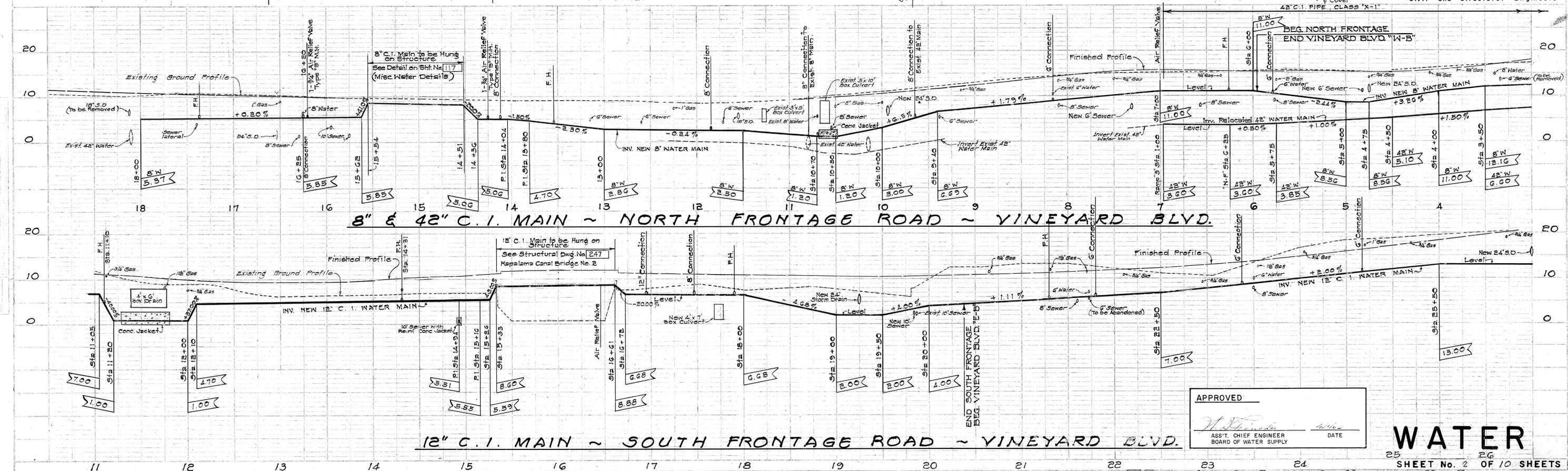
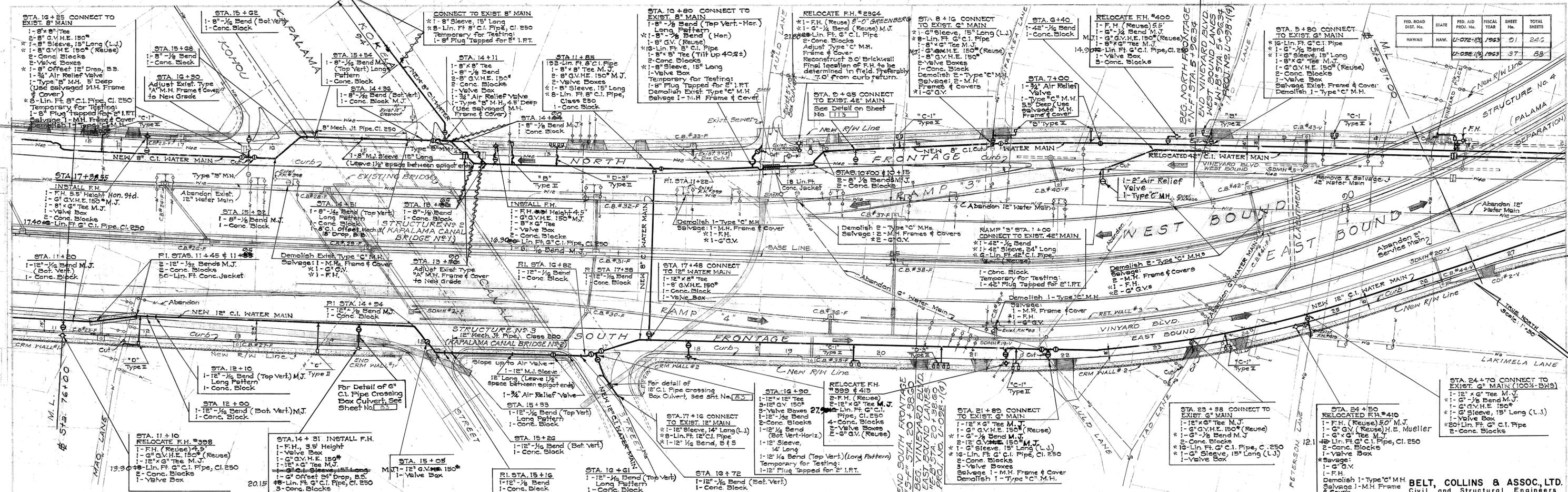


FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
	HAWAII	U-072-13	1963	91	242
		U-028-13	1963	37	88

