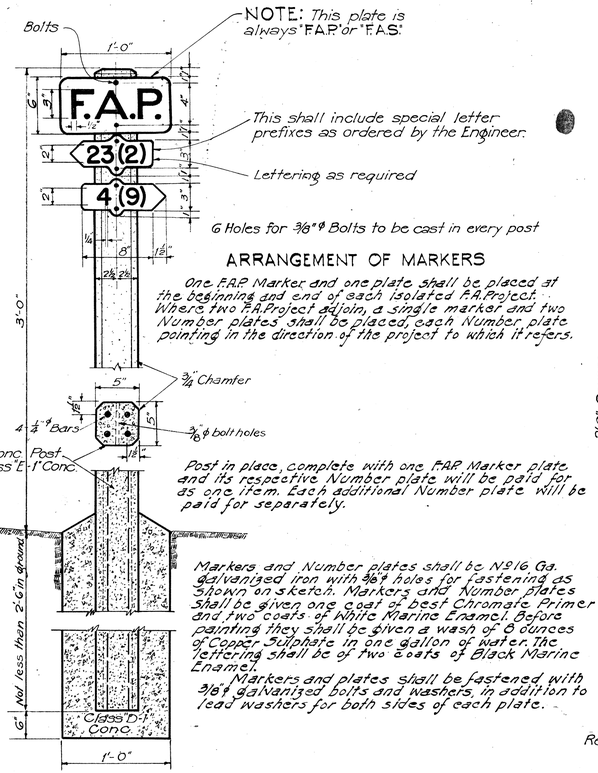
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	S.2(2)	1947	5	15



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.

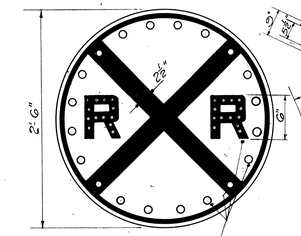
Post in place, complete with one F.A.P. Marker plate and its respective Number plate will be paid for as one item. Each additional Number plate will be paid for separately.

Markers and Number plates shall be N°16 Ga. galvanized iron with 9/64" holes for fastening as shown on sketch. Markers and Number plates shall be given one coat of Best Grannate 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.

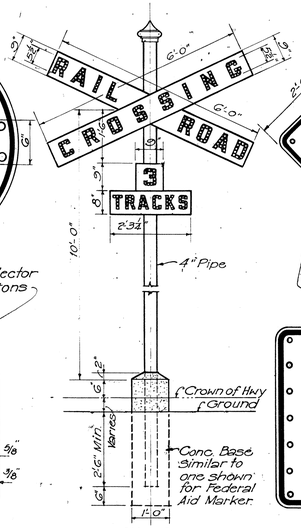
Markers and plates shall be fastened with 3/8" ϕ galvanized bolts and washers, in addition to lead washers for both sides of each plate.

FEDERAL AID MARKER

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



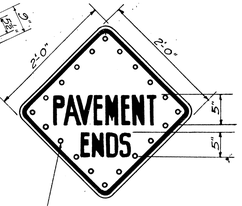
W-1



W-2

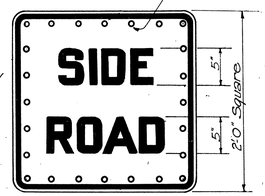
Black Letters on Yellow. Reflector Buttons White.

For W-2 only Black Letters on White. Reflector Buttons White.

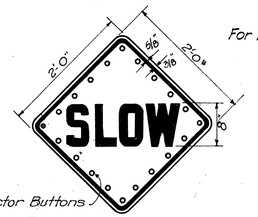


C-14

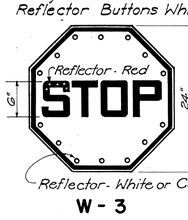
O-C-15



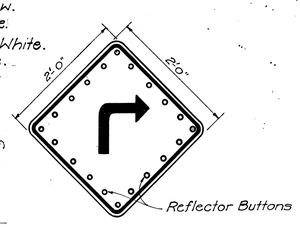
O-C-16



O-C-5



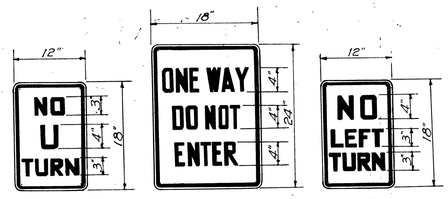
W-3



C-6

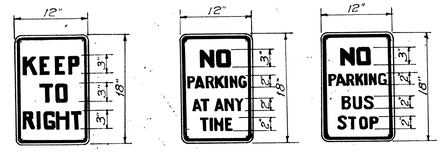
WARNING AND CAUTION SIGNS

NOTE: Each sign, except W-2 is to be mounted on 3" Galv. Pipe in the same manner as detailed for Regulatory Sign.



