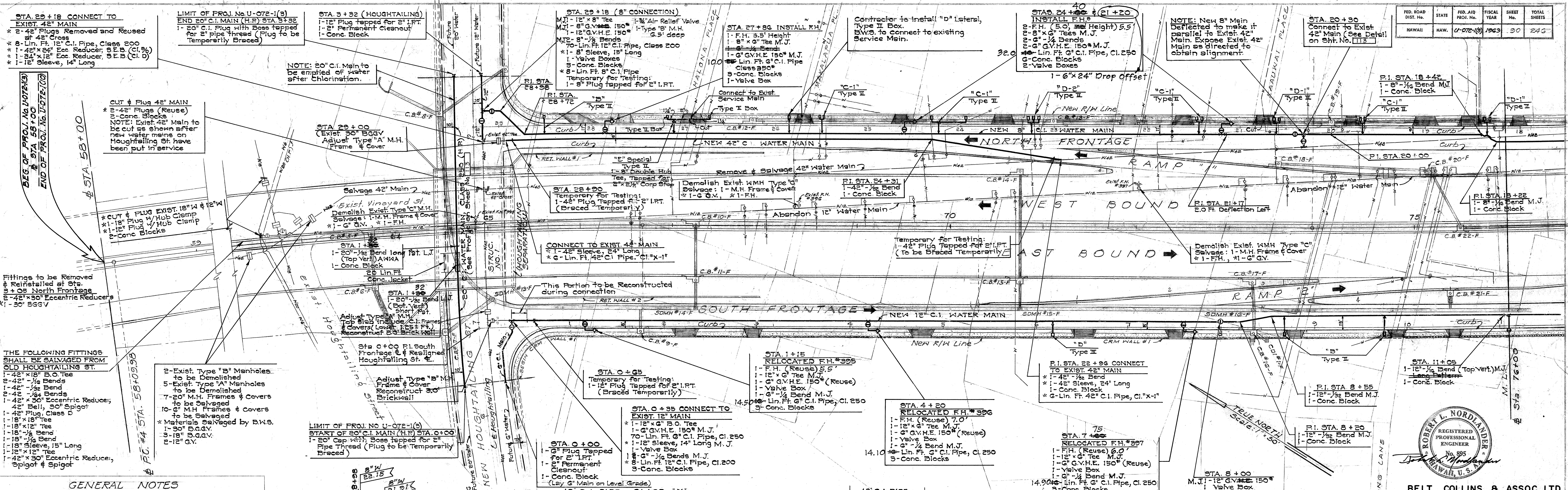
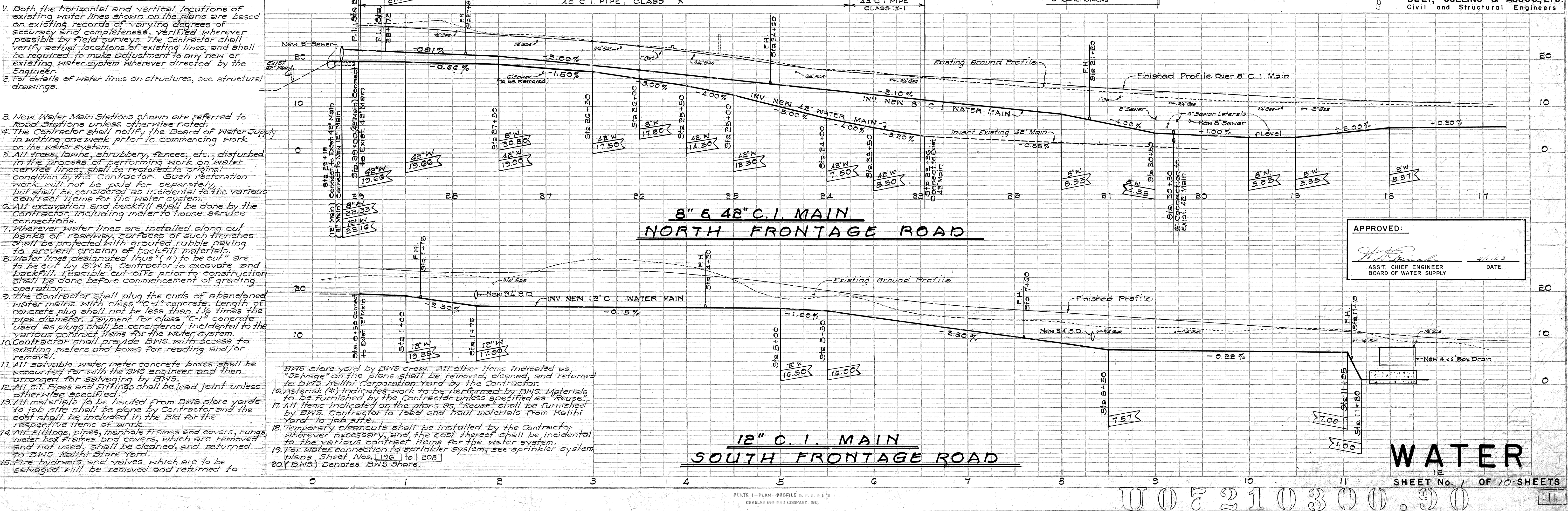
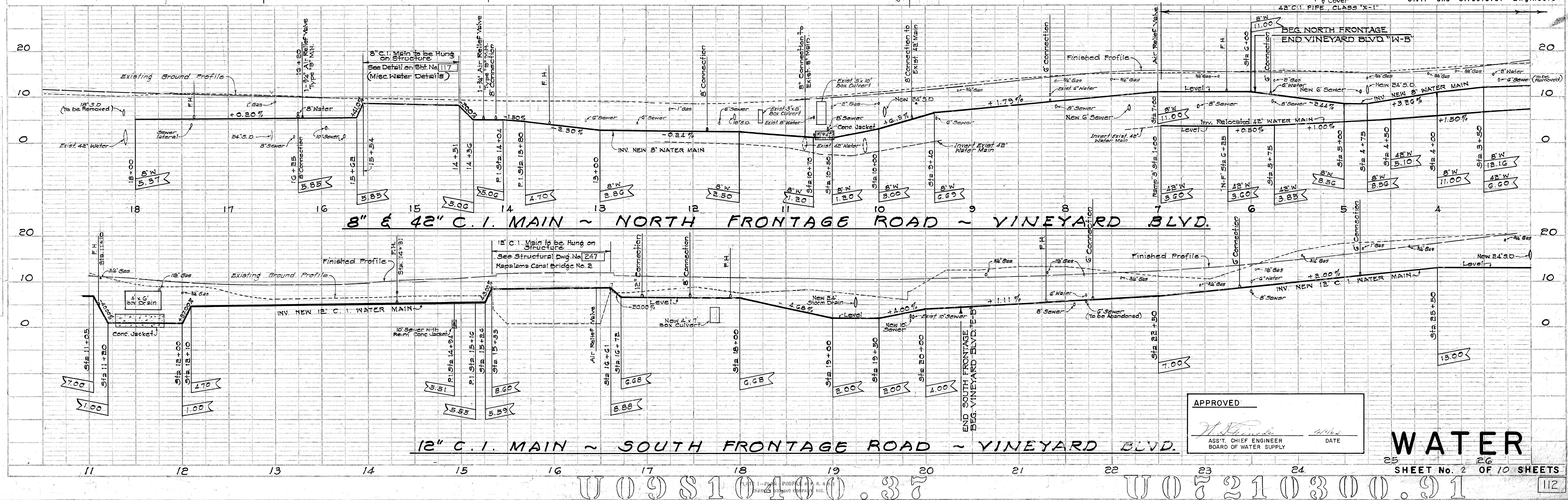




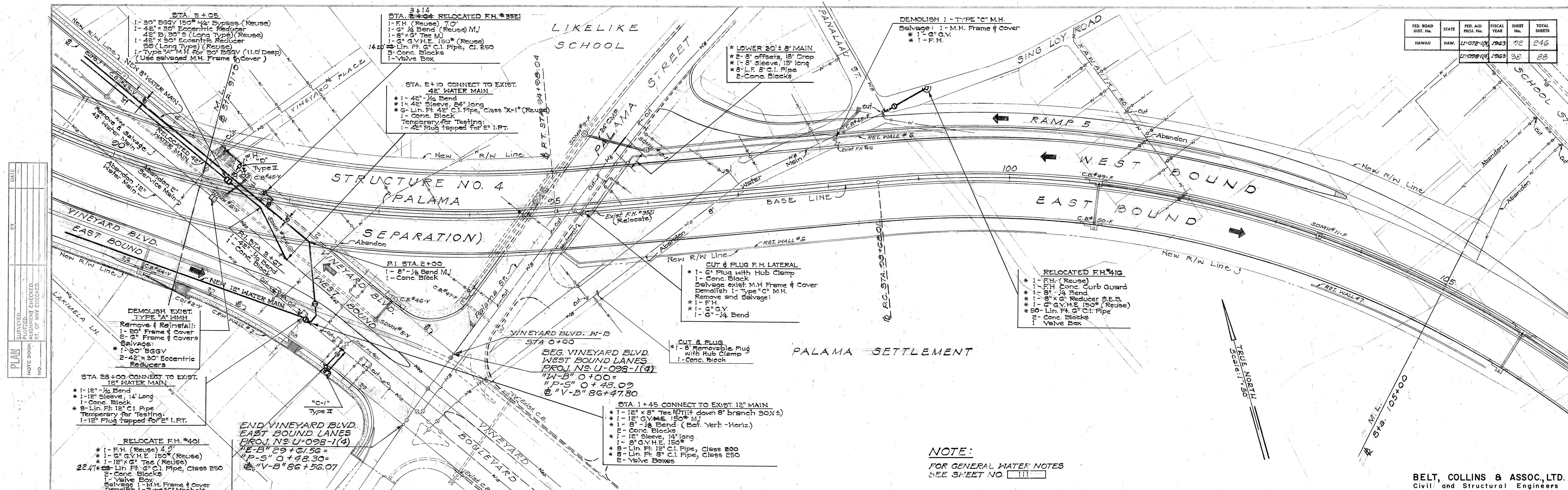
ROBERT L. NORDLANDER
 REGISTERED PROFESSIONAL ENGINEER
 No. 895
 HAWAII, U.S.A.

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

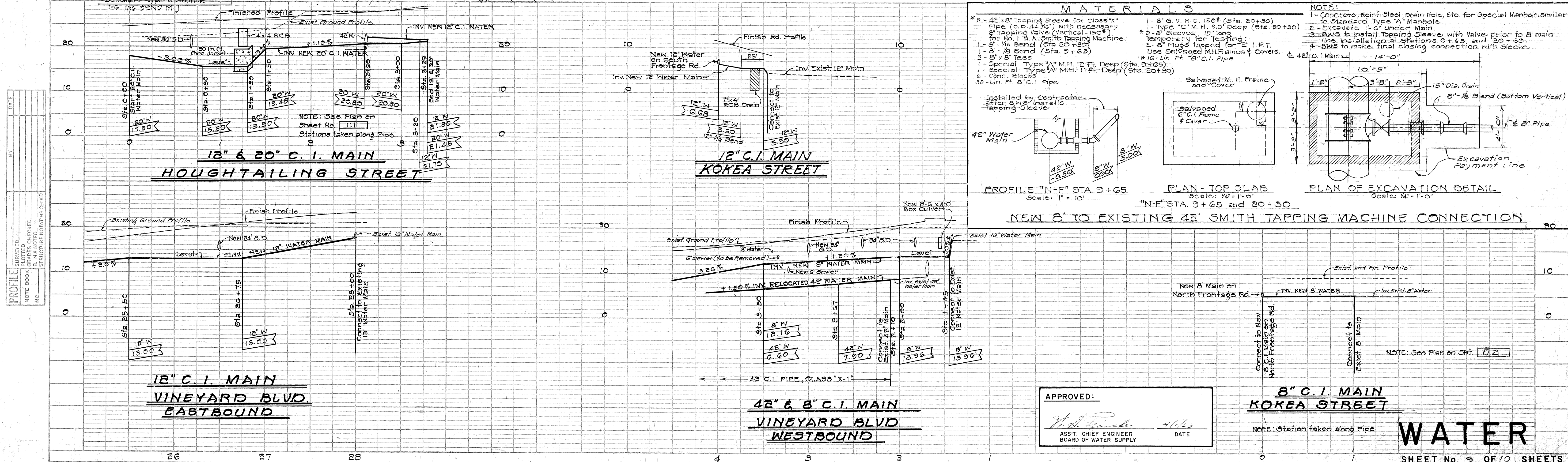




FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	U-072-1(3)	1963	72	246
		U-078-1(4)	1963	38	88



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



WATER

NOTE: Station taken along Pipe

APPROVED:

H. S. Kincke 4/1/63

ASS'T. CHIEF ENGINEER
BOARD OF WATER SUPPLY

DATE

SHEET No. 3 OF 10 SHEETS

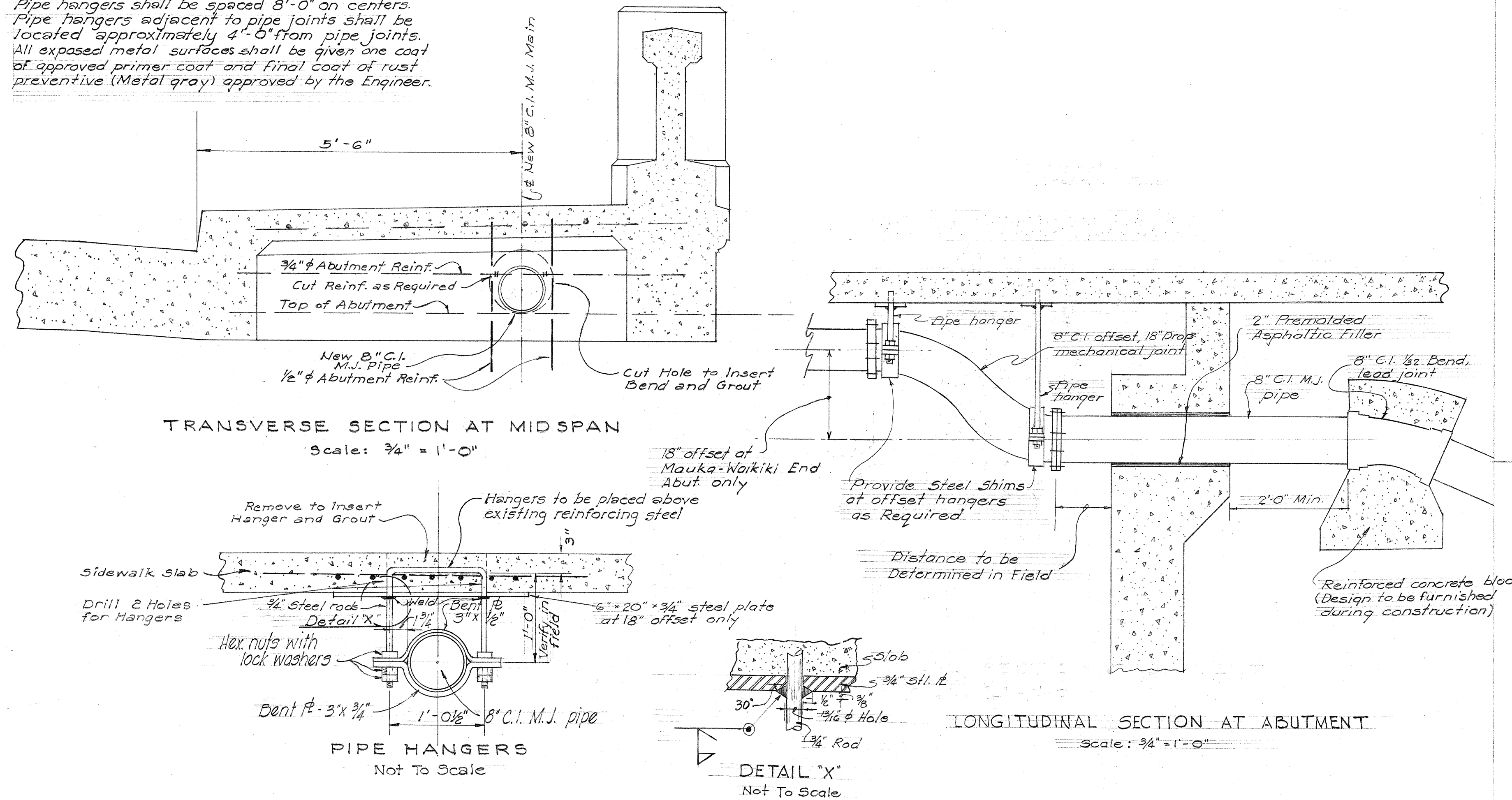
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U (9) S 1 (4) (1) . 3 S

