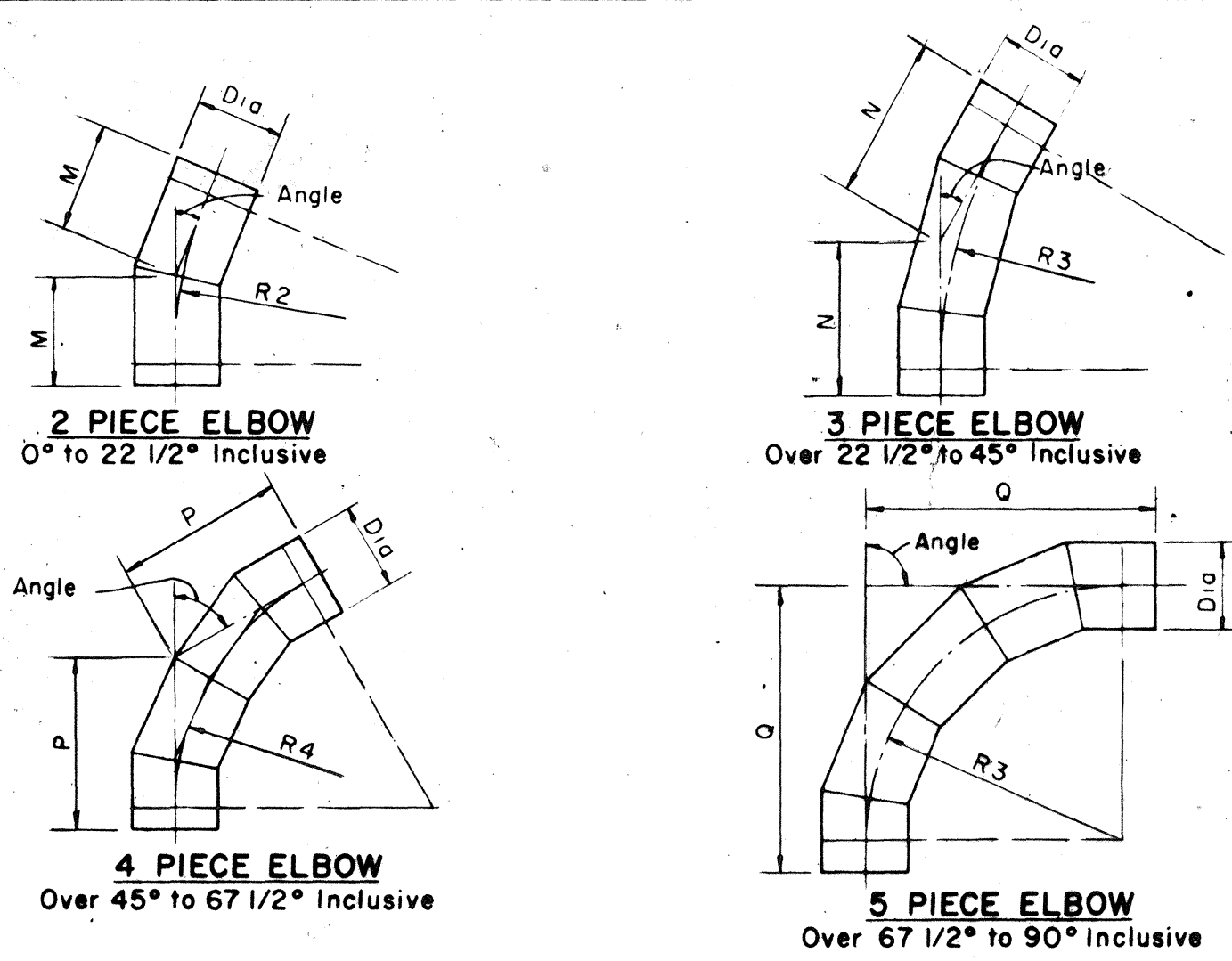




STANDARD FITTING DIMENSIONS												
DIAMETER	TEE		CROSS (Both Ways)	LATERAL (30° to 75°)		ELBOWS (Center to End)						
	Run J+J	Outlet J		Run X+Y	Outlet Y	2 Piece (up to 22 1/2°)	3 Piece (22 1/2° to 45°)	4 Piece (45° to 67 1/2°)	5 Piece (67 1/2° to 90°)			
16"	34"	17"	34"	62"	52"	12"	60"	18"	44"	26"	39"	34"
18"	36"	18"	36"	66"	56"	12"	60"	19"	47"	27"	41"	36"
20"	38"	19"	38"	72"	60"	13"	65"	20"	49"	28"	42"	39"
22"	40"	20"	40"	78"	66"	13"	65"	21"	51"	30"	45"	41"
24"	42"	21"	42"	84"	72"	14"	70"	22"	54"	32"	48"	44"
30"	60"	30"	60"	96"	84"	15"	75"	25"	61"	37"	51"	51"
36"	66"	33"	66"	110"	96"	16"	80"	27"	66"	40"	60"	56"

DIMENSIONS FOR ECCENTRIC REDUCER REDUCING SECTION

36" X 30" Eccentric Reducer - Length 66"
30" X 24" Eccentric Reducer - Length 66"
24" X 20" Eccentric Reducer - Length 26"
20" X 16" Eccentric Reducer - Length 26"

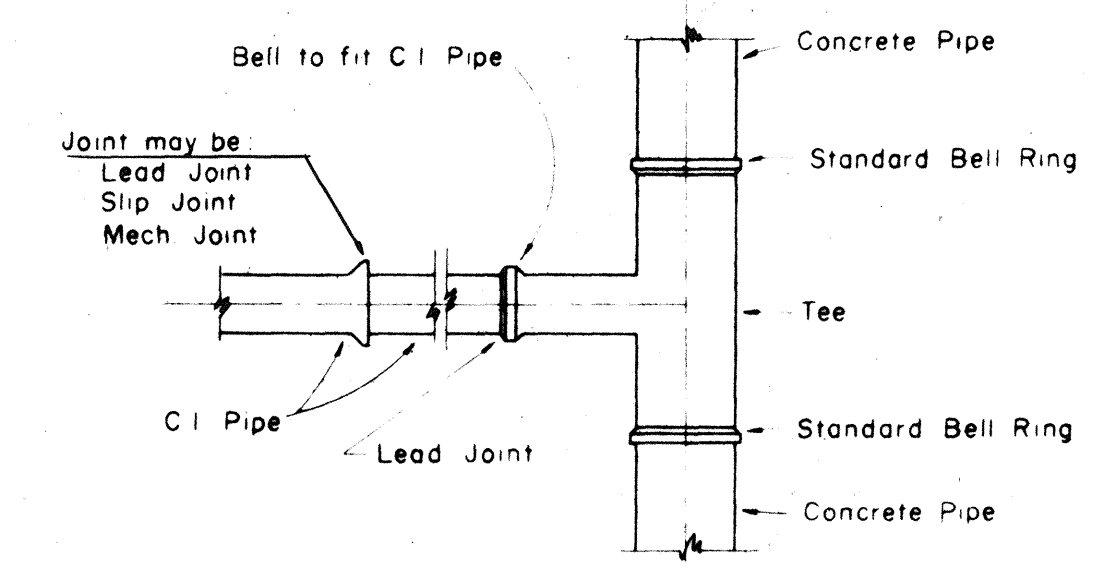
NOTE:

All dimensions shown are laying lengths.

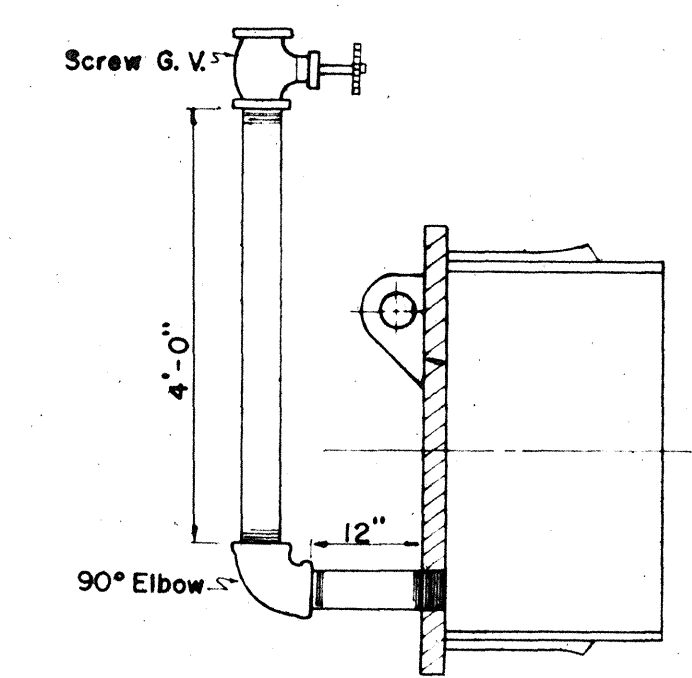
All fittings and specials shall be fabricated independent from pipe sections and in accordance with the dimensions shown.

All fittings and specials shall be all bell unless otherwise noted.

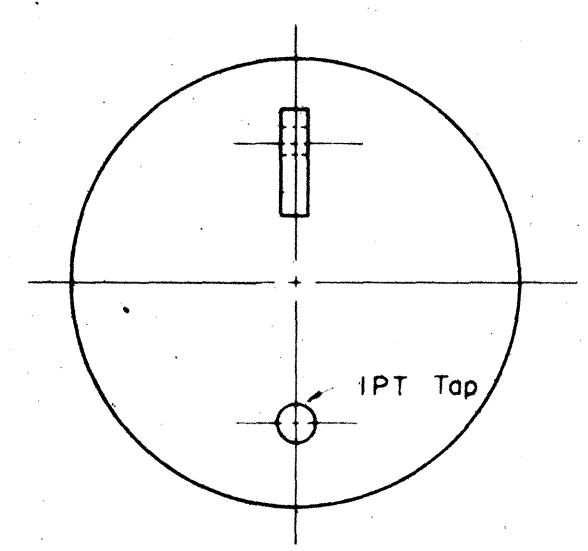
All tees, wyes, crosses and reducers 16-inch in diameter and larger shall be reinforced with steel ribs or steel crotch plates welded continuously to the cylinder or by other methods to withstand the longitudinal crushing effect caused by the test pressure as called for in the plans.



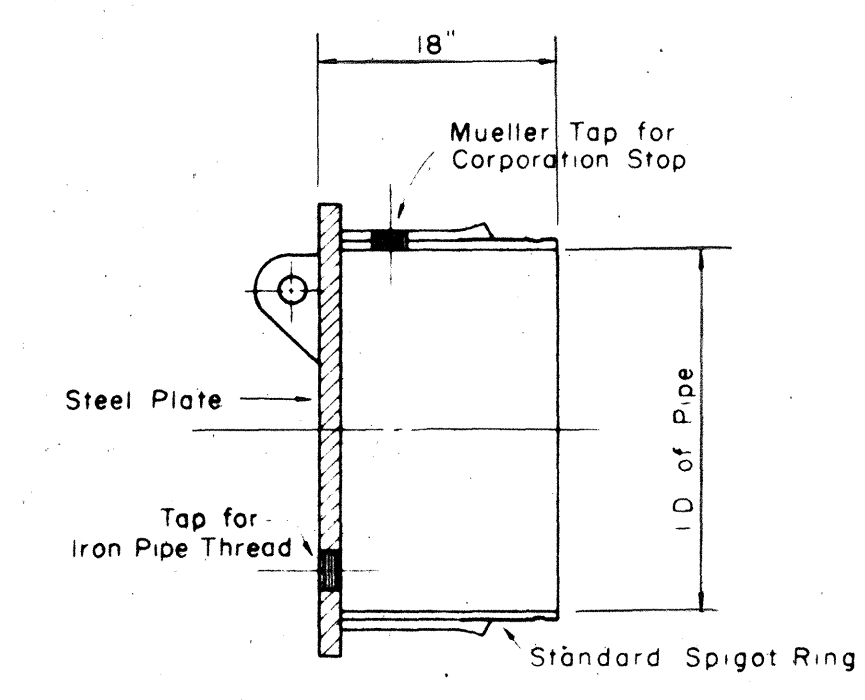
TYPICAL CAST IRON PIPE CONNECTION TO CONCRETE CYLINDER PIPE