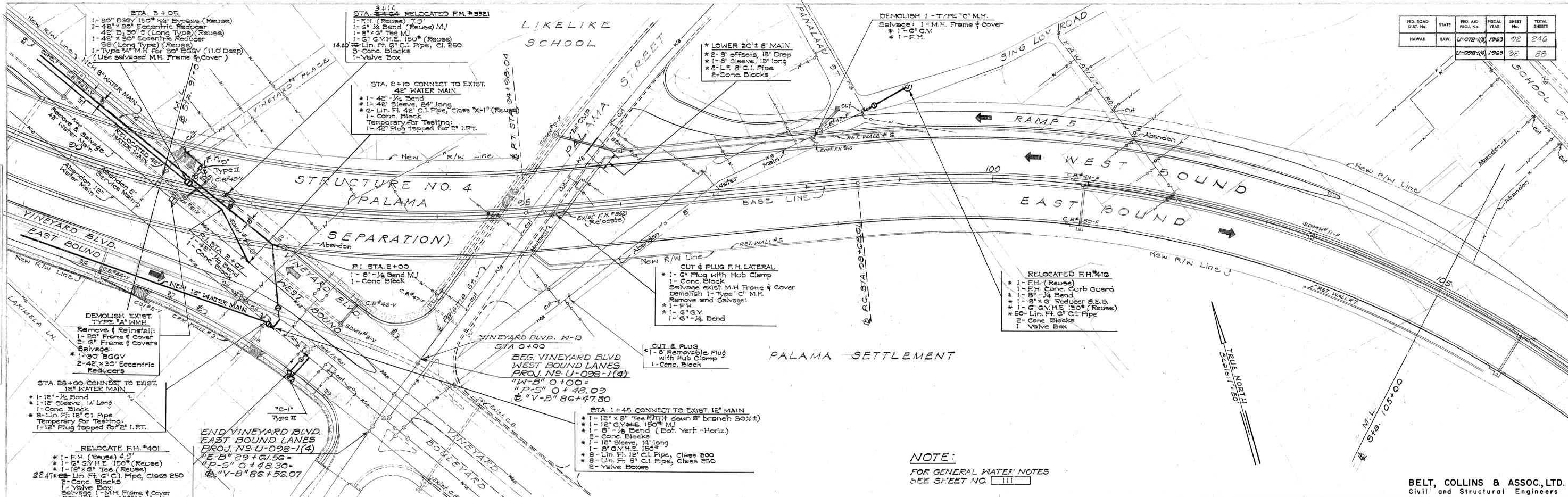


APPROVED
 ASST. CHIEF ENGINEER
 BOARD OF WATER SUPPLY

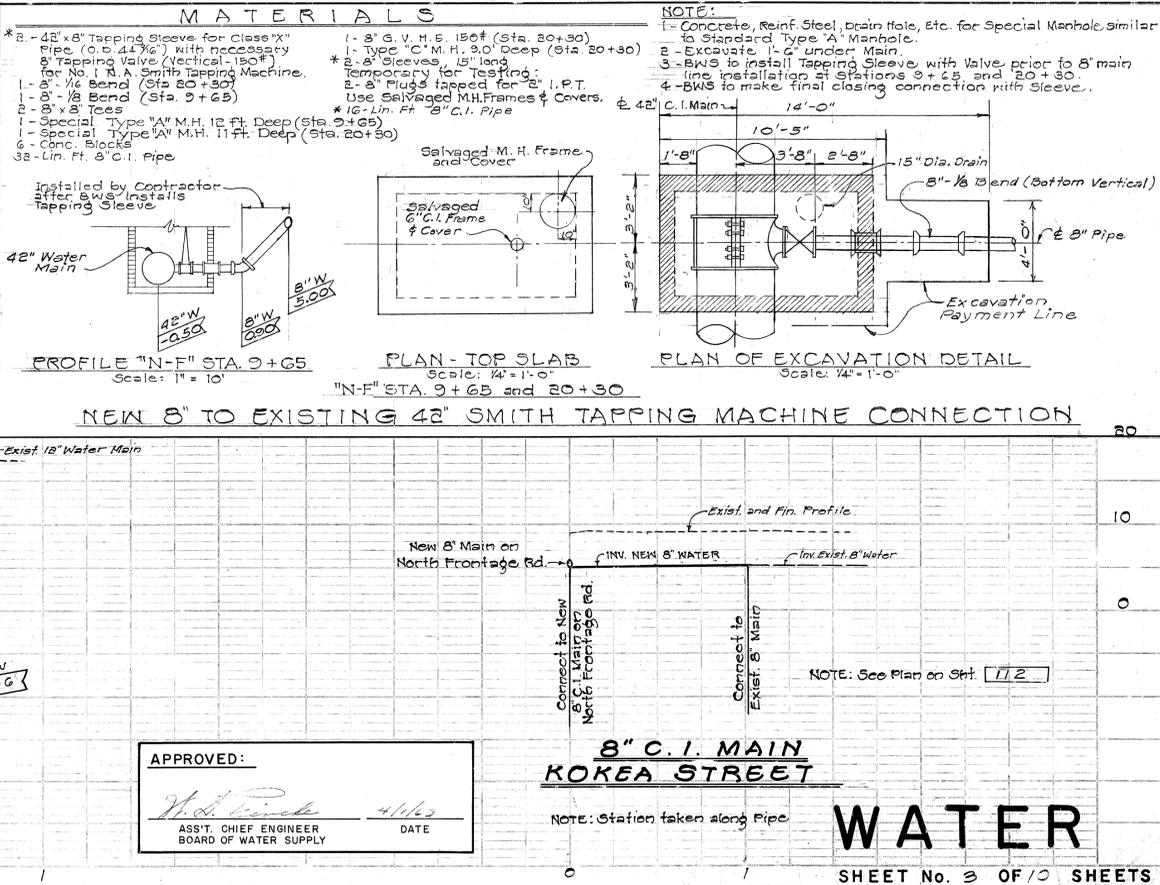
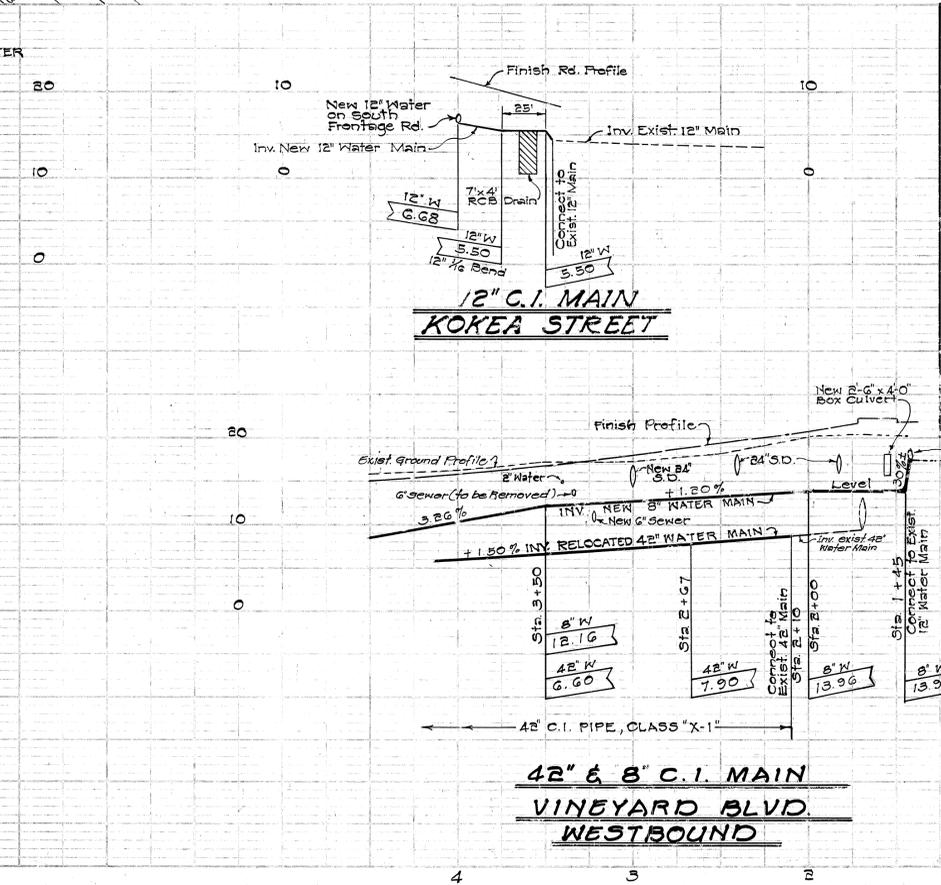
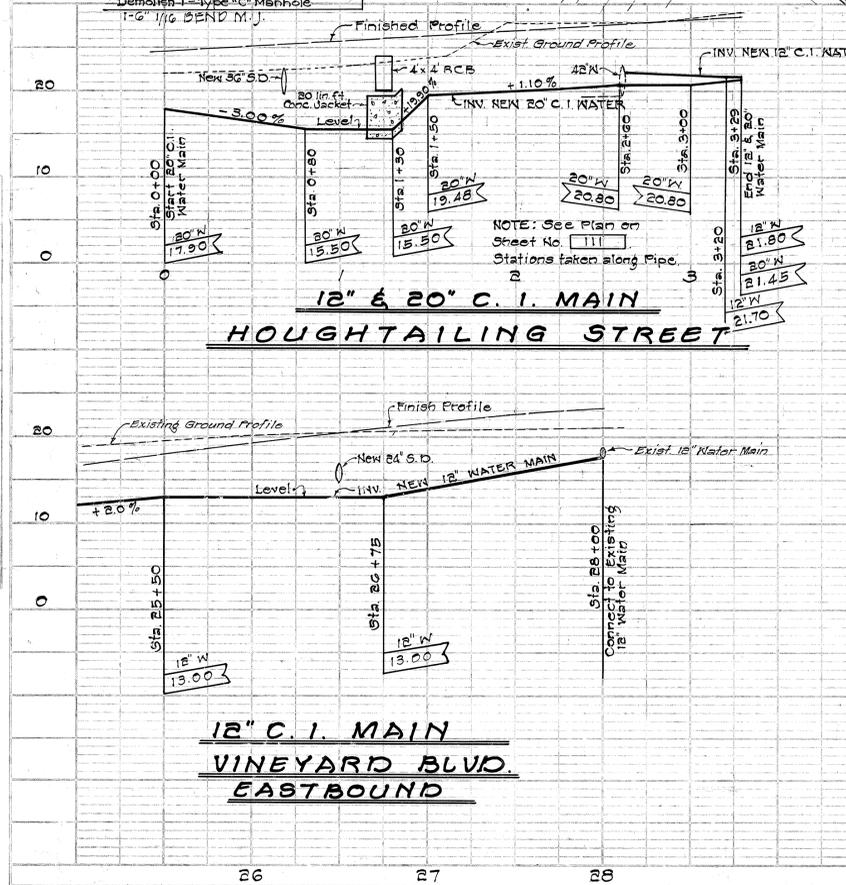
WATER