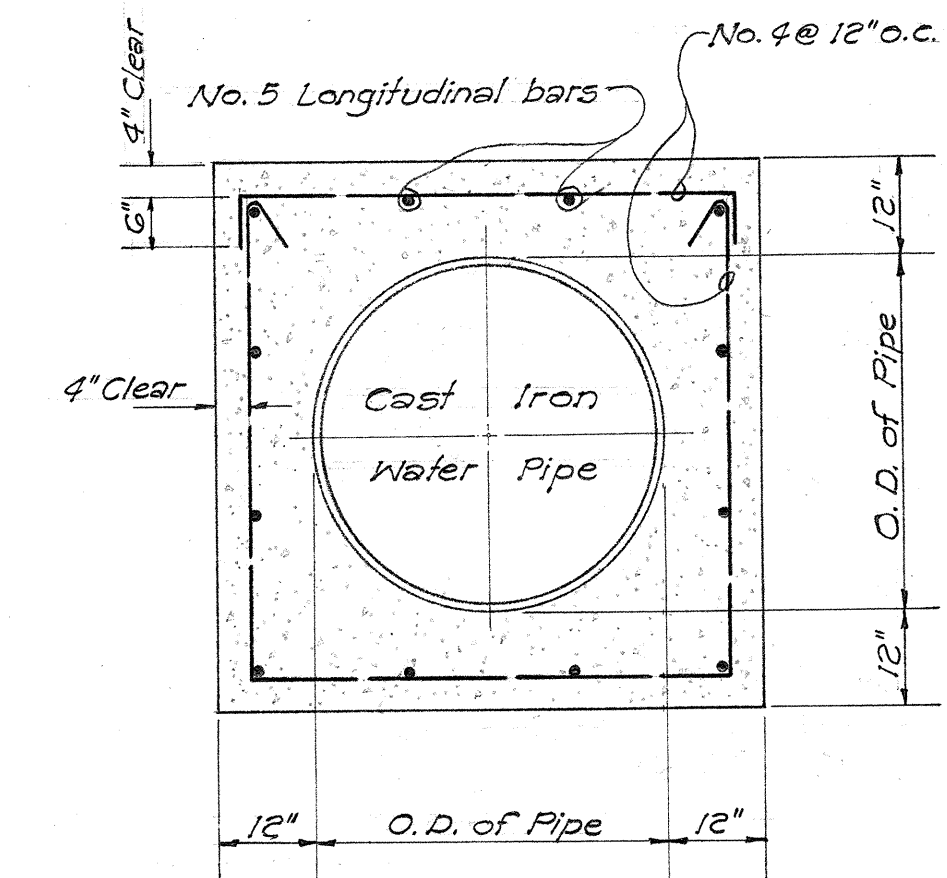
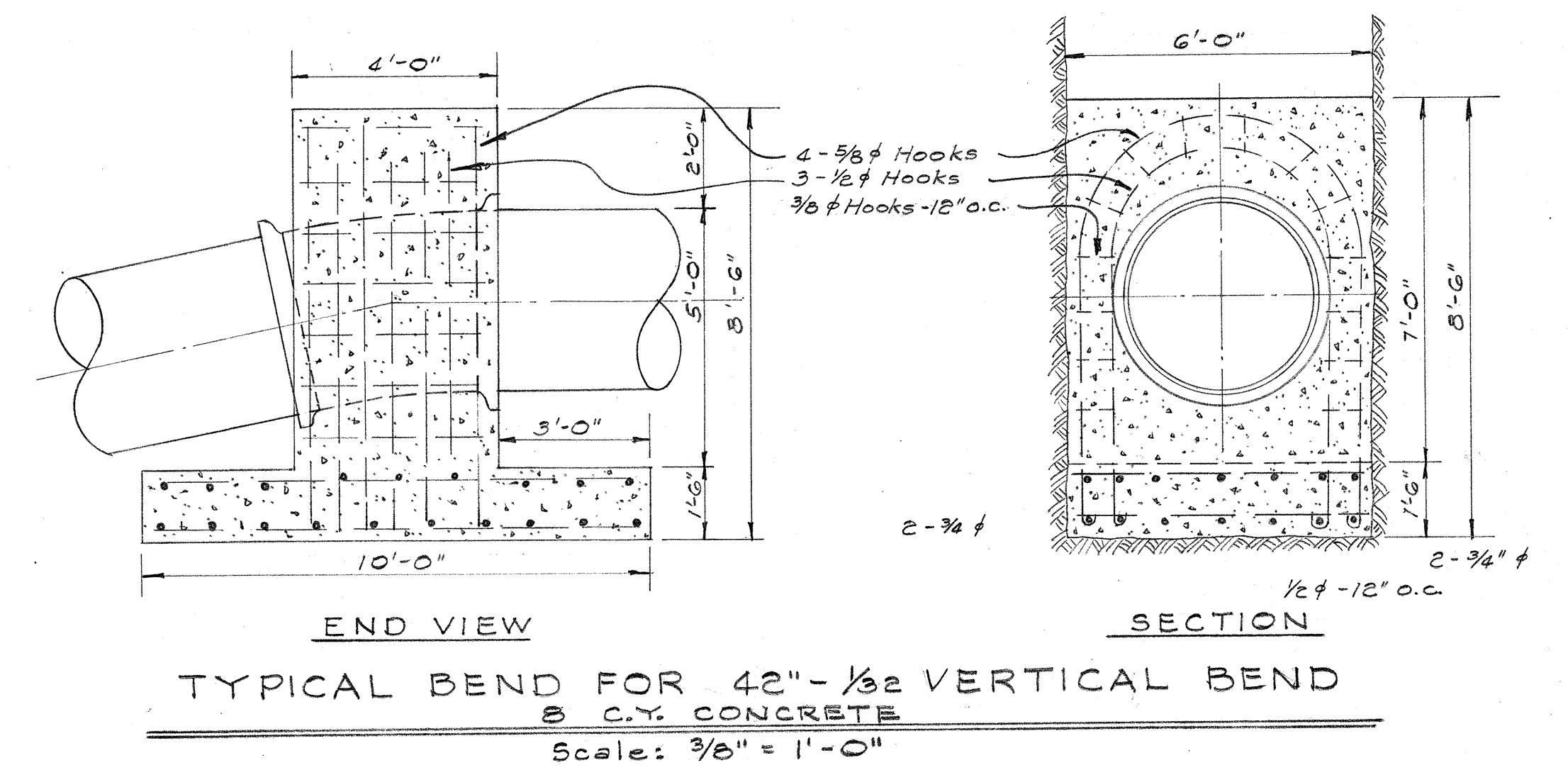
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-072-1(5)	1963	95	246
		U-098-1(4)	1963	39	88
		F-090-1(2)	1963	27	73

NOTE:
Pipe hangers shall be spaced 8'-0" on centers.
Pipe hangers adjacent to pipe joints shall be located approximately 4'-6" from pipe joints.
All exposed metal surfaces shall be given one coat of approved primer coat and final coat of rust preventive (Metal gray) approved by the Engineer.

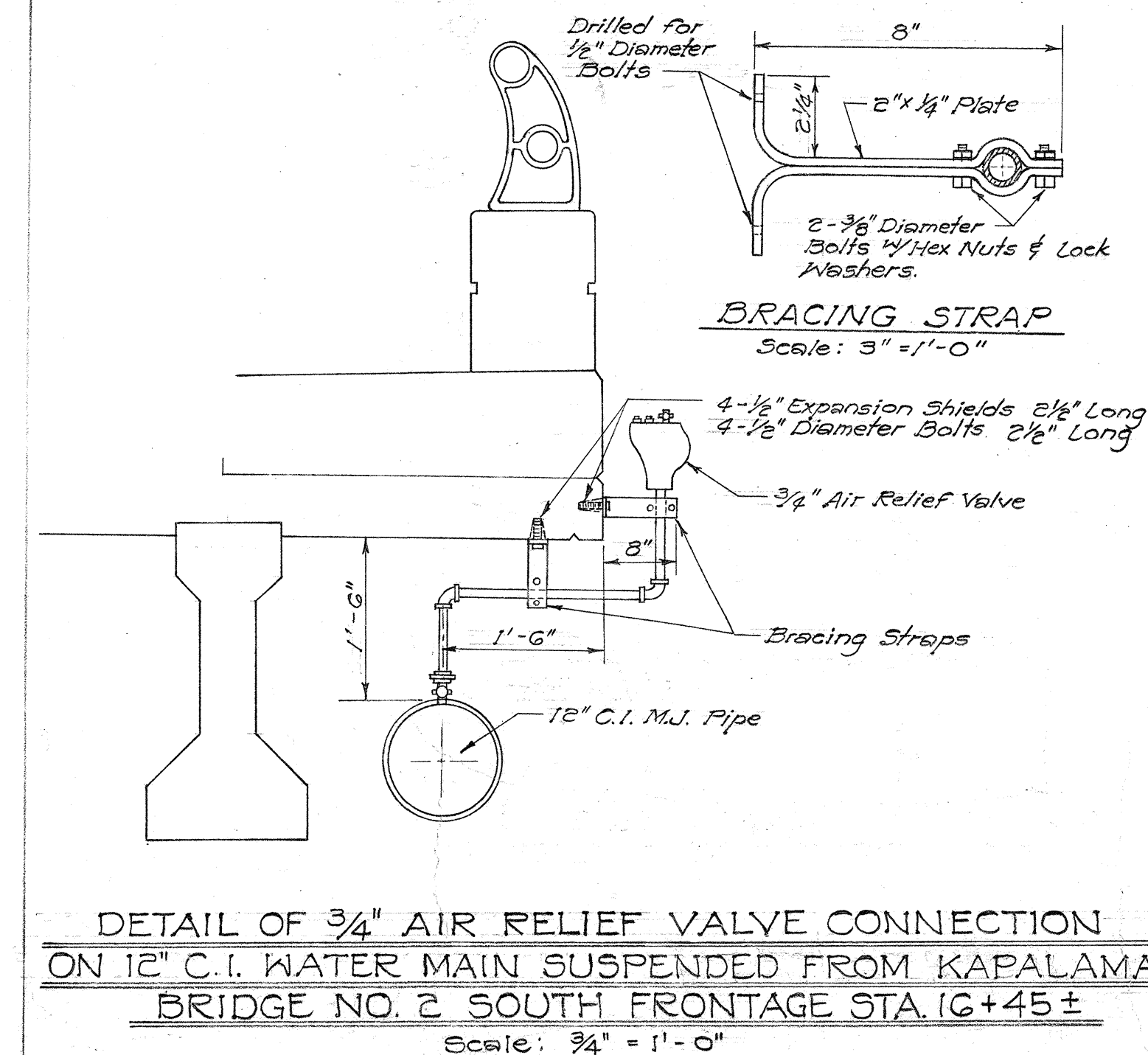
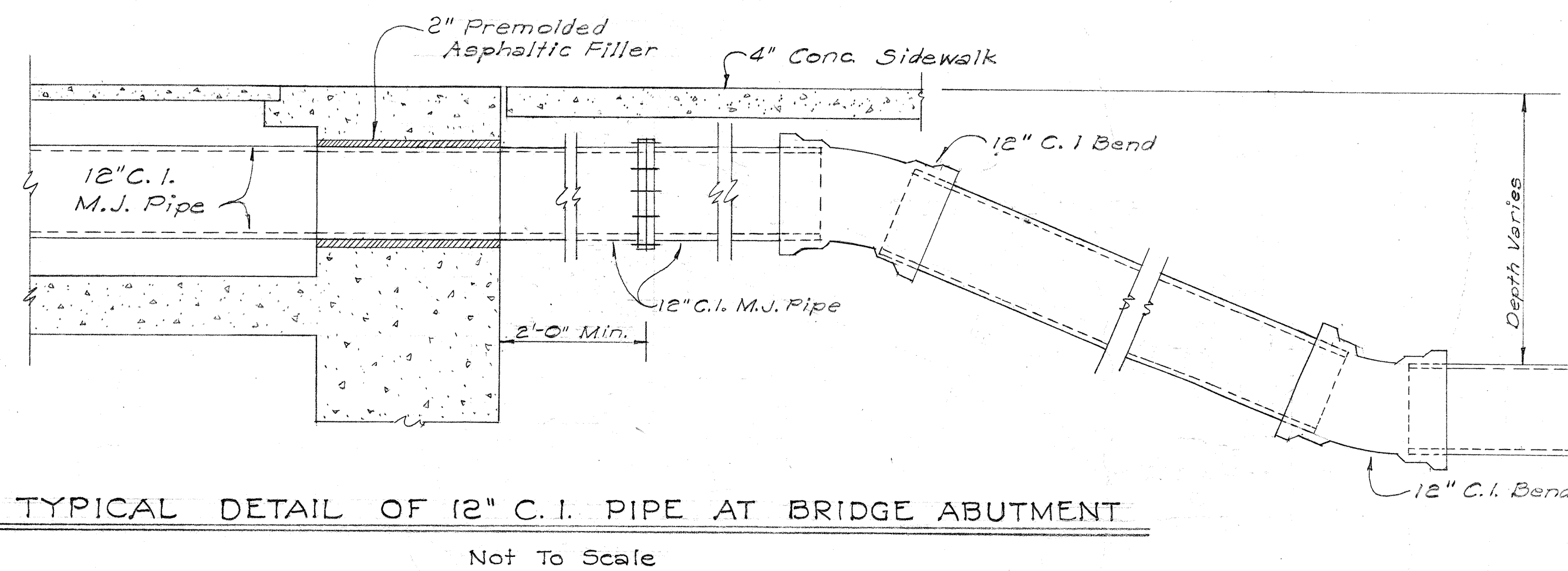


DETAIL OF 8" C.I. WATER MAIN TO BE SUSPENDED ON EXISTING KAPALAMA CANAL BRIDGE



I.D. OF PIPE	SIZE OF JACKET	NO. 4 BARS	NO. 5 LONGITUDINAL BARS		
			TOP & BOT.	SIDES	TOTAL
20"	46"x46"	12" o.c.	10	6	16
12"	38"x38"	No. 3, 12" o.c.	8	4	12
8"	34"x34"	No. 3, 12" o.c.	8	4	12

Jacket to be poured after completion of test.
Lead joint required at both faces of jacket.
2 1/2" depth of lead required at all embedded joints.



NOTE:
Bracing Strap shall be incidental to 3/4" Air Relief Valve.

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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

MISC. WATER DETAILS

LUNALILO FREEWAY
VINEYARD BOULEVARD
LILIHA STREET

U-072-1 (3)
U-098-1 (4)
F-090-1 (2)

SHEET No. 7 OF 10 SHEETS

DATE
DRAWN BY
CHECKED BY
NOTED BY
ORIGINAL PLAN
NOTE BOOK
No.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YR.	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-072-1(3)	1963	96	246
		U-072-1(4)	1963	40	88
		F-090-1(2)	1963	38	73