TYPICAL SECTION OF TEMPORARY CLEANOUT

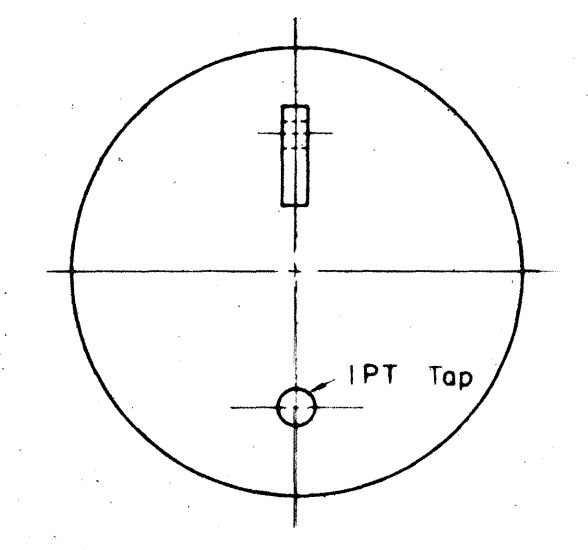


PLAN OF STEEL PLATE

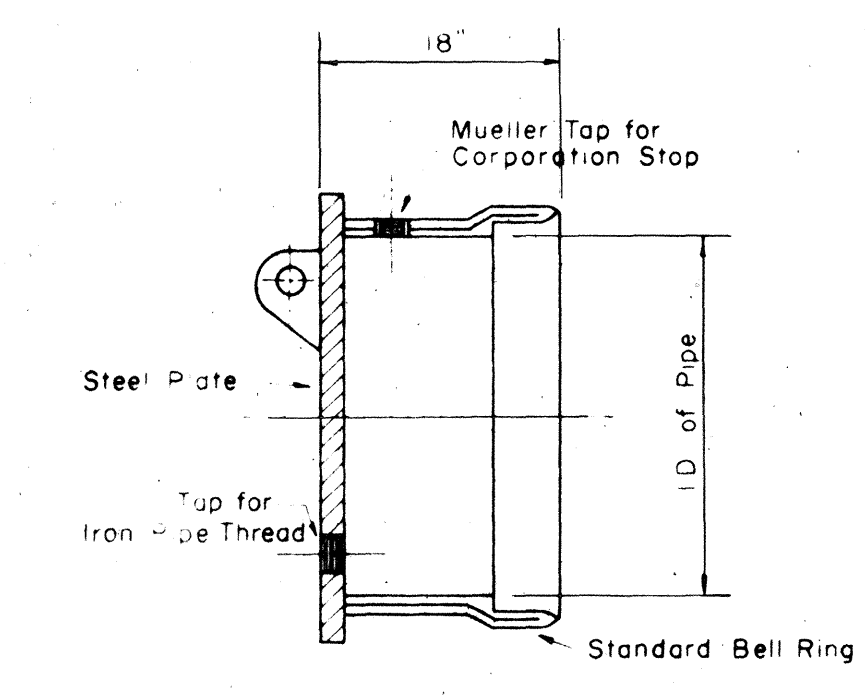


SECTION

DETAIL OF PLUG

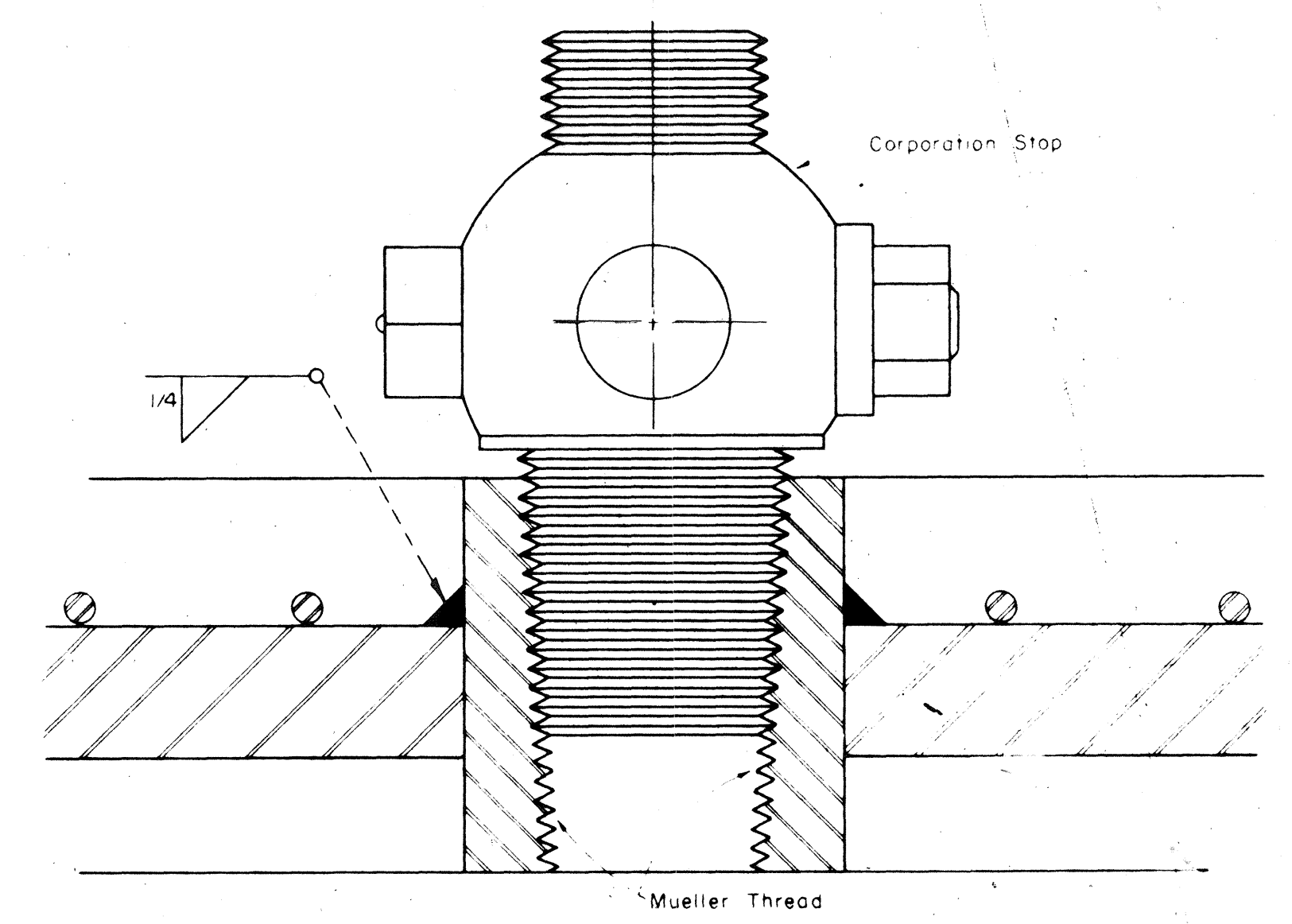
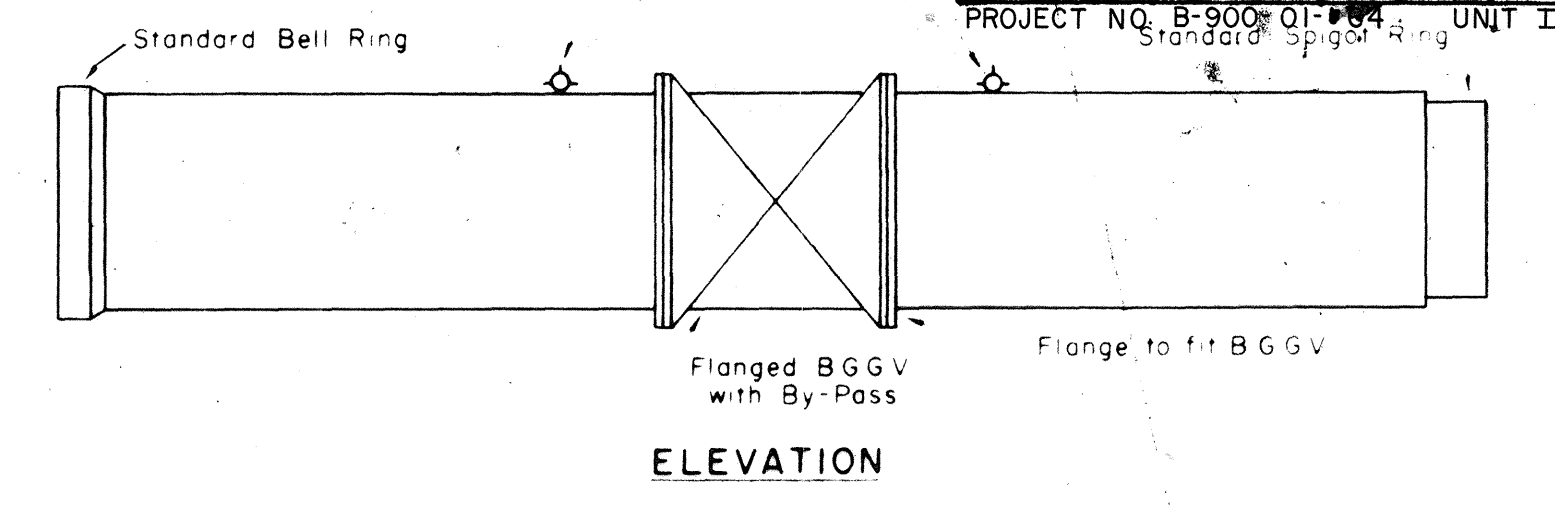


PLAN OF STEEL PLATE

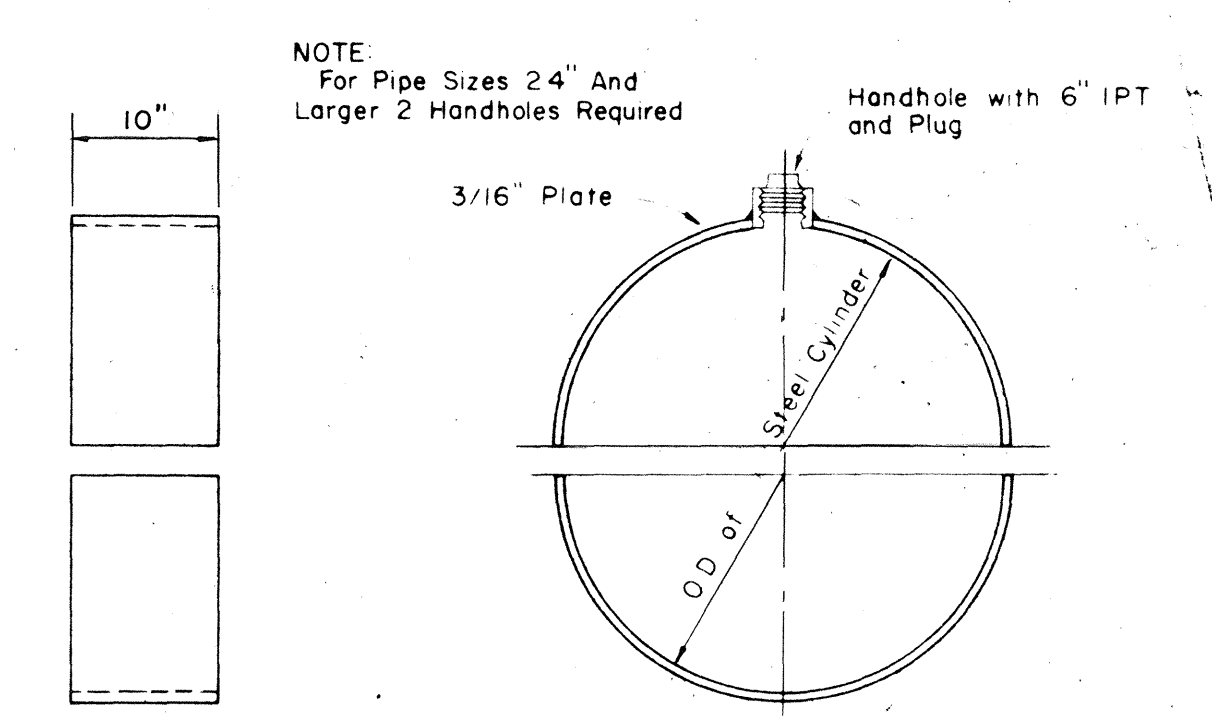


SECTION

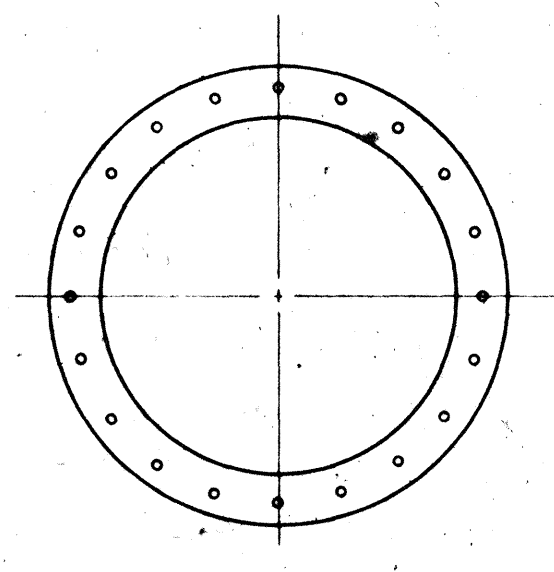
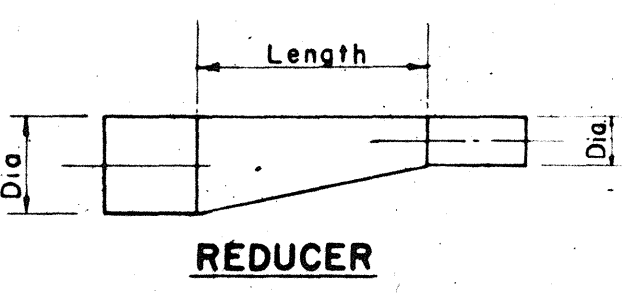
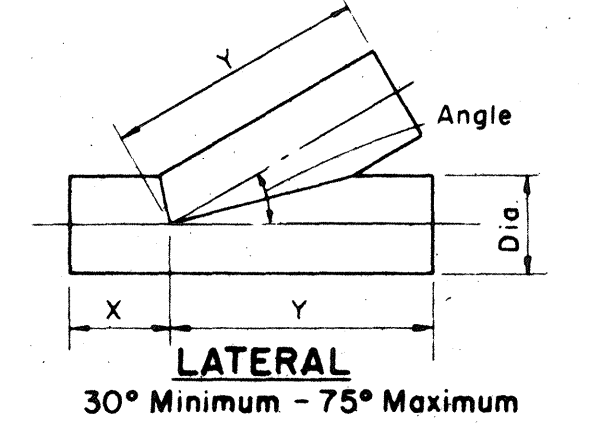
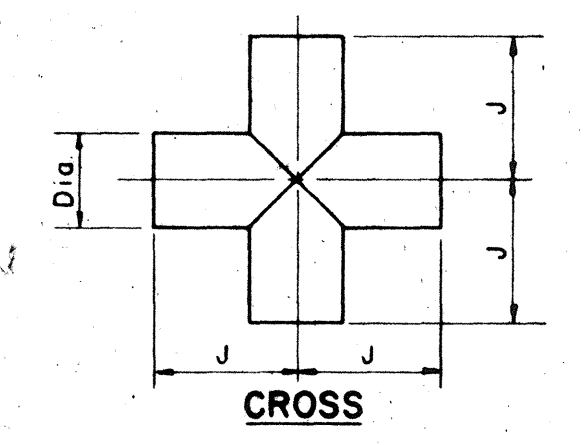
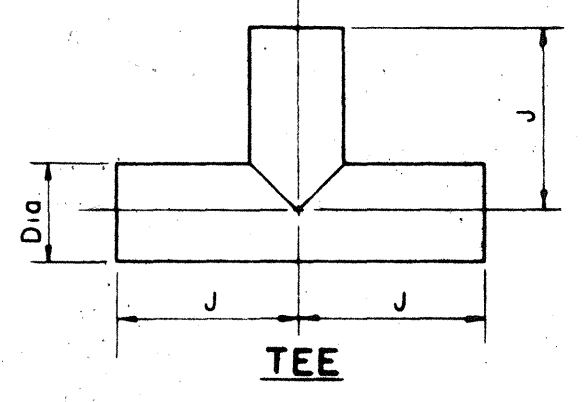
DETAIL OF CAP



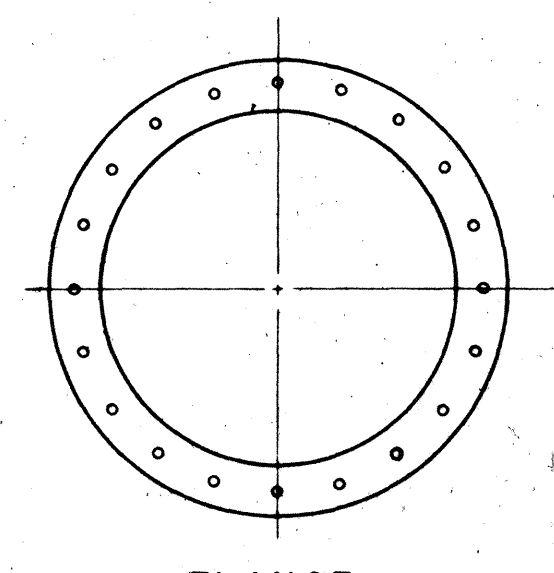
TYPICAL SECTION THRU CONCRETE PIPE AT CORPORATION STOP



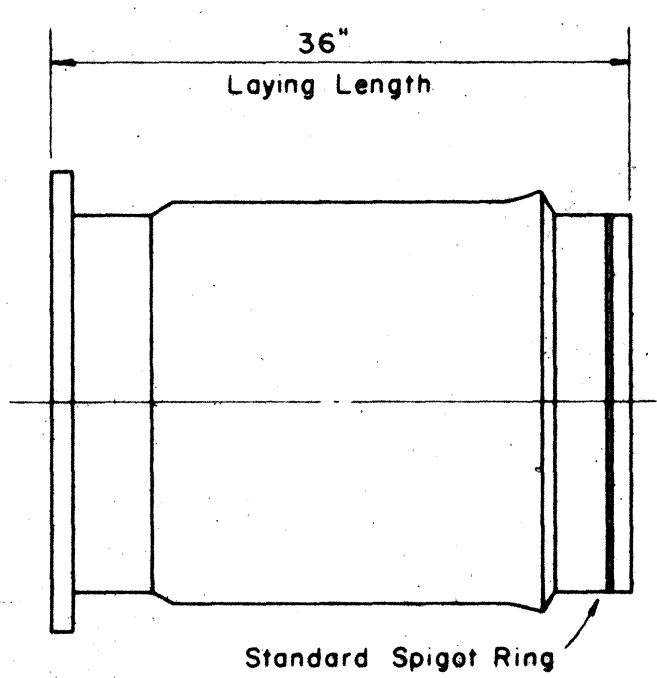
DETAIL OF SPLIT BUTT STRAP



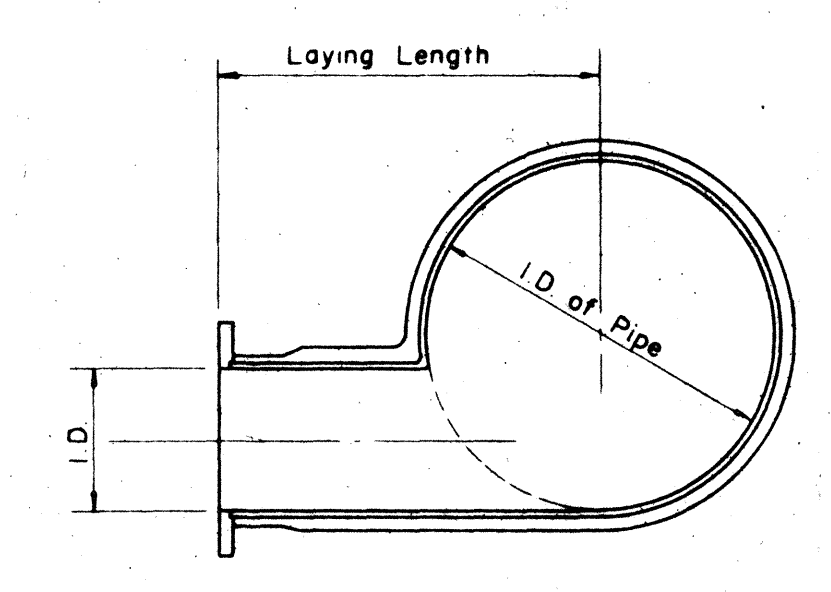
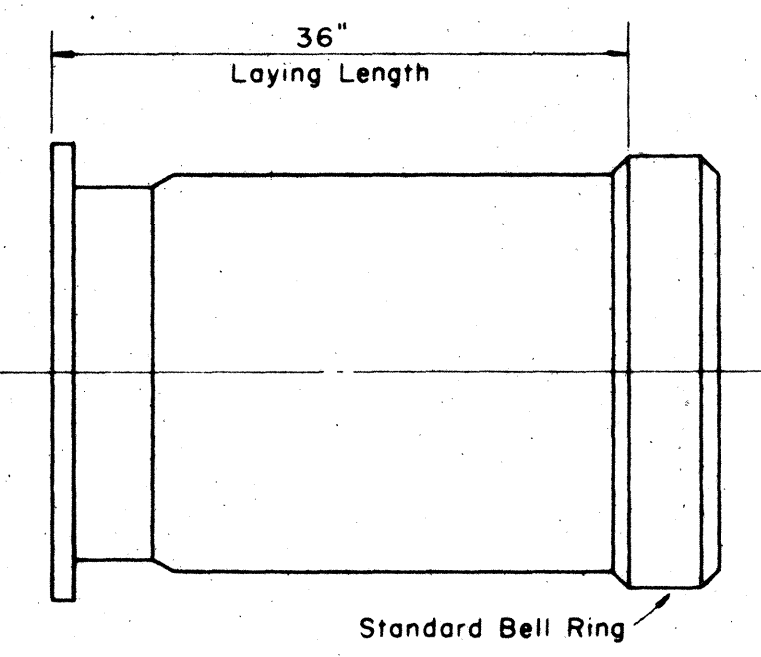
See Specs. for Flange Class