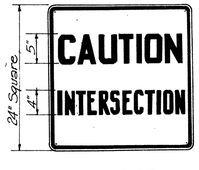
R-15 R-13 R-12

For R-15, R-13, R-12, R-22, R-3, and R-19: Black Letters and Borders on White Background.



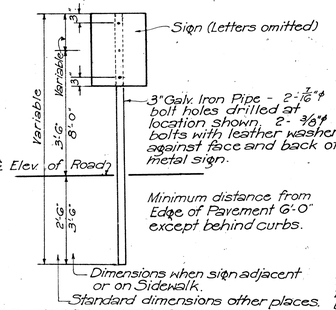
R-22 R-3 R-19

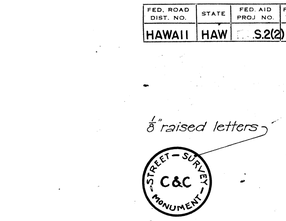
For NS-R33: Black Letters and Borders on Yellow Background.



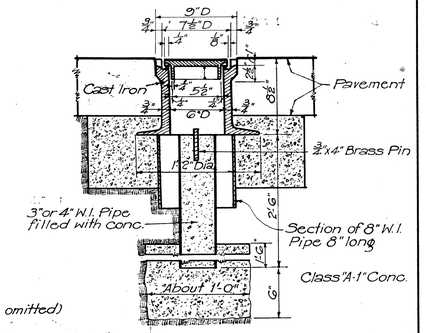
NS-R33

DETAILS OF REGULATORY SIGNS

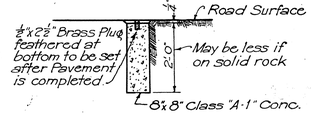




PLAN OF TOP



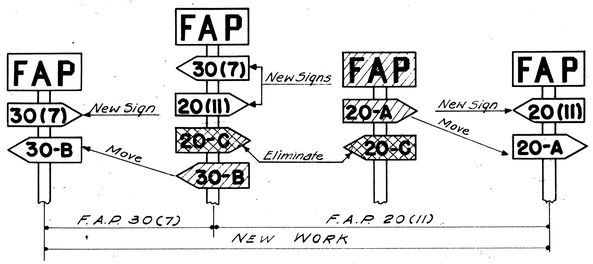
STD. C&C STREET SURVEY MONUMENT



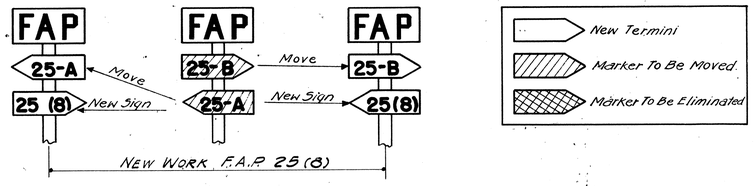
CENTER LINE MONUMENT

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

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 MARKNG F.A. PROJECTS AT OVERLAPS

(USING NUMBER SUFFIX ON NEW WORK)

Note: Letters to be 12" high and 1½" thick. Secondary detour and direction signs necessary to be at least ⅔ the above size. Detour signs shall be placed at the location ordered by the Engineer.

STANARD DETOUR SIGN

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

STANDARD DETAILS

SCALES AS NOTED Sept. 5, 1946

APPROVED: B. F. Rush
Territorial Highway Engineer

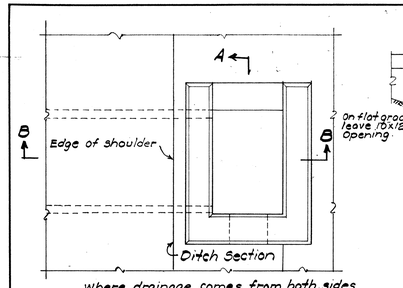
SHEET Nº 2 OF 4 SHEETS

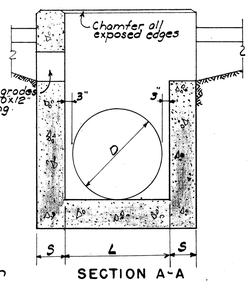
5254.5

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

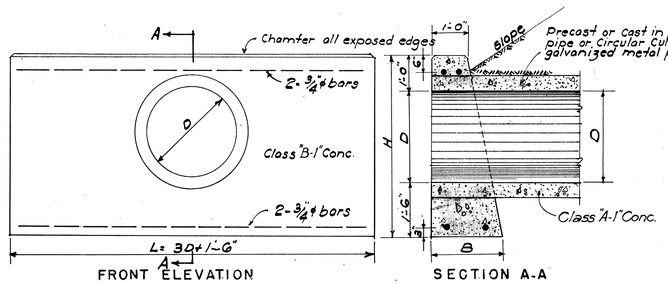
K & E CO., N.Y.
"IMPERIAL" TRACING CLOTH
PRINTED IN