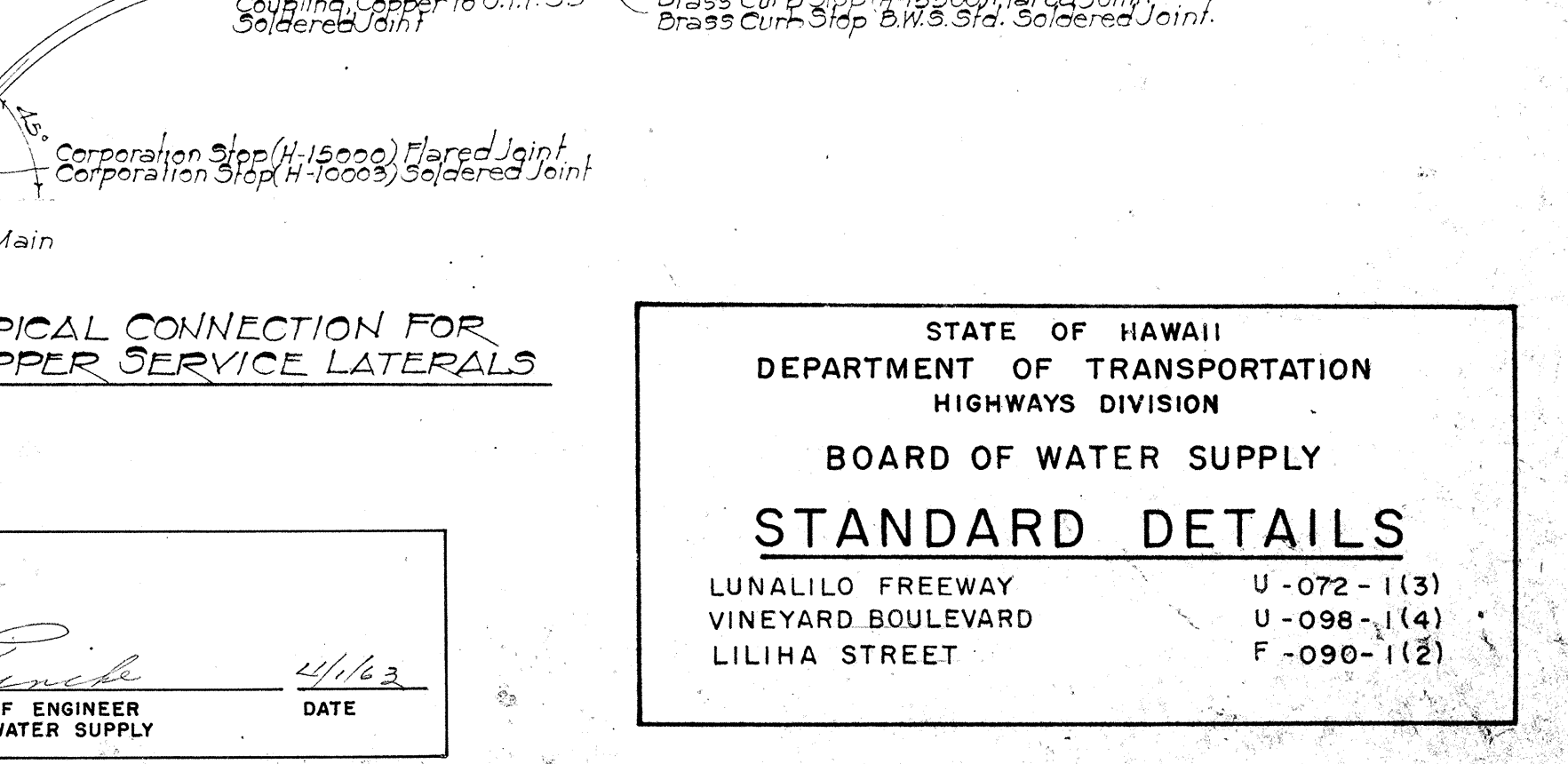
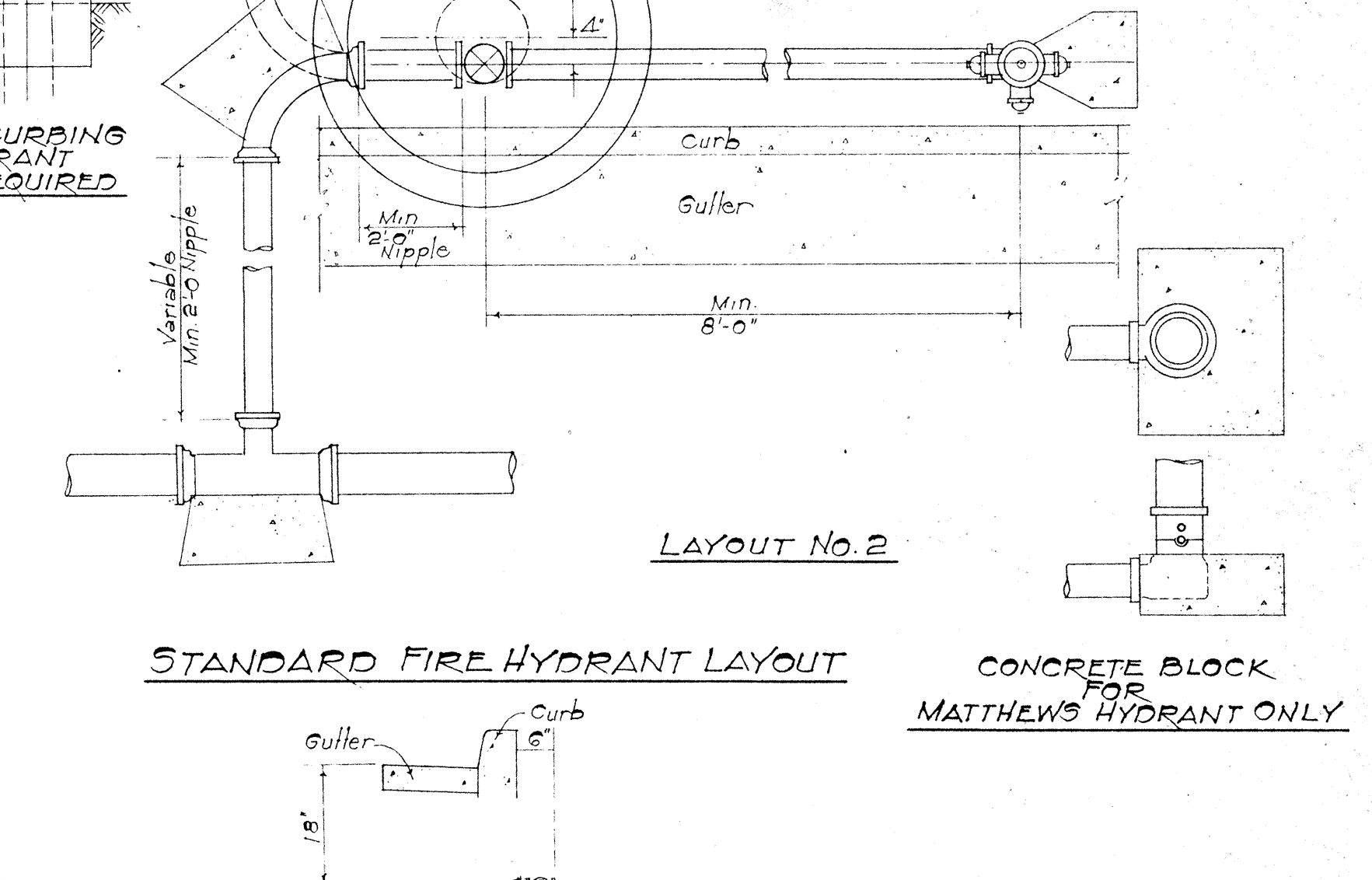
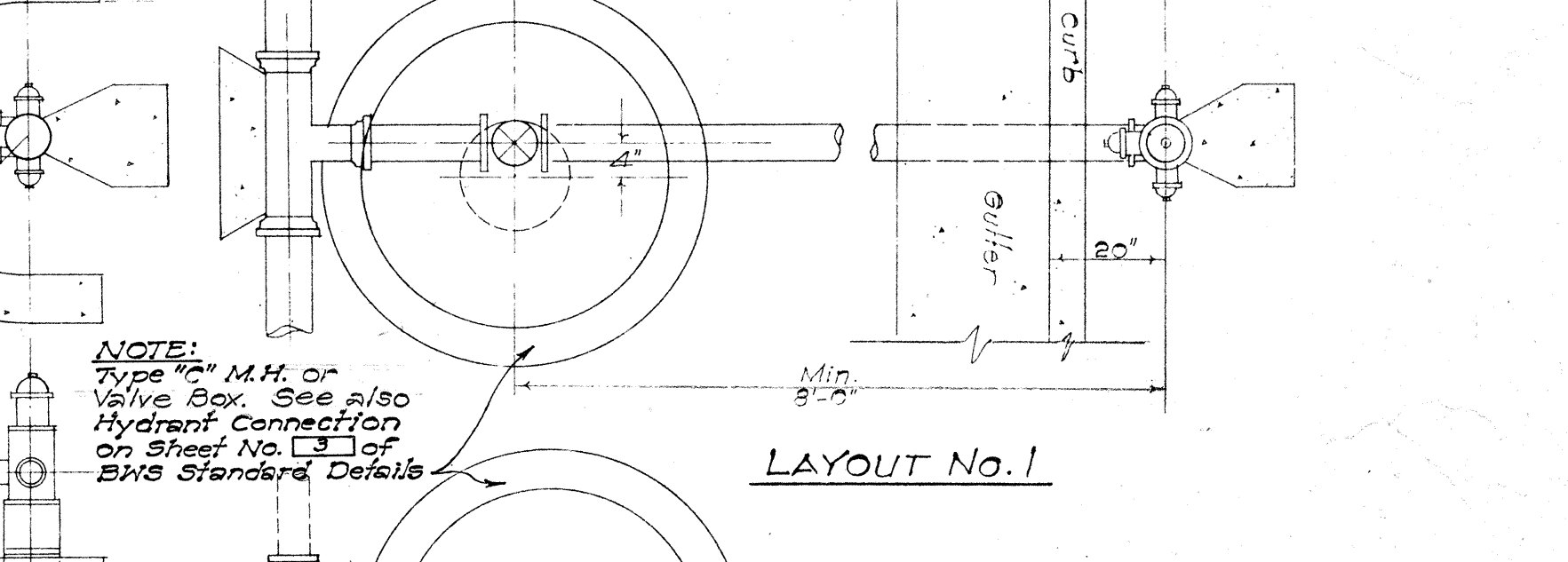
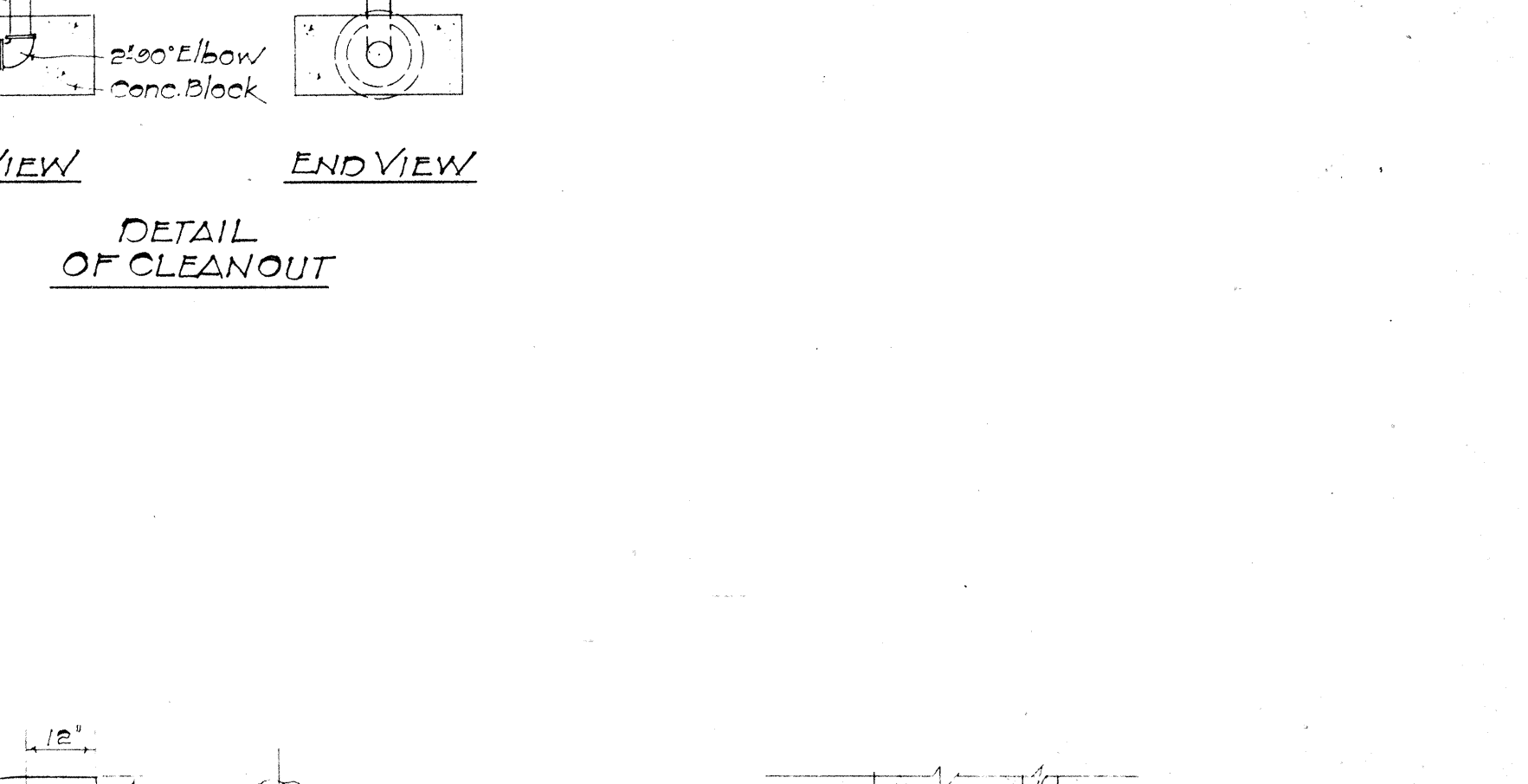
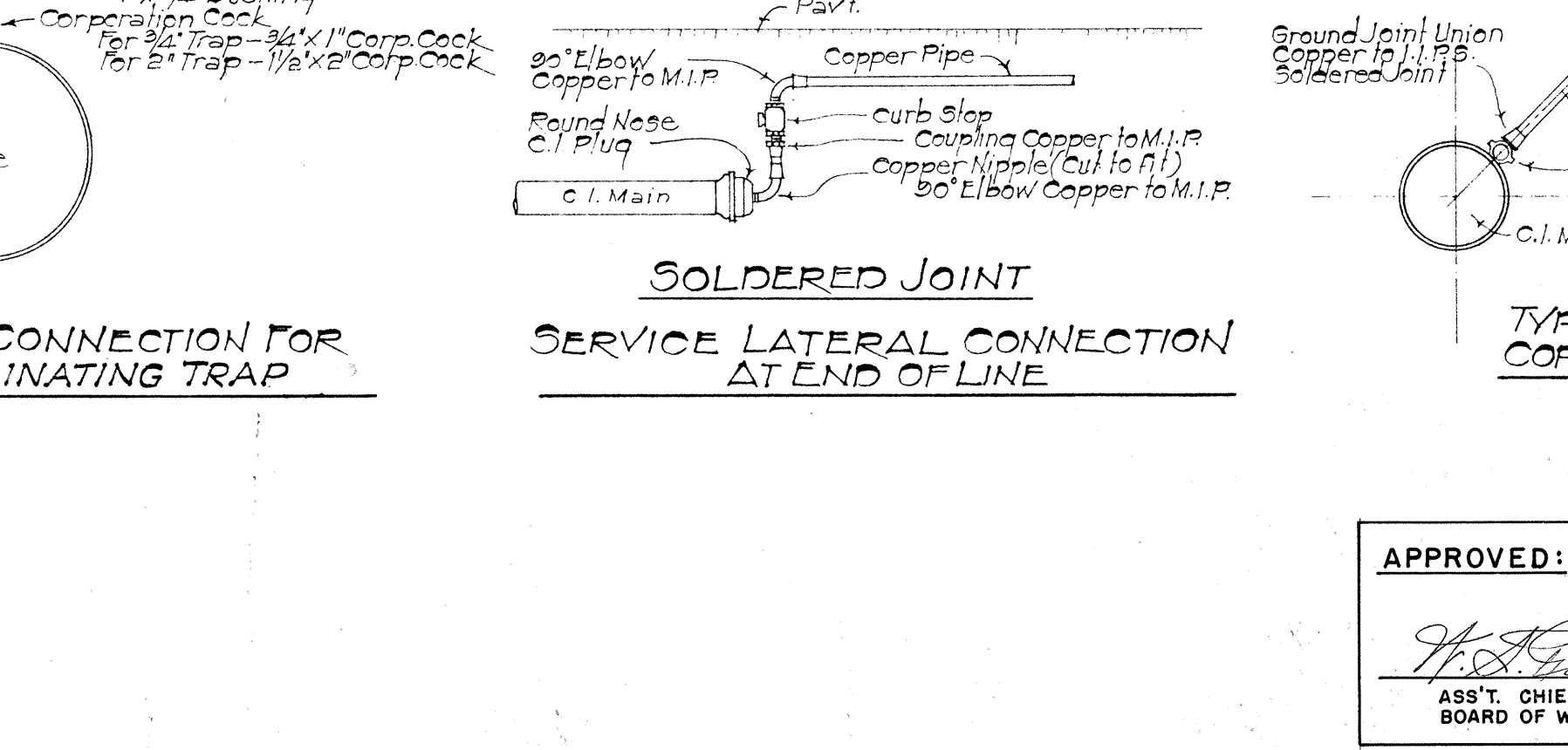
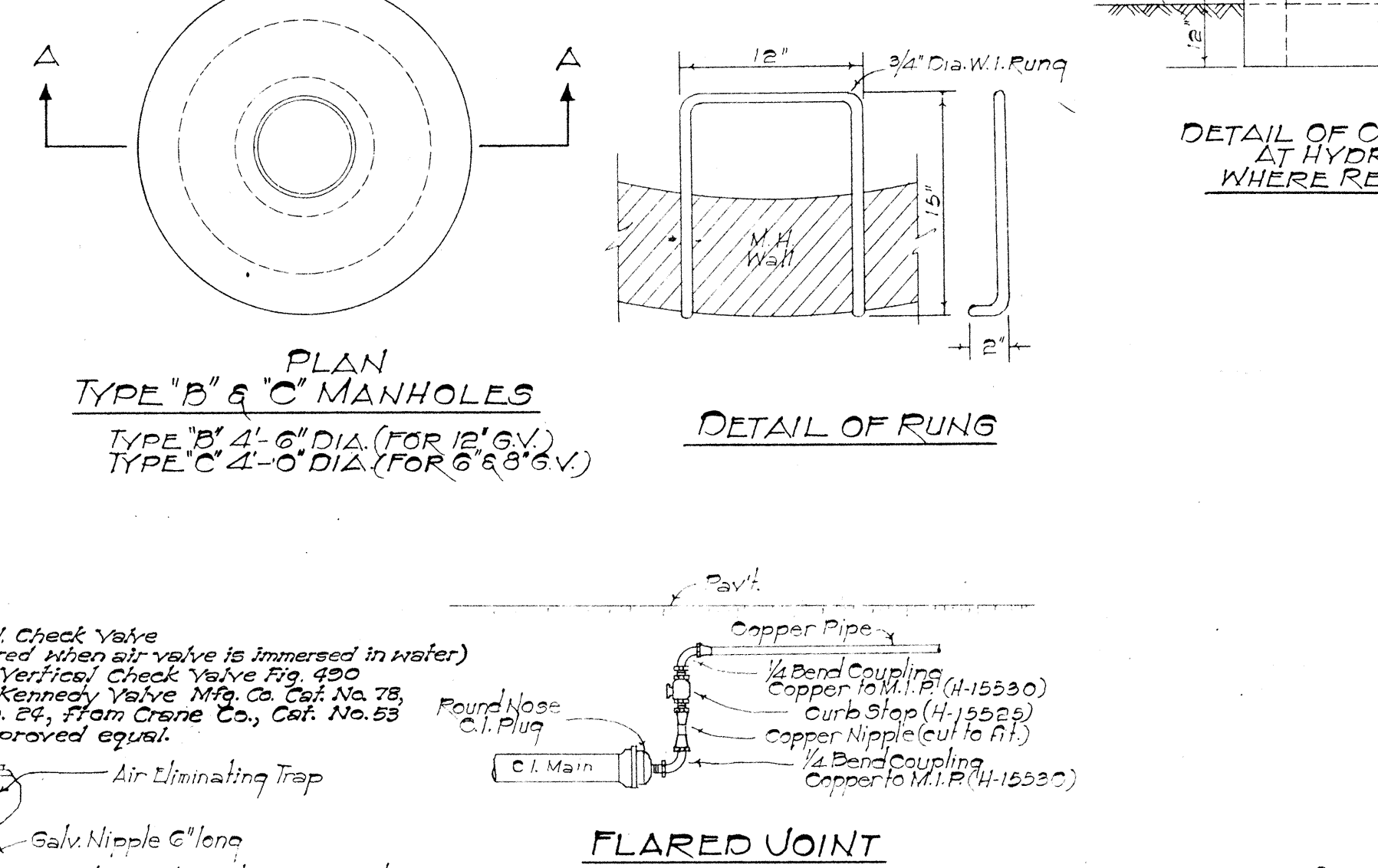