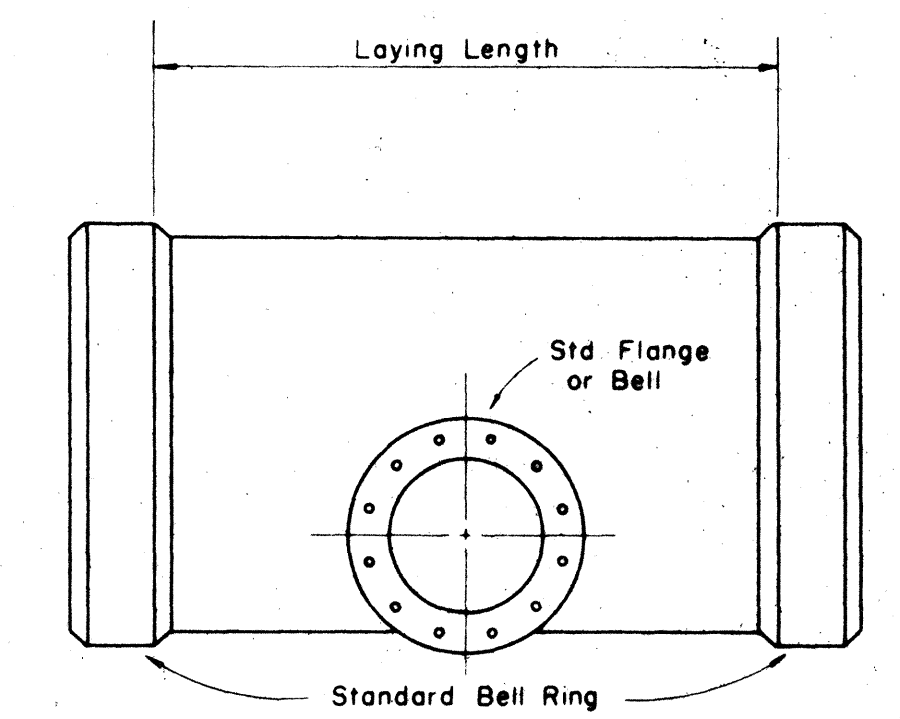
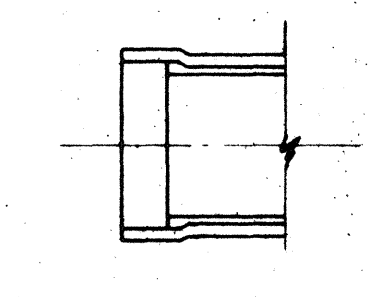
See Specs. for Flange Class



TYPICAL DETAIL OF ADAPTER

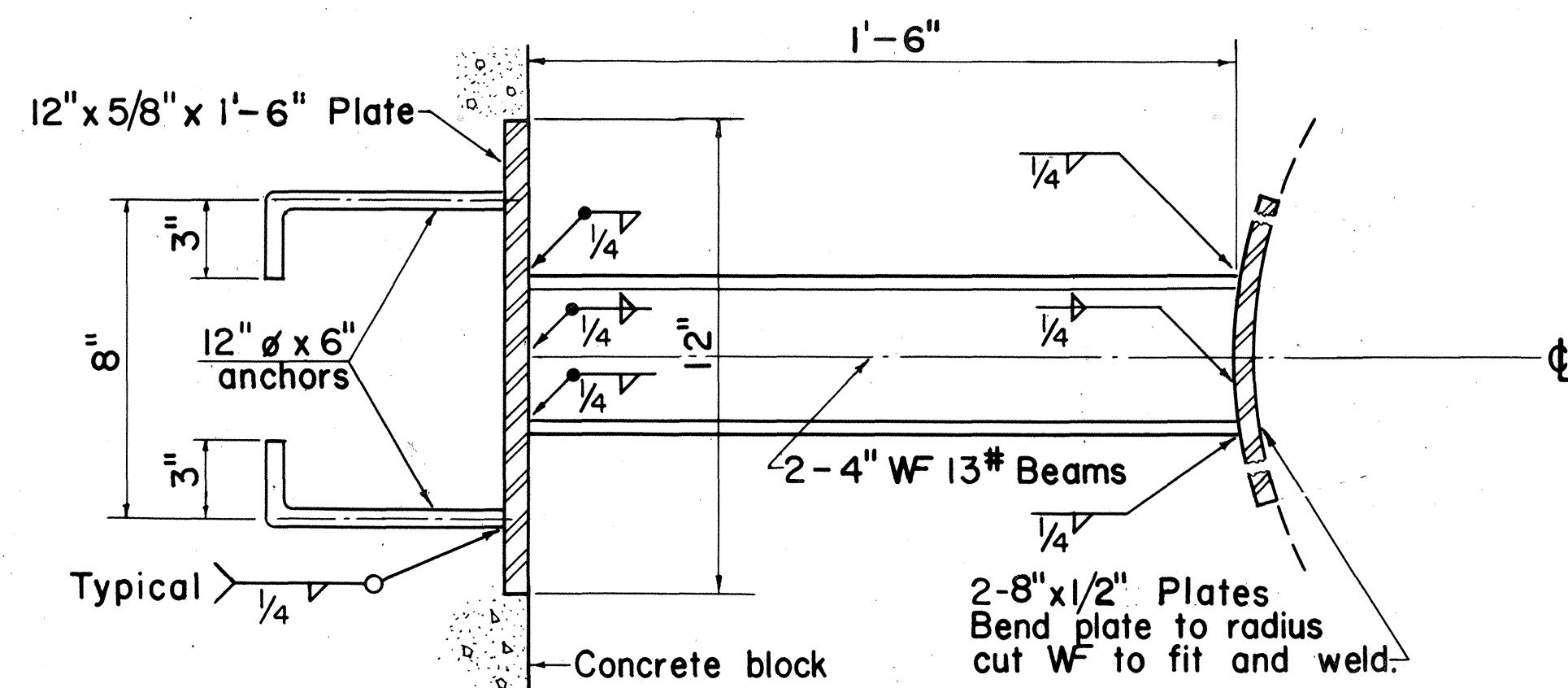


SECTION



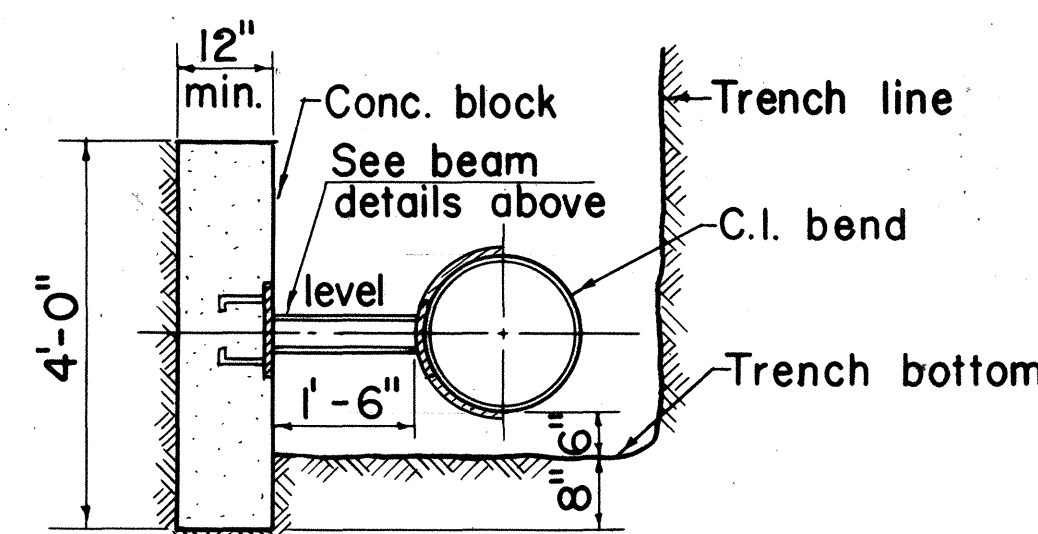
TYPICAL DETAIL OF BLOW-OFF TEE

STATE OF HAWAII		DEPARTMENT OF TRANSPORTATION		HIGHWAYS DIVISION	
WATER DETAILS		CONCRETE CYLINDER PIPE		MISCELLANEOUS DETAILS	
APPROVED		ASSISTANT CHIEF ENGINEER		POCKET FOLDER NO.	
SCALE No Scale		DATE April 25, 1968			
BOARD OF WATER SUPPLY					
HONOLULU, HAWAII					
SHEET 1 OF 6 SHEETS		FIELD BOOK NO.			



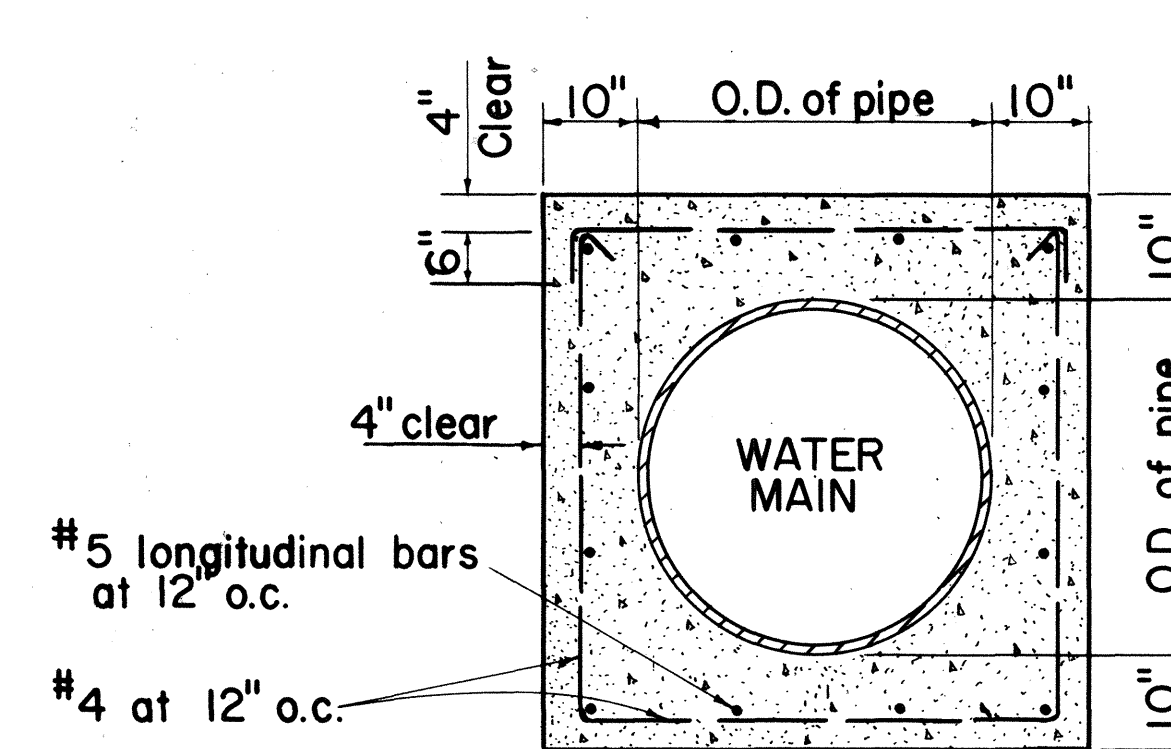
BEAM DETAIL

Scale: 3" = 1'-0"

