

**WATER NOTES: (B.W.S.)**

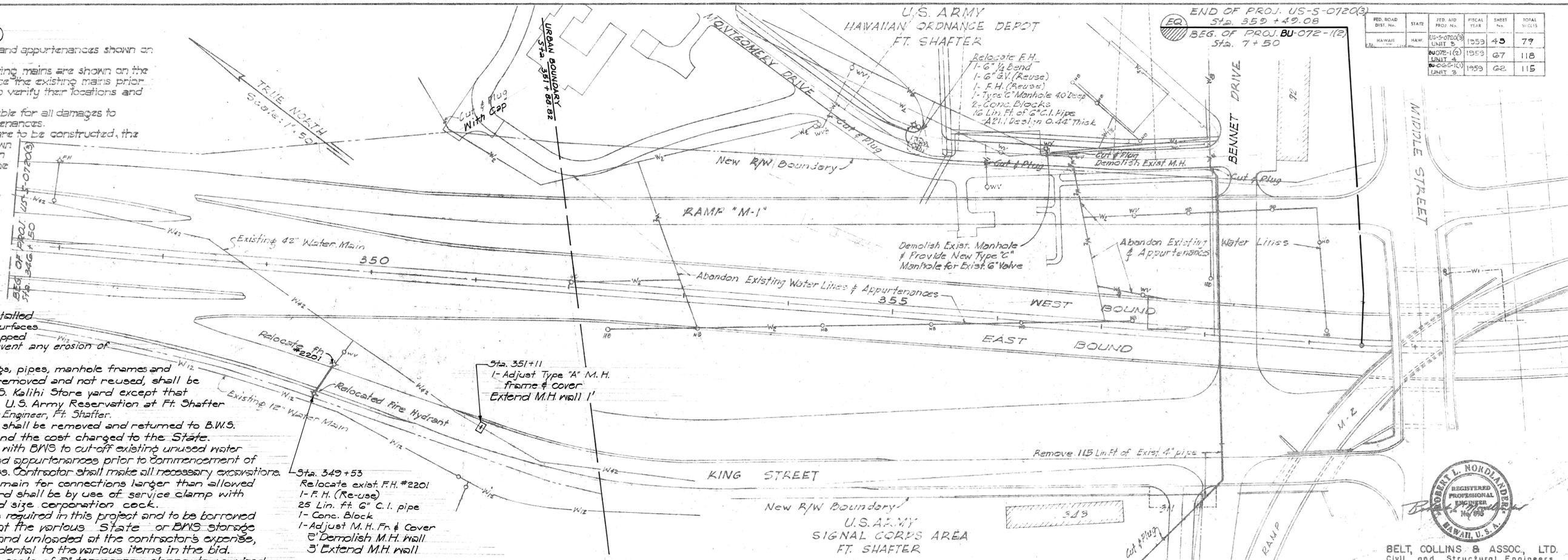
1. Location of existing water mains and appurtenances shown on the plans are approximate only.
2. Whenever connections to existing mains are shown on the plans, the contractor shall expose the existing mains prior to excavation of main trenches to verify their locations and depths.
3. The contractor shall be responsible for all damages to existing water mains and appurtenances.
4. Where RM, tile or concrete walls are to be constructed, the contractor shall provide at his own expense, adequate size sleeves in wall at locations approved by the Board of Water Supply engineer to facilitate consumer water pipe extension into the property.
5. The contractor shall notify the Board of Water Supply in writing one week prior to commencing work on the water system.
6. All existing water manholes shall be adjusted to new grade.
7. Unless otherwise specified F.H. to be installed off an existing main shall be installed by the BWS.
8. Whenever water mains are installed across cut banks of Roadway, surfaces of such trenches shall be rip-rapped with Grouted Rubble Paving to prevent any erosion of backfilled materials.
9. All fire hydrants, valves, fittings, pipes, manhole frames and covers, rungs, etc. that are removed and not reused, shall be cleaned and returned to B.W.S. Kalihī Store yard except that materials removed from the U.S. Army Reservation at Ft. Shafter shall be returned to the Sector Engineer, Ft. Shafter.
10. Fire hydrants to be salvaged shall be removed and returned to B.W.S. Kalihī yard by B.W.S. crew and the cost charged to the State.
11. The contractor shall arrange with BWS to cut-off existing unused water laterals, remove meter boxes and appurtenances prior to commencement of cleaning and grading operations. Contractor shall make all necessary excavations.
12. Tapping into existing water main for connections larger than allowed in B.W.S. construction standard shall be by use of service clamp with boss tapped for the required size corporation cock.
13. All those water main materials required in this project and to be borrowed or replaced, shall be loaded at the various State or BWS storage yard, hauled to the job site and unloaded at the contractor's expense, the cost thereof shall be incidental to the various items in the bid.
14. Removal and reinstallation costs of 2" temporary obstructions required for testing and chlorination of new water mains shall be incidental to cost of pipe installation.
15. When "F.H. (reused)" is indicated on the plan and if this F. Hydrant is to be installed off a new main, the Contractor shall obtain a re-conditioned or new substitute fire hydrant from the BWS Kalihī Storeyard.