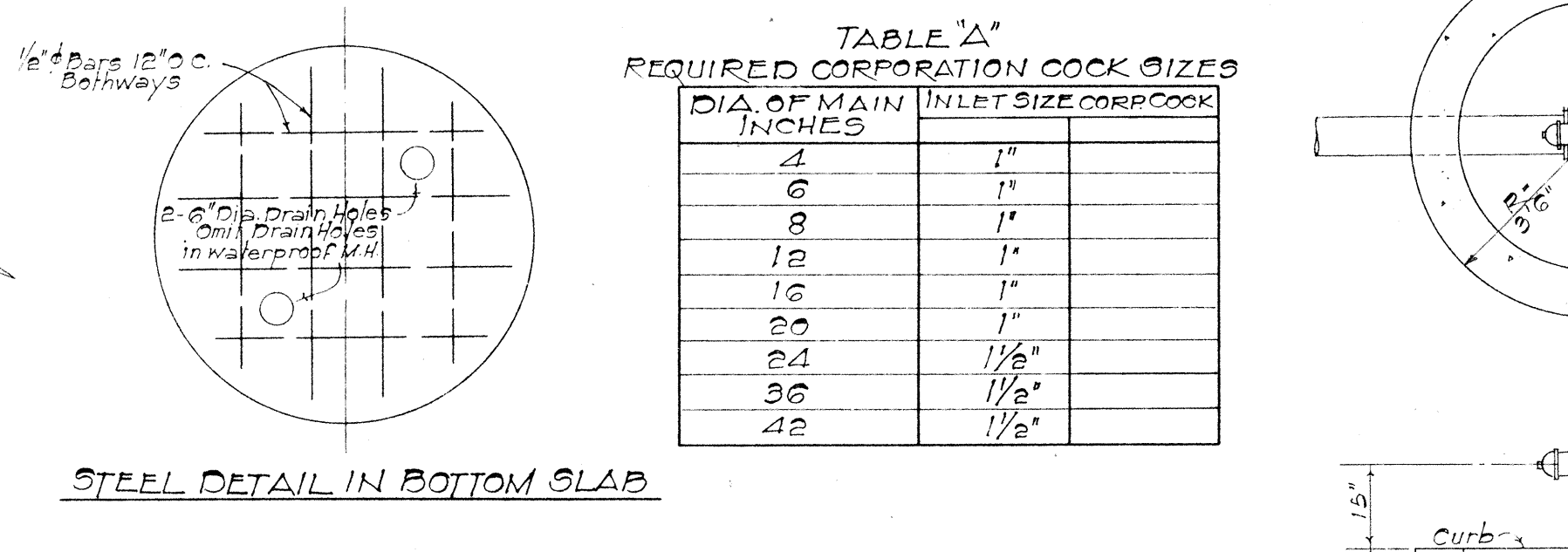
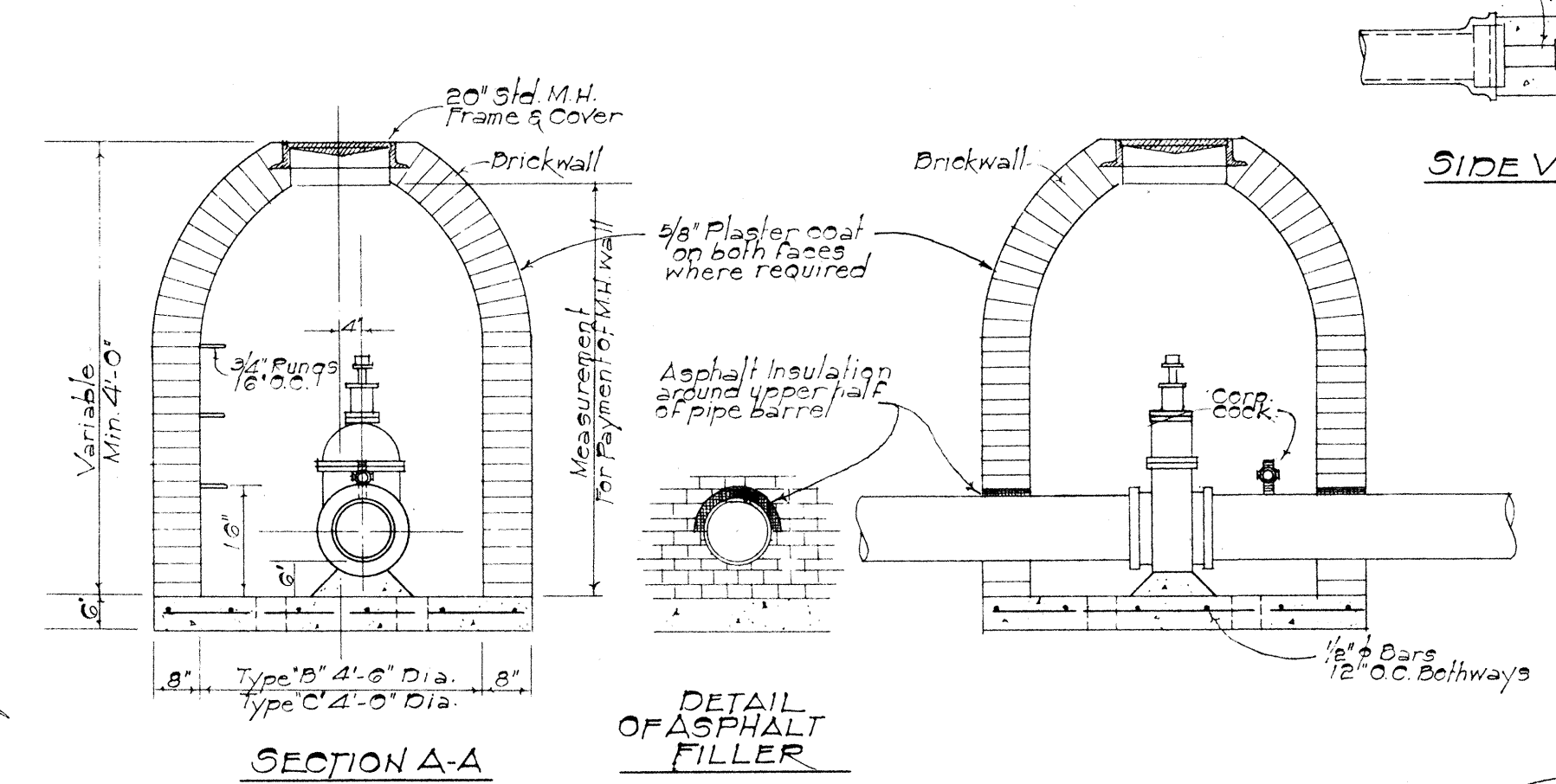
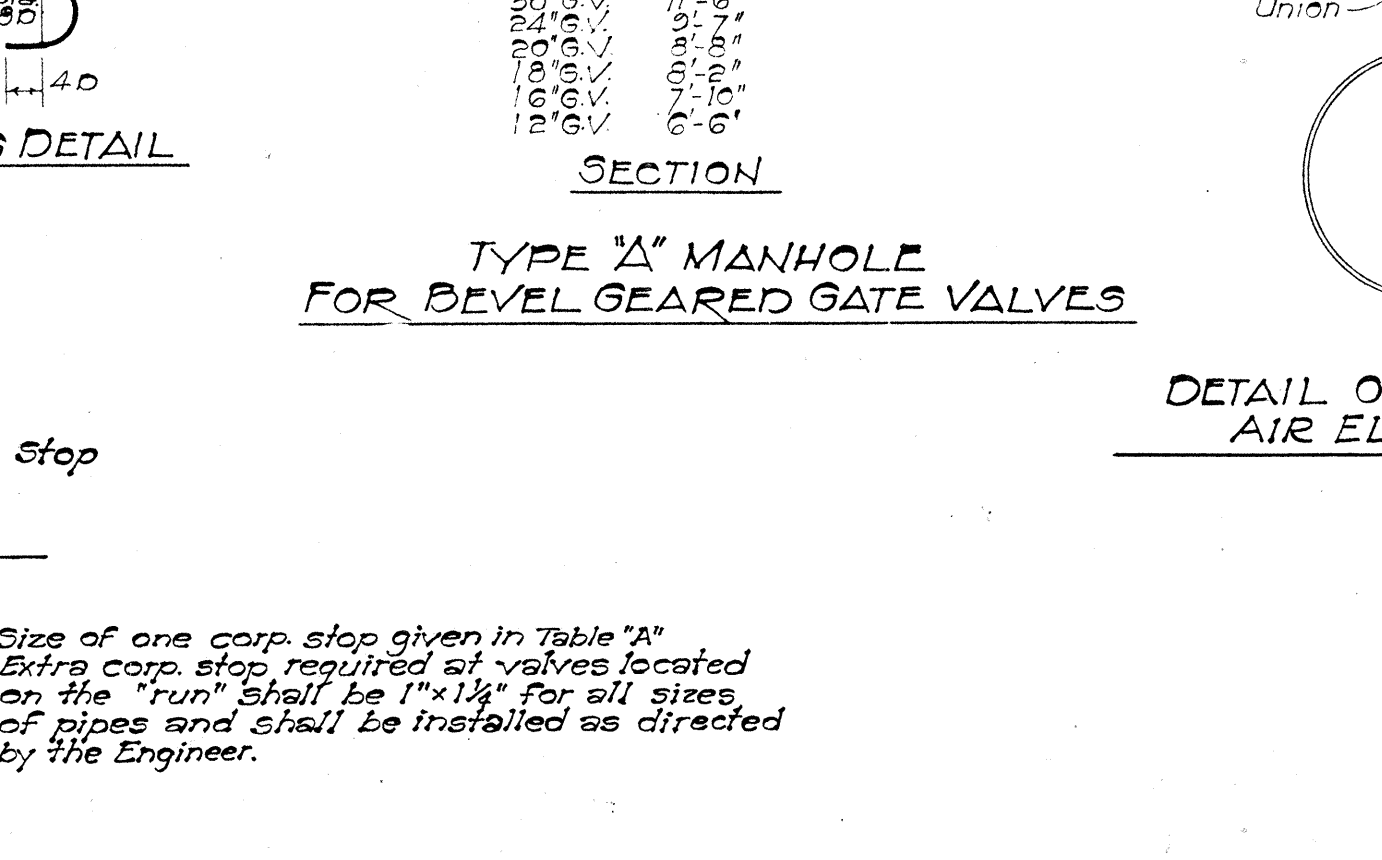
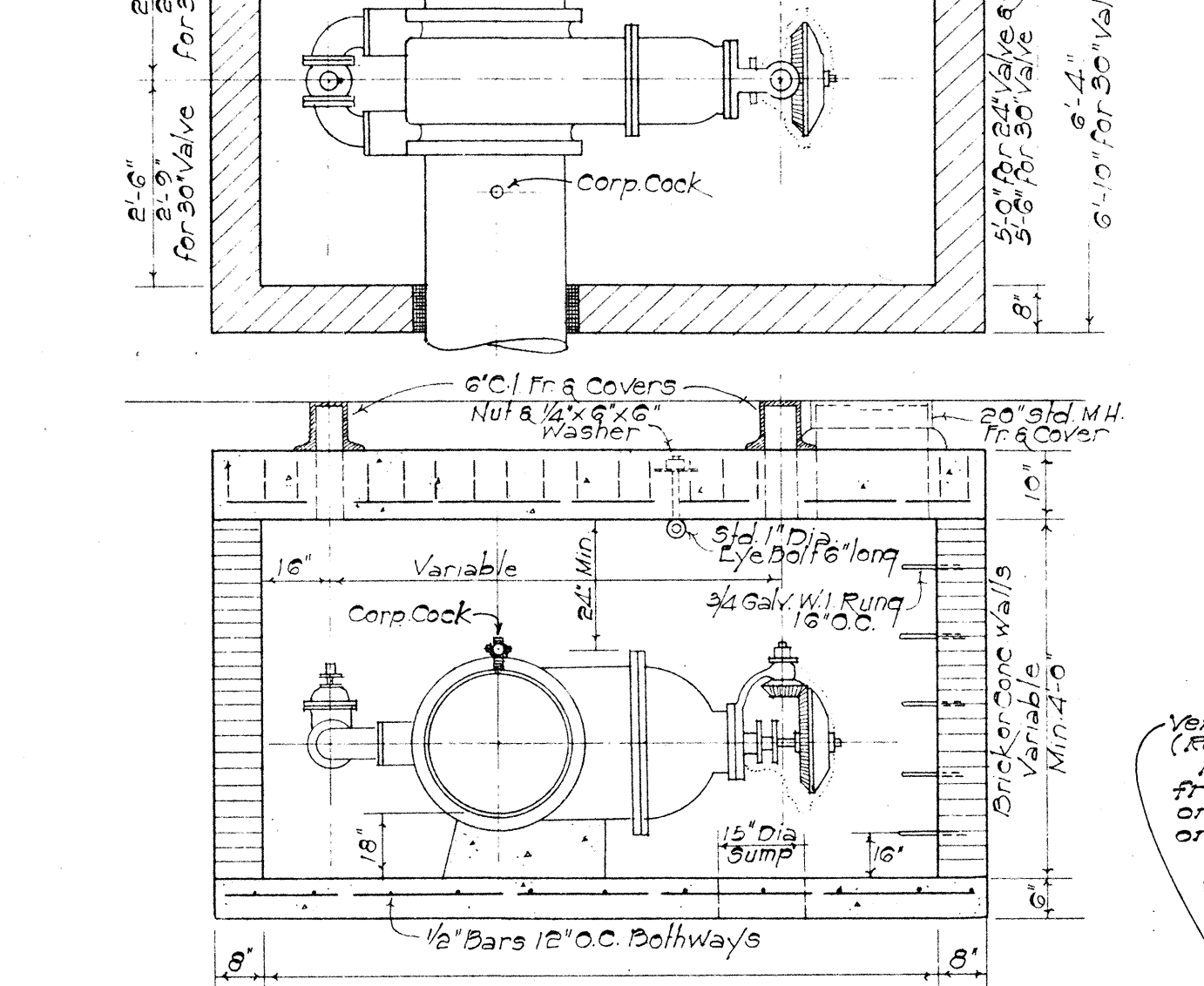
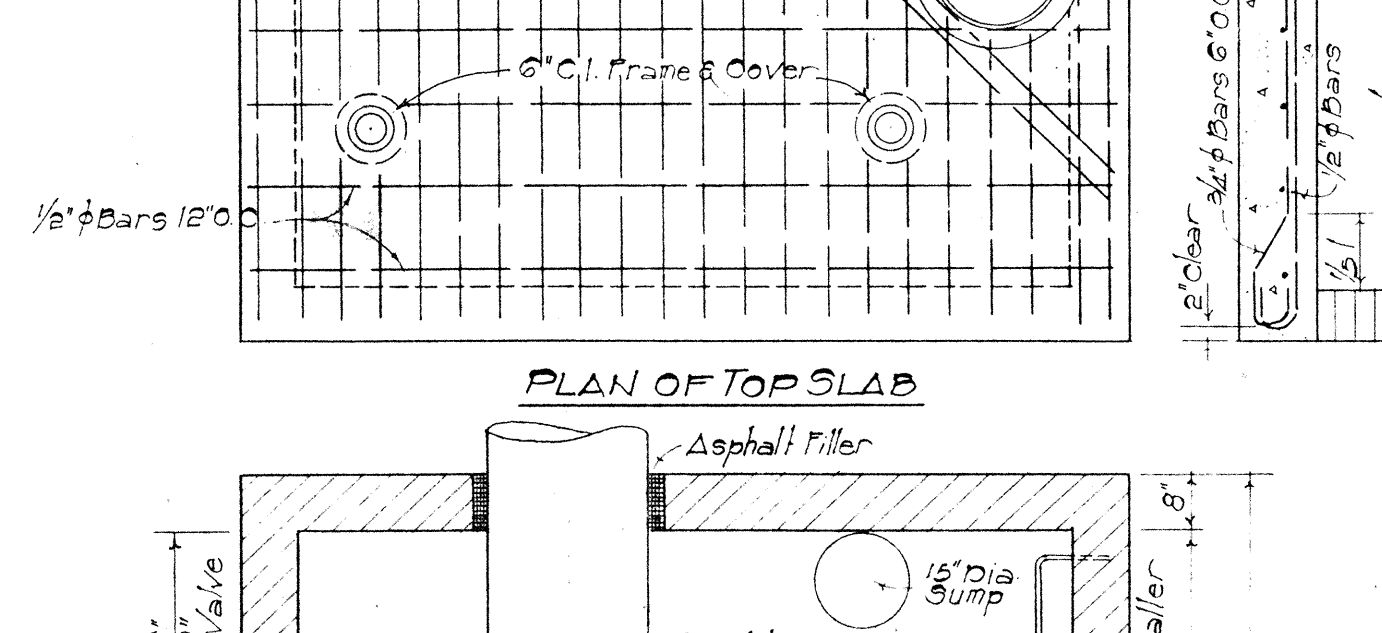
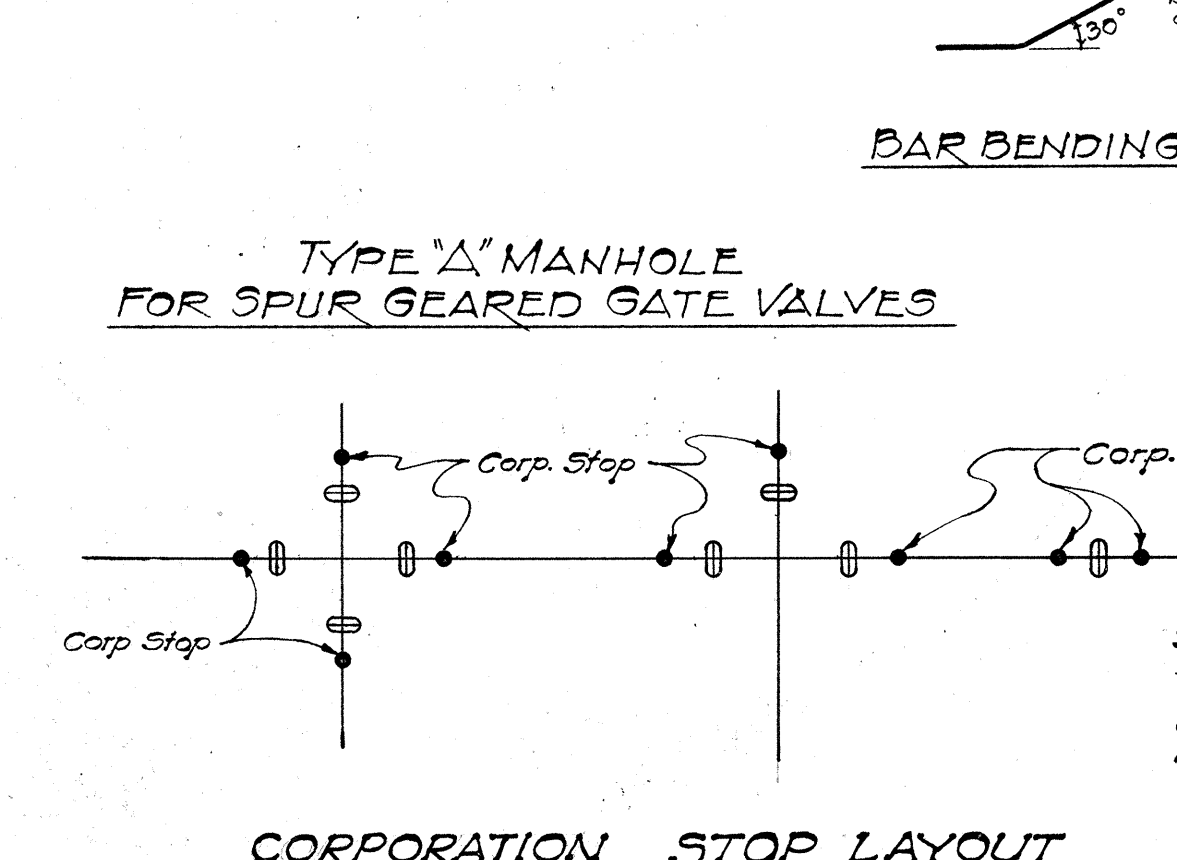
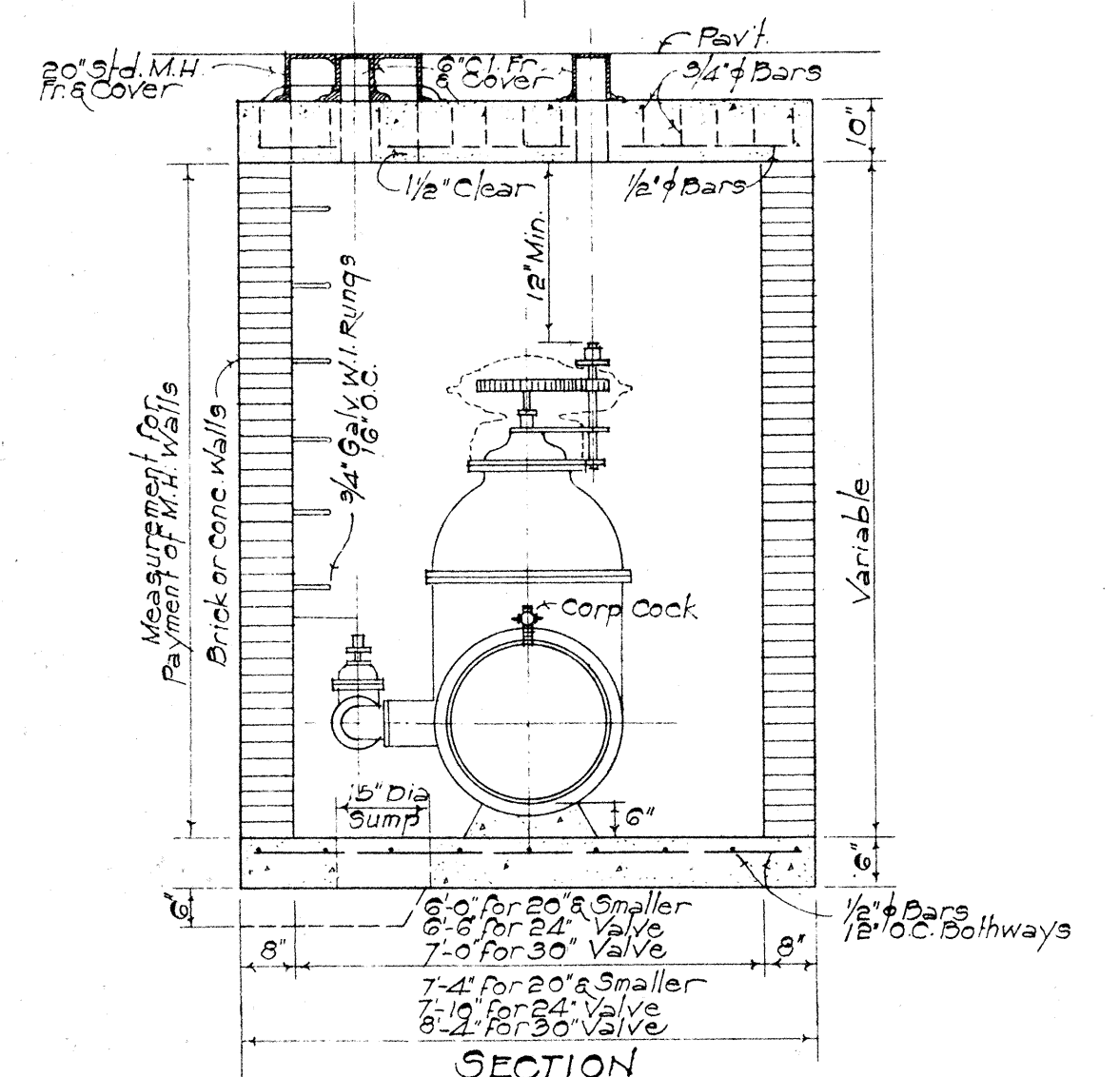