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YR.	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	S.2(2)	1947	6	45



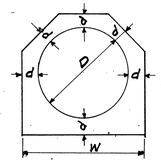


SECTION A-A



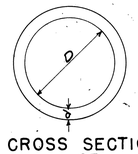
FRONT ELEVATION

SECTION A-A



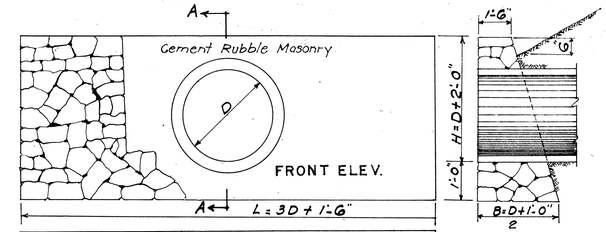
Data: Cast in Place Conc. Culv't.			
D	d	W	Cu. Yd per ft.
18"	4"	2'-2"	0.11
24"	4½"	2'-9"	0.14
30"	5"	3'-4"	0.19
36"	5½"	3'-11"	0.26

CROSS SECTION OF CAST-IN-PLACE CONCRETE CULVERT



CROSS SECTION OF CONCRETE PIPE CULVERT

Note! Thickness 'd' reinforcing and concrete used are to conform with the approved design as provided by the specification

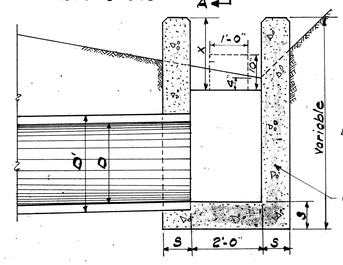


SECTION A-A

Cast in Place	Precast	Data- Standard Rubble Masonry H.W.				
Cu. Yds.	Cu. Yds.	D	H	B	L	CY one H.W.
0.85	0.95	18"	3'-6"	1'-9"	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
2.49	2.84	36"	5'-0"	2'-6"	10'-6"	2.72

Note! Volume for one headwall is for corrugated pipe Culvert

STANDARD MASONRY HEADWALL



Data- Standard Drop Intake					Where Variable Equals
D	D	L = D+1'-6"	S	Cu. Yds.	
22½"	18"	2'-0"	8"	1.10	4'-6"
29"	24"	2'-6"	8"	1.33	5'-0"
35½"	30"	3'-0"	9"	1.79	6'-6"
42"	35"	3'-6"	9"	2.07	6'-0"

Note! Dimension "x" is assumed as 2'-4" in figuring the above quantities

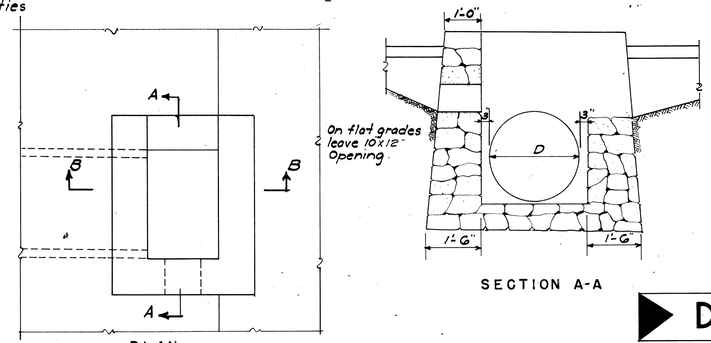
STANDARD CONCRETE DROP INTAKE

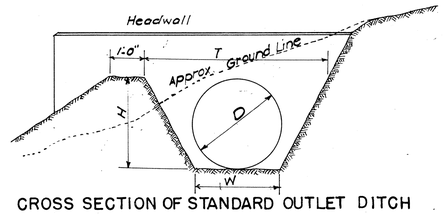
Scale ½" = 1'-0"

Cast in Place	Data- Standard Concrete Headwall					Steel One Headwall			
Cu. Yds.	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	¾"ϕ	5'-6"	33
1.25 " "	24"	1'-6"	7'-6"	4'-6"	1.38 " "	4	"	7'-0"	42
1.95 " "	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

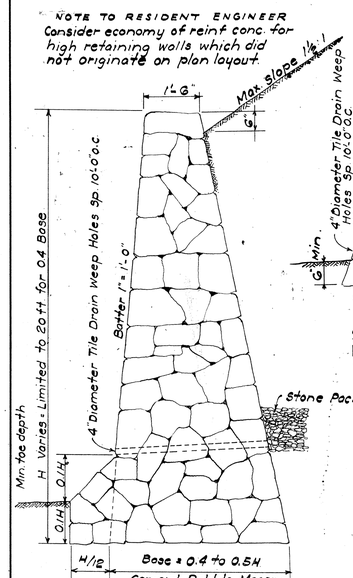
Scale ½" = 1'-0"