END OF PROJ. US-S-0720(3)  
Sta. 359+49.08  
BEG. OF PROJ. BU-072-1(2)  
Sta. 7+50

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
	HAWAII	US-S-0720(3)	1959	43	79
		UNIT 2			
		NOTE-1(2)	1959	67	118
		UNIT 3			
		NOTE-1(1)	1959	62	115
		UNIT 3			

PLAN	DATE	BY
DESIGNED		
PLOTTED		
ALIGNED		
CHECKED		
RT. OF WAY CHECKED		
NO.		

PROFILE	DATE	BY
DESIGNED		
PLOTTED		
GRADES CHECKED		
NO. OFFERED		
STRUCTURAL DATE		
NO.		



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

**NOTE:**  
THESE PLANS WERE PREPARED IN COOPERATION WITH THE OFFICE OF THE BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU.

APPROVED:  
*W. B. Smith* 8/17/59  
ASSISTANT CHIEF ENGINEER  
BOARD OF WATER SUPPLY

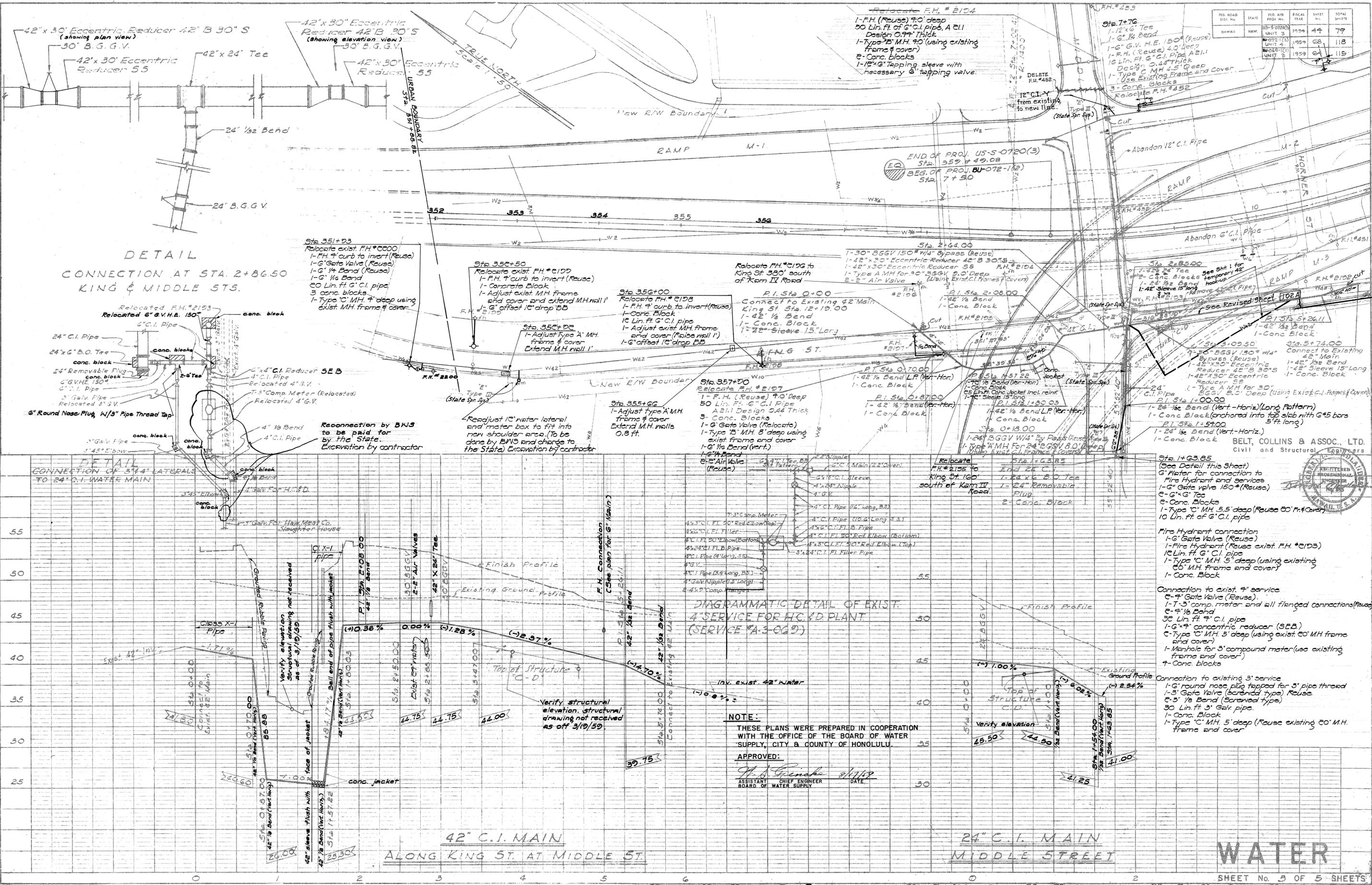
**WATER**

SHEET No. 1 OF 5 SHEETS

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