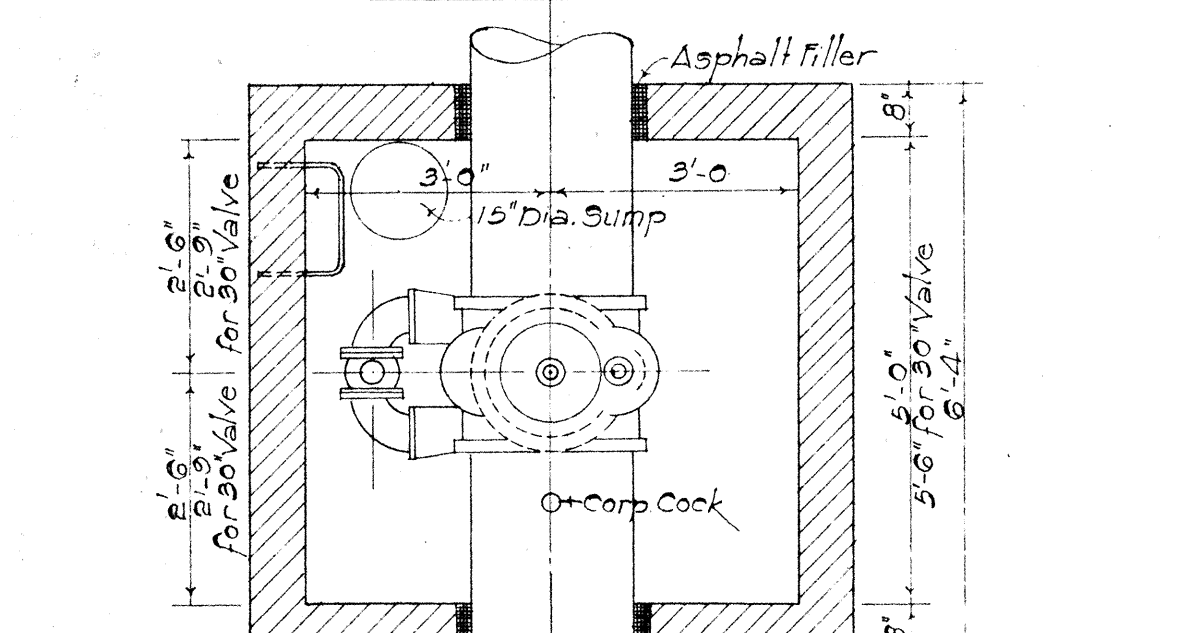
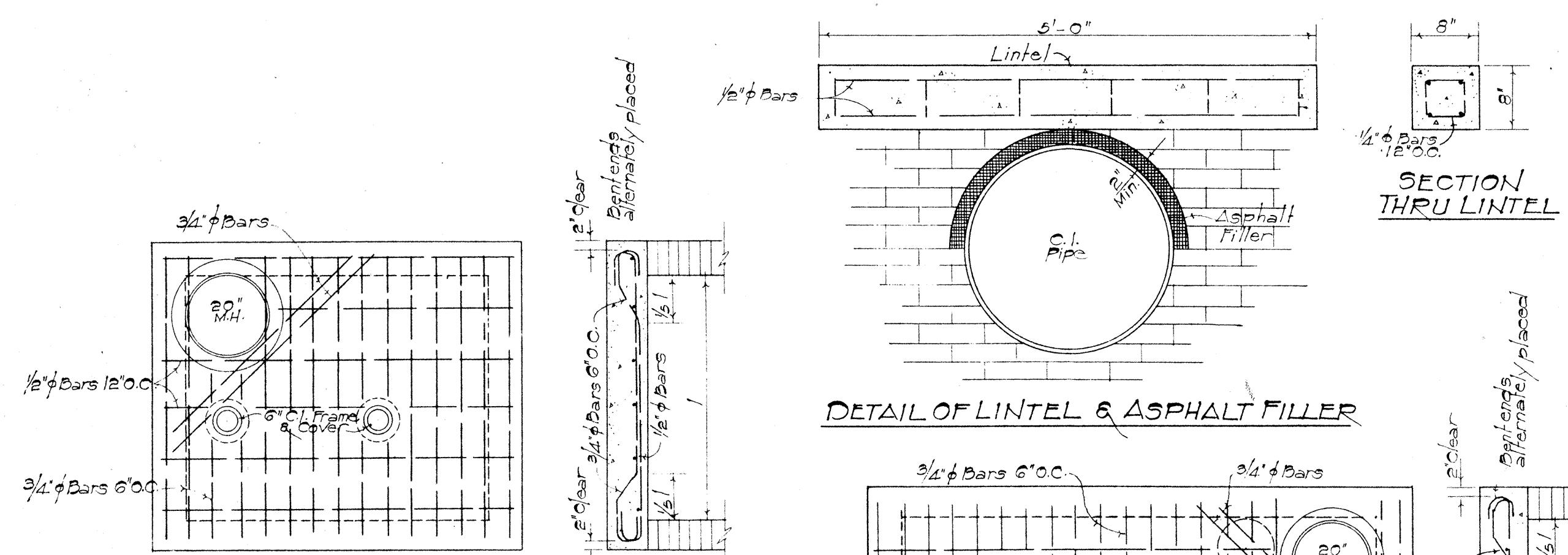
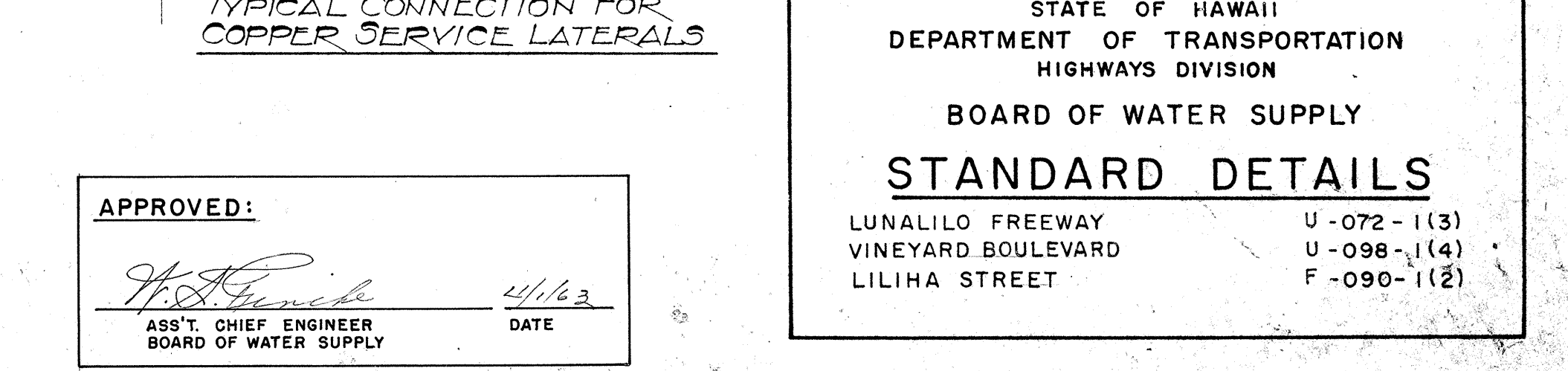
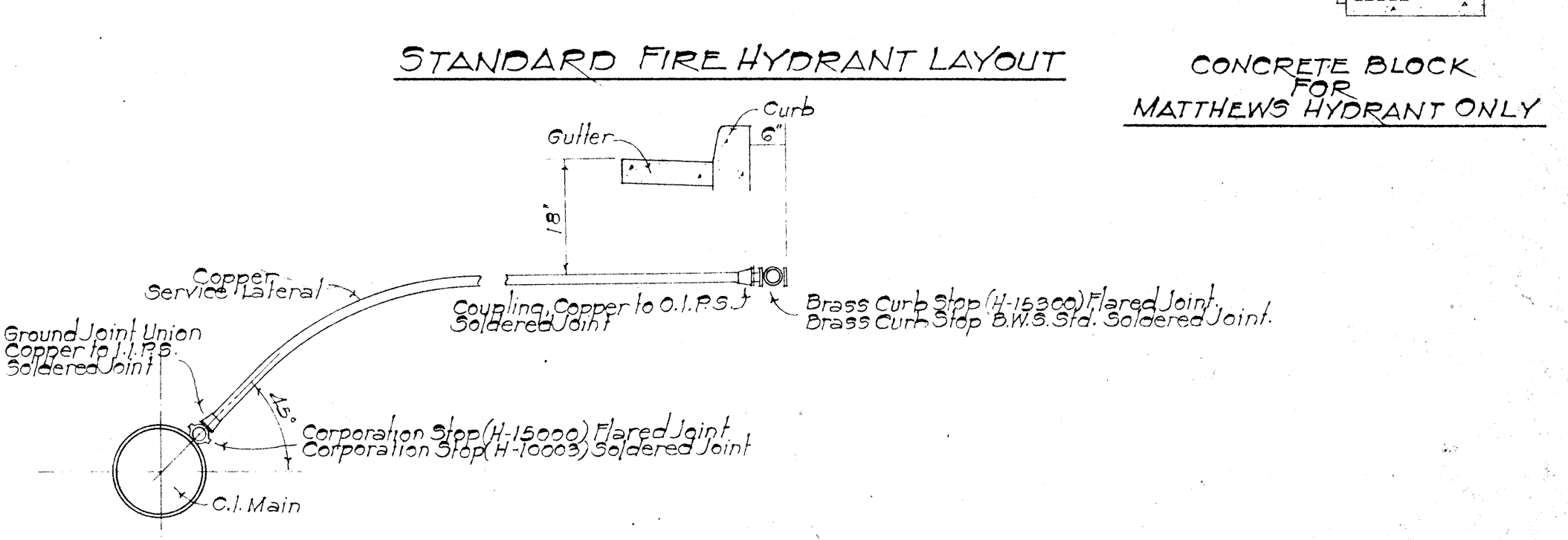
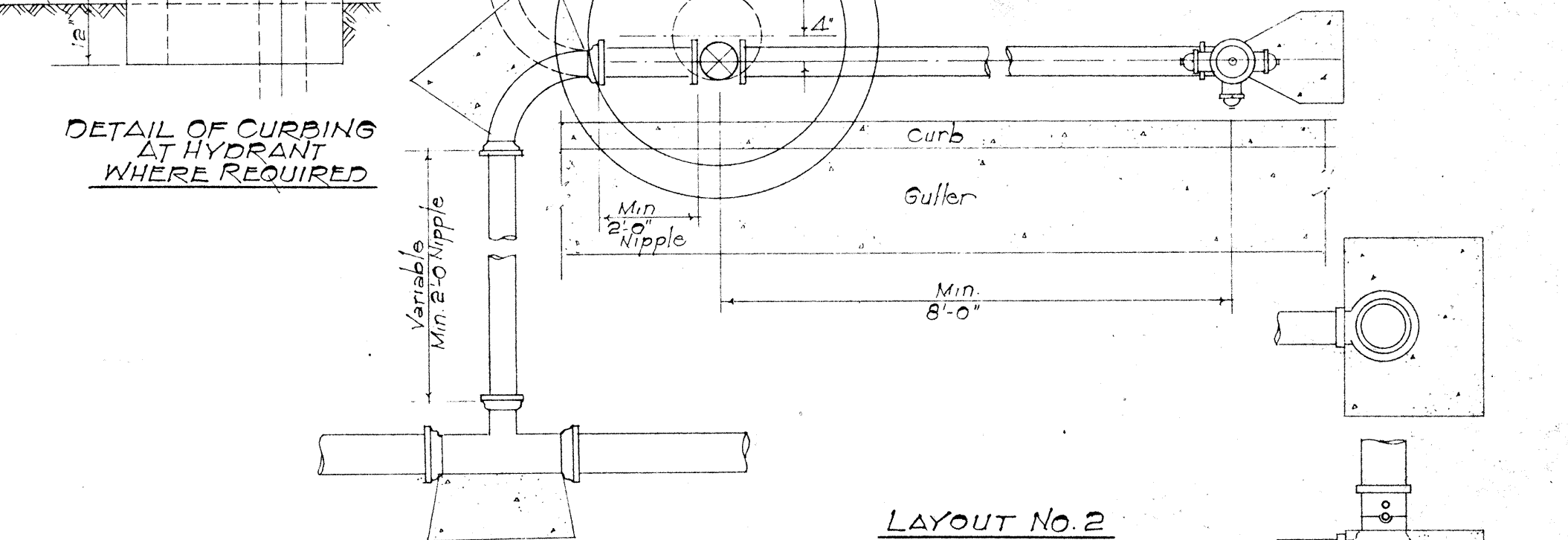
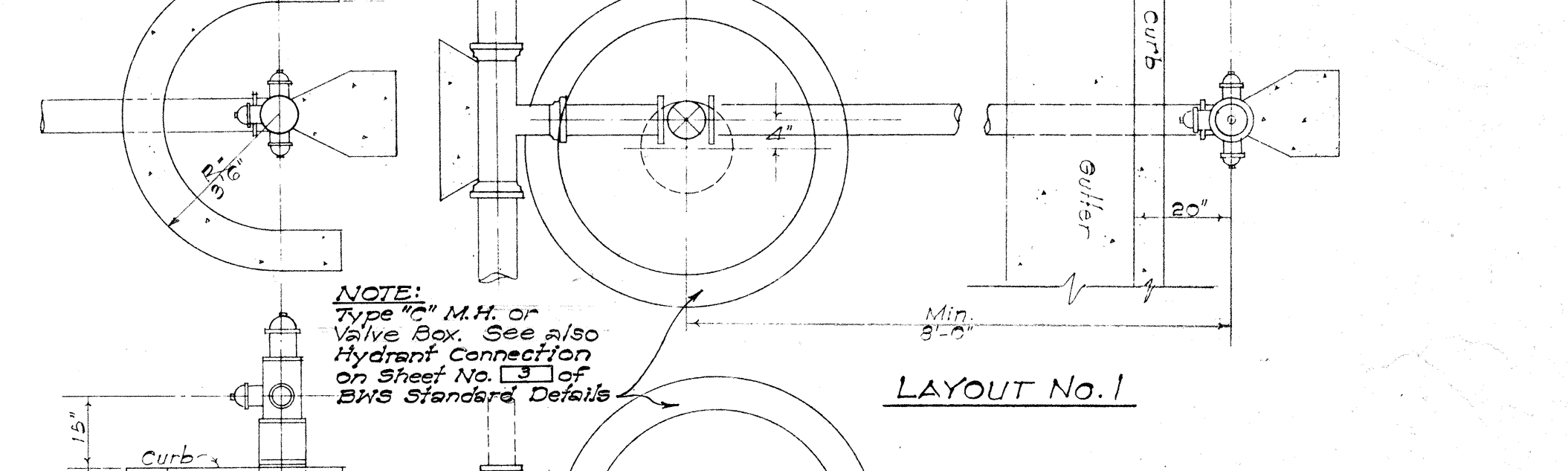


