X	Y	Z
6" for 18" D	$\frac{D}{2} + T$	Z must be from pipe to face of Trench
7" " 24" D		Minimum = X
8" " 30" D		Maximum pay quantity will be for Z = 12"
9" " 36" D		
10" " 42" D		
11" " 48" D		
12" " 54" D		

STANDARD CONCRETE CATCHBASIN TYPE "A"

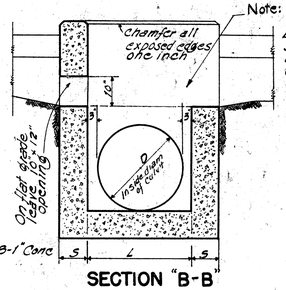
Scale: 1/2" = 1'-0"

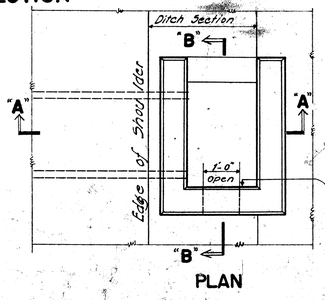
12" unless otherwise ordered.

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



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.





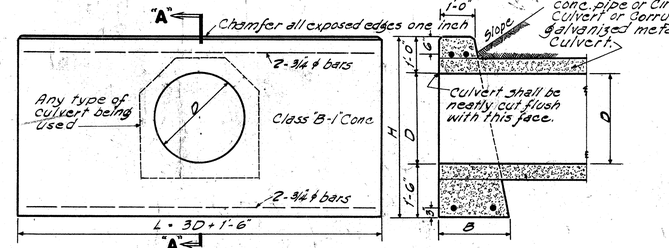
Data: Standard Drop Intake					Where Variable Equals
D'	D	L=D+6"	S	Cu. Yds.	
22½"	18"	2'-0"	8"	1.10	4'-6"
20"	24"	2'-6"	8"	1.33	5'-0"
33½"	30"	3'-0"	9"	1.70	5'-6"
42"	36"	3'-6"	9"	2.07	6'-0"
48½"	42"	4'-0"	10"	2.90	6'-6"
55"	48"	4'-6"	10"	3.27	7'-0"

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

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

ST'D. CONC. DROP INTAKE

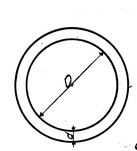
Scale: 1/2" = 1'-0"

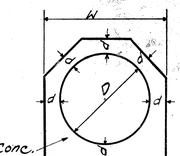


Cast-in-Place Cu. Yds.	Data: Standard Concrete Headwall					Steel One Headwall			
	D	B	L	H	Conc. one H.W.	No. of Bars	Size	Length	Wt Lbs
0.92 Cu. Yds.	18"	1'-6"	6'-0"	4'-0"	1.00 Cu. Yds.	4	3/4" ϕ	5'-6"	33
1.25 " "	24"	1'-6"	7'-6"	4'-6"	1.38 " "	4	"	7'-0"	42
1.99 " "	30"	2'-0"	9'-0"	5'-0"	2.17 " "	4	"	8'-6"	51
2.45 " "	36"	2'-0"	10'-6"	5'-6"	2.74 " "	4	"	10'-0"	60

STANDARD CONCRETE HEADWALL

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





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. Culvt.			
D	d	W	Cu. Yds. per ft.
18"	4"	2'-2"	0.11
24"	4½"	2'-9"	0.14
30"	5"	3'-4"	0.18
36"	5½"	3'-11"	0.26