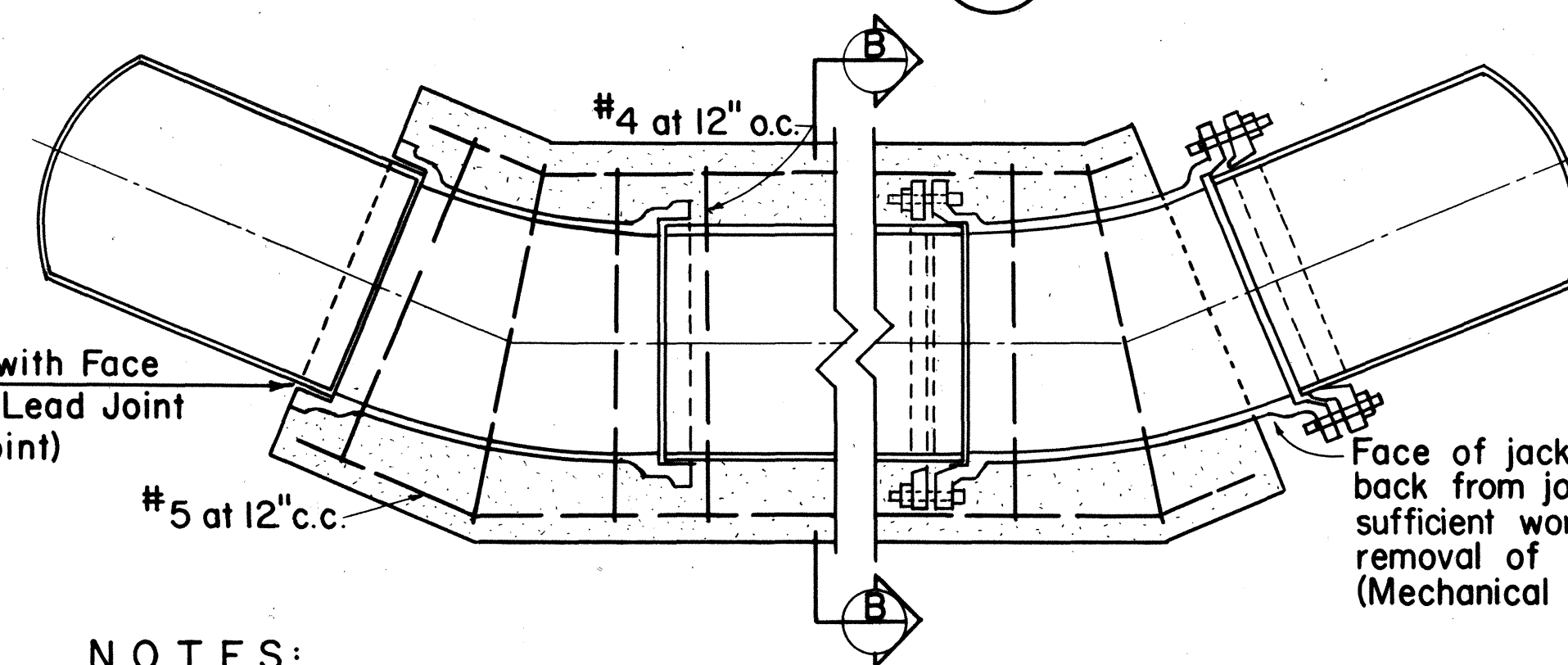


SECTION C

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



SECTION B

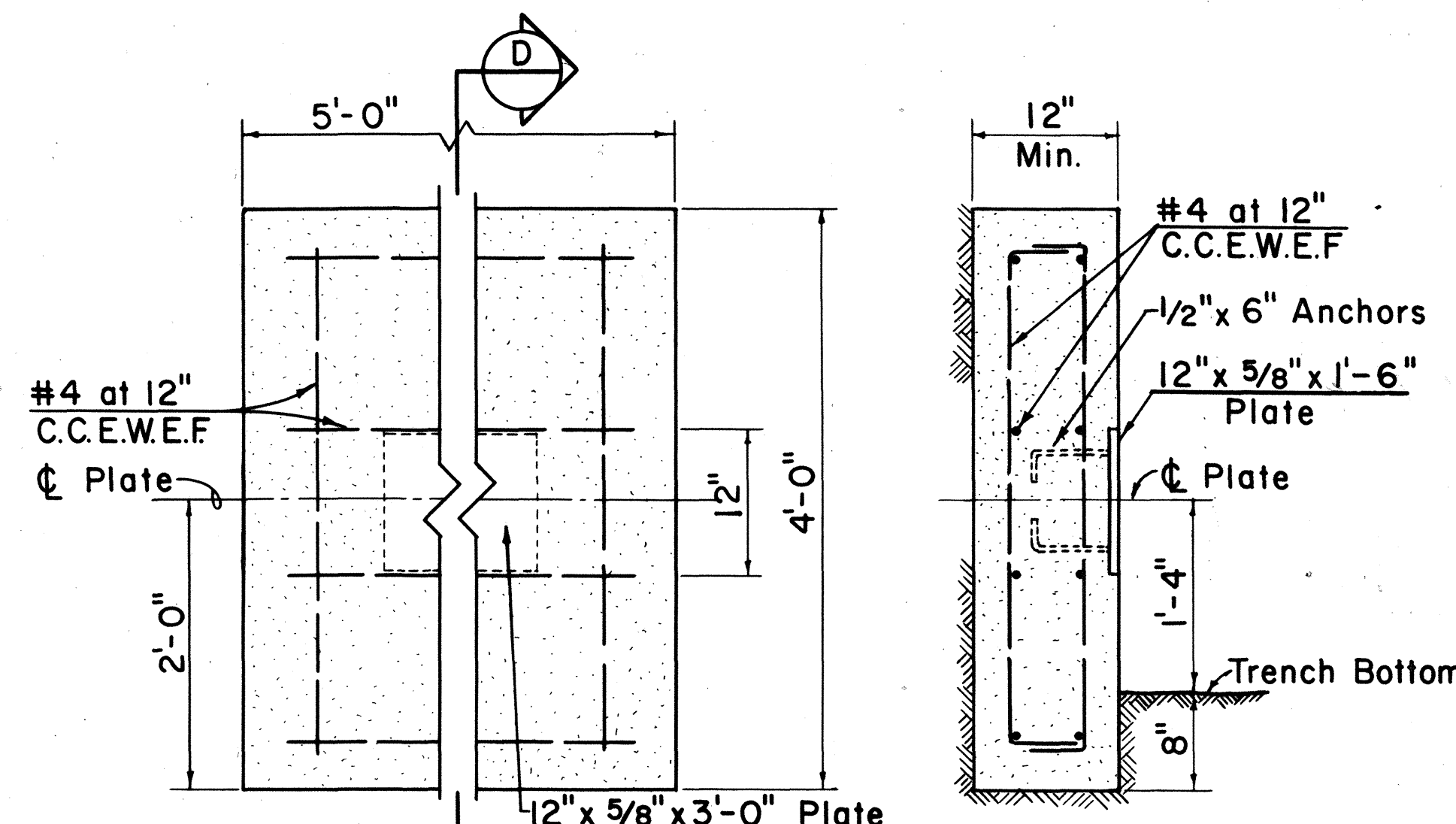


NOTES:

1. Jacket to be poured after completion of test.
2. 2 1/2" depth of lead for lead joint pipe required at all embedded joints.
3. Wherever construction joints are required, 6" rubber or neoprene waterstops shall be installed. Waterstops shall be of the type specified and manufactured by the Servicized Products Corporation, Gate Rubber Company or approved equal.

REINFORCED CONCRETE JACKET

Scale: Not to Scale

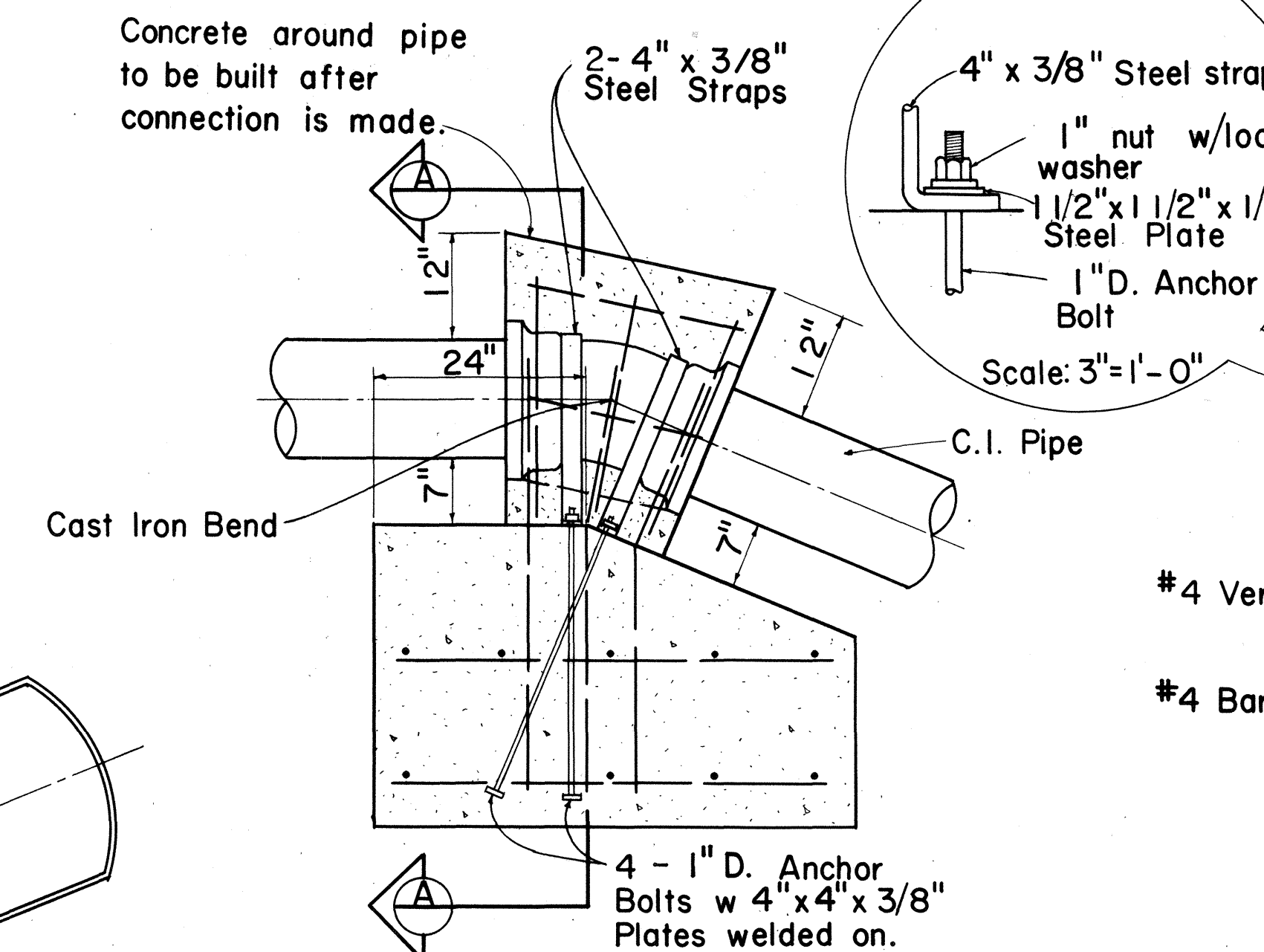


ELEVATION

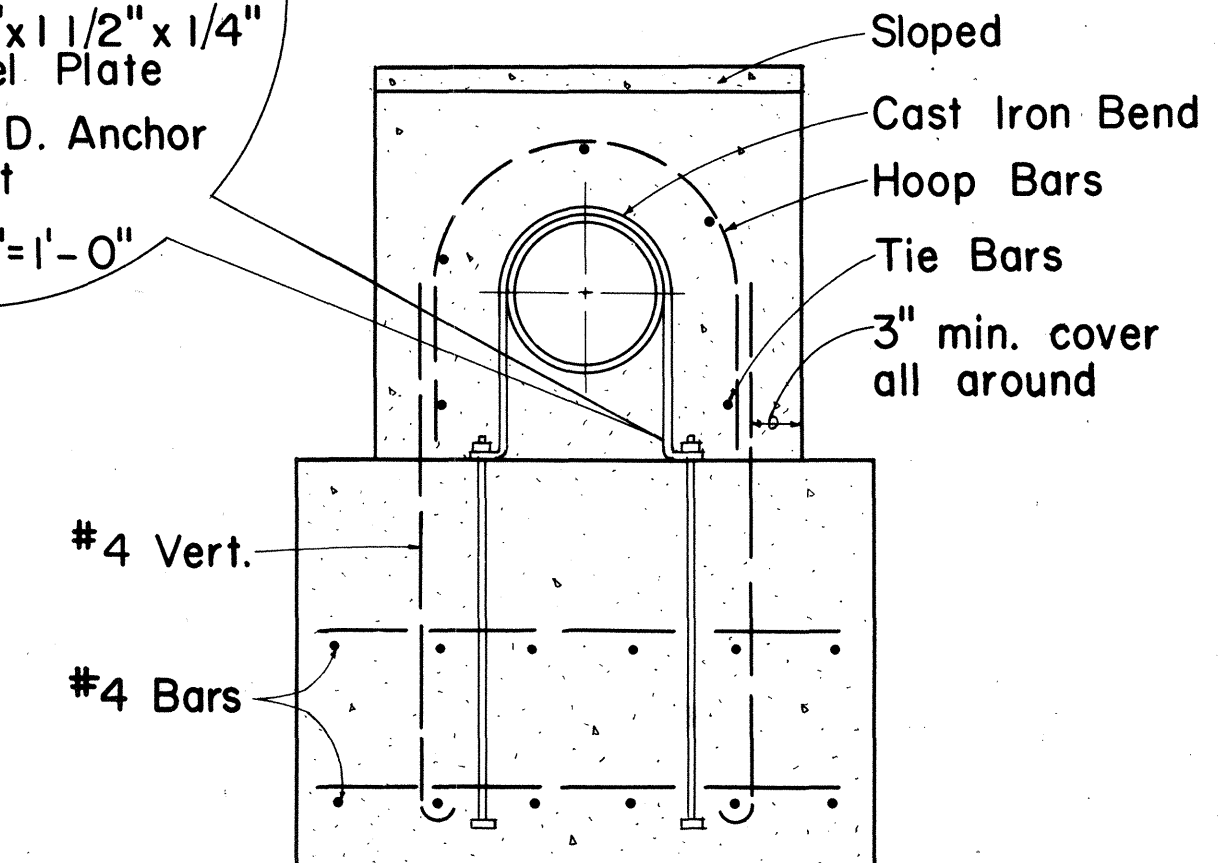
SECTION D

DETAILS OF CONCRETE BLOCK

Scale: 1" = 1'-0"



ELEVATION



SECTION A

TYPICAL DETAIL OF CONCRETE REACTION BLOCK WITH STRAPS

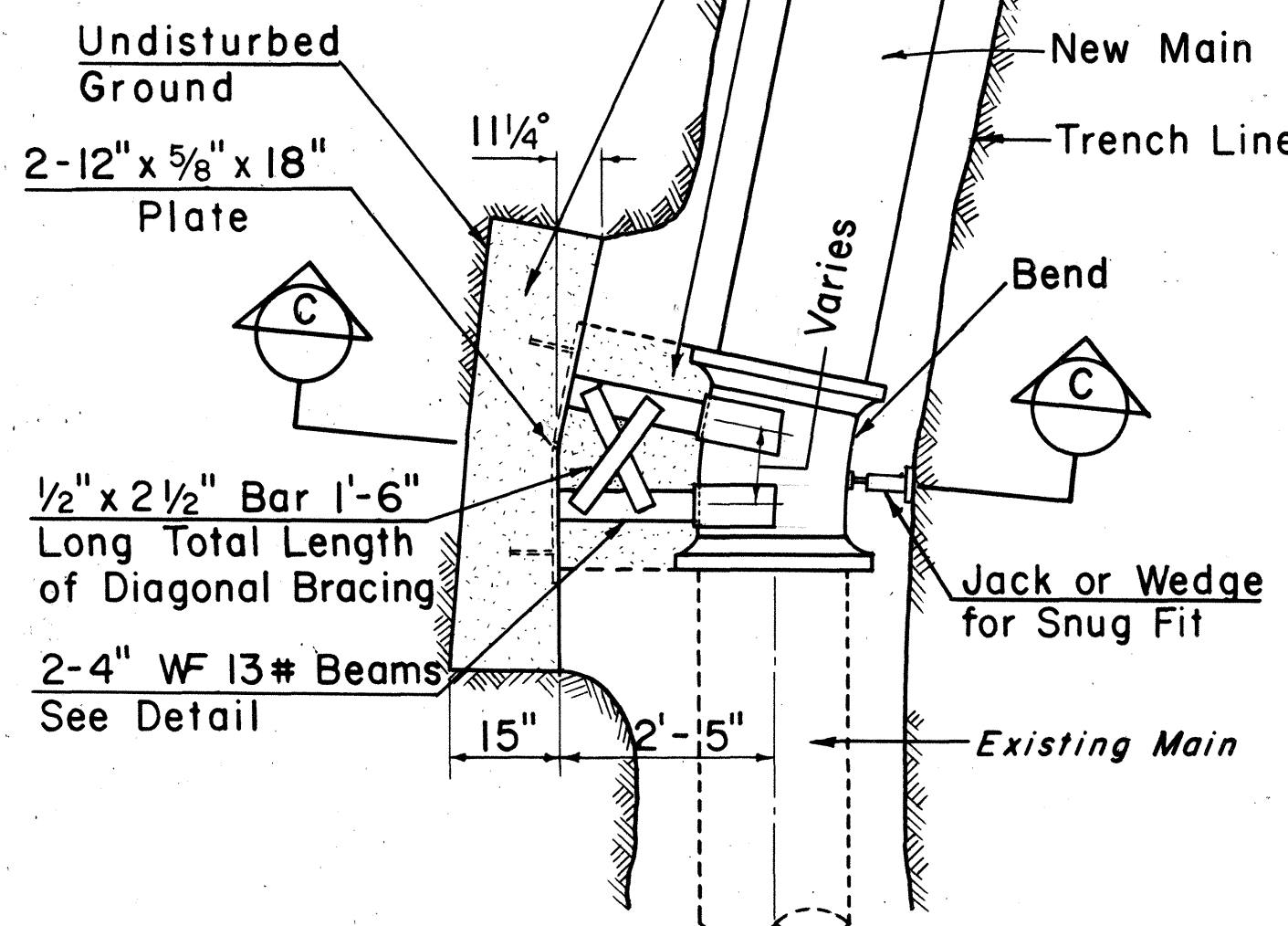
Scale: 3/4" = 1'-0"

GENERAL NOTES:

1. Detail drawings of actual precast blocks and other reaction blocks (not precast) to be used, shall be furnished during construction by B.W.S. and or State.
2. Steel straps, anchor bolts, nuts, washers, etc., furnished and installed by the Contractor will not be paid for directly, but shall be considered incidental to the various contract items for the water system.
3. Minimum cover over all reinforcing steel shall be 3 inches.