	HAWAII	30-5-0720	1959	44	79
		UNIT 3		68	118
		UNIT 4		68	118
		UNIT 5		68	118

PLAN	DATE
SUPERVISED	
PLOTTED	
NOTE BOOK	
ALIGNMENT CHECKED	
BY	
DATE	

PROFILE	DATE
SUPERVISED	
PLOTTED	
NOTE BOOK	
STRUCTURE N.E.T.A.N.S.P.A.	
BY	
DATE	



**DETAIL CONNECTION AT STA. 2+86.50 KING & MIDDLE STS.**

**DIAGRAMMATIC DETAIL OF EXIST. 4" SERVICE FOR H.C. #D PLANT (SERVICE A-3-069)**

**NOTE:**  
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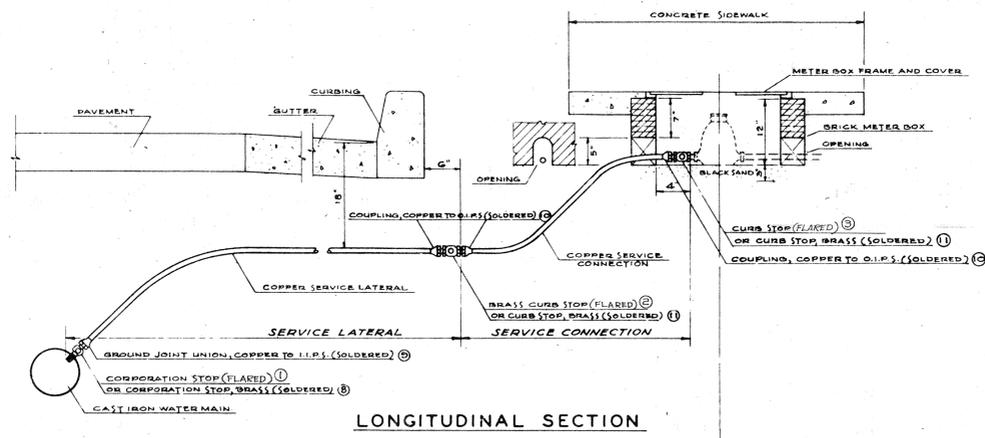
**APPROVED:**  
*[Signature]* 8/17/59  
 ASSISTANT CHIEF ENGINEER  
 BOARD OF WATER SUPPLY



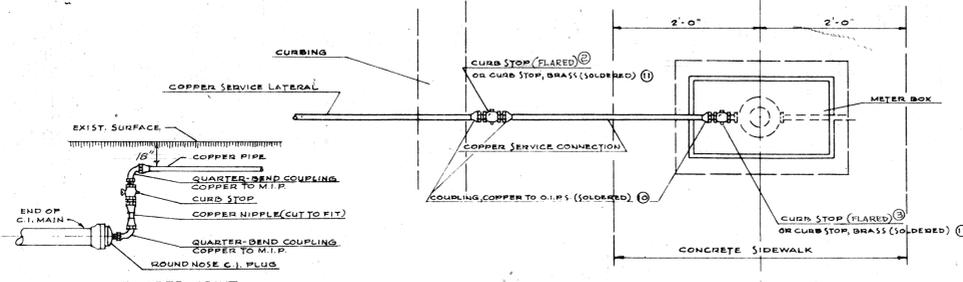
**WATER**



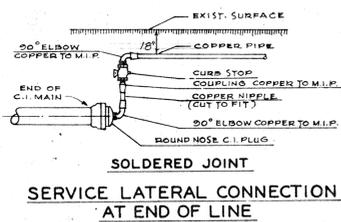
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	HAWAII	US-0720(3)	1959	46	77
		UNIT 3			
		BU-065(1)	1959	7C	118
		UNIT 4			
		BU-065(1)	1959	67	115
		UNIT 5			