CAST-IN-PLACE CONC. CULVERT

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

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

STANDARD DETAILS

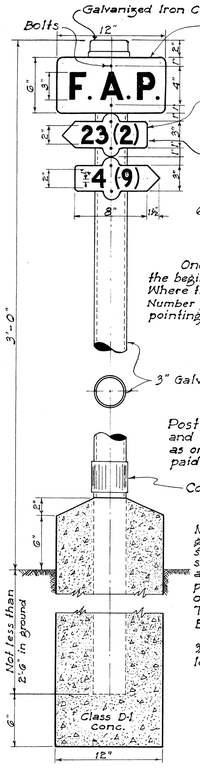
SCALES AS NOTED Apr. 15, 1948

APPROVED: Territorial Highway Engineer

SHEET Nº 12 OF 304 SHEETS

5468.12

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	FDR 3(16)	1950	13	1004



ARRANGEMENT OF MARKERS

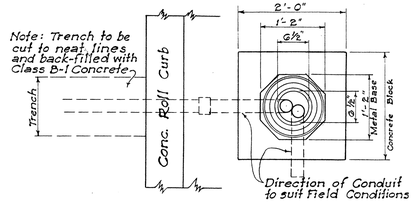
One F.A.P. Marker and one plate shall be placed at the beginning and end of each isolated F.A. Project. Where two F.A. Project adjoin, a single marker and two Number plates shall be placed, each Number plate pointing in the direction of the project to which it refers.

Post in place, complete with one F.A.P. Marker plate and its respective Number plate will be paid for as one item. Each additional Number plate will be paid for separately.

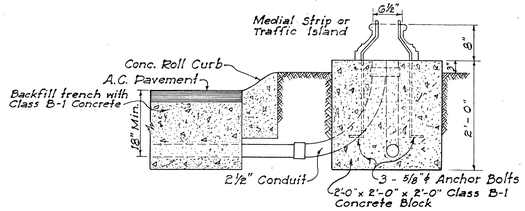
Markers and Number plates shall be No 16 Ga. galvanized iron with 3/8"ϕ holes for fastening as shown on sketch. Markers and Number plates shall be given one coat of best Chromate primer and two coats of White Marine Enamel. Before painting they shall be given a wash of 8 ounces of Copper Sulphate in one gallon of water. The lettering shall be of two coats of Black Marine Enamel.

Markers and plates shall be fastened with 3/8"ϕ galvanized bolts and washers in addition to lead washers for both sides of each plate.

FEDERAL AID MARKER
Scale: 1½" = 1'-0"



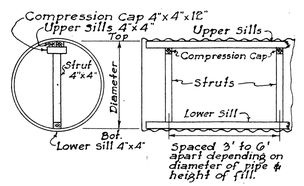
PLAN



SECTION

NOTE: Unless otherwise specified, all concrete for base for Traffic Standards, Pull Boxes, Concrete Jackets for Transite Ducts shall be Class B-1 Concrete.

DETAIL OF BASE FOR TRAFFIC STANDARD AND DISPATCHER PEDESTAL

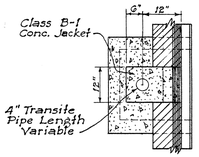


END VIEW — LONGITUDINAL SECTION

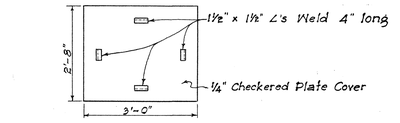
Diameter of Pipe in inches	Length of Struts in inches	Spacing of Struts in ft. for Various Heights: FILL 1' to 5'	FILL 5' to 10'	FILL 10 to 20'	FILL 20 to 30'	FILL Over 30'
48	38 3/8	–	–	–	6	4
54	44 3/4	6	6	6	6	4
60	51	6	6	6	6	4
72	57 1/4	6	6	6	6	4
78	63 5/8	6	6	6	5	3.5
78	69 7/8	6	6	6	4.5	3.5
84	76 1/4	6	6	6	4	3

NOTE: Length of Struts are based on 4"x4" timbers which is the minimum size recommended. If larger sills or compression caps are used, length of struts should be changed accordingly.