U09S10400.37 U07210300.91

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	U-078-1(3)	1963	72	246
		U-078-1(1)	1963	38	88



BELT, COLLINS & ASSOC., LTD.
Civil and Structural Engineers



MATERIALS

1- 42" x 8" Tapping Sleeve for Class 'X' Pipe (0.641 1/2") with necessary 8" Tapping Valve (Vertical - 150") for No. 1 R.A. Smith Tapping Machine.
1- 8" x 1/2 Bend (Sta. 20+30)
2- 8" x 8" Tees (Sta. 20+65)
1- Special Type 'W' M.H. 12 ft. Deep (Sta. 2+65)
1- Special Type 'W' M.H. 11 ft. Deep (Sta. 20+30)
6- Conc. Blocks
38- Lin. Ft. 8" C.I. Pipe

1- 6" G.V. H.E. 150" (Sta. 20+30)
1- Type 'C' M.H. 9.0' Deep (Sta. 20+30)
2- 8" x 8" Tees (Vertical - 150") Temporary for Testing.
2- 8" Plugs tapped for 2" I.P.T. Use Salvaged M.H. Frames & Covers.
1- 16" Lin. Ft. 8" C.I. Pipe @ 42" C.I. Main

Installed by Contractor after BWS installs Tapping Sleeve.

Salvaged M.H. Frame and Cover

Salvaged 6" C.I. Frame & Cover

NOTE:
1- Concrete, Reinf. Steel, Drain Hole, Etc. for Special Manhole, similar to Standard Type 'A' Manhole.
2- Excavate 1'-6" under Main.
3- BWS to install Tapping Sleeve with Valve prior to 8" main line installation at Stations 9+65 and 20+30.
4- BWS to make final closing connection with Sleeve.

APPROVED:
[Signature]
ASS'T. CHIEF ENGINEER
BOARD OF WATER SUPPLY
DATE

WATER
SHEET No. 3 OF 10 SHEETS

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	U-072-1(3)	1963	26	240
		U-098-1(4)	1963	40	88
		F-090-1(2)	1963	38	73