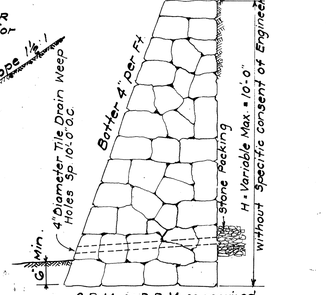


CROSS SECTION OF STANDARD OUTLET DITCH

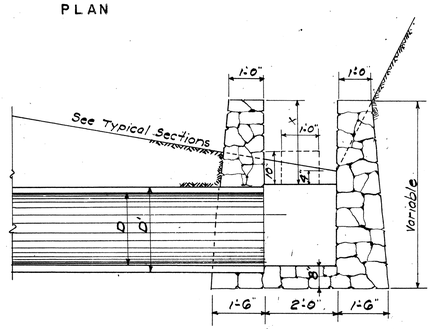
Data- Standard Outlet Ditch				
D	W	H	T=W+H	
18"	24"	2'-0"	4'-0"	
24"	24"	2'-0"	4'-0"	
30"	30"	2'-0"	5'-0"	
36"	36"	3'-0"	6'-0"	



STANDARD SECTION OF HIGH CEMENT RUBBLE MASONRY RETAINING WALLS OR SEAWALL



STANDARD SECTION OF LOW MASONRY RETAINING WALL OR SEAWALL



SECTION B-B

STANDARD MASONRY DROP-INTAKE

Scale ½" = 1'-0"

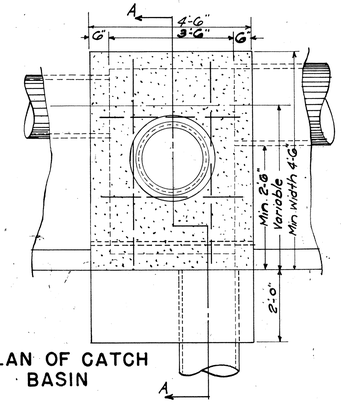
Data- Standard Masonry Intake				Where Variable Equals
D'	D	L = D+1'-6"	Cu. Yds.	
22½"	18"	2'-0"	2.41	4'-6"
29"	24"	2'-6"	2.39	5'-0"
35½"	30"	3'-0"	3.38	5'-6"
42"	36"	3'-6"	3.02	6'-0"

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

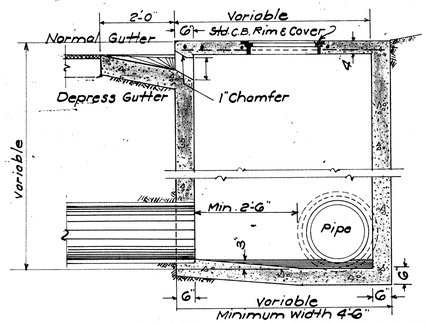
DETOUR

STANDARD DETOUR SIGN

Letters to be 12" high and 1½" thick. Secondary detour and direction signs necessary to be at least ⅔ the above size. Detour signs shall be at the location ordered by the Engineer.

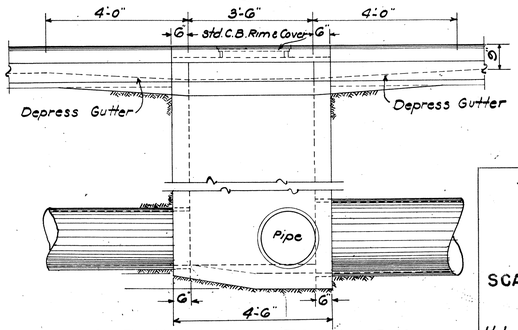


PLAN OF CATCH BASIN

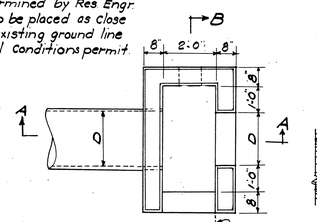


SECTION A-A OF CATCH BASIN

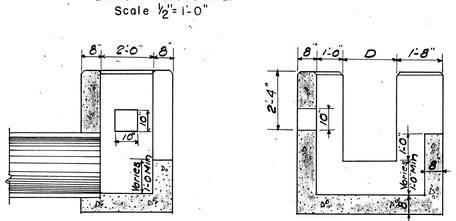
Scale ½" = 1'-0"



FRONT ELEV. OF CATCH BASIN



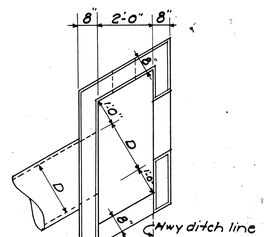
Note! Ends of intake are interchangeabe depending upon direction of flow of Highway ditch.