LONGITUDINAL SECTION

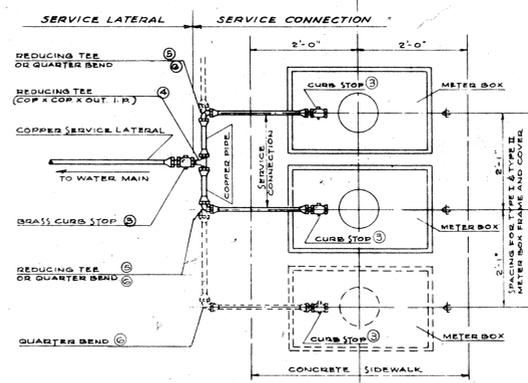


SINGLE SERVICE CONNECTION

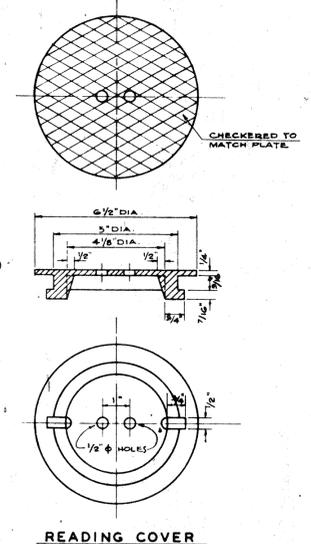


SCHEDULE OF COPPER FITTINGS (FLARED JOINT)

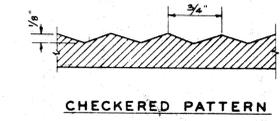
ITEM NO.	DESCRIPTION	SINGLE SERVICE CONN.	TWO SERVICES	THREE SERVICES
1	CORPORATION STOP WITH STRAIGHT COUPLING NUT	1	1	1
2	BRASS CURB STOP	1	-	-
3	CURB STOP WITH TUBE NUT COPPER TO I.P.S.	1	3	4
4	REDUCING TEE WITH TUBE NUTS - COPPER TO COPPER TO OUTSIDE I.P.	-	1	1
5	REDUCING TEES WITH TUBE NUTS - COPPER TO COPPER TO COPPER	-	-	1
6	1/4 BEND UNION COUPLING WITH TUBE NUTS - COPPER TO COPPER	-	2	2
7	THREE PART UNION COUPLING OR SOLDER	-	-	1



MULTIPLE SERVICE CONNECTION FLARED JOINTS



READING COVER

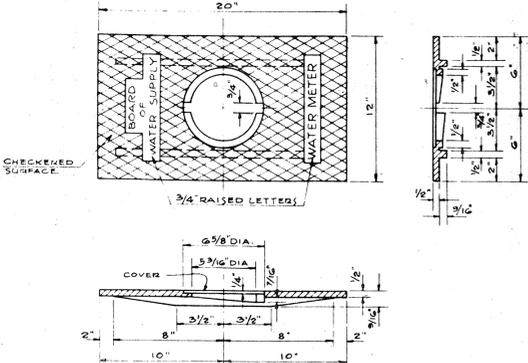


CHECKERED PATTERN

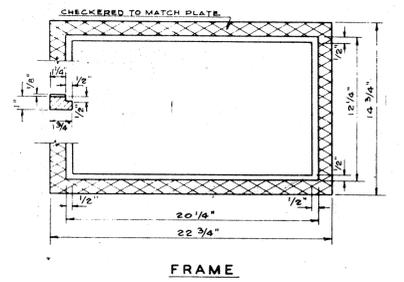
CAST IRON COVER FOR TYPE I & TYPE II FRAMES

SCHEDULE OF COPPER FITTINGS (SOLDERED JOINT)

ITEM NO.	DESCRIPTION	SINGLE SERVICE CONN.	TWO SERVICES	THREE SERVICES
8	CORPORATION STOP, BRASS	1	1	1
9	GROUND JOINT UNION COPPER TO I.P.S.	1	1	1
10	COUPLING, COPPER TO O.I.P.S.	2	1	1
11	CURB STOP, BRASS (B.W.S. STANDARD)	1	1	1
12	FITTING ADAPTER, FITTING TO O.I.P.S.	-	1	1
13	TEE, COPPER TO COPPER TO COPPER	-	1	1
14	BUSHINGS, FITTING TO COPPER	-	2	2
15	90° ELBOW, COPPER TO COPPER	-	2	2
16	COUPLING, COPPER TO O.I.P.S.	1	2	3
17	CURB STOP, BRASS (B.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	-	-	1
20	BUSHING, FITTING TO COPPER	-	-	1
21	REDUCING TEE, COPPER TO COPPER (SUBSTITUTE FOR ITEM NUMBER 13 & 20)	-	-	1