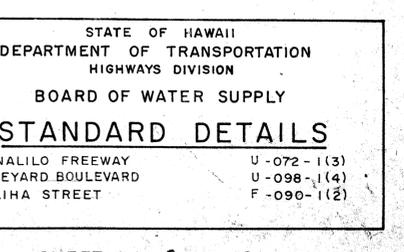
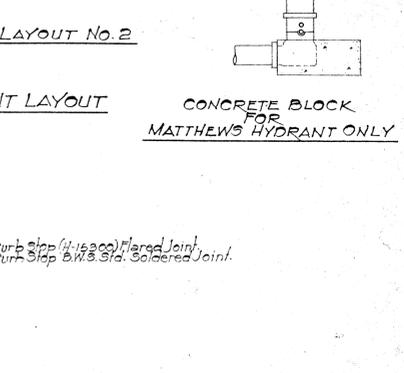
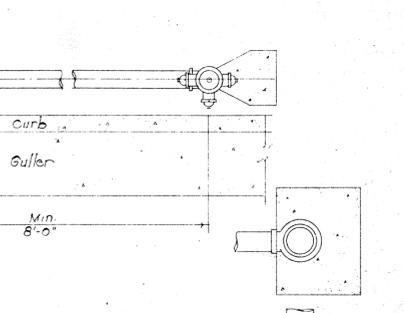
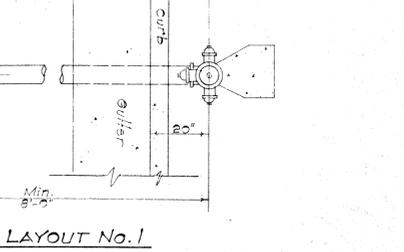
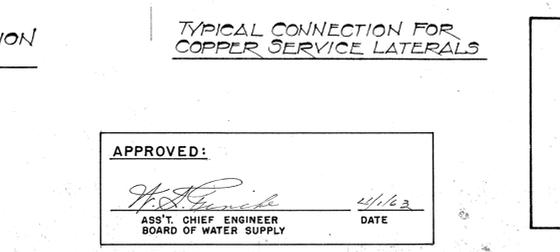
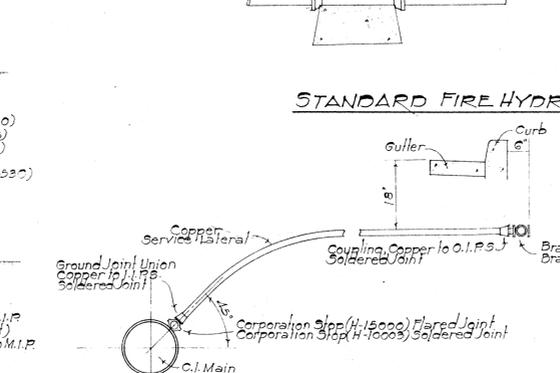
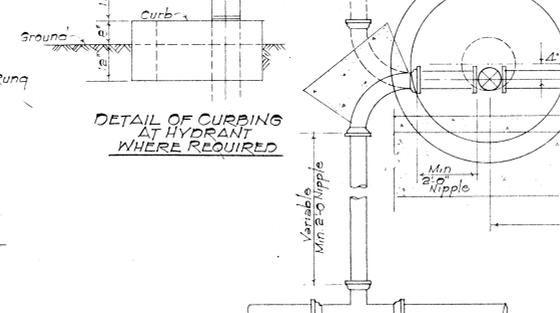
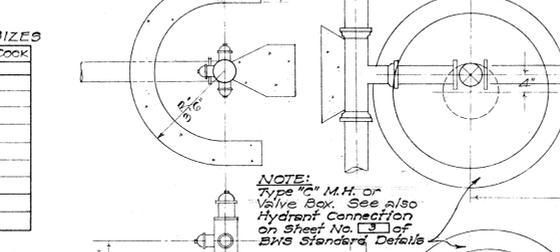
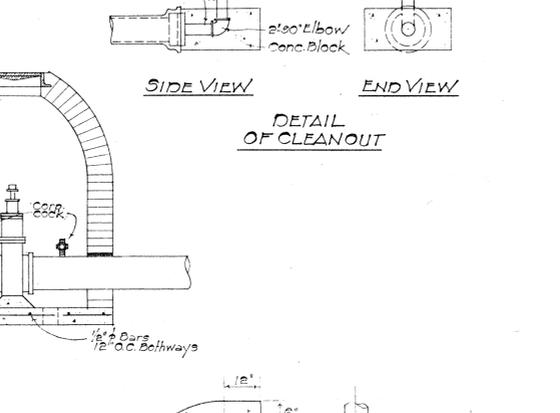
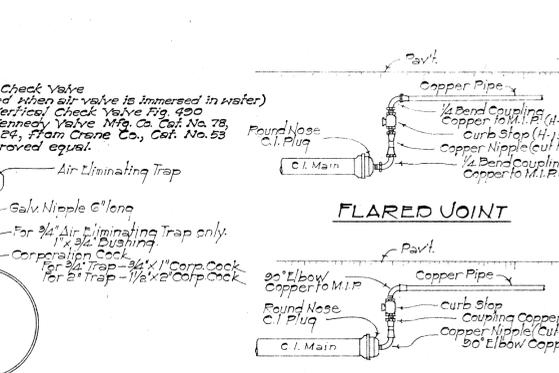
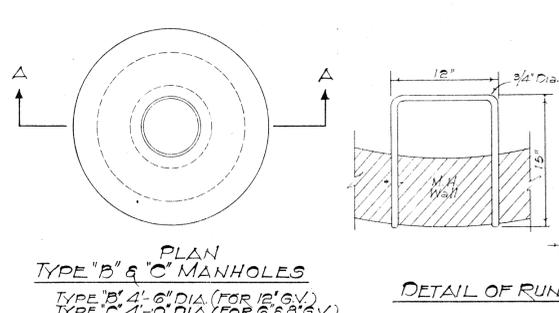
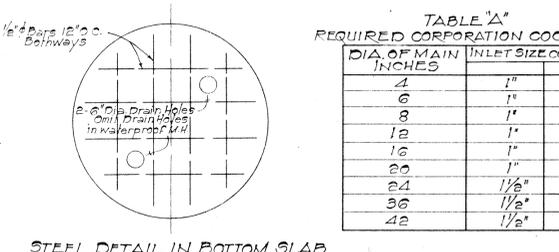
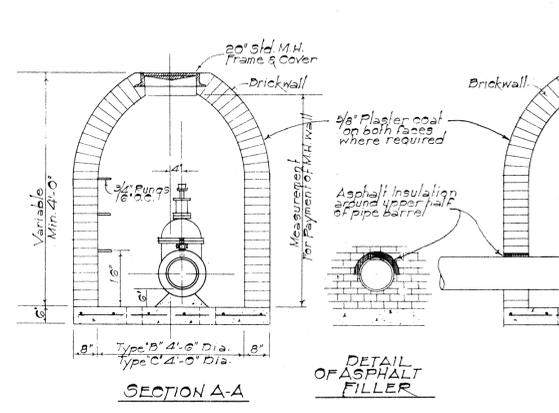
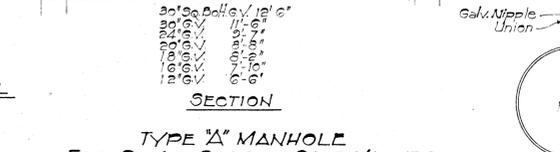
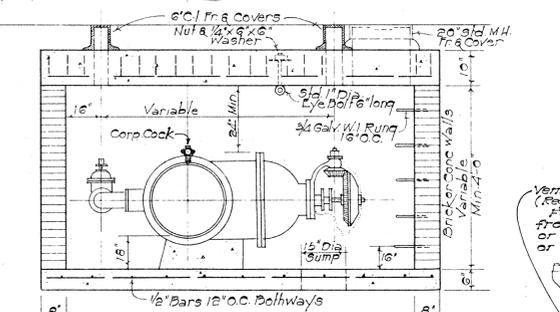
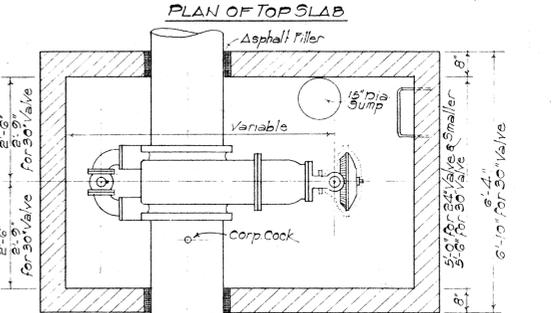
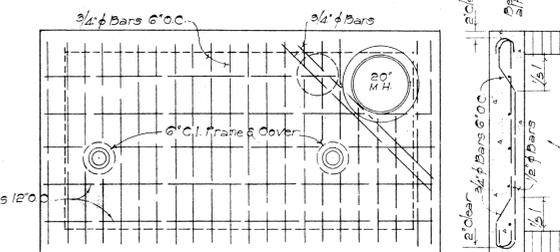
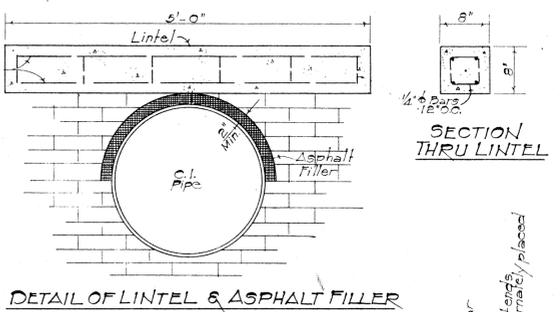
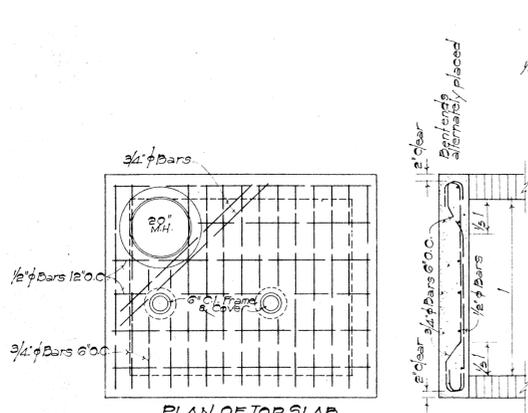
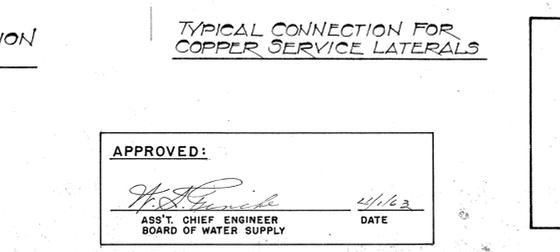
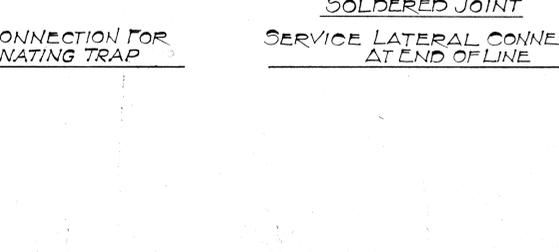
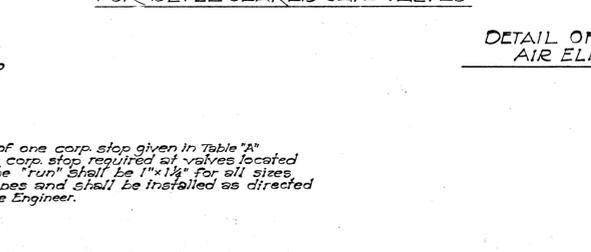
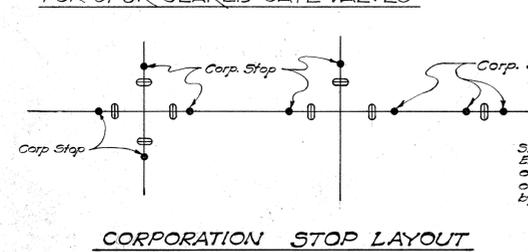
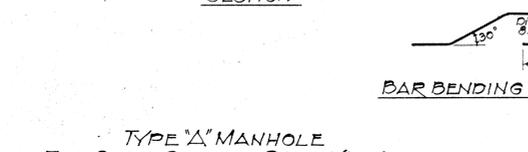