TABLE "A"
REQUIRED CORPORATION COCK SIZES

DIA. OF MAIN INCHES	REQUIRED COCK SIZE INCHES
4	1"
6	1"
8	1"
12	1"
16	1"
20	1 1/2"
24	1 1/2"
36	1 1/2"
48	1 1/2"



APPROVED:

[Signature]

ASS'T. CHIEF ENGINEER
BOARD OF WATER SUPPLY

DATE: 4/1/63

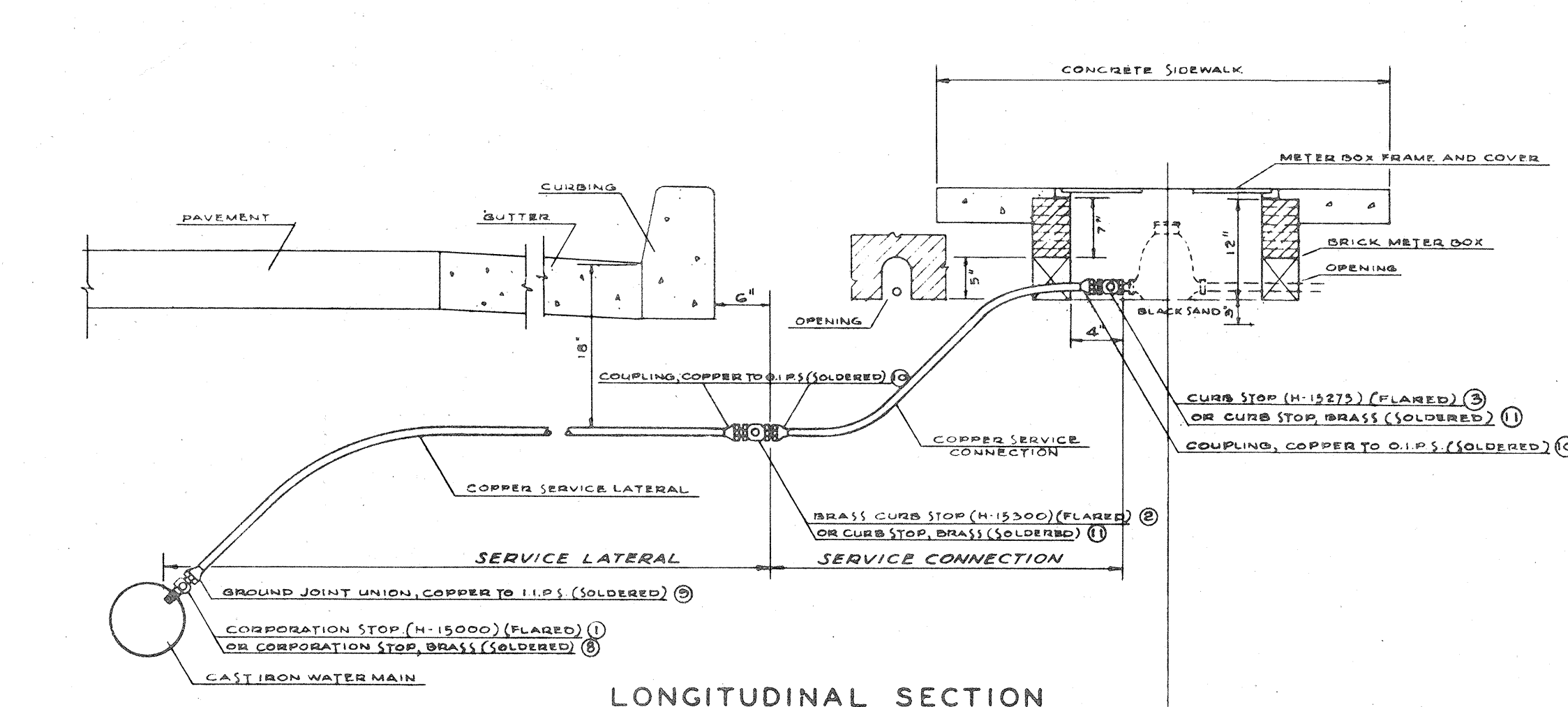
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BOARD OF WATER SUPPLY

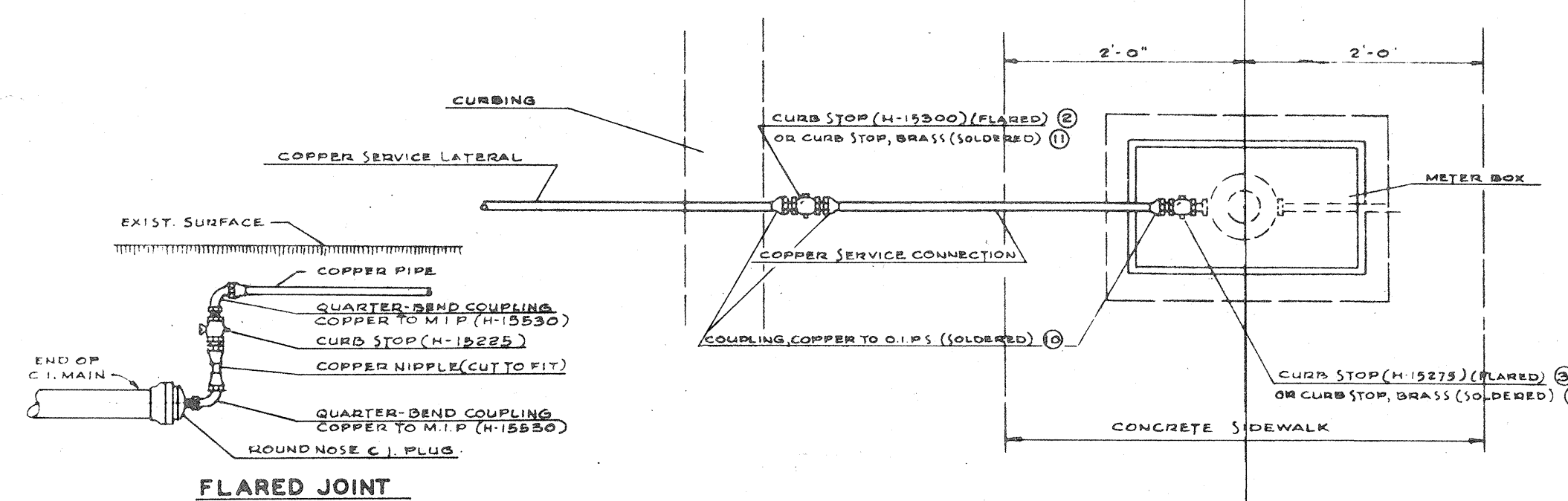
STANDARD DETAILS

LUNALILO FREEWAY U-072-1(3)
VINEYARD BOULEVARD U-098-1(4)
LILIHA STREET F-090-1(2)

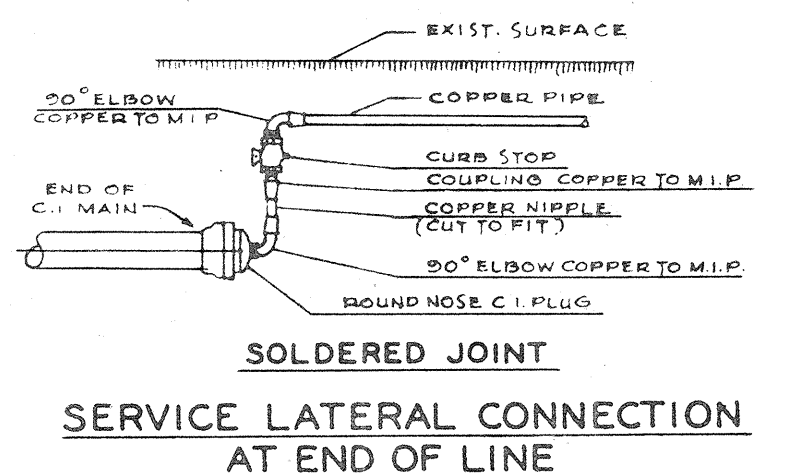
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	U-072-1(3)	1963	97	246
		U-078-1(4)	1963	41	88
		F-090-1(2)	1963	39	73



LONGITUDINAL SECTION



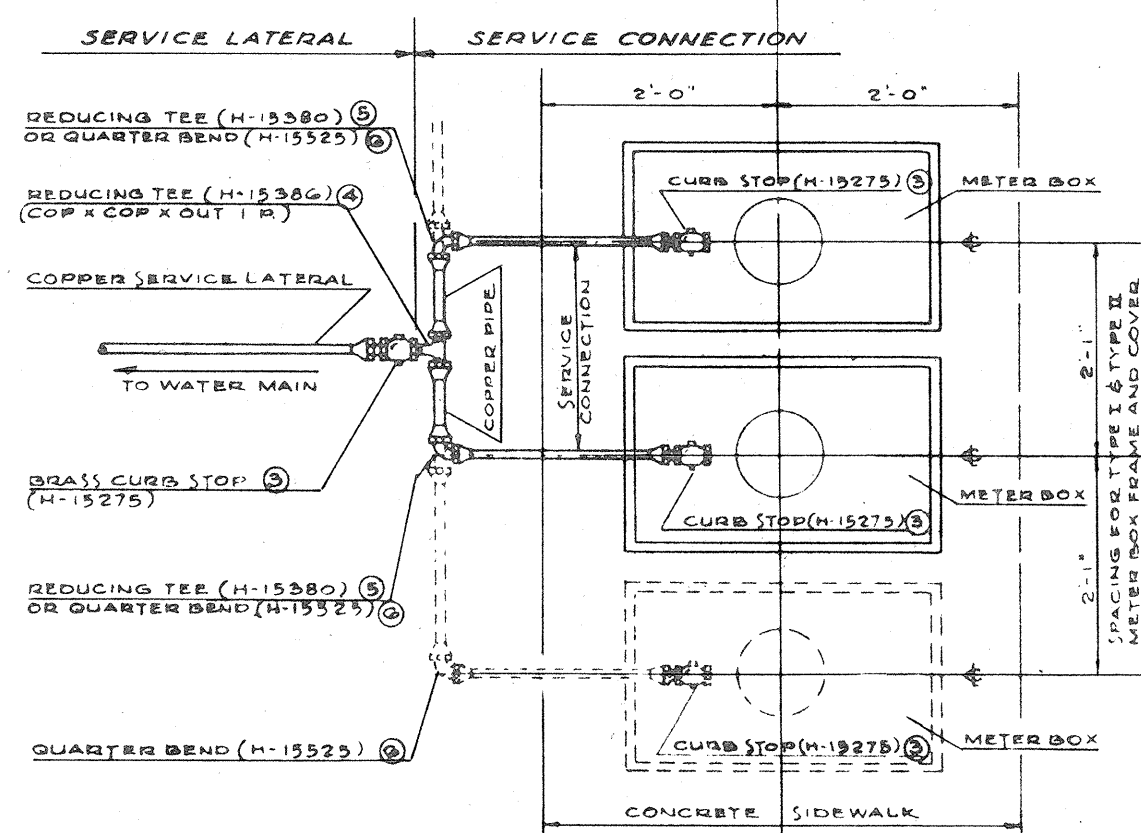
SINGLE SERVICE CONNECTION



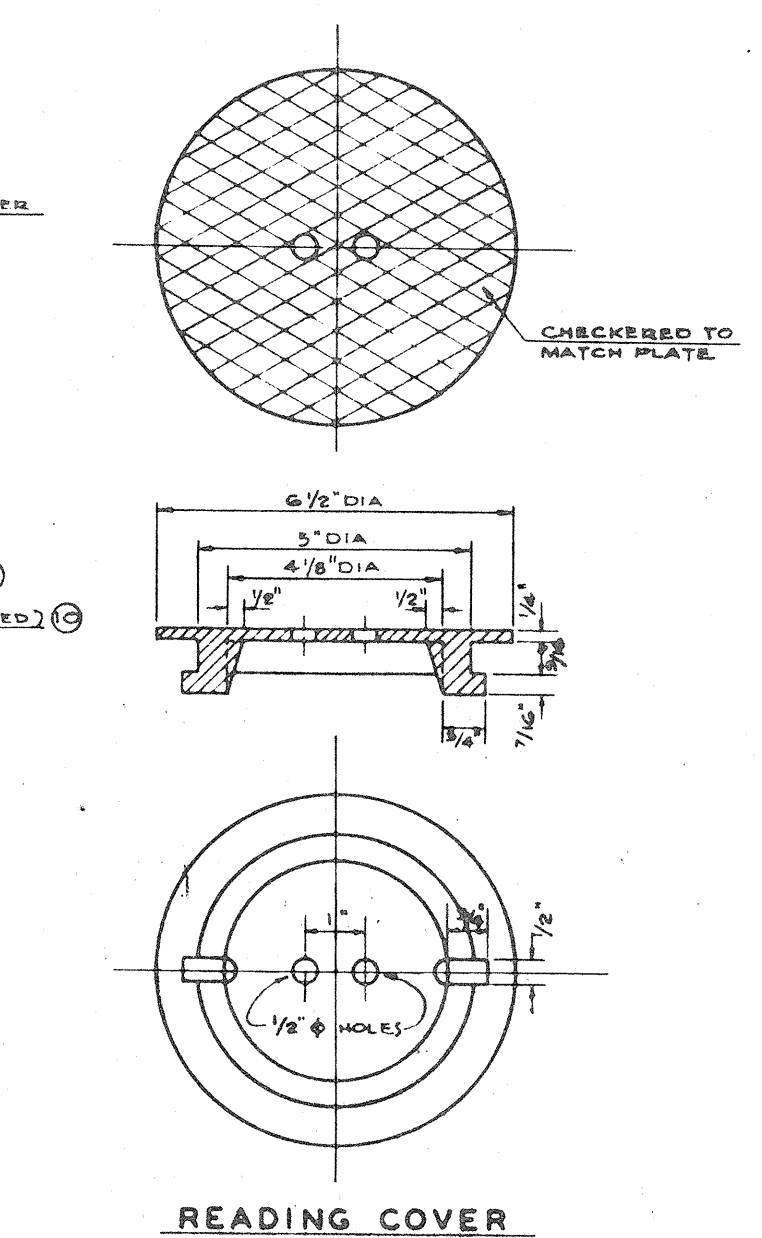
SCHEDULE OF COPPER FITTINGS (FLARED JOINT)