Place Class "B-1" Concrete 2500 p.s.i. after connection is completed.

Concrete Block, See Detail (Approx. Conc. Yardage = 0.93 cy.)

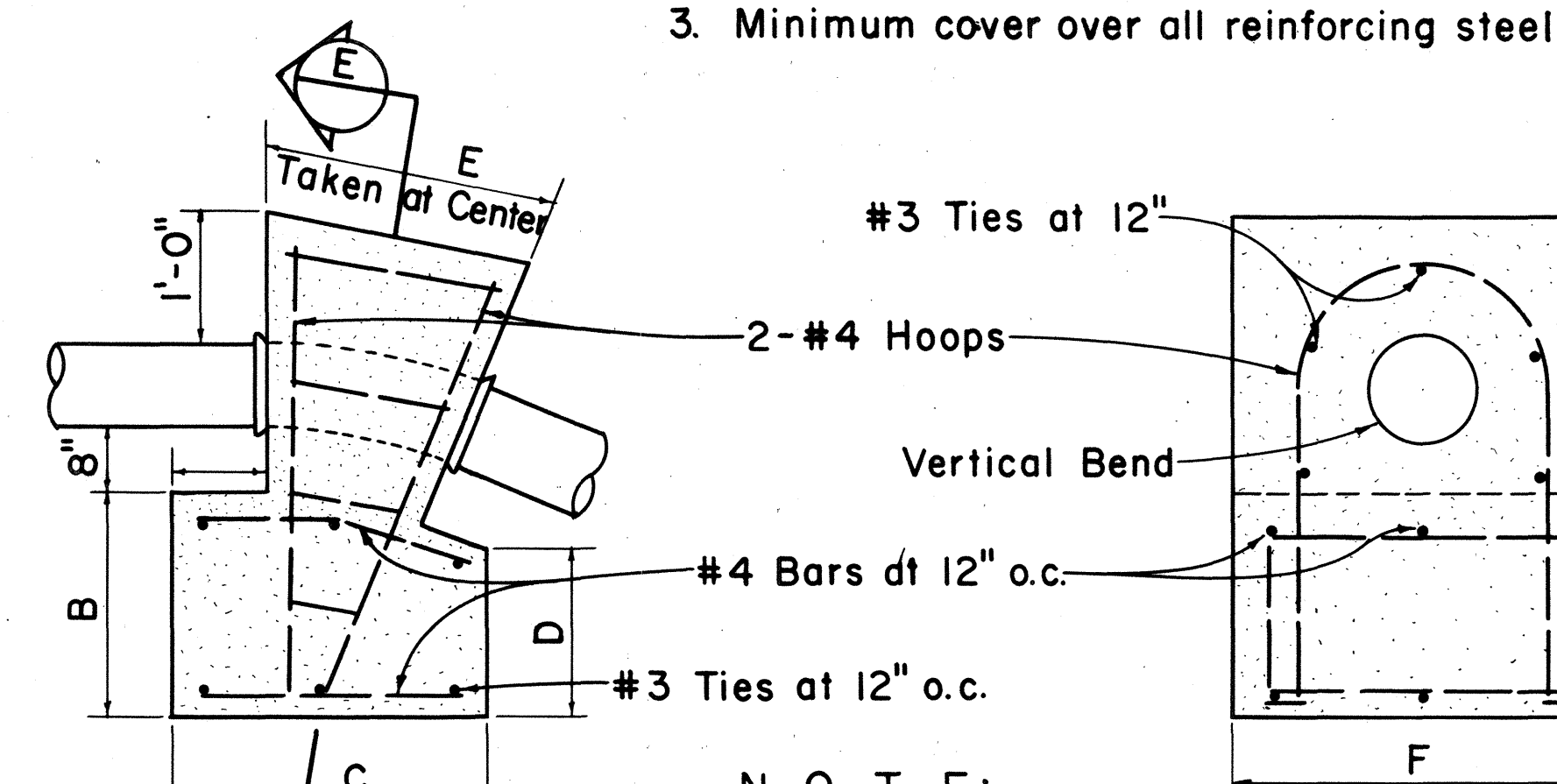


PLAN

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

NOTE:

Concrete Block with structural strut shall be used for bends at connections or for tee connections.



ELEVATION

SECTION E

TYPICAL DETAIL OF REINFORCED CONCRETE REACTION BLOCK FOR TOP VERTICAL BENDS

Scale: Not to Scale

1/16 VERTICAL BENDS, A.W.A.A. 250 p.s.i.							
PIPE SIZE	DIMENSIONS						CU. YDS.
	A	B	C	D	E	F	
8	1'-0"	2'-0"	3'-0"	1'-6"	1'-6"	4'-0"	1 1/4
6	0'-9"	1'-9"	2'-6"	1'-4"	1'-6"	3'-0"	3/4

APPROVED:

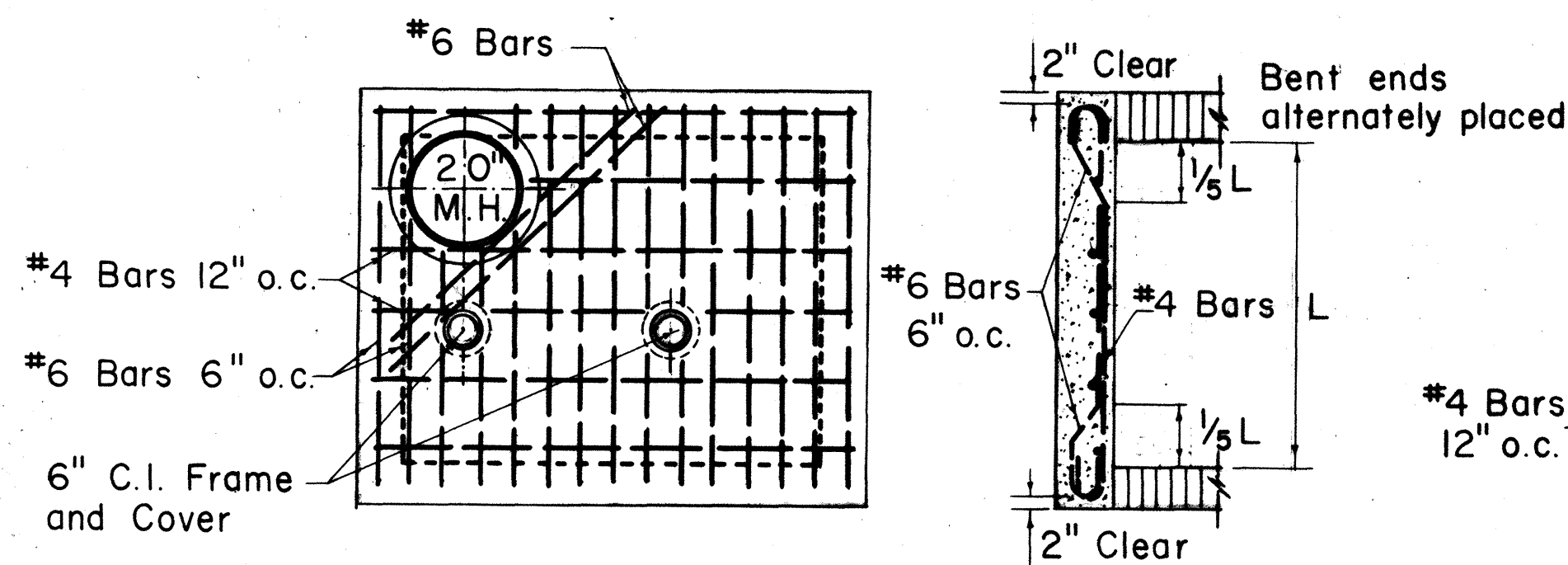
L. Kawakami 10/3/67
CHIEF, ENGINEERING DIVISION
BOARD OF WATER SUPPLY
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU
STANDARD DETAILS

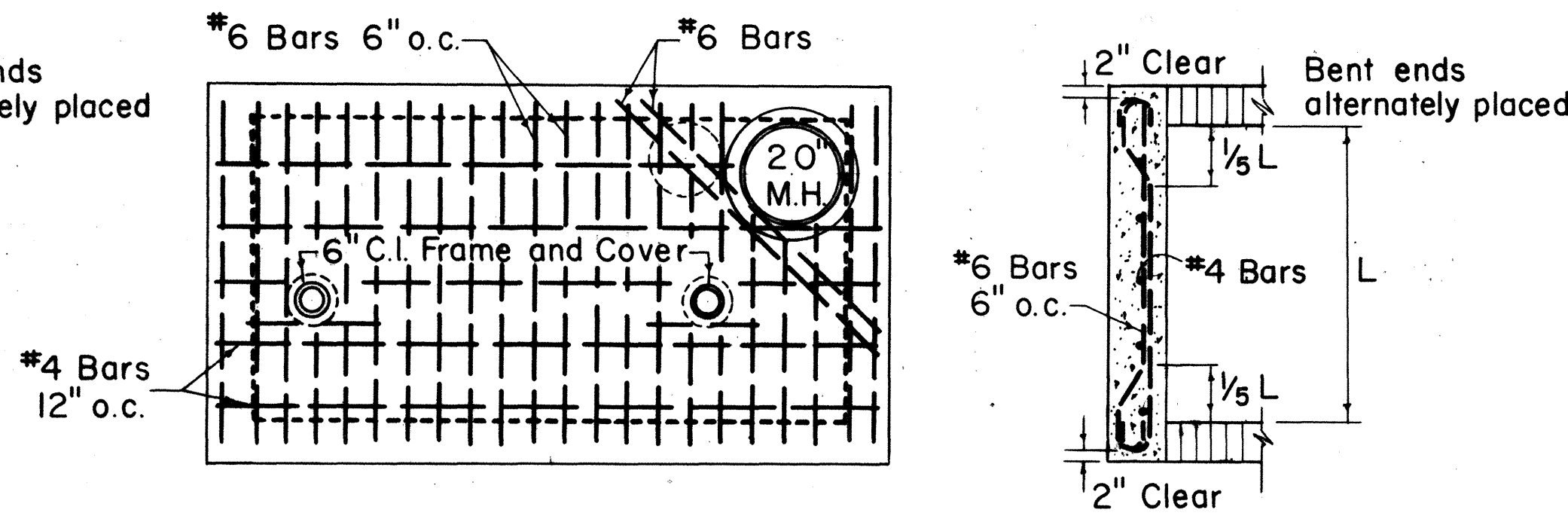
Scale: As Shown

SHEET No. 2 OF 6 SHEETS

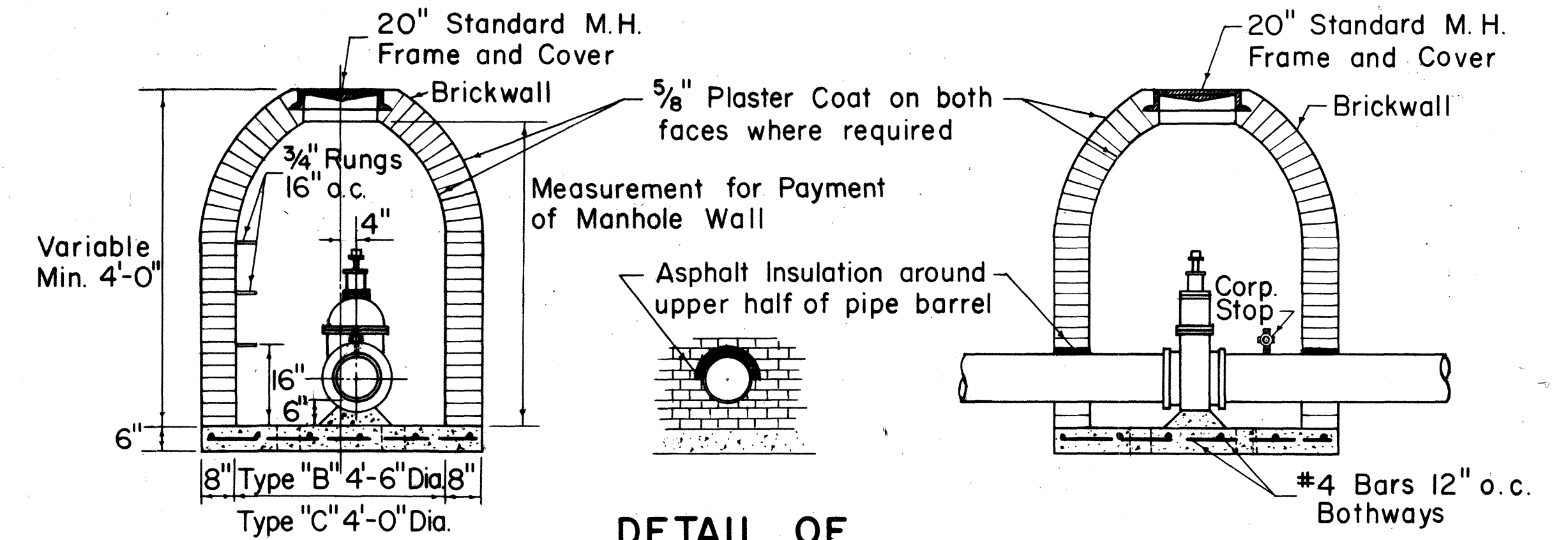
TYPICAL DETAIL OF CONCRETE BLOCK WITH STRUCTURAL STRUT