TABLE "A"
REQUIRED CORPORATION COCK SIZES

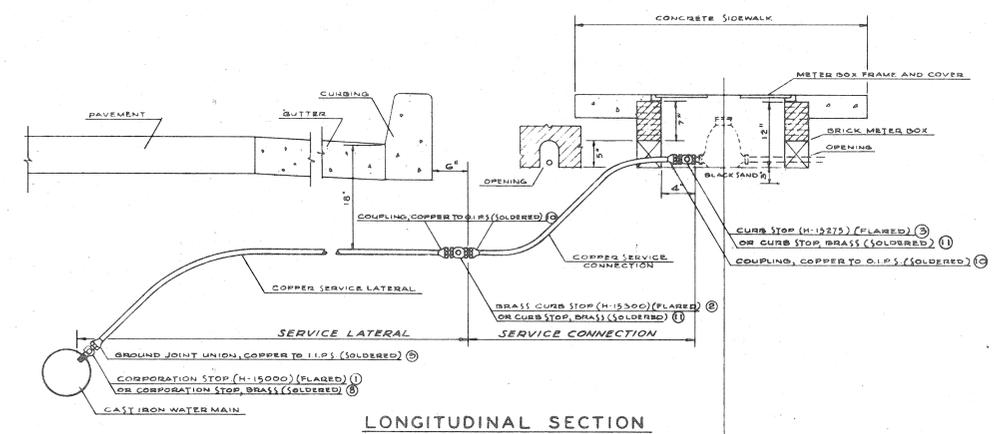
DIA. OF MAIN INCHES	INLET SIZE CORP. COCK
4	1"
6	1"
8	1"
12	1"
16	1"
20	1"
24	1 1/2"
36	1 1/2"
42	1 1/2"



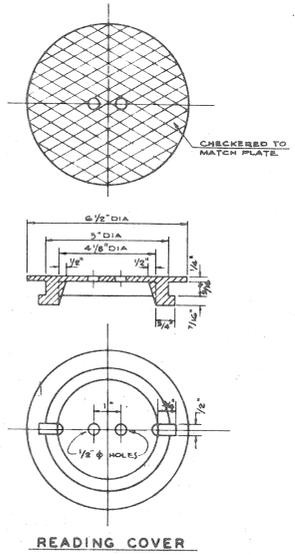
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BOARD OF WATER SUPPLY
STANDARD DETAILS
LUNALILO FREEWAY U-072-1(3)
VINEYARD BOULEVARD U-098-1(4)
LILIIHA STREET F-090-1(2)