Data	
D	CY
18"	1.53
24"	1.61

CONCRETE DROP INTAKE FOR IRRIGATION DITCHES

Scale ⅜" = 1'-0"



SKEW PLAN

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

TERRITORIAL HIGHWAY DEPARTMENT

TERRITORY OF HAWAII

STANDARD DETAILS

SCALES AS NOTED MARCH 1945

APPROVED BY _____

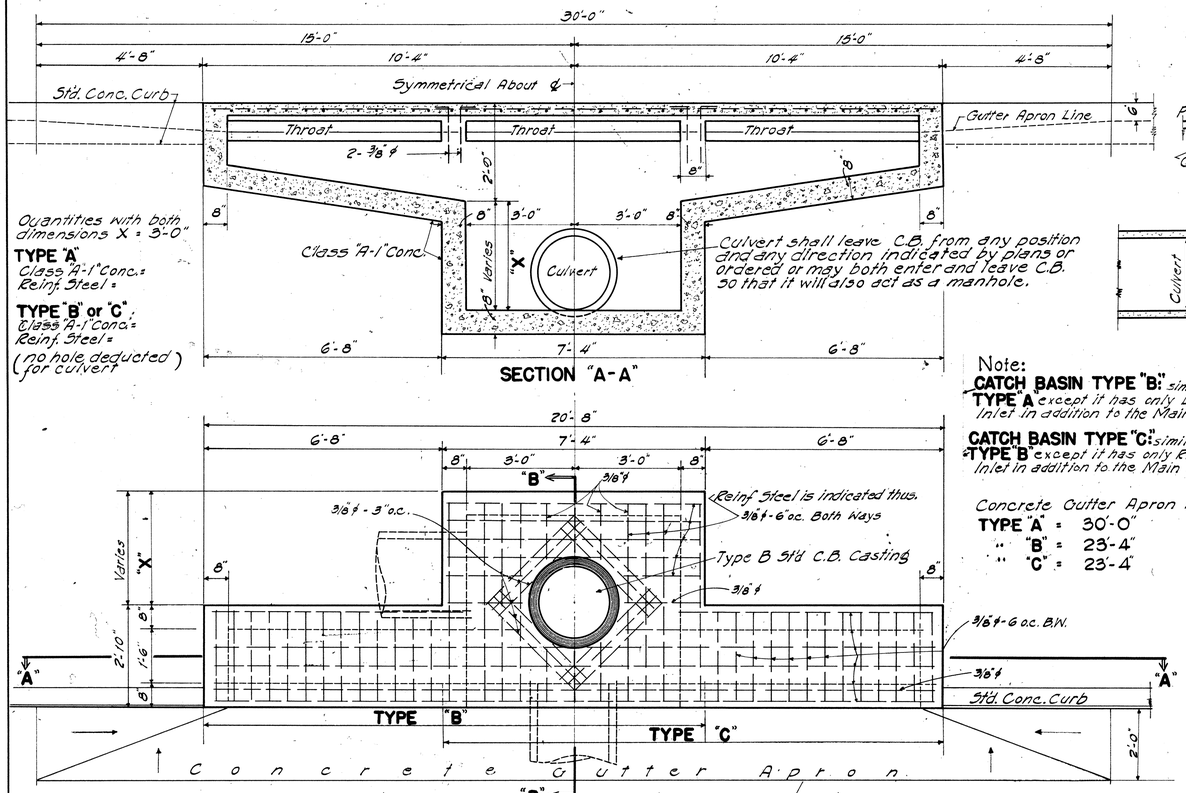
Territorial Highway Engineer

H-1

SHEET Nº 5 OF SHEETS

5254.6

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	S.212	1947	7	15



Bottom of Finished Pavement or Base Course
Back Fill & Tamp
Concrete Protection (Class "B-1" Concrete)
X
Z
Face of Trench
Face of Trench
Circ. Conc. Pipe
D
Fill & Tamp
Fill & Tamp
less than 18"

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		
8" " 30" D		Minimum = X
9" " 36" D		
10" " 42" D		Maximum pay Quantity will be be Z = 12"
11" " 48" D		
12" " 54" D		

STANDARD CONCRETE CATCHBASIN TYPE "A"
Scale: 1/2" = 1'-0"

12" unless otherwise ordered.
Top limits of unclassified excavation for structures other than at bridges.
Excavate recess in roadway excavation slope for inlet to dimensions and form designated by Engineer. This is "Unclassified Excavation."
Position for narrow shoulders of restricted section - When ordered.
D
Culvert
D
Variable
Class "B-1" Conc
3
2'-0"
3
SECTION "A-A"
Chamfer all exposed edges one inch
1.0"
3
3
On flat grade tapering to 12" in depth at outlet
D
Invert depth of Culvert
L
SECTION "B-B"
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.