PLAN OF TOP SLAB

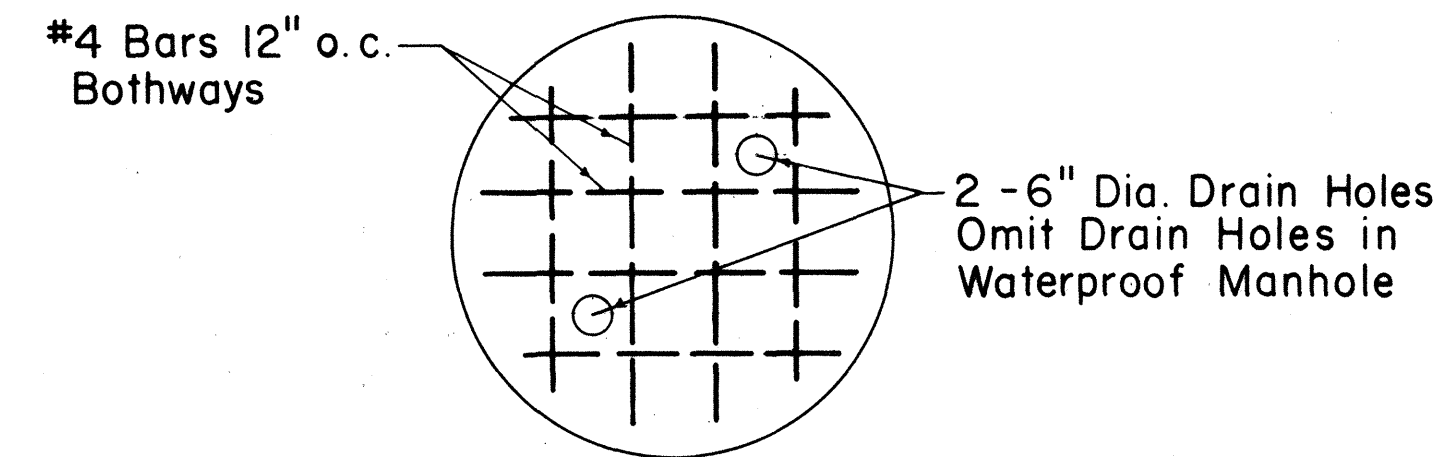
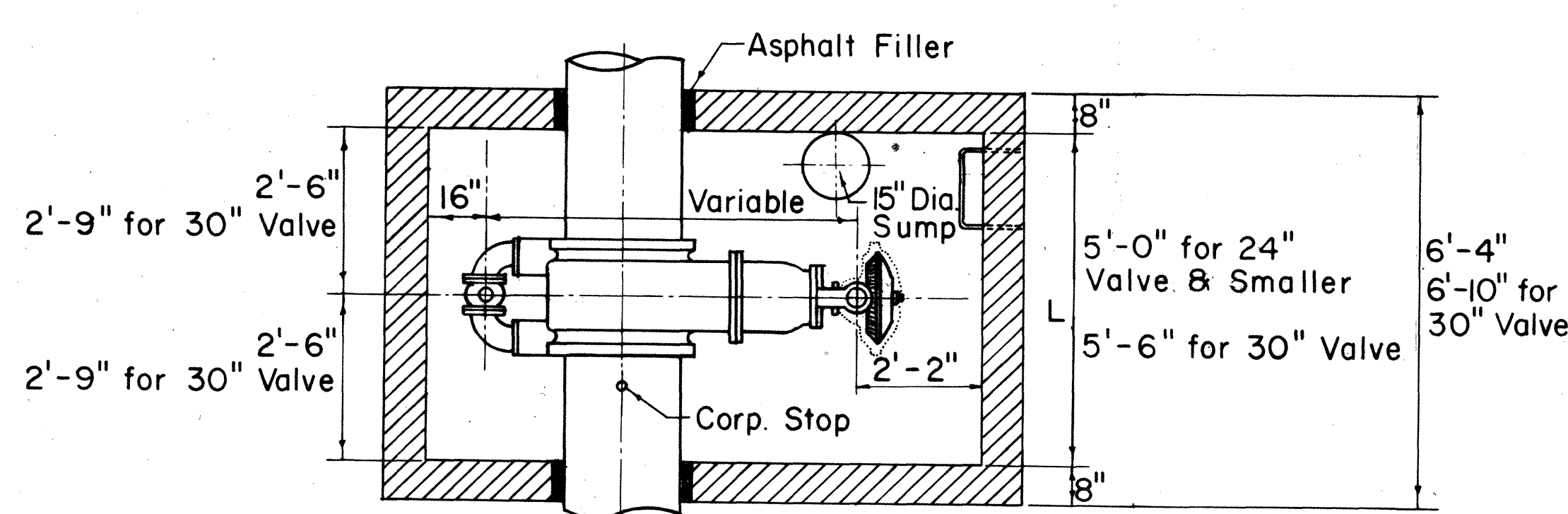
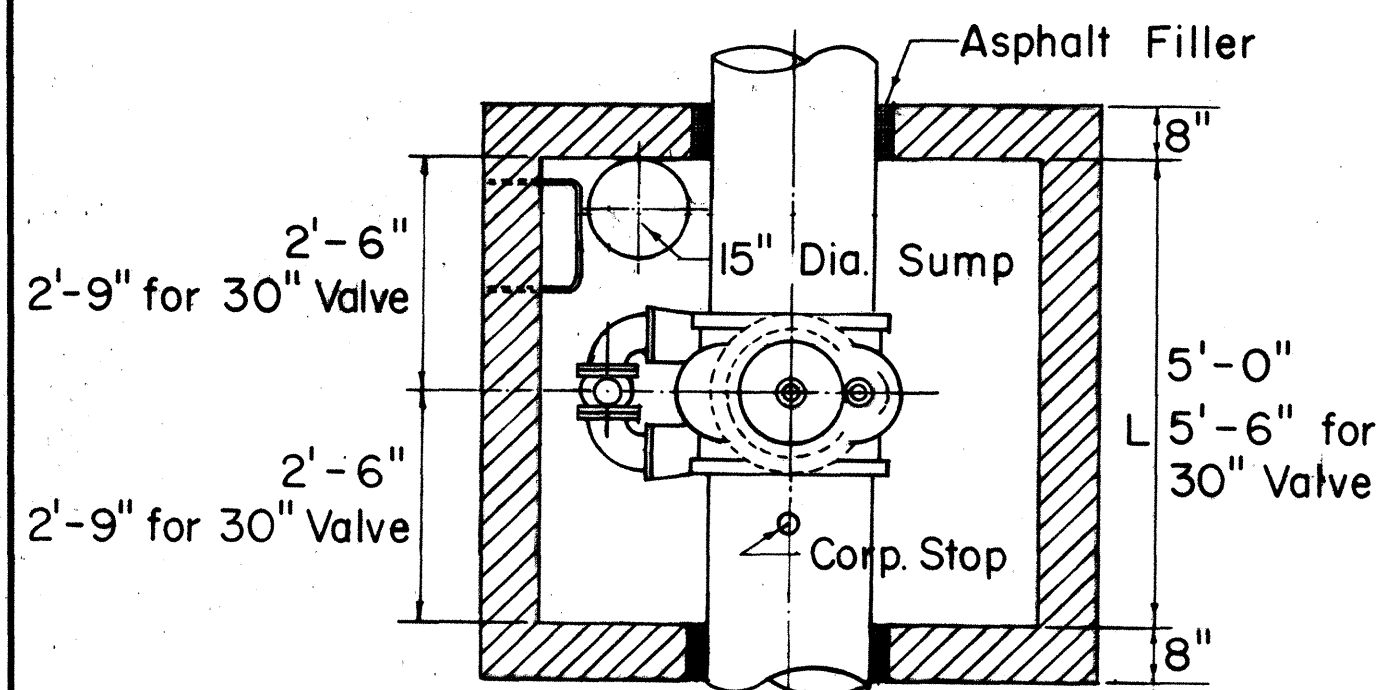