APPROVED:
[Signature]
ASS'T. CHIEF ENGINEER
BOARD OF WATER SUPPLY
DATE 4/16/63

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	U-072-1(3)	1963	97	246
		U-098-1(4)	1963	41	88
		F-090-1(2)	1963	39	73



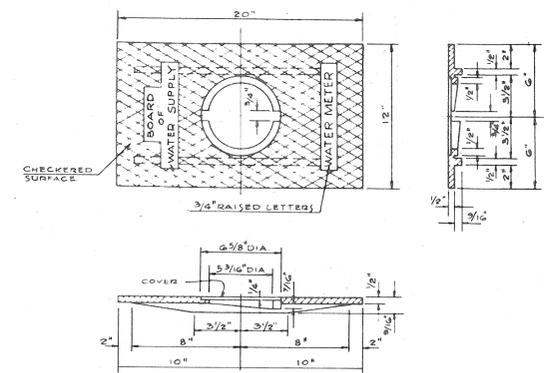
LONGITUDINAL SECTION



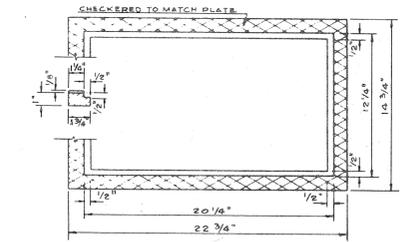
READING COVER

CHECKERED PATTERN

CAST IRON COVER FOR TYPE I & TYPE II FRAMES

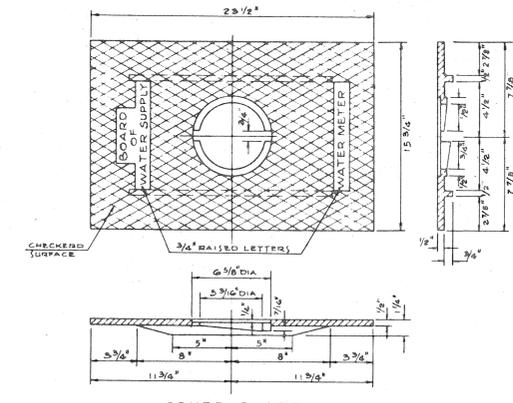


COVER PLATE

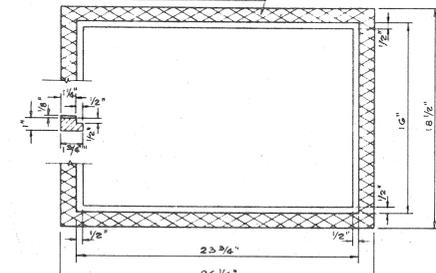


FRAME

CAST IRON FRAME AND PLATE TYPE I

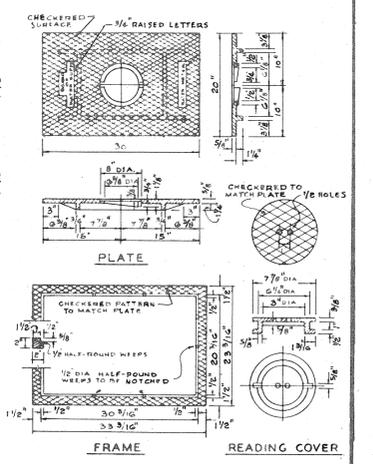


COVER PLATE

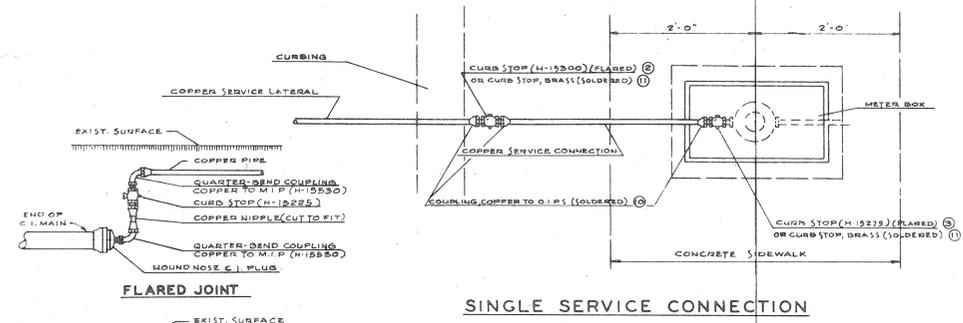


FRAME

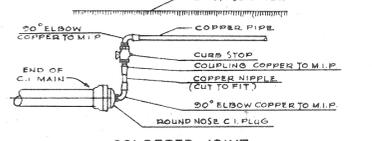
CAST IRON FRAME AND PLATE TYPE II



CAST IRON FRAME, PLATE & COVER TYPE III



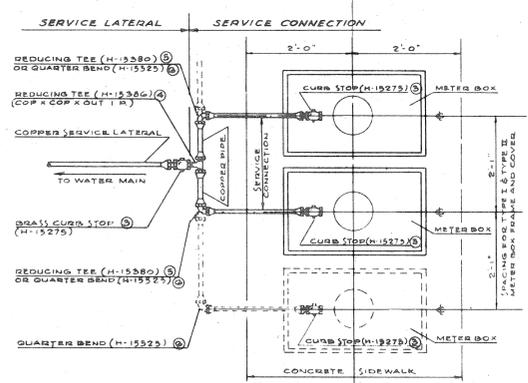
SINGLE SERVICE CONNECTION



FLARED JOINT

SOLDERED JOINT

SERVICE LATERAL CONNECTION AT END OF LINE



MULTIPLE SERVICE CONNECTION FLARED JOINTS

SCHEDULE OF COPPER FITTINGS (FLARED JOINT)

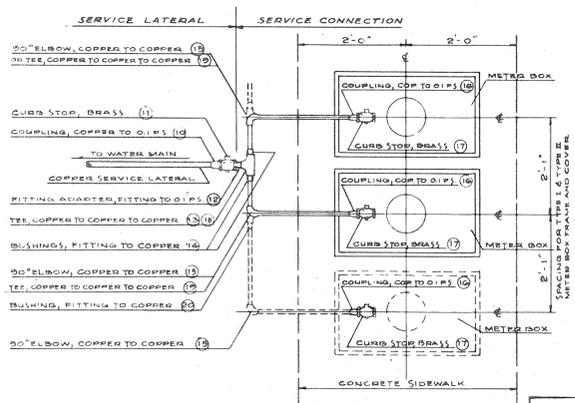
ITEM NO.	DESCRIPTION	SINGLE SERVICE CONN.	MULTIPLE SERV. CONN. TWO SERVICES	MULTIPLE SERV. CONN. THREE SERVICES
1	CORPORATION STOP WITH STRAIGHT COUPLING NUT (H-15000)	1	1	1
2	BRASS CURB STOP (H-15300)	1	-	-
3	CURB STOP WITH TUBE NUT COPPER TO M.I.P. (H-15275)	1	3	4
4	REDUCING TEE WITH TUBE NUTS COPPER TO M.I.P. (H-15386)	-	1	1
5	REDUCING TEES WITH TUBE NUTS COPPER TO COPPER (H-15380)	-	-	1
6	1/2 BEND UNION COUPLING WITH TUBE NUTS COPPER TO COPPER (H-15525)	-	2	2
7	THREE PART UNION COUPLING (H-15400) OR SOLDER COUPLING	-	-	-