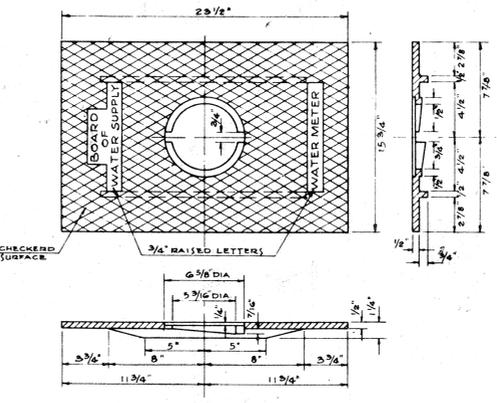


COVER PLATE

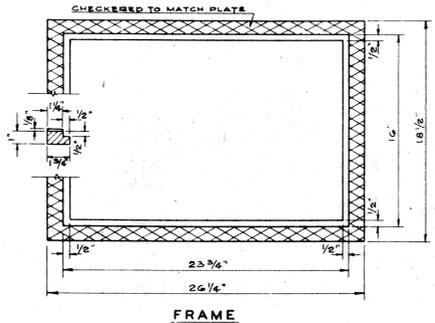


FRAME

CAST IRON FRAME AND PLATE TYPE I

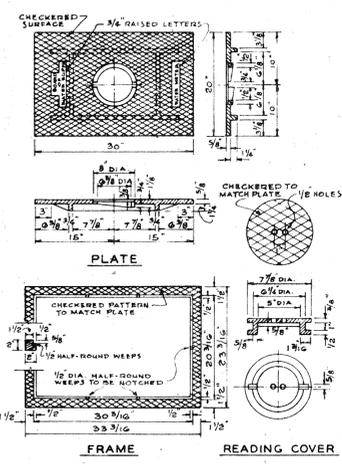


COVER PLATE

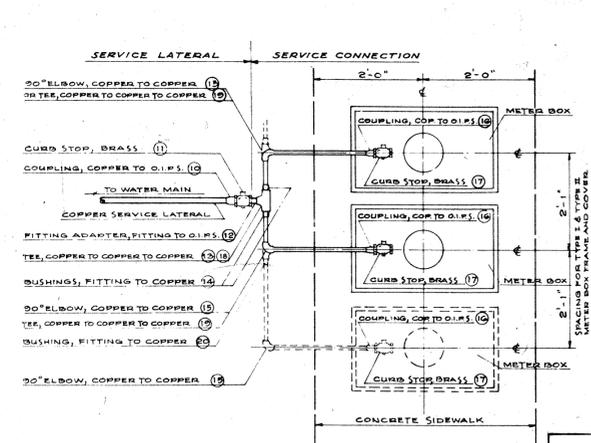


FRAME

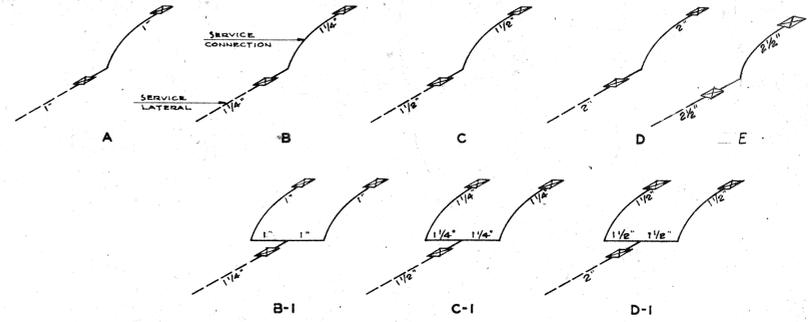
CAST IRON FRAME AND PLATE TYPE II



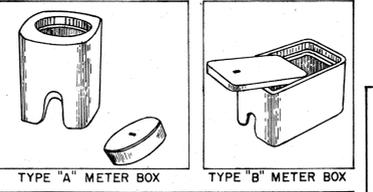
CAST IRON FRAME, PLATE & COVER TYPE III



MULTIPLE SERVICE CONNECTION SOLDERED JOINTS



TYPICAL LAYOUT OF SERVICE LATERALS AND CONNECTIONS



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" Valve	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"