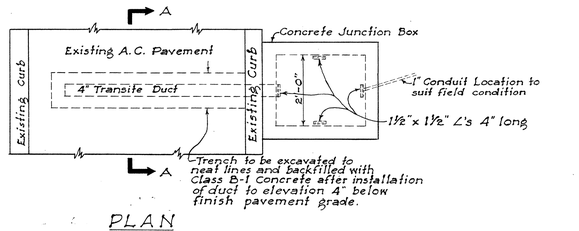
STRUTTING DIAGRAM & TABLE FOR CORRUGATED METAL PIPE CULVERT



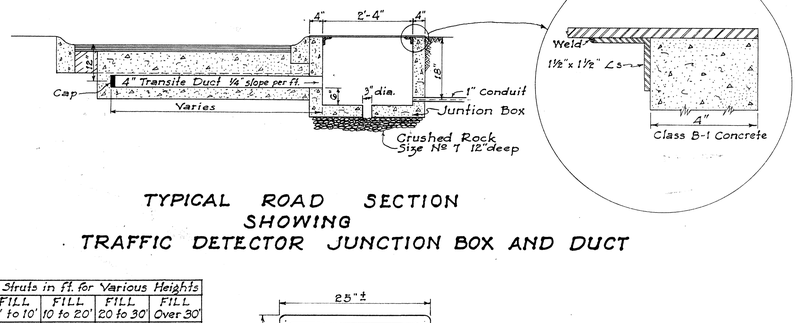
SECTION "A-A"



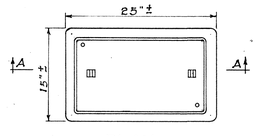
PLAN OF COVER PLATE



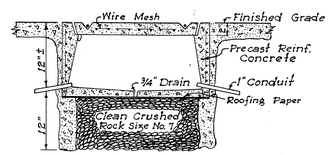
PLAN



TYPICAL ROAD SECTION SHOWING TRAFFIC DETECTOR JUNCTION BOX AND DUCT



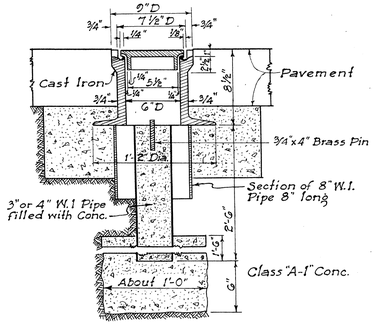
PLAN



SECTION A-A

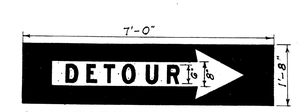
DETAIL OF PULL BOX
Scale: 1" = 1'-0"

PLAN OF TOP



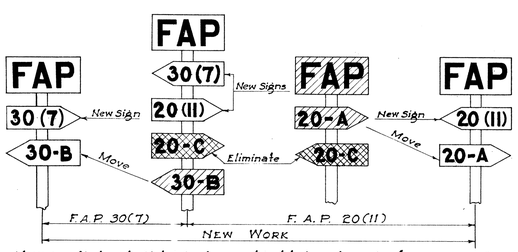
STANDARD C&C STREET SURVEY MONUMENT

CENTER LINE MONUMENT
Scale: ½" = 1'-0"

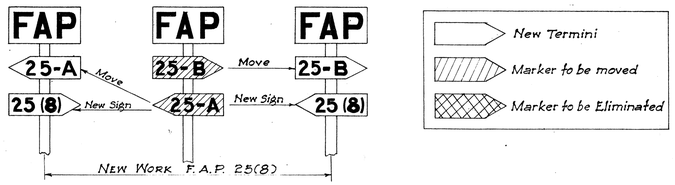


STANDARD DETOUR SIGN

F.A.P. 20 & 30



F.A.P. 25



NOTE: Federal Aid Markers should be placed at the termini of suffix designated sections. Intermediate letter designated markers of adjacent sections located within the limits of new improvements should be moved to the termini of the new work. The same procedure would be followed on each successive improvement until all markers for letter designated sections are eventually eliminated.

METHOD OF MARKING F.A. PROJECTS AT OVERLAPS
(USING NUMBER SUFFIX ON NEW WORK)

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

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

STANDARD DETAILS

SCALES AS NOTED — May 31, 1949

APPROVED: ..... Territorial Highway Engineer

SHEET Nº 3 OF 3 SHEETS

5468.13