NOTE: REFERENCE NUMBERS SHOWN ARE FROM MUELLER CATALOG "H" FOR PURPOSES OF IDENTIFYING FITTINGS. APPROVED EQUAL MAY BE USED.

SCHEDULE OF COPPER FITTINGS (SOLDERED JOINT)

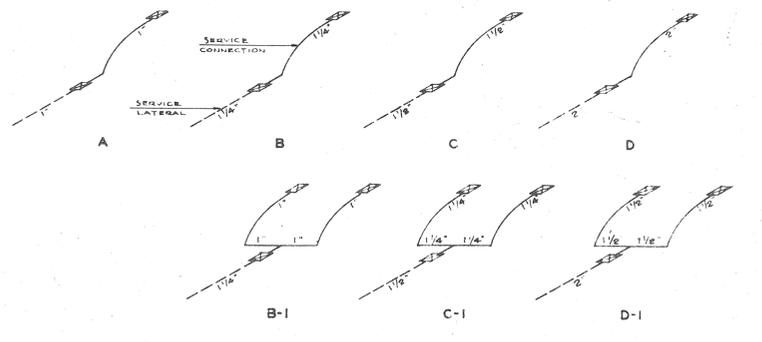
ITEM NO.	DESCRIPTION	SINGLE SERVICE CONN.	MULTIPLE SERV. CONN. TWO SERVICES	MULTIPLE SERV. CONN. THREE SERVICES
8	CORPORATION STOP, BRASS (H-10008)	1	1	1
9	GROUND JOINT UNION (A-14587) COPPER TO I.P.S. (A-14587)	1	1	1
10	COUPLING, COPPER TO O.I.P.S. (A-1553 TO A-1678)	2	1	1
11	CURB STOP, BRASS (S.W.S. STANDARD)	1	1	1
12	FITTING ADAPTER (A-1553 TO FITTING TO O.I.P.S. (A-1674)	-	1	1
13	TEE, COPPER TO COPPER TO COPPER (A-1566 TO A-2710)	-	1	1
14	BUSHINGS, FITTING TO COPPER (W-1343 TO W-1562)	-	2	2
15	90° ELBOW, COPPER TO COPPER (A-1553 TO A-1672)	-	2	2
16	COUPLING, COPPER TO O.I.P.S. (A-1553 TO A-1672)	1	2	3
17	CURB STOP, BRASS (S.W.S. STANDARD)	1	2	3
18	REDUCING TEE, COPPER TO COPPER (SUBSTITUTE FOR ITEM NUMBER 13 & 14)	-	1	1
19	TEE, COPPER TO COPPER TO COPPER (A-1566 TO A-2710)	-	-	1
20	BUSHING, FITTING TO COPPER (W-1343 TO W-1562)	-	-	1
21	REDUCING TEE, COPPER TO COPPER (SUBSTITUTE FOR ITEM NUMBER 13 & 14)	-	-	1

NOTE: REFERENCE NUMBERS SHOWN THIS (H-10008) ARE FROM MUELLER CO. CATALOG "H" AND (A-1424) ARE FROM MUELLER BRASS CO. "STRAFLINE" CATALOG. "H" APPROVED EQUAL MAY BE USED.

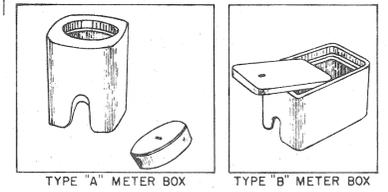


MULTIPLE SERVICE CONNECTION SOLDERED JOINTS

NOTE: USE OF COPPER PIPE AND FITTINGS WITH "SOLDERED" JOINTS OPTIONAL UNTIL FURTHER NOTICE.



TYPICAL LAYOUT OF SERVICE LATERALS AND CONNECTIONS



TYPE "A" METER BOX TYPE "B" METER BOX

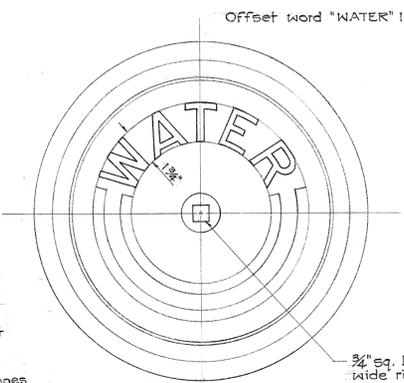
METER BOX DATA

TYPE METER BOX	METER SIZES	OVERALL DIMENSIONS AT BOTTOM	OVERALL DIMENSIONS AT TOP	COMPLETE WEIGHT	OVERALL DIMENSIONS OF LID
A	5/8" or 3/4"	7 1/4" x 7 1/4"	10" x 10"	45 lbs.	7 3/8" Dia.
B	5/8" or 3/4"	9 1/2" x 16"	12 1/4" x 18 3/8"	82 lbs.	8 3/4" x 14 1/2"

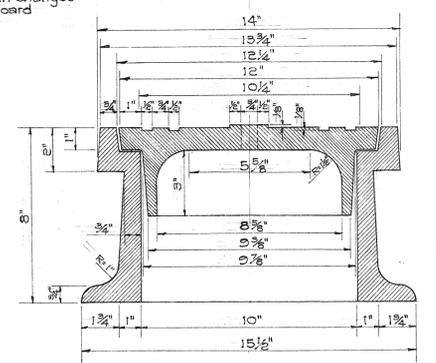
APPROVED: *[Signature]*
ASS'T. CHIEF ENGINEER
BOARD OF WATER SUPPLY
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BOARD OF WATER SUPPLY
STANDARD DETAILS
LUNALILO FREEWAY U-072-1(3)
VINEYARD BOULEVARD U-098-1(4)
LILIHAI STREET F-090-1(2)