PLAN OF TOP SLAB

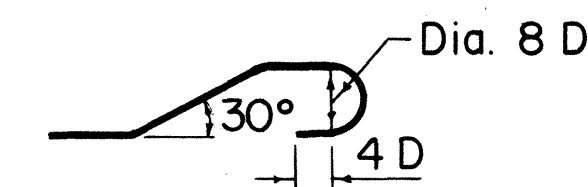


SECTION A-A

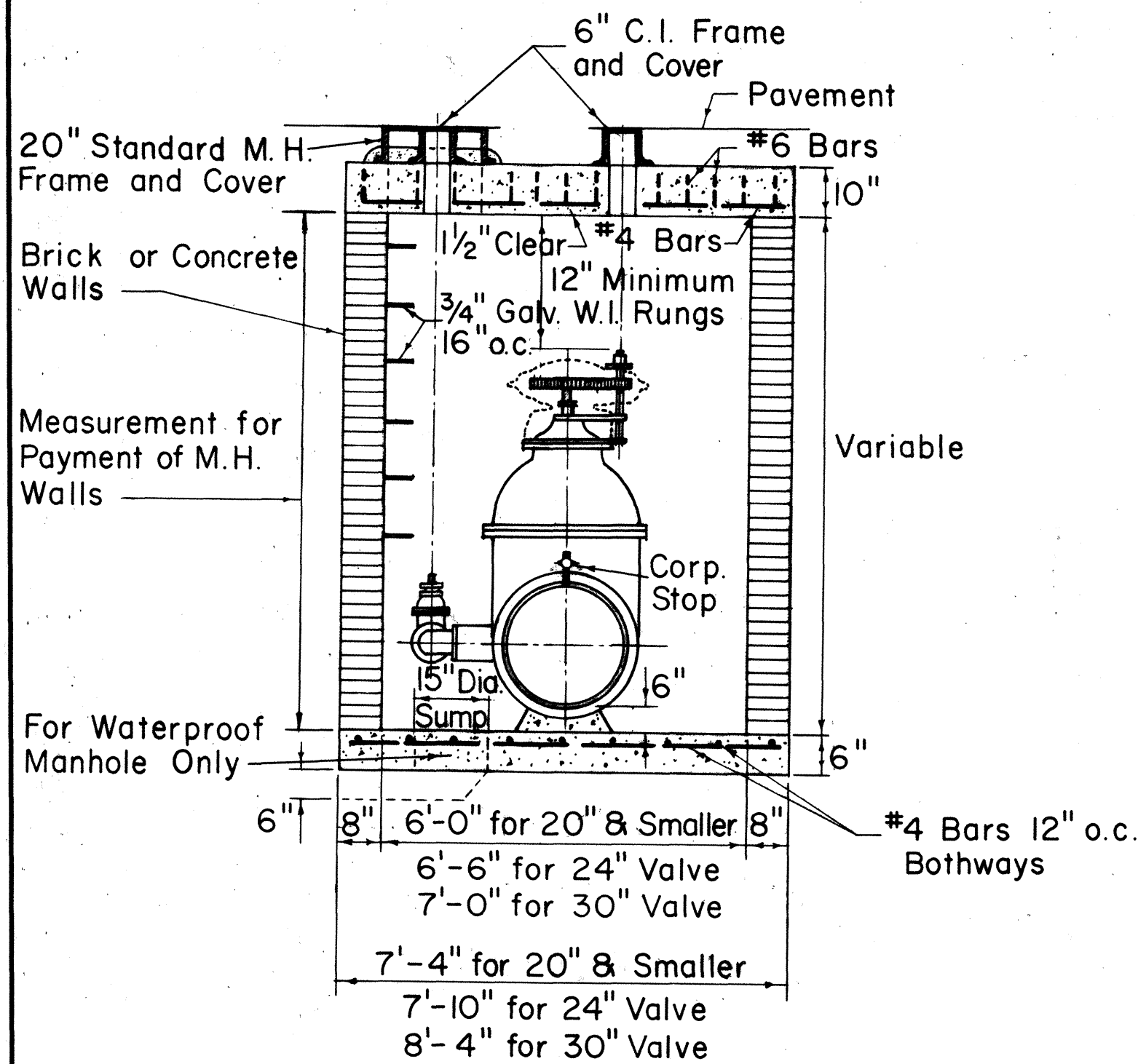
DETAIL OF ASPHALT FILLER



STEEL DETAIL IN BOTTOM SLAB

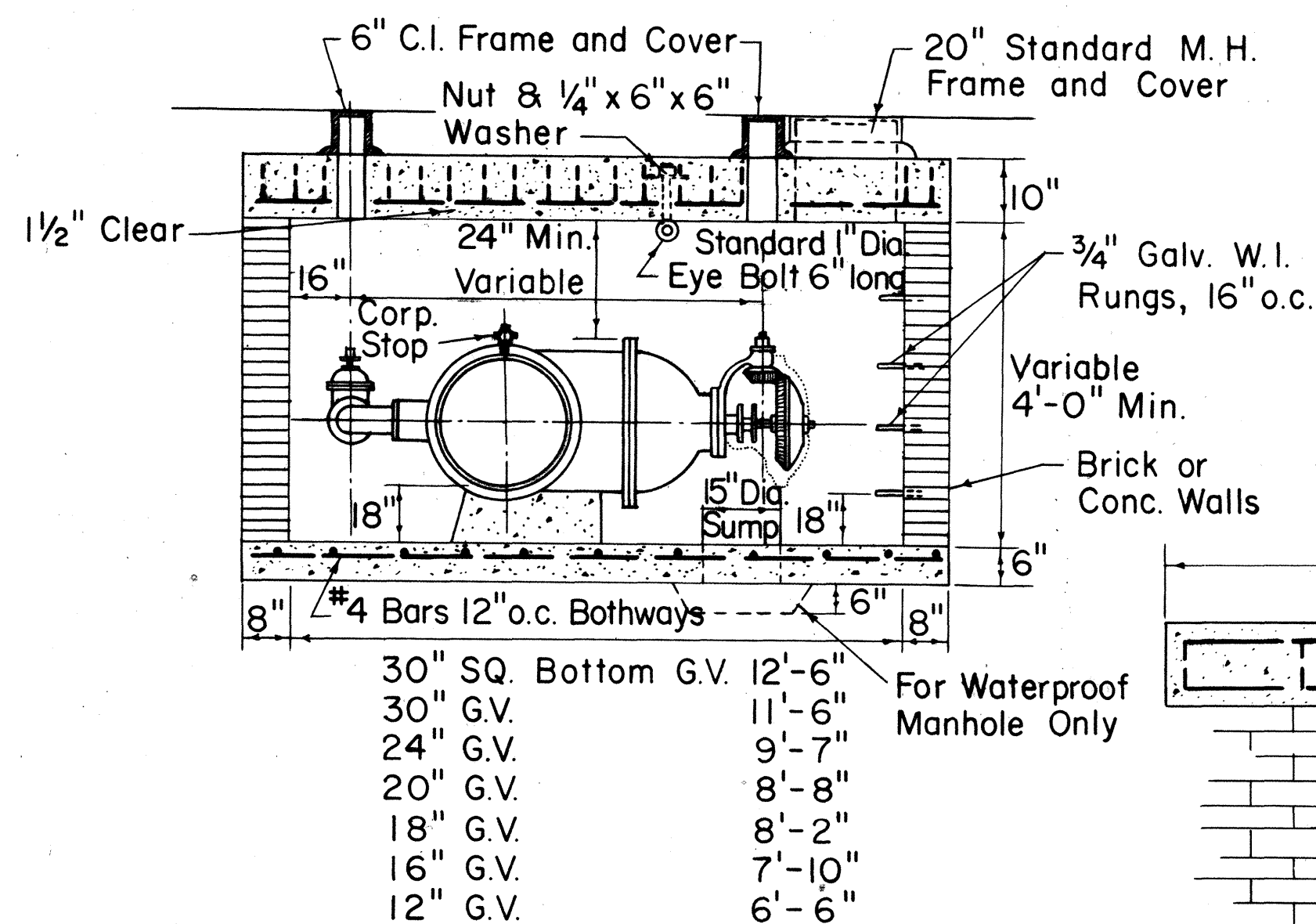


BAR BENDING DETAIL



TYPE "A" MANHOLE

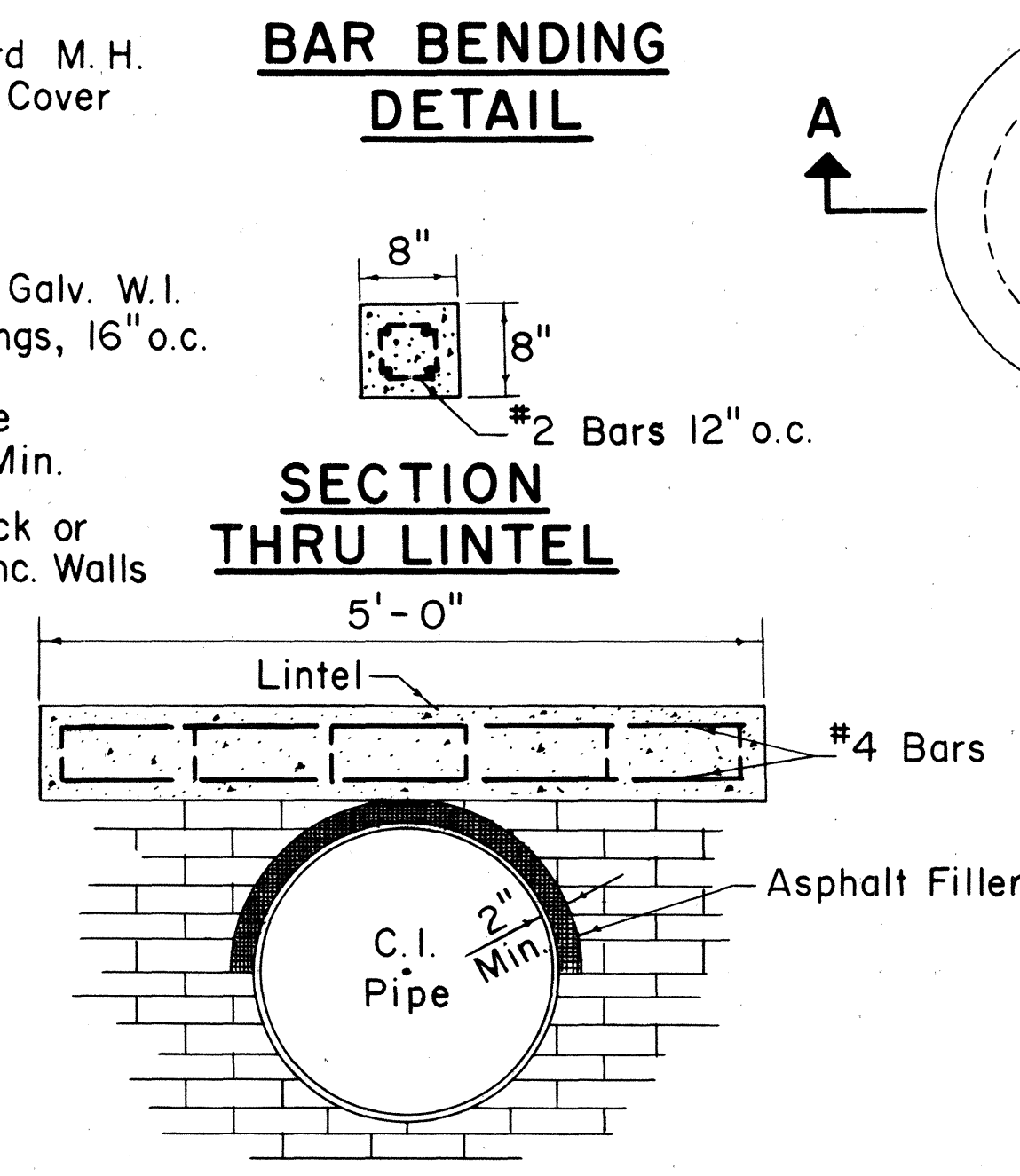
FOR SPUR GEARED GATE VALVES



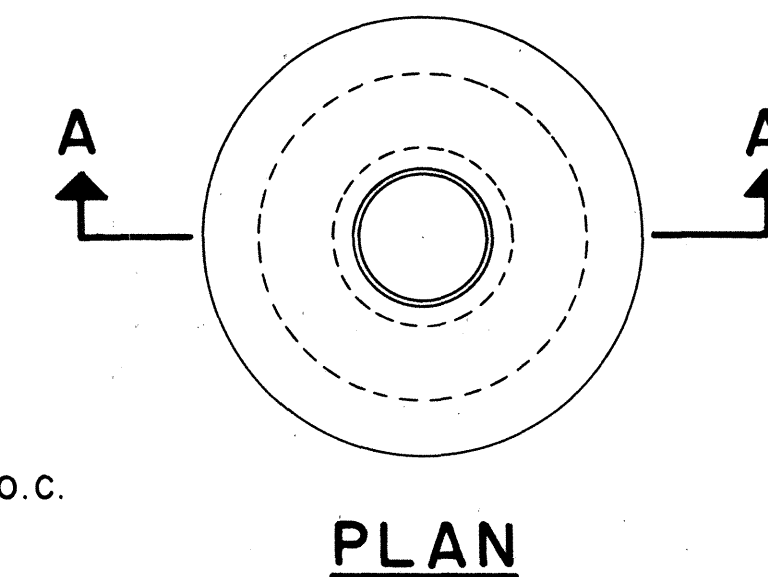
SECTION

TYPE "A" MANHOLE

FOR BEVEL GEARED GATE VALVES



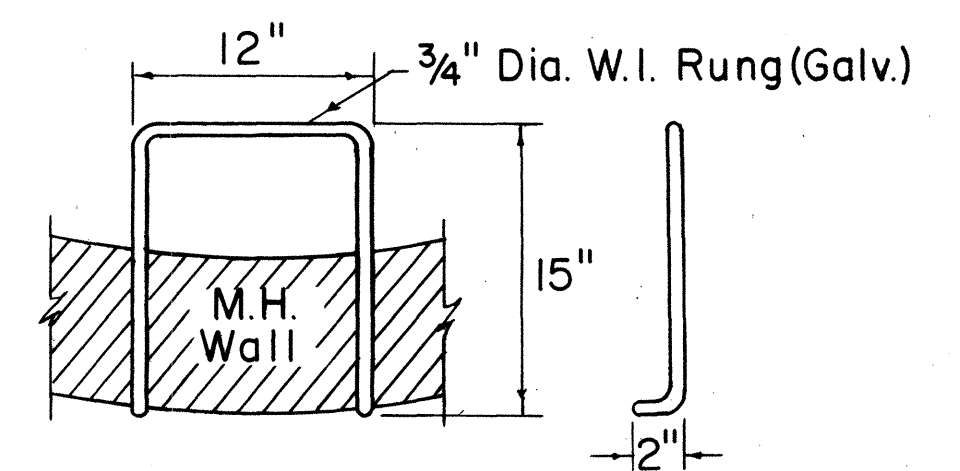
DETAIL OF LINTEL AND ASPHALT FILLER



TYPE "B" AND "C" MANHOLES
TYPE "B" 4'-6" DIA. (FOR 12" G.V.)
TYPE "C" 4'-0" DIA. (FOR 6" & 8" G.V.)

TABLE "A"
REQUIRED CORPORATION STOP SIZES
AT GATE VALVE

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



DETAIL OF RUNG

APPROVED:

S. Kawakami 10/3/67
CHIEF, ENGINEERING DIVISION
BOARD OF WATER SUPPLY

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU

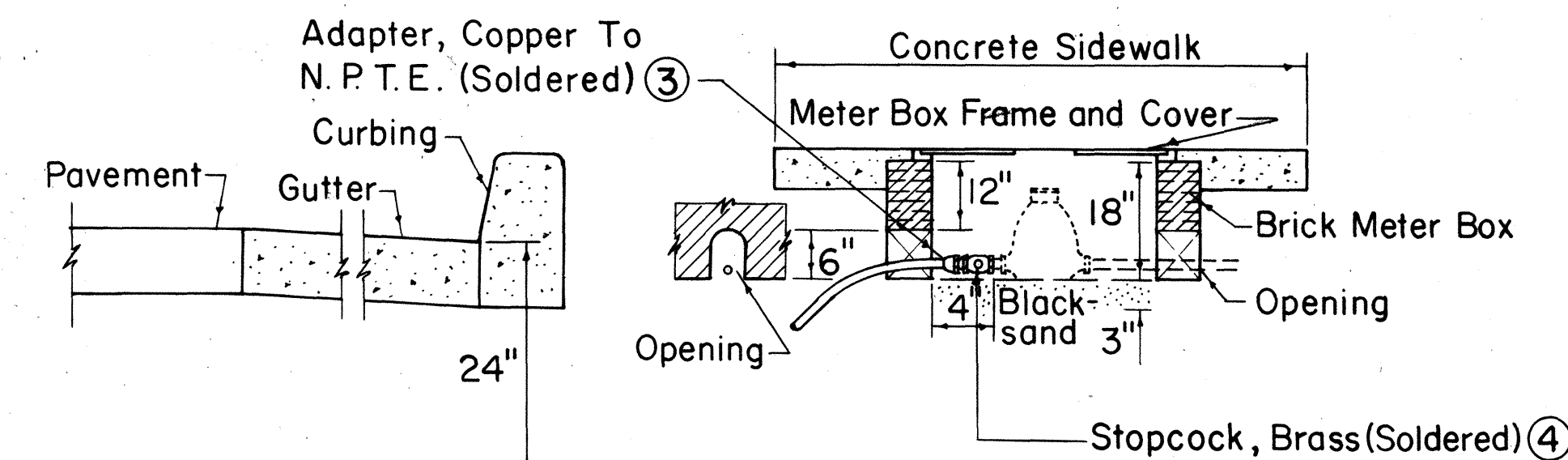
STANDARD DETAILS

Not to Scale Date
SHEET NO. 3 OF 6 SHEETS

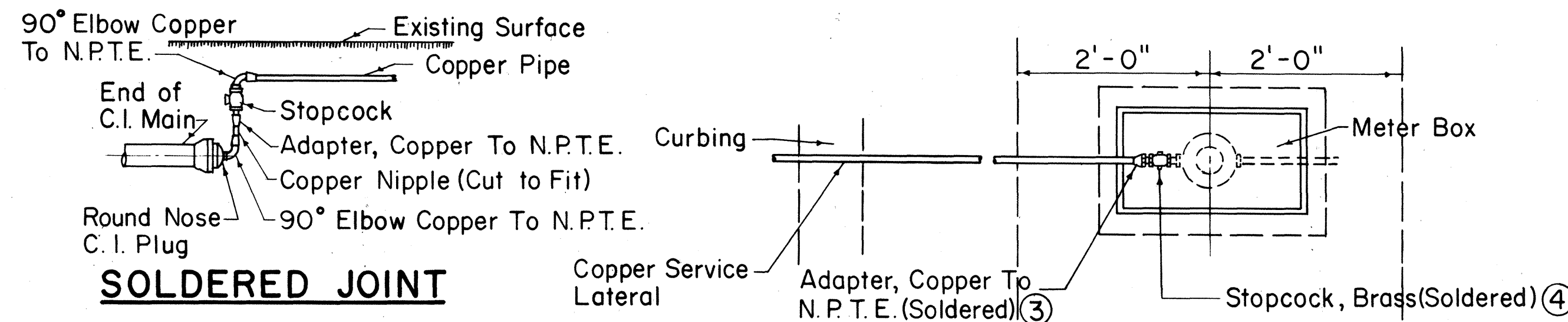
**SCHEDULE OF COPPER FITTINGS
(SOLDERED JOINT)**

ITEM NO.	DESCRIPTION	SINGLE SERVICE CONN.	MULTIPLE SERV. CONN.	
			TWO SERVICES	THREE SERVICES
1	Corporation Stop Brass (H-10003)	1	1	1
2	Ground Joint Union (Style Copper To N.P.T.E. No. C-109)	1	1	1
3	Adapter, Copper To N.P.T.E. (Style No. C-101)	2	1	1
4	Stopcock Brass (BWS Standard)	1	1	1
5	Fitting Adapter, (Style Fitting To N.P.T.E. No. C-104)	—	1	1
6	Tee, Copper To Copper To Copper (Style No. T-300)	—	1	1
7	Bushings, Fitting To Copper (Style No. C-103)	—	2	2
8	90° Elbow, Copper To Copper (Style No. C-200)	—	2	2
9	Adapter, Copper To N.P.T.E. (Style No. C-101)	1	2	3
10	Stopcock Brass (BWS Standard)	1	2	3
11	Reducing Tee, Copper To Copper To Copper (Substitute For Items Number 6 and 7). (Style No. T-300)	—	1	1
12	Tee, Copper To Copper To Copper (Style No. T-300)	—	—	1
13	Bushing, Fitting To Copper (Style No. C-103)	—	—	1
14	Reducing Tee, Copper To Copper To Copper (Substitute For Items Number 12 and 13) (Style No. T-300)	—	—	1

NOTE:
Reference Numbers shown thus (H-10003) are from Mueller Co. Catalog "H" and (Style No. T-300) are from Mueller Brass Co. "Streamline" Catalog S-354. Approved Equal may be used.

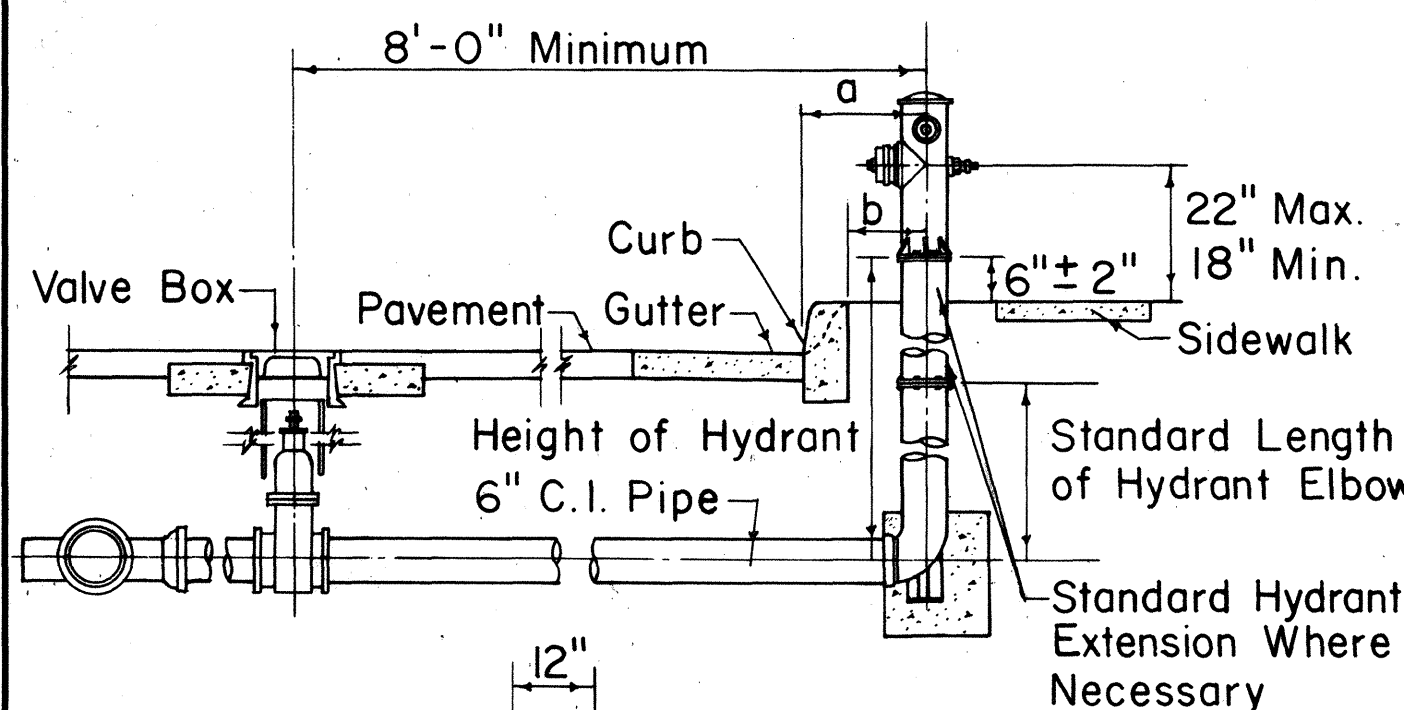


LONGITUDINAL SECTION



SOLDERED JOINT

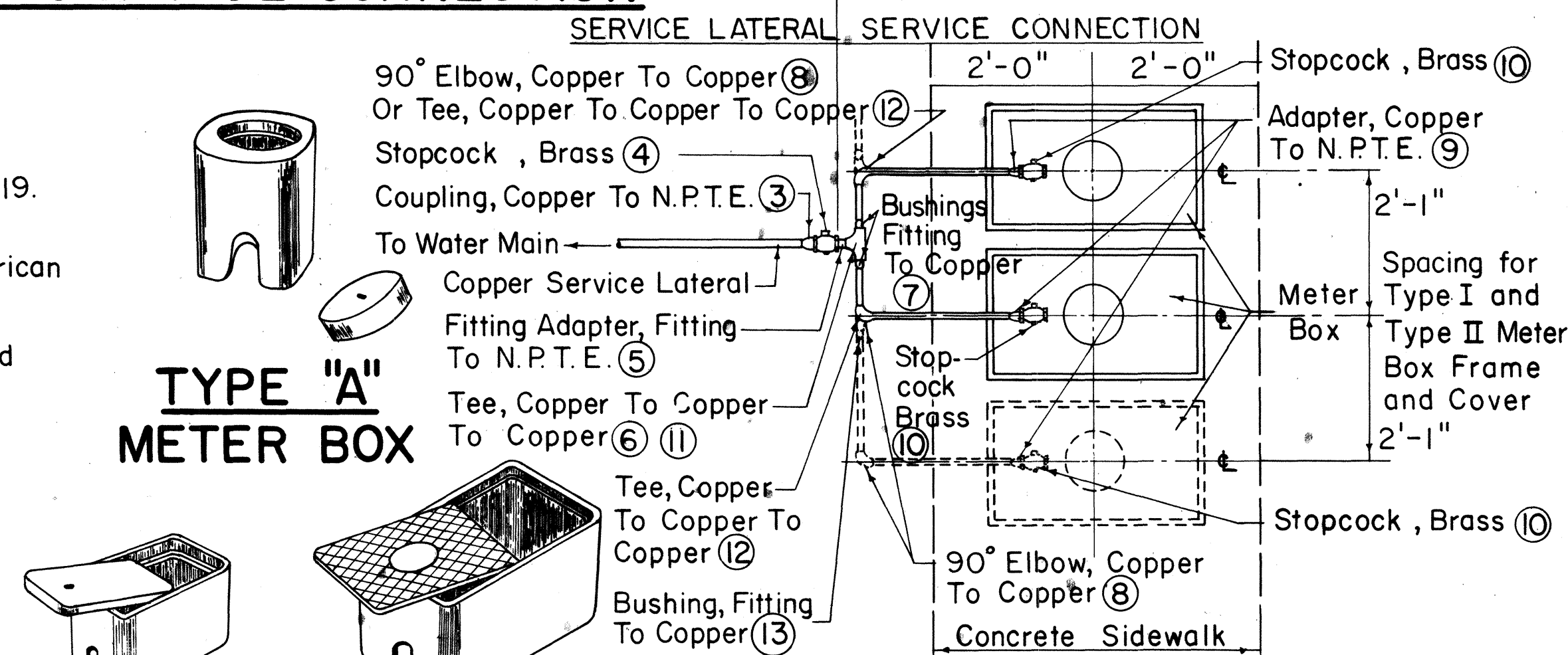
SERVICE LATERAL CONNECTION AT END OF LINE



a	20" Min. (Standard Curb)
b	20" Min. (Roll Curb)

NOTE:
Gaskets for flanged joints shall be 1/6 inch duck-inserted rubber packing Garlock No. 19. Bolts shall be 5/8" diameter x 2 3/4" long steel machine bolts with cut threads, American Standard heavy hexagon heads, galvanized. Nuts shall be American Standard heavy cold punched hexagon nuts, galvanized.