Ditch Section
"B"
"A"
"A"
Edge of Shoulder
1'-0" Open
"B"
PLAN

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"
35½	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"

"A"
Chamfer all exposed edges one inch
2-3/4" ϕ bars
Any type of culvert being used
Class "B-1" Conc
2-3/4" ϕ bars
L = 3D + 1'-6"
"A"
FRONT ELEVATION
1'-0"
Slope
Precast or Cast-in-Place conc. pipe or Circular Culvert or Corrugated galvanized metal pipe Culvert.
1'-6"
H
D
1'-6"
Culvert shall be neatly cut flush with this face.
B
SECTION "A-A"

Cast-in-Place	Data: Standard Concrete Headwall					Steel One Headwall			
Cu. Yds.	D	B	L	H	Conc. one H.W.	No. of Bars	Size	Length	Wt Lbs
0.82 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
1.89 " "	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"

W
d
d
d
d
D
d
d
d
SECTION
Class "A-1" Conc.
SECTION

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"	6½"	3'-11"	0.26

CONC. PIPE CULVERT
CAST-IN-PLACE CONC. CULVERT
Note: Thickness "d" reinforcing, and concrete used are to conform with the approved design as provided by the Specifications.

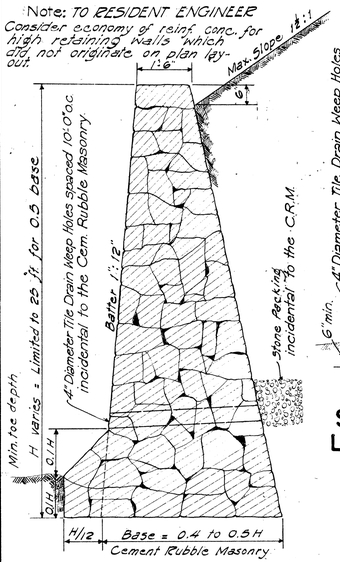
ORIGINAL PLAN
NOTE BOOK
SURVEY PLOTTED BY
DESIGNED BY
DRAWN BY S. Uemoto
TRACED BY
QUANTITIES
CHECKED BY
No.
DATE

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
STANDARD DETAILS
SCALES AS NOTED
Sept. 5, 1946
APPROVED: B. F. Rush
Territorial Highway Engineer
SHEET Nº 3 OF 4 SHEETS
5254.7

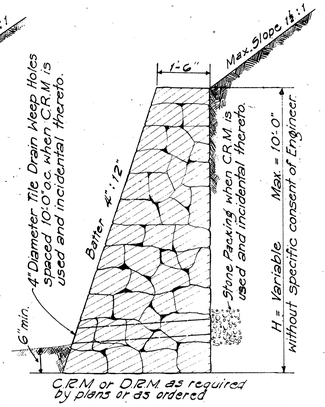
K & E CO., N.Y.
"IMPERIAL" TRACING CLOTH
PRINTS ON

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	S.2(3)	1947	8	15

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



STANDARD SECTION OF HIGH CEMENT RUBBLE MASONRY RETAINING WALL OR SEAWALL

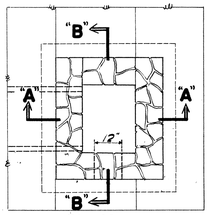


STANDARD SECTION OF LOW MASONRY RETAINING WALL OR SEAWALL

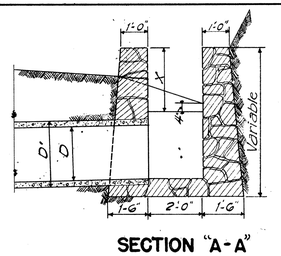
NOTE:
Elevation of weep holes to be determined by Resident Engineer. Holes to be placed as close to the existing ground line as local conditions permit.

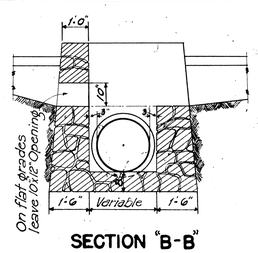
Data Standard Masonry Drop Intake				Where Variable Equals
O"	D	L= D+6"	Cu.Yds	
22½"	18"	2'-0"	2.41	4'-6"
29"	24"	2'-6"	2.89	5'-0"
35½"	30"	3'-0"	3.38	5'-6"
42"	36"	3'-6"	3.92	6'-0