ITEM NO.	DESCRIPTION	SINGLE SERVICE CONN.	TWO SERVICES	THREE SERVICES
1	CORPORATION STOP WITH STRAIGHT COUPLING NUT (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	2	4
4	REDUCING TEE WITH TUBE NUTS, COPPER TO COPPER TO OUTSIDE, I.P. (H-15380)	-	1	1
5	REDUCING TEES WITH TUBE NUTS, COPPER TO COPPER (H-15380)	-	-	1
6	1/4 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.



MULTIPLE SERVICE CONNECTION FLARED JOINTS

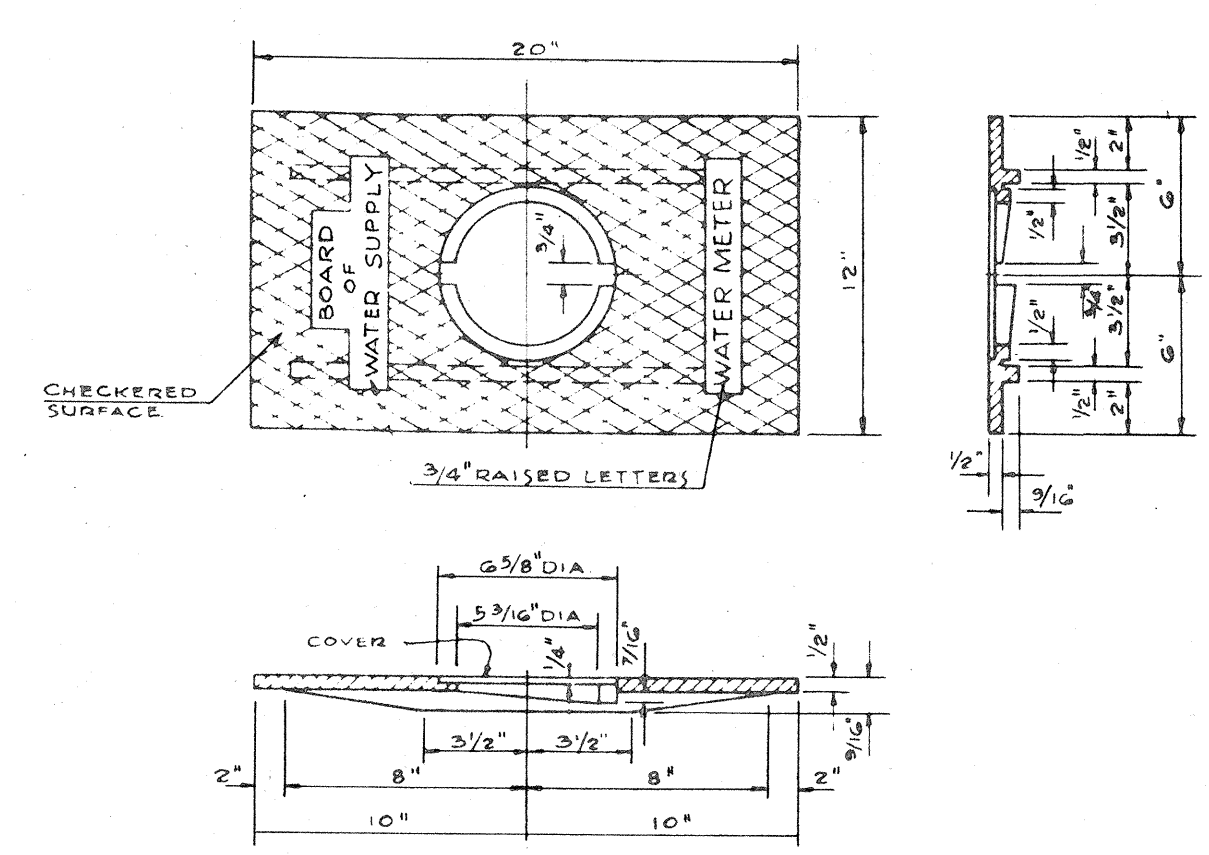


READING COVER

CHECKERED PATTERN
CAST IRON COVER FOR TYPE I & TYPE II FRAMES

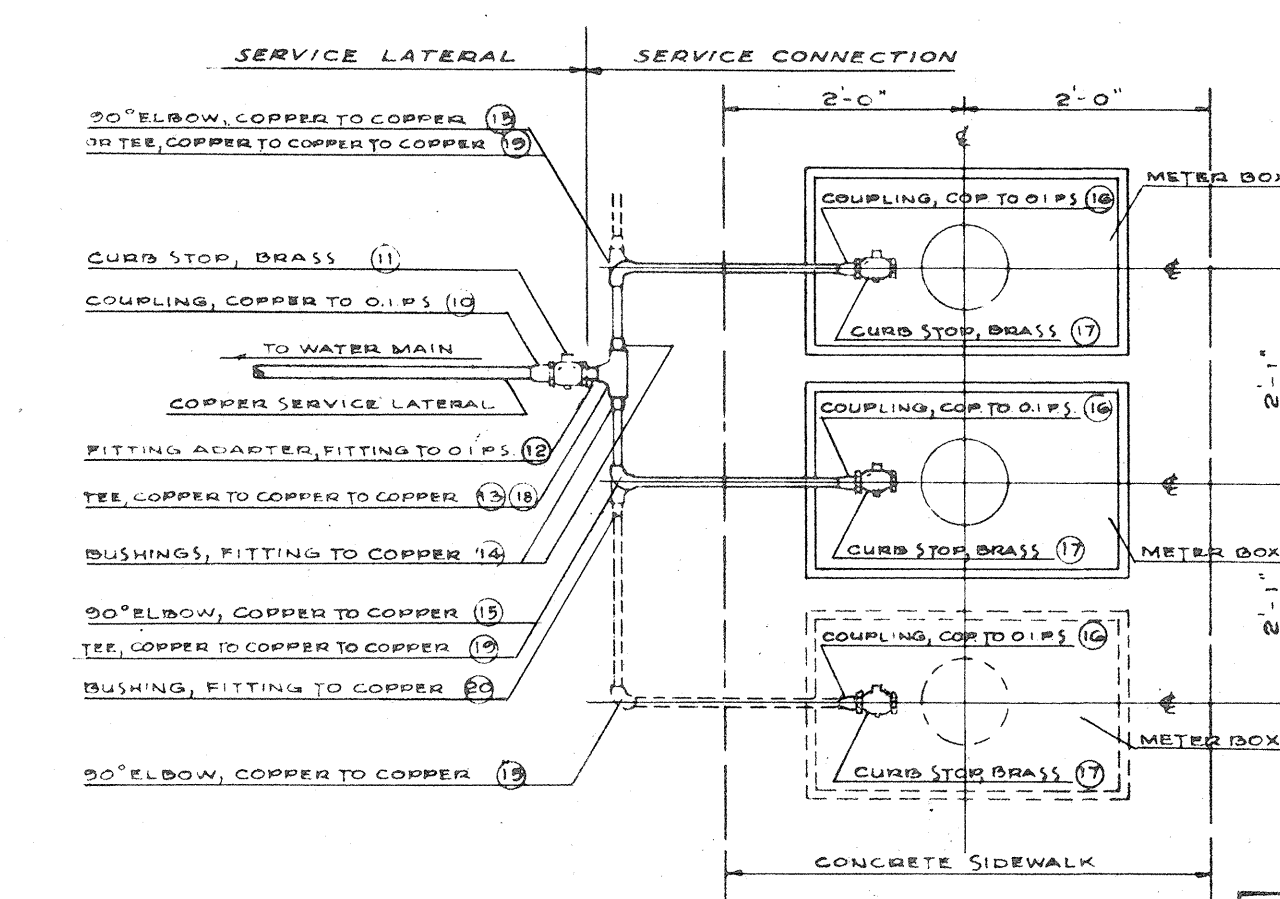
ITEM NO.	DESCRIPTION	SINGLE SERVICE CONN.	TWO SERVICES	THREE SERVICES
8	CORPORATION STOP, BRASS (H-10000)	1	1	1
9	GROUND JOINT UNION (A-1424) COPPER TO I.P.S. (A-1427)	1	1	1
10	COUPLING, COPPER TO O.I.P.S. (A-1533 TO A-1678)	2	1	1
11	CURB STOP, BRASS (B.W.S. STANDARD)	1	1	1
12	FITTING ADAPTER (A-1593) 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	BUSHING, FITTING TO COPPER (W-1343 TO W-1362)	-	2	2
15	90° ELBOW, COPPER TO COPPER (A-1537 TO A-2724)	-	2	2
16	COUPLING, COPPER TO O.I.P.S. (A-1533 TO A-1672)	1	2	3
17	CURB STOP, BRASS (B.W.S. STANDARD)	1	2	3
18	REDUCING TEE, COPPER TO 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-1362)	-	-	1
21	REDUCING TEE, COPPER TO COPPER TO COPPER (SUBSTITUTE FOR ITEM NUMBER 13 & 14)	-	-	1

NOTE: REFERENCE NUMBERS SHOWN THUS, (H-10000) ARE FROM MUELLER CO. CATALOG "H" AND (A-1424) ARE FROM MUELLER BRASS CO. "STRAIGHTLINE" CATALOG "H". APPROVED EQUAL MAY BE USED.



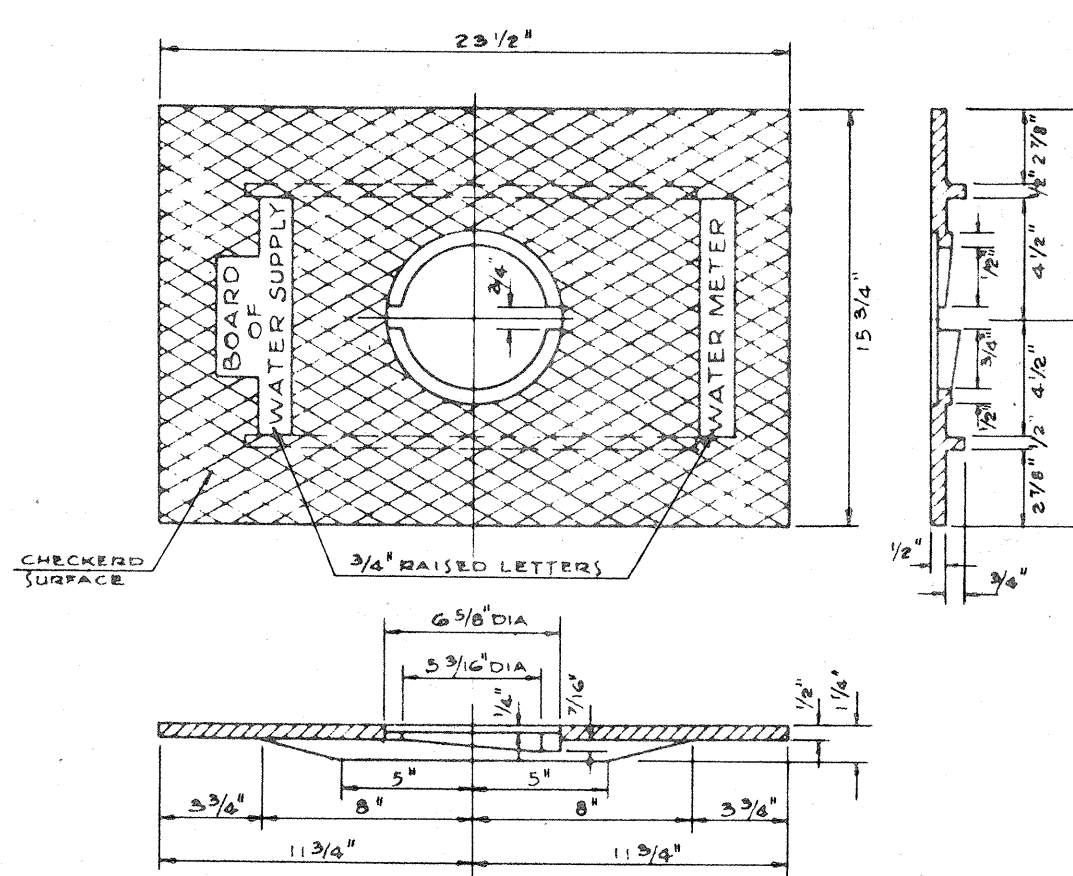
COVER PLATE

CAST IRON FRAME AND PLATE TYPE I



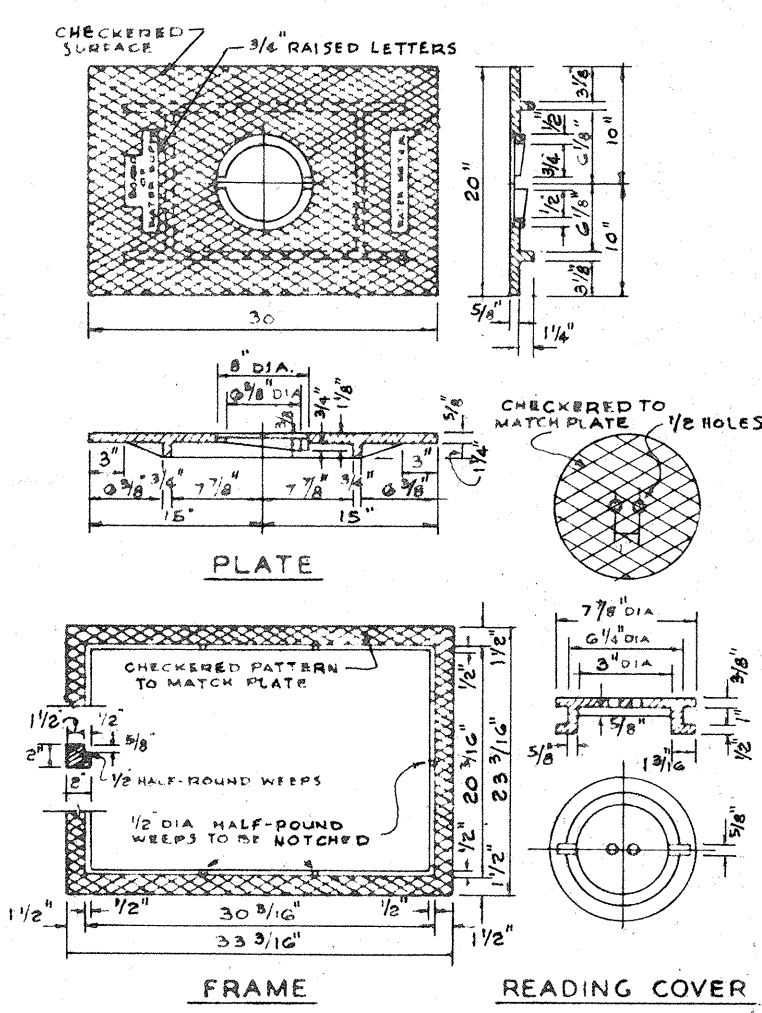
MULTIPLE SERVICE CONNECTION SOLDERED JOINTS