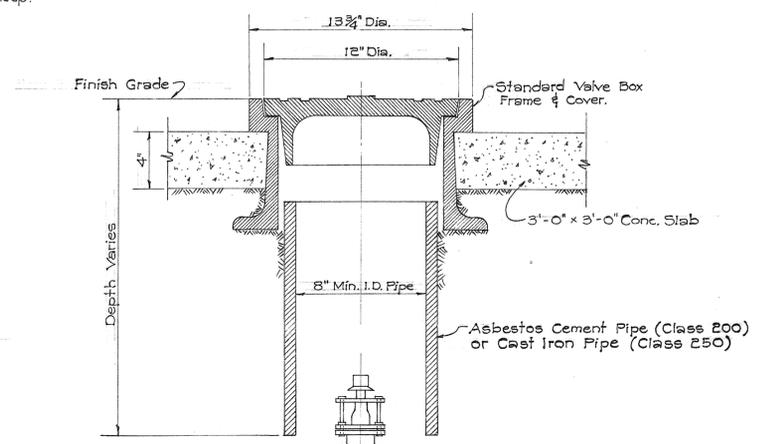
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-072-(3)	1963	28	246
		U-098-(4)	1963	42	88
		F-090-(2)	1963	40	73



NOTE:
All castings shall be made accurately to the dimensions shown. Seat and cover shall be ground where necessary to secure flat and true surfaces. The cover shall not rest in any position.
Minor changes in dimensions may be made to suit foundry conditions provided such changes are approved by the Board of Water Supply.



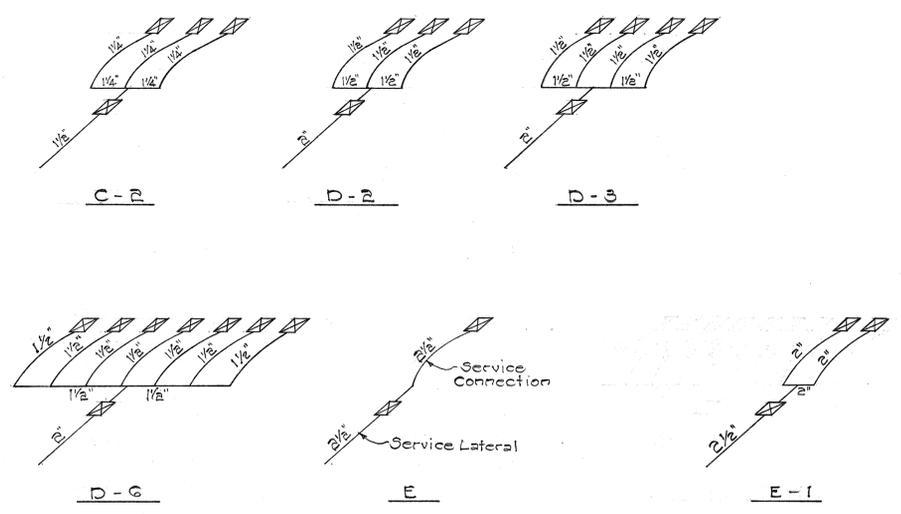
CAST IRON FRAME & COVER
Scale: 3/4" = 1"



The limit of Blacksand Backfill around the Valve shall be the Trench Width x 4 ft on each side of Valve and Fill to 8" below Finish Grade. Payment for Blacksand Backfill shall be incidental to Trench Excavation.

NOTE:
For Bevel Geared Gate Valves see B.W.S. Standard. (Detail Sheet filed in B.W.S. Engr. Div.)

INSTALLATION OF VALVE BOX FOR GATE VALVES
Not to Scale

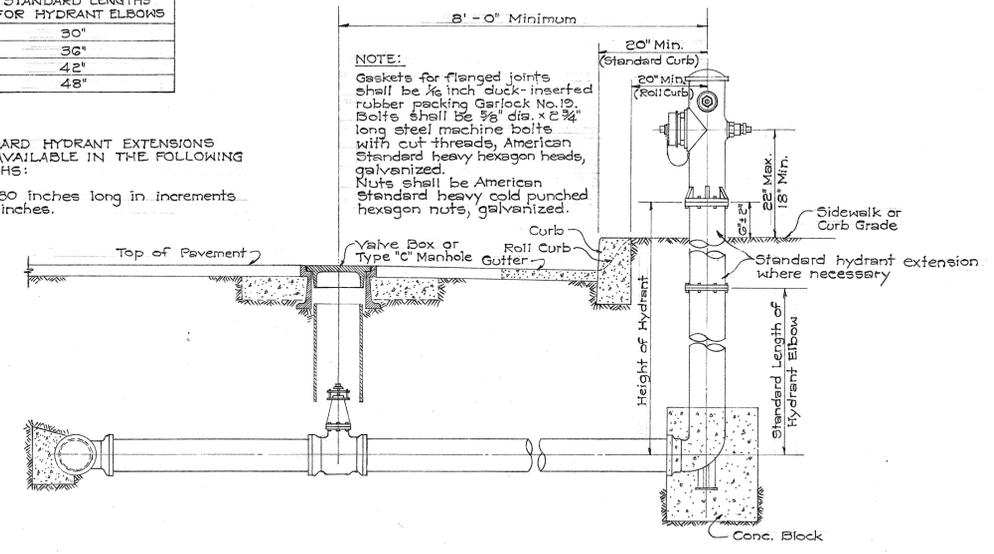


TYPICAL LAYOUT OF SERVICE LATERALS & CONNECTIONS
NOT SHOWN ON THE STANDARD DETAIL SHEETS
Not to Scale

NOTE:
1. Prior to backfilling around the valves and the installation of valve boxes, the gate valves shall be cleaned and given one coat of paint. See Standard Specifications.
2. Upon completion of the valve boxes, the cast-iron frames and covers shall be cleaned and painted with one coat of approved asphaltum paint.

STANDARD LENGTHS FOR HYDRANT ELBOWS	
30"	
36"	
42"	
48"	

STANDARD HYDRANT EXTENSIONS ARE AVAILABLE IN THE FOLLOWING LENGTHS:
6 to 30 inches long in increments of 6 inches.



HYDRANT CONNECTION
STRAIGHT RUN
(Not to Scale)

ORIGINAL PLAN NO. _____
DATE _____
DESIGNED BY _____
CHECKED BY _____
DATE _____

APPROVED:
W. H. ...
ASST. CHIEF ENGINEER
BOARD OF WATER SUPPLY
DATE 4/16/63

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BOARD OF WATER SUPPLY
STANDARD DETAILS
LUNALILO FREEWAY U-072-1(3)
VINEYARD BOULEVARD U-098-1(4)
LILIHA STREET F-090-1(2)
SCALE: AS NOTED
SHEET No. 10 OF 10 SHEETS