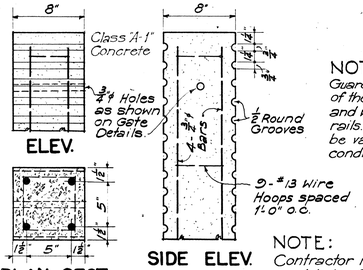
NOTE: *Dimension "X" is assumed as 2'-4" in figuring the above quantities.*



STANDARD MASONRY DROP INTAKE



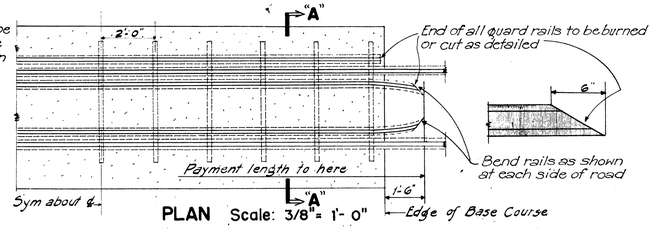




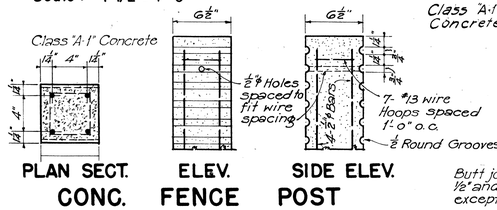
CONC. GATE POST

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.

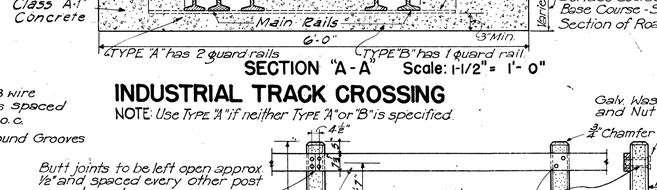


NOTE:
Contractor may either cast holes for fastening fence wire or cast post with ¾"-½ round grooves on 2 sides.



CONC. FENCE POST

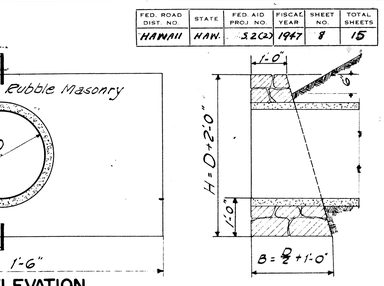
Scale: 1-1/2"= 1'-0"



INDUSTRIAL TRACK CROSSING

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

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



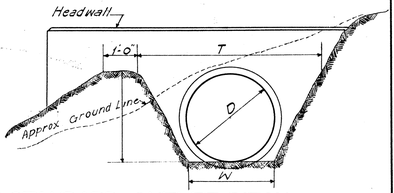
Cast-in-Place	Precast	Data-Standard Rubble Masonry H.W.				
Cu. Yds.	Cu. Yds.	D	H	B	L	Cy. one H.W.
0.85	0.95	18"	3'-6"	1'-0"	6'-0"	0.93
1.28	1.45	24"	4'-0"	2'-0"	7'-6"	1.41
1.83	2.06	30"	4'-6"	2'-3"	9'-0"	2.00
2.49	2.84	36"	5'-0"	2'-6"	10'-6"	2.72

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

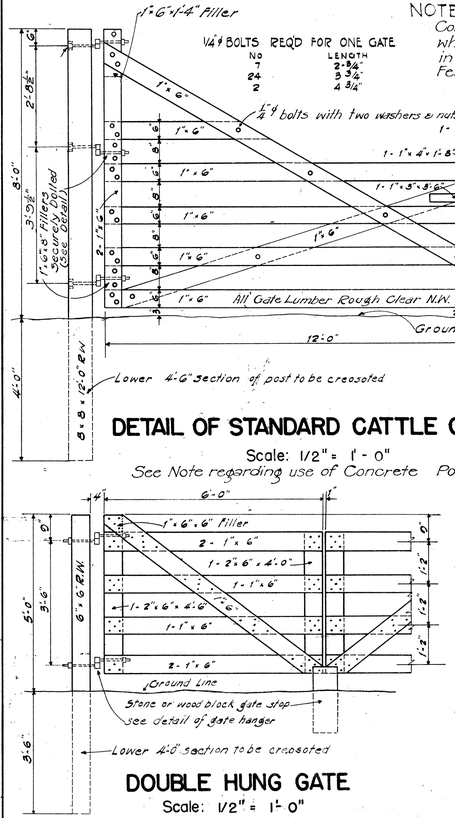
STANDARD MASONRY HEADWALL

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

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



DETAIL OF STANDARD CATTLE GATE

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

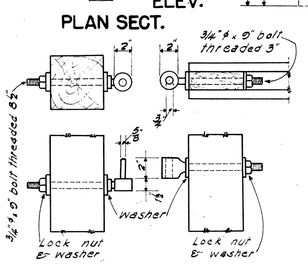
See Note regarding use of Concrete Posts.