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

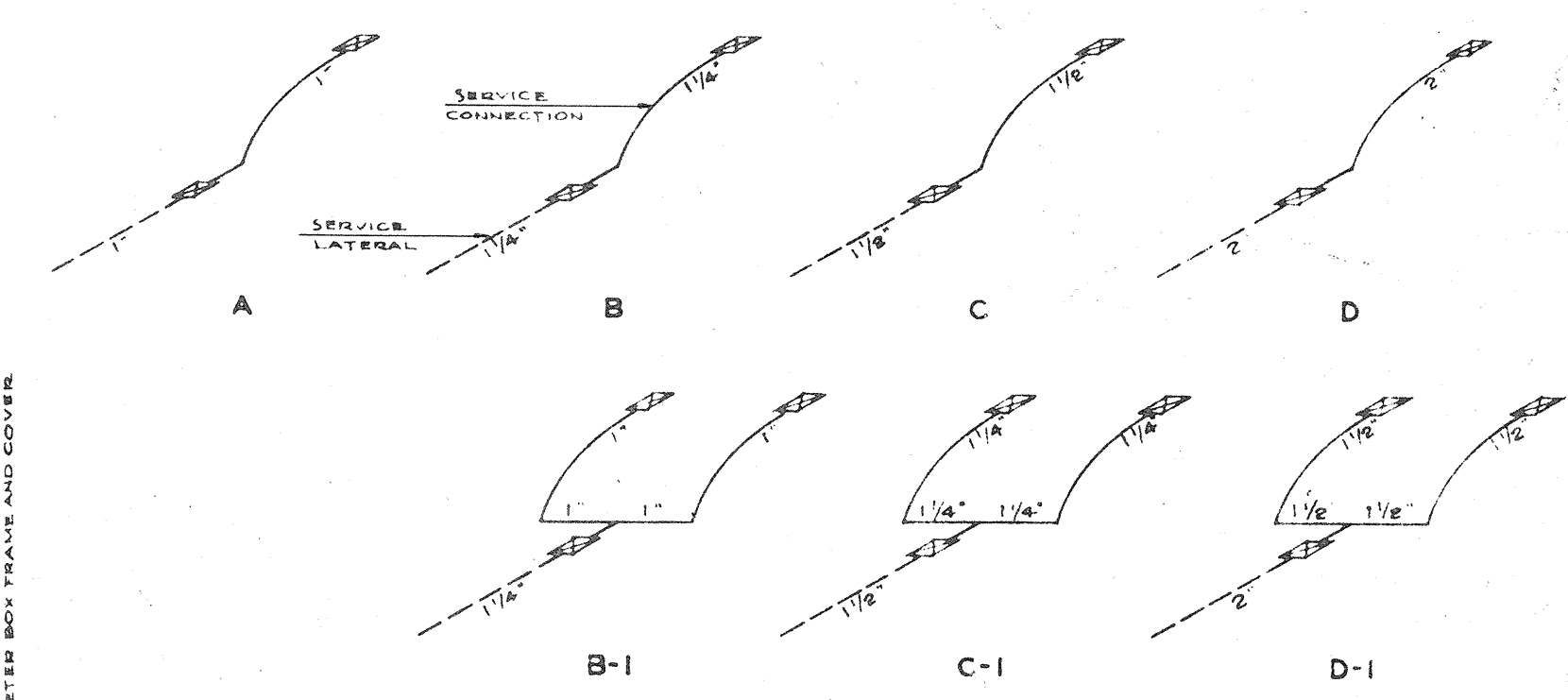


COVER PLATE

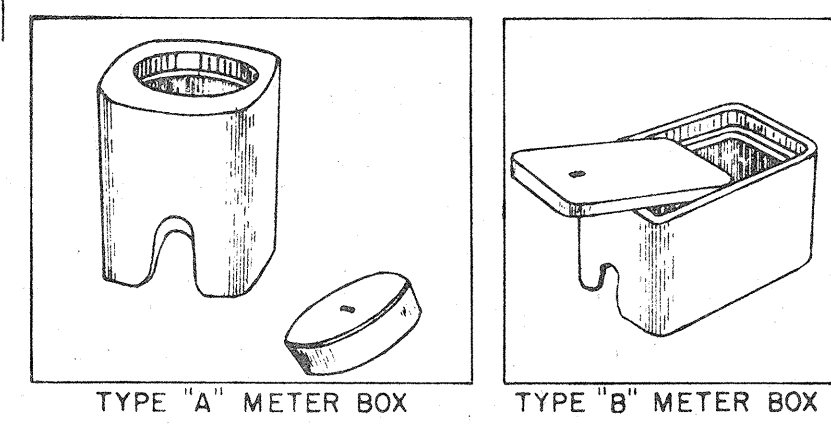
CAST IRON FRAME AND PLATE TYPE II



CAST IRON FRAME, PLATE & COVER TYPE III



TYPICAL LAYOUT OF SERVICE LATERALS AND CONNECTIONS

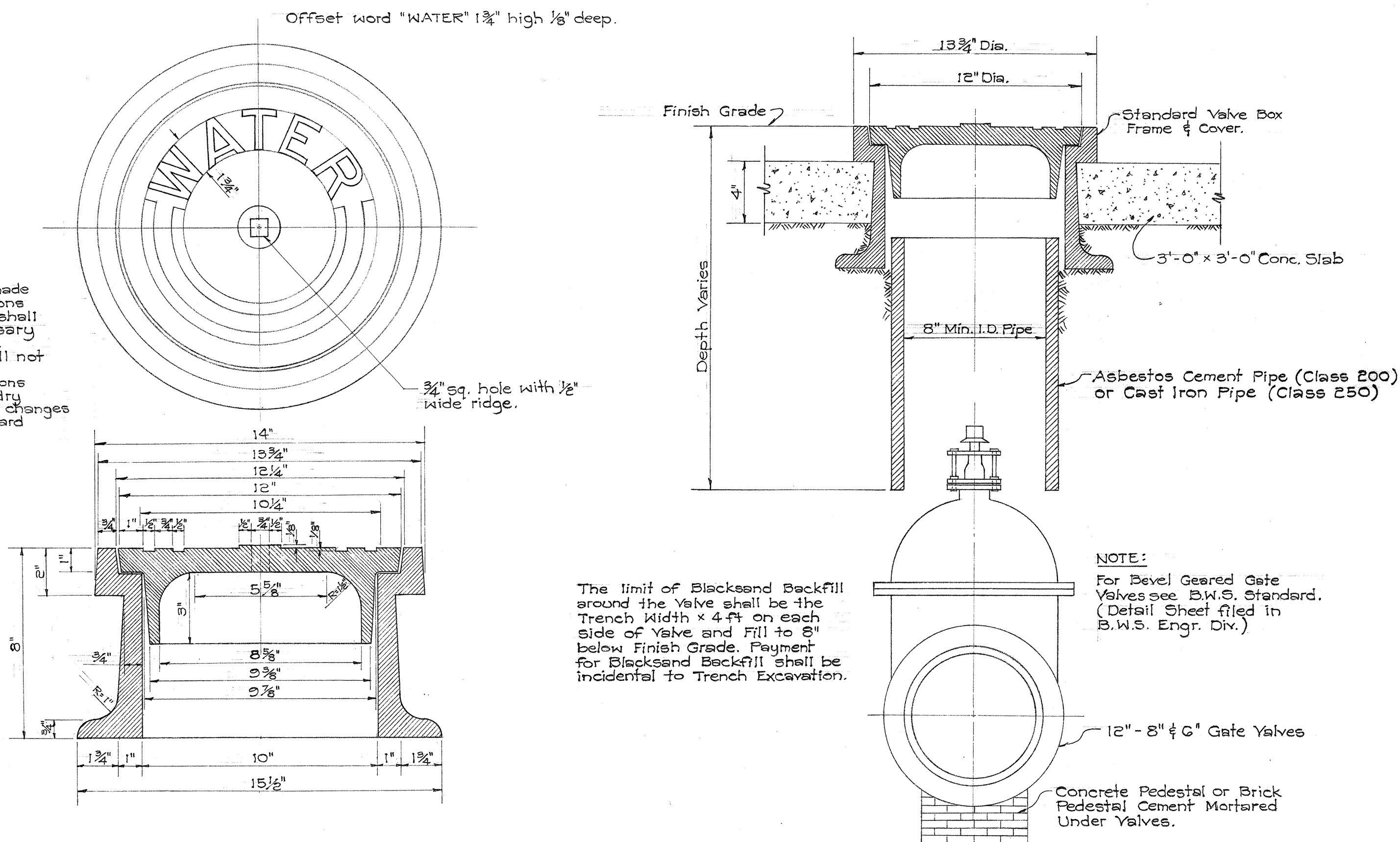


TYPE METER BOX	METER SIZES	OVERALL DIMENSIONS AT BOTTOM	OVERALL DIMENSIONS AT TOP	COMPLETE WEIGHT	OVERALL DIMENSIONS OF LID
A	5/8" or 3/4" Without Valve	7 1/4" x 7 1/4"	10" x 10"	45 lbs.	7 3/8" Dia.
B	5/8" or 3/4"	9 1/2" x 16"	12 1/4" x 18 3/8"	82 lbs.	8 3/4" x 14 1/2"

APPROVED: *[Signature]* DATE *4/16/63*
ASST. CHIEF ENGINEER
BOARD OF WATER SUPPLY

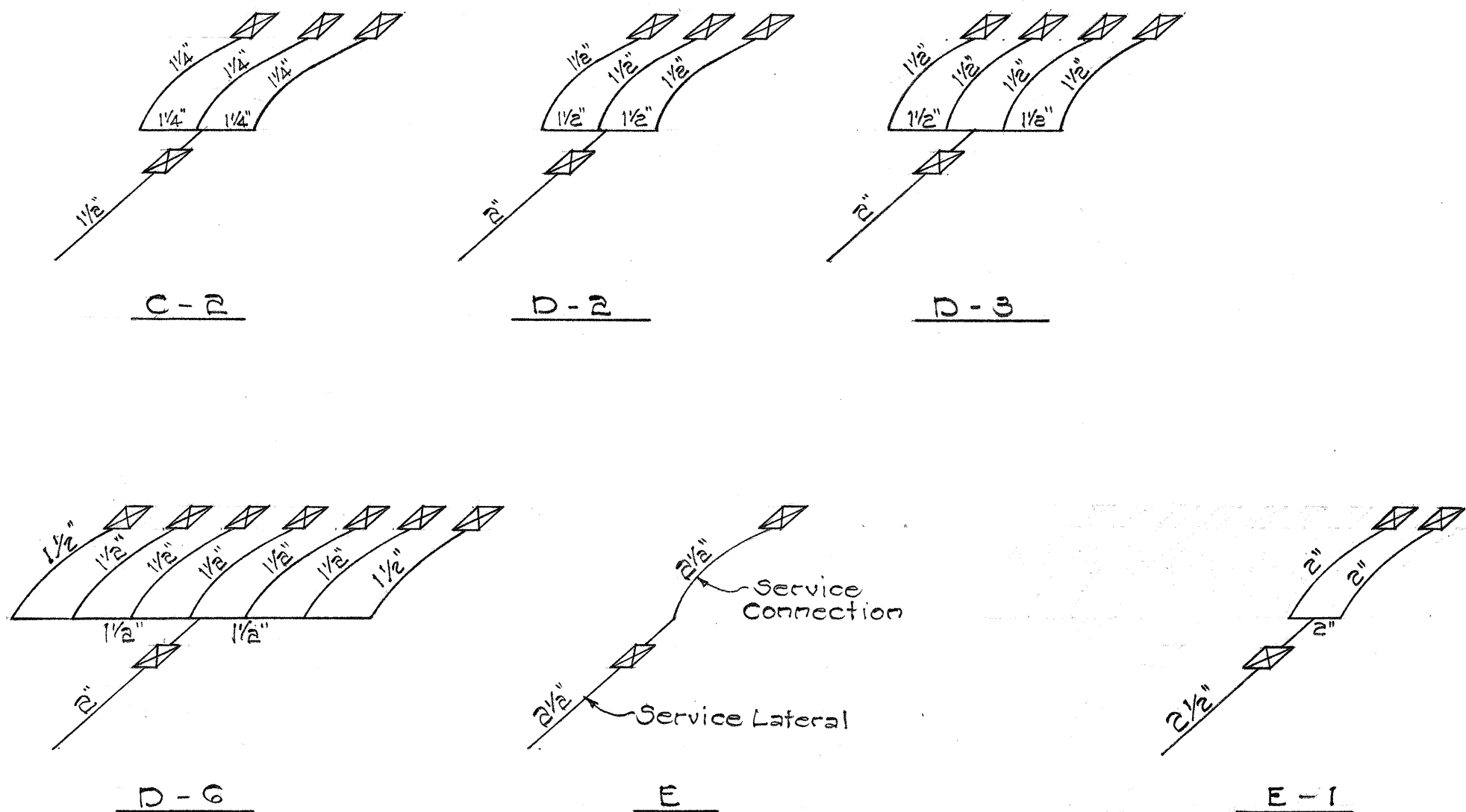
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BOARD OF WATER SUPPLY
STANDARD DETAILS
LUNALILO FREEWAY U-072-1(3)
VINEYARD BOULEVARD U-098-1(4)
LILIHA STREET F-090-1(2)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-072-1(3)	1963	28	246
		U-098-1(4)	1963	42	88
		F-090-1(2)	1963	40	73



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

INSTALLATION OF VALVE BOX FOR GATE VALVES
Not to Scale



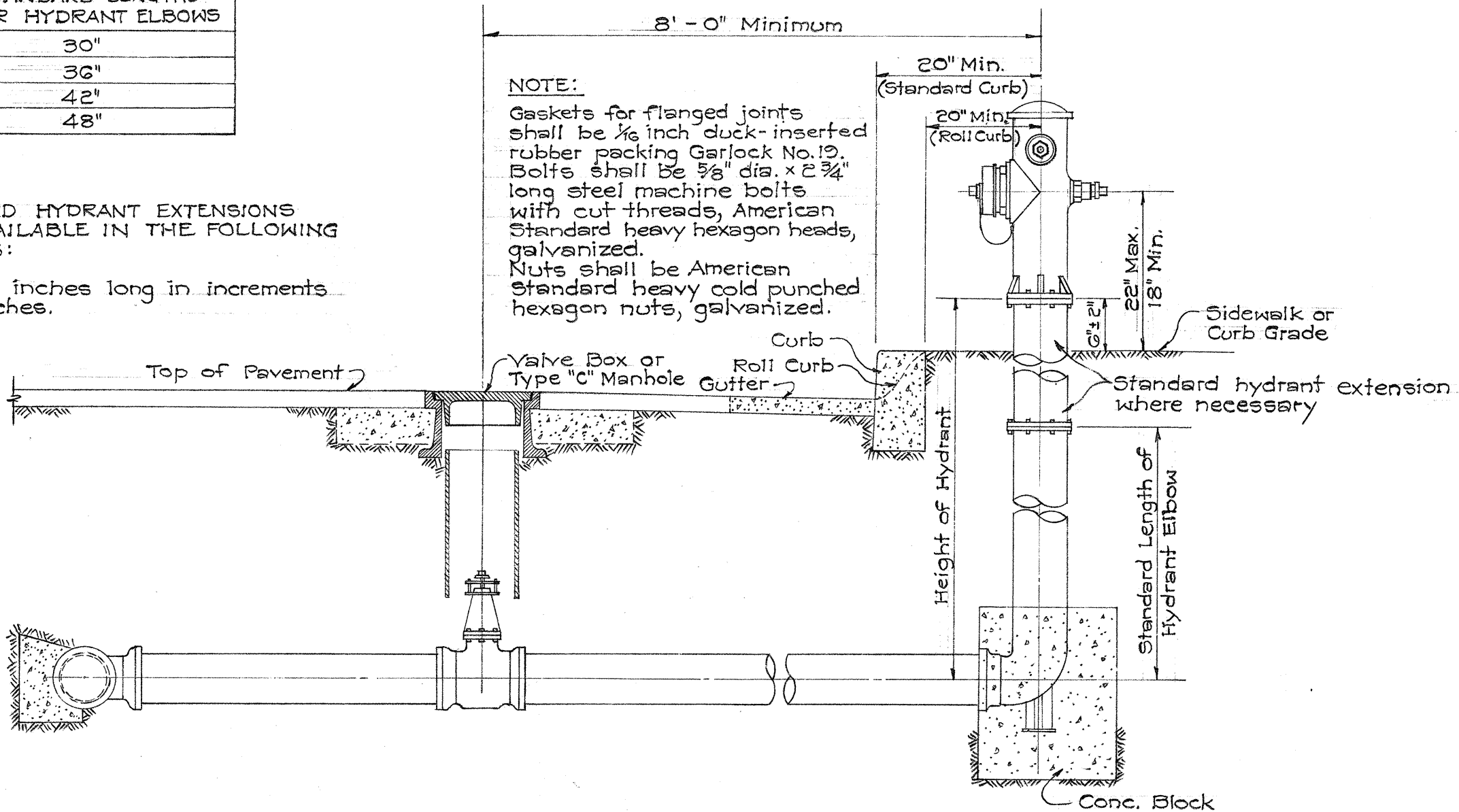
TYPICAL LAYOUT OF SERVICE LATERALS & CONNECTIONS
NOT SHOWN ON THE STANDARD DETAIL SHEETS
Not to Scale

- NOTE:**
- 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.
 - 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)

APPROVED:
[Signature]
ASST. CHIEF ENGINEER
BOARD OF WATER SUPPLY
DATE 4/1/63

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 1963