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

**APPROVED:**  
*J. D. ...* 8/17/59  
ASSISTANT CHIEF ENGINEER  
BOARD OF WATER SUPPLY

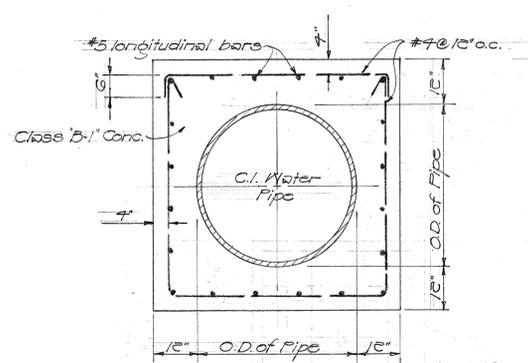
**NOTE:**  
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HAWAII STATE HIGHWAY DEPARTMENT  
STATE OF HAWAII

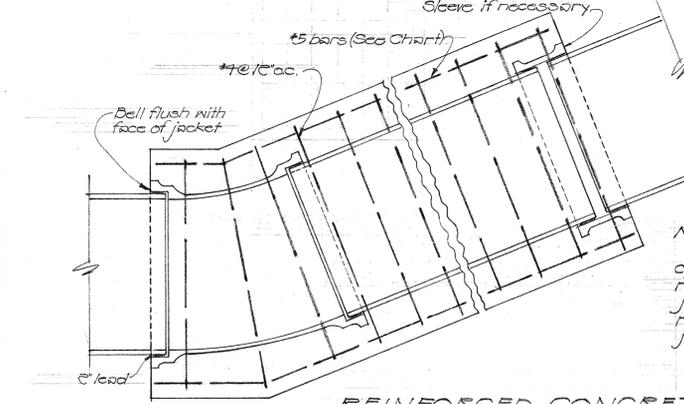
BOARD OF WATER SUPPLY  
**STANDARD DETAILS**

MOANALUA ROAD US-S-0720(3) UNIT 3  
LUNALILO FREEWAY BU-072-(12) UNIT 4  
MIDDLE STREET BU-065-(11) UNIT 3

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	15-507000	1950	47	79
		BU-072-1(2)	1950	73	118
		BU-065-1(1)	1950	68	115

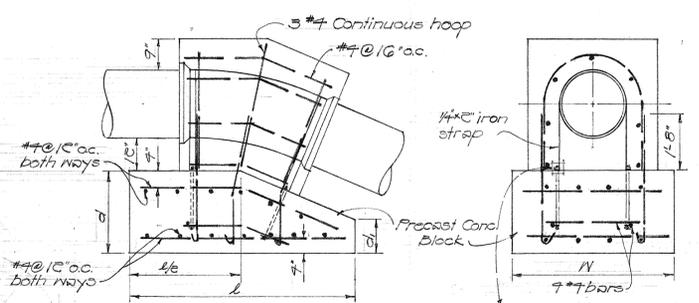


I.D. of Pipe	Size of Jacket	#4 bars	#5 Longitudinal Bars Top & Bot.	Sides	Total
7E"	28" x 28"	1E" o.c.	1E"	8	20
3G"	6E" x 6E"	"	1E"	8	20
30"	56" x 56"	"	10	8	16
34"	50" x 50"	"	10	6	16
50"	76" x 76"	"	10	6	16
1G"	7E" x 7E"	"	8	7	1E
1E"	33" x 33"	"	8	7	1E
8"	39" x 39"	"	8	7	1E
6"	3E" x 3E"	"	6	E	8
7"	30" x 30"	"	6	E	8



**REINFORCED CONCRETE JACKET**  
Not to scale

NOTE: Jacket to be poured after completion of test. Lead joint required at both faces of jacket. 2" depth of lead required at all embedded joints.

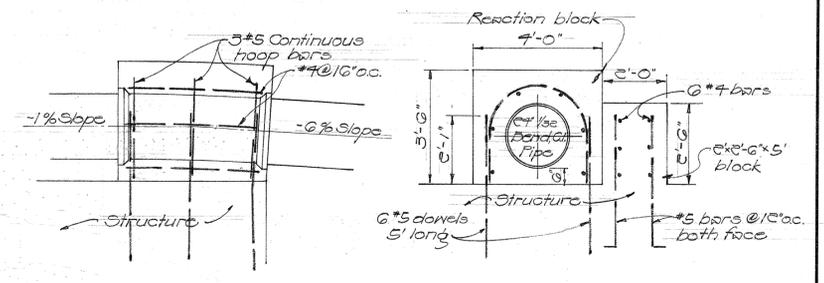


Dimensions of Precast Block for Top Vertical Bends (60 psi. Pressure)