NOTE:
Conc. Gate Posts are required wherever gates are installed in or at the end of Std Wire Fence with Conc. Posts.

DOUBLE HUNG GATE

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

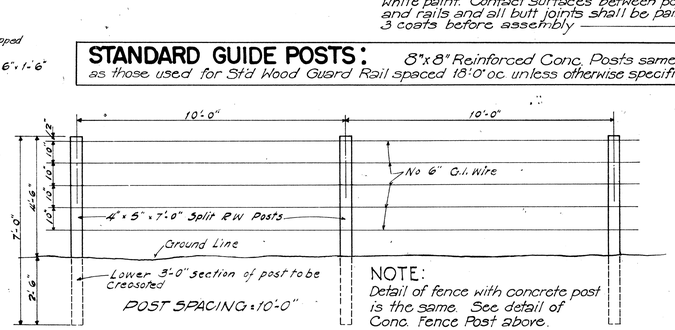
See Note regarding use of Concrete Posts.



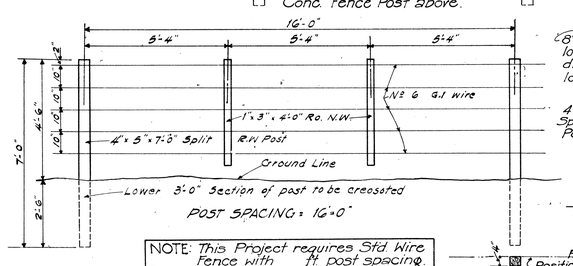
DETAIL OF GATE HANGER

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

Note: *Use ¾"ϕ x 11" bolts for cattle gate*



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



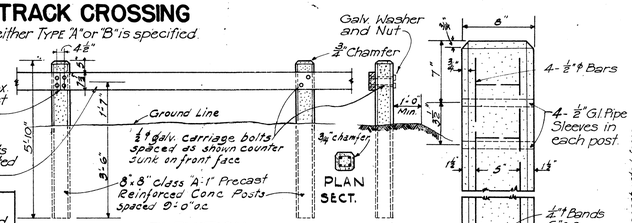
NOTE: *This Project requires Std Wire Fence with ft post spacing. (If spacing is not indicated above, use 10 ft.)*

DETAILS OF STANDARD WIRE FENCE WITH WOODEN POSTS

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

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

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

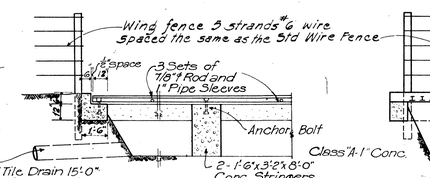


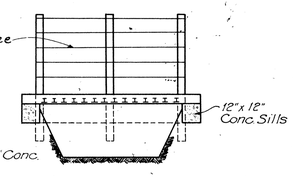
STANDARD WOOD GUARD RAIL

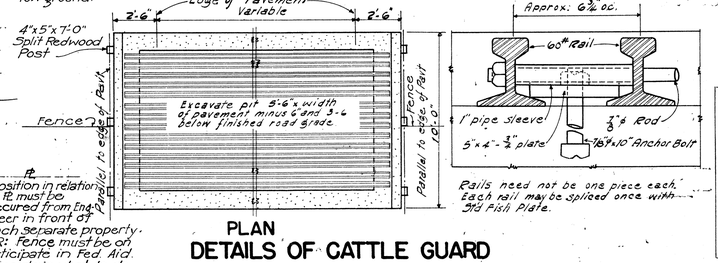
Scale: 3/8" = 1'- 0"

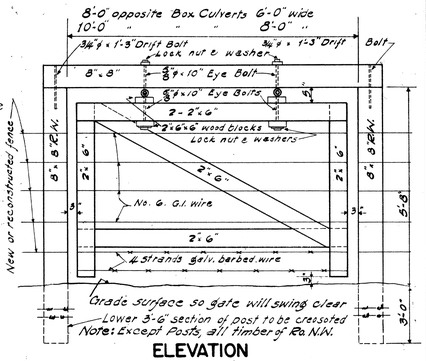
DET. OF CONC. POST

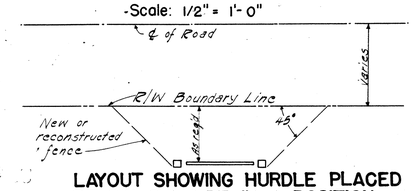
Scale: 1-1/2" = 1'- 0"











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

DETAILS OF HURDLE

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

STANDARD DETAILS

SCALES AS NOTED Sept. 5, 1946

APPROVED: P. F. Rush
Territorial Highway Engineer

SHEET Nº 1 OF 4 SHEETS

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

5254.8
5254.8