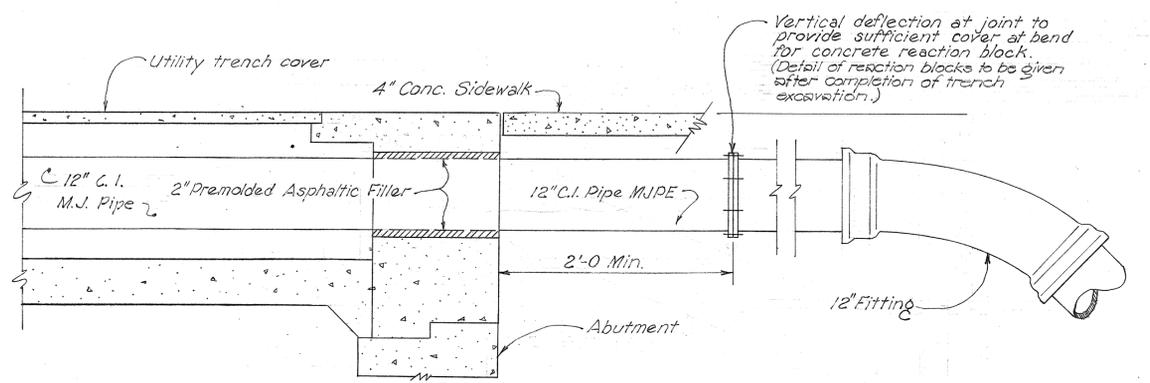
Bend	Vol. of Conc.	l	W	d	d <sub>1</sub>
6 1/8" Bend	5 c.f.	5'-6"	5'	2'-6"	1'-5"
6 1/4" Bend	6 c.f.	6'-6"	6'-6"	1'-0"	1'-0"
6 1/2" Bend	5 c.f.	6'-6"	6'-6"	1'-0"	1'-0"

**TOP VERTICAL REACTION BLOCKS FOR KAM IV ROAD AT CONNECTIONS**  
Not to scale

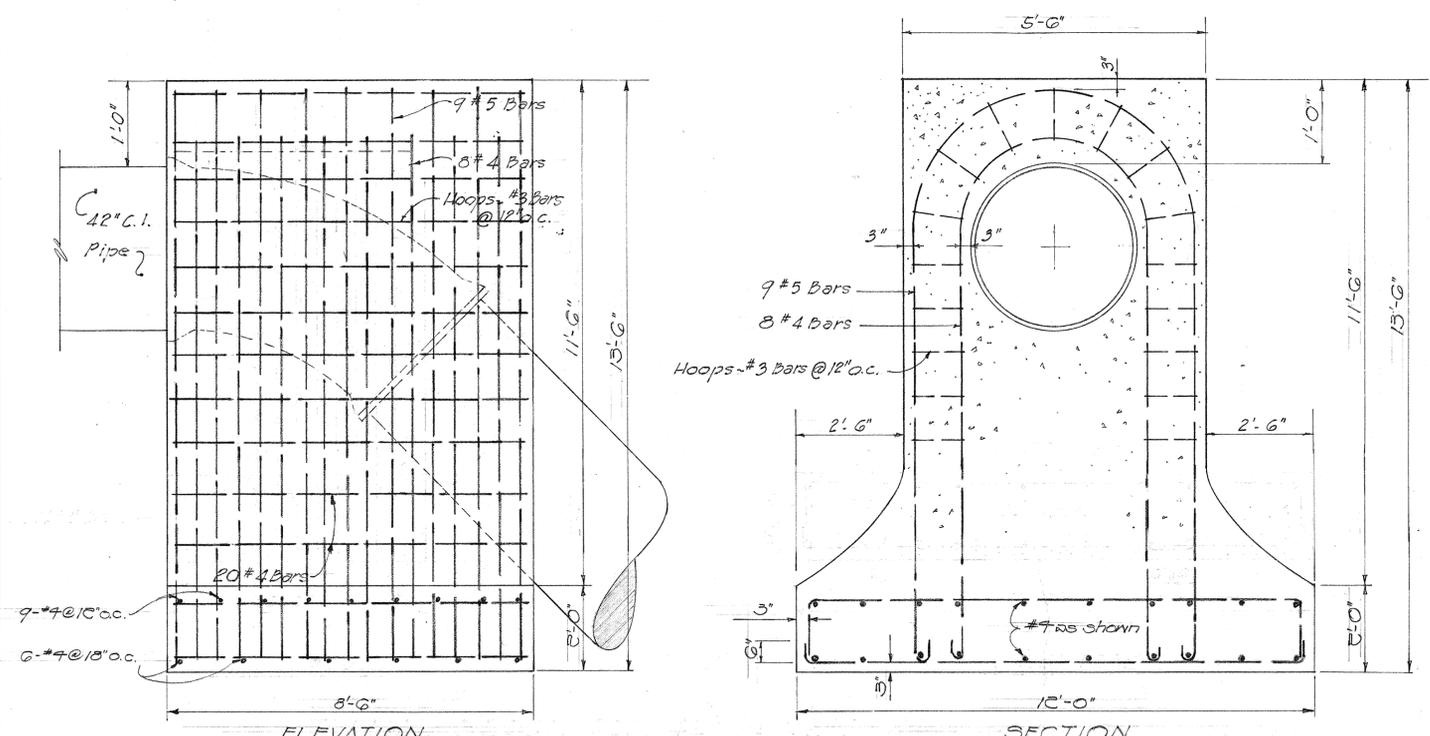
(Bends to be installed by BNS. Reaction blocks to be installed by Contractor.)



**REACTION BLOCK FOR TOP VERTICAL-HORIZONTAL 6 1/8" BEND AT STA. 1+00, MIDDLE STREET**  
Not to scale

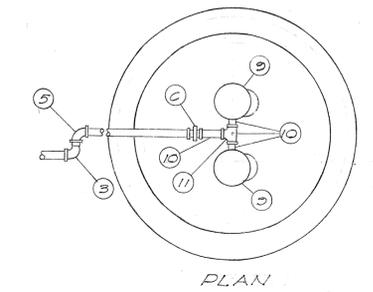


**12" C.I. PIPE CONNECTION (OLA LANE OVERPASS)**

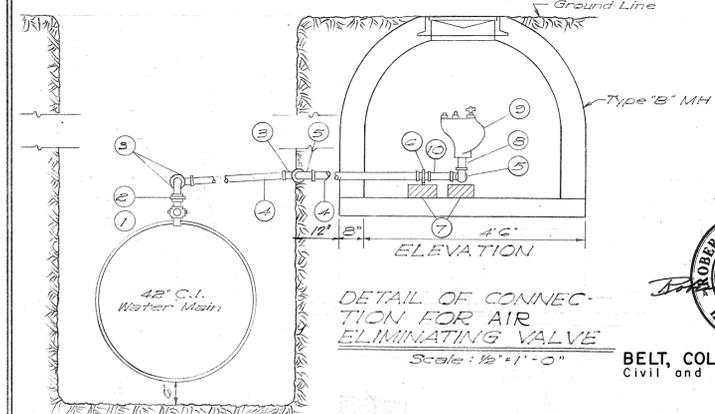


**TYPICAL BLOCK FOR 7E" 1/8 VERTICAL BEND**

17.7 cu. yds. (Reaction block anchored in rock)  
Not to scale  
(Details subject to revision in field)



PLAN



**DETAIL OF CONNECTION FOR AIR ELIMINATING VALVE**  
Scale: 1/2" = 1'-0"

LIST OF MATERIALS

Item No.	Qty.	DESCRIPTION
1	1	1/8" Concentration Cock
2	1	2" Union, Galv.
3	3	2" St. Elbow Galv.
4	2	2" Galv. Pipe, Cut to Fit
5	3	90° Elbow, Galv.
6	1	2" 3-Way Cock, Brass
7	2	Brick Support
8	2	2" x 4" Nipple, Galv.
9	2	2" Air Elim. Valve
10	3	2" x 4" Nipple, Galv.
11	1	2" Tee, Galv.

*Robert L. Nordlander*  
ASSISTANT CHIEF ENGINEER  
BOARD OF WATER SUPPLY  
DATE: 8/17/52



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

**HAWAII STATE HIGHWAY DEPARTMENT**  
STATE OF HAWAII

**MISC. WATER DETAILS**

MOANALUA ROAD US-S-0720(3) UNIT 3  
LUNALILO FREEWAY BU-072-1(2) UNIT 4  
MIDDLE STREET BU-065-1(1) UNIT 3

DATE: \_\_\_\_\_  
SURVEY PLOTTED BY: \_\_\_\_\_  
DESIGNED BY: \_\_\_\_\_  
TRACED BY: \_\_\_\_\_  
QUANTITIES CHECKED BY: \_\_\_\_\_  
NOTE BOOK NO. \_\_\_\_\_  
CHECKED BY: \_\_\_\_\_