SINGLE SERVICE CONNECTION



TYPE "A" METER BOX

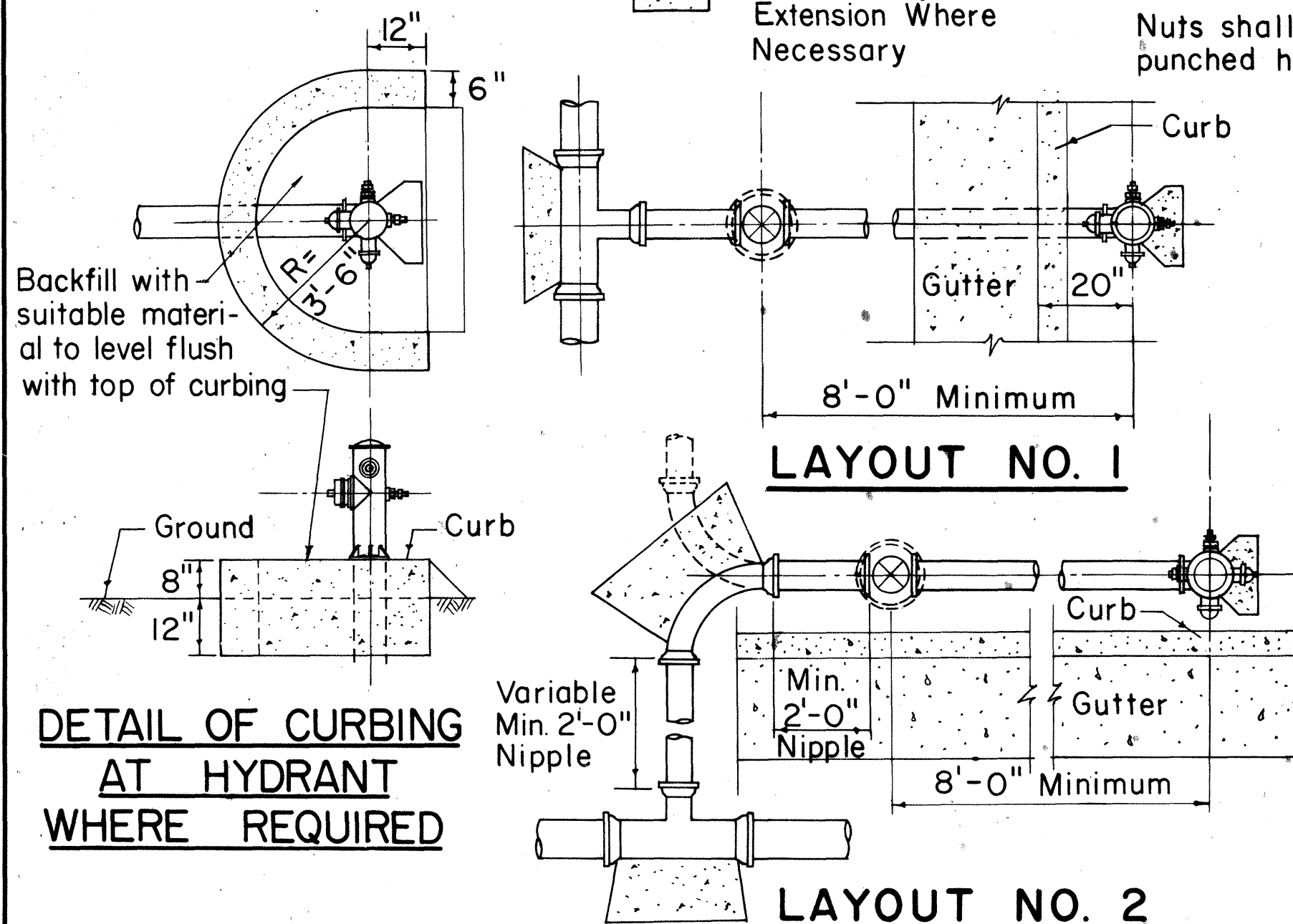
TYPE "B" METER BOX

TYPE "X" METER BOX

**MULTIPLE SERVICE CONNECTION
SOLDERED JOINTS**

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



**DETAIL OF CURBING
AT HYDRANT
WHERE REQUIRED**

STANDARD FIRE HYDRANT LAYOUT

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" 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"
X		14 1/2" x 23 1/2"	16" x 25"	143 lbs.	13 1/8" x 22 1/8"

APPROVED:

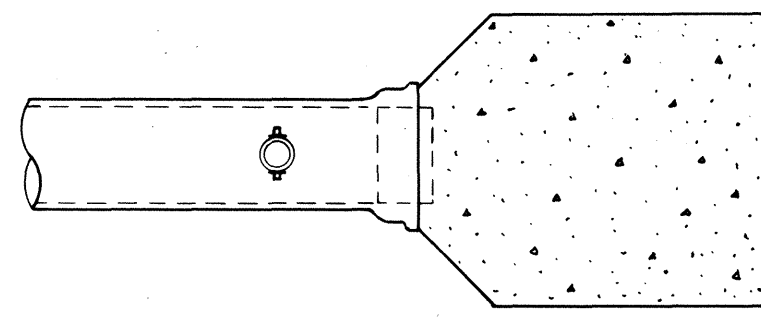
S. Kawakami 10/3/67
CHIEF, ENGINEERING DIVISION
BOARD OF WATER SUPPLY

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU

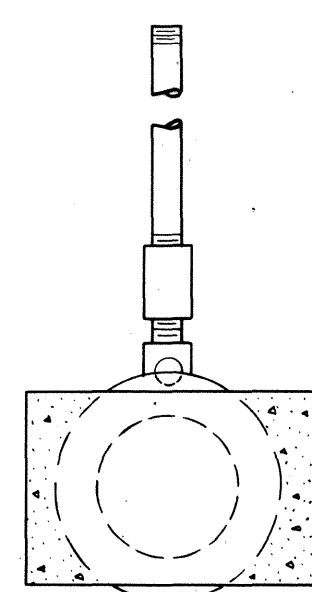
STANDARD DETAILS
Not to Scale
Date

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII		1968	65	95
PROJECT NO. B-900-01-64 UNIT II					

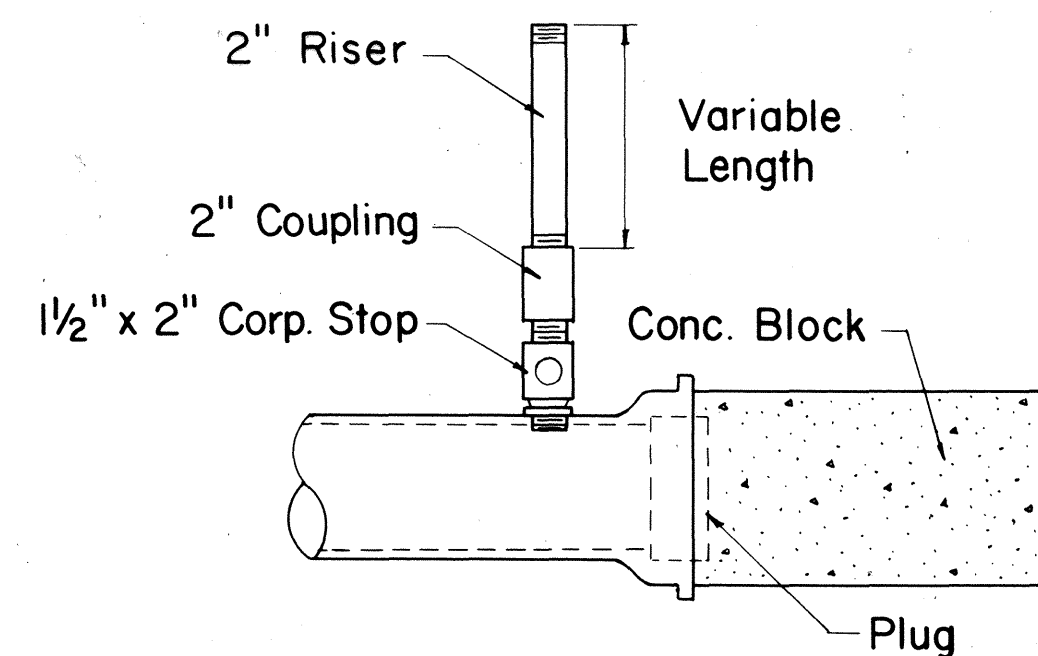
NOTE:
Contractor to furnish 1 1/2" brass plug (Tapered thread) to replace corporation stop upon completion of chlorination.



TOP VIEW

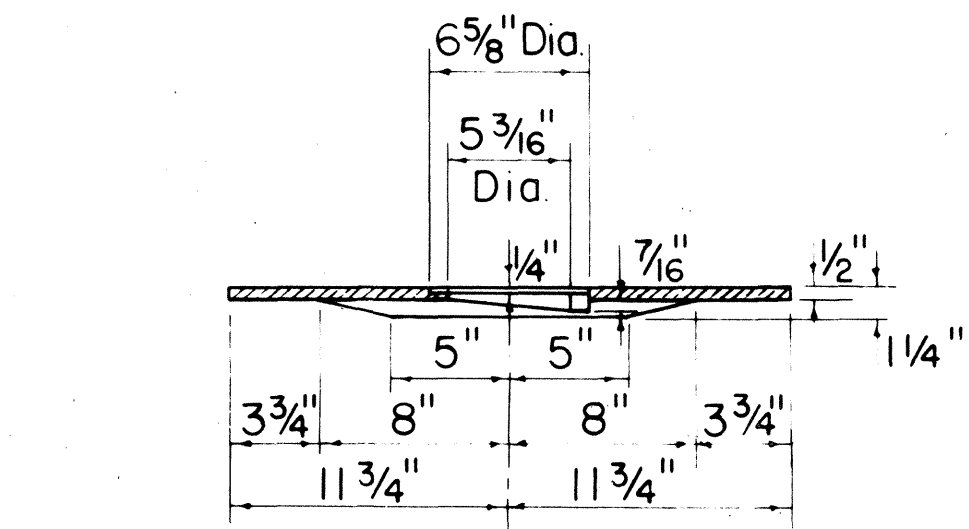
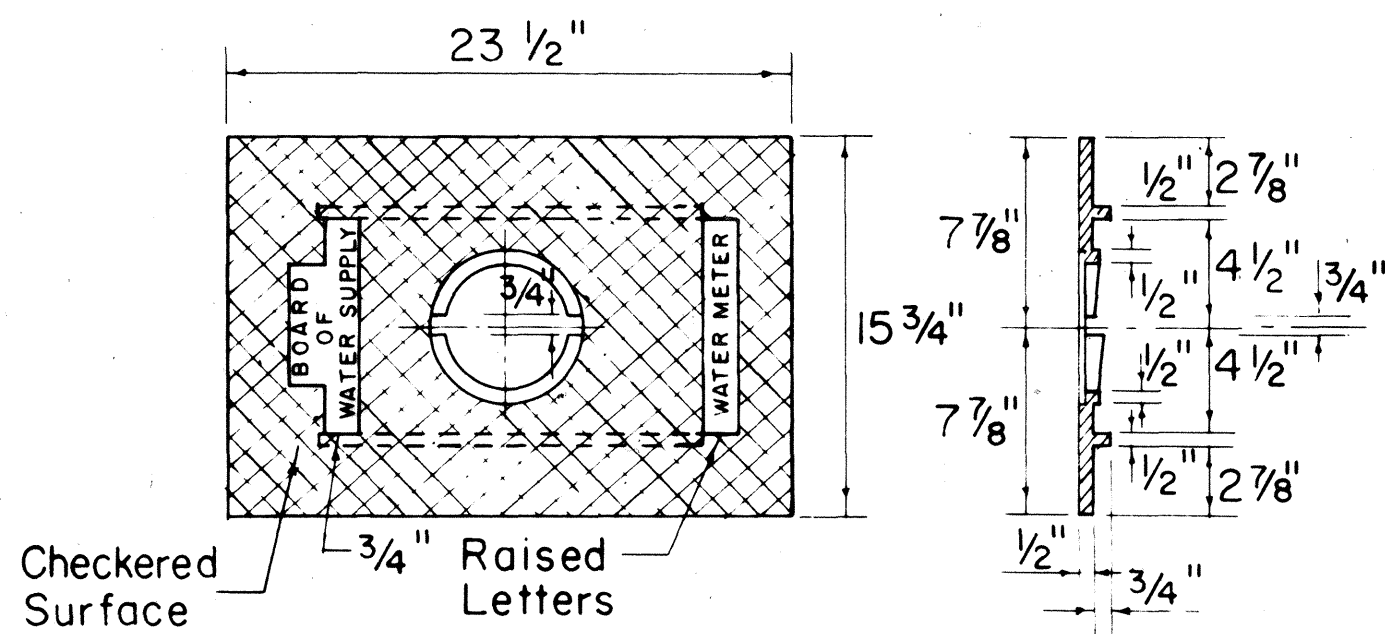


END VIEW

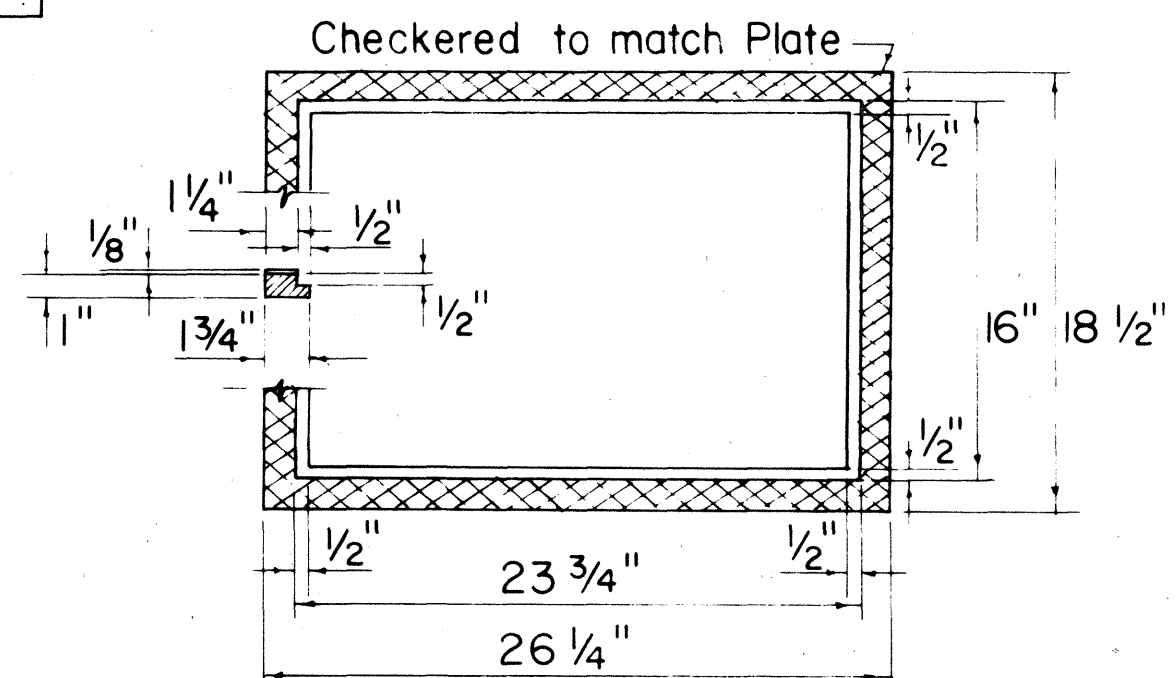


SIDE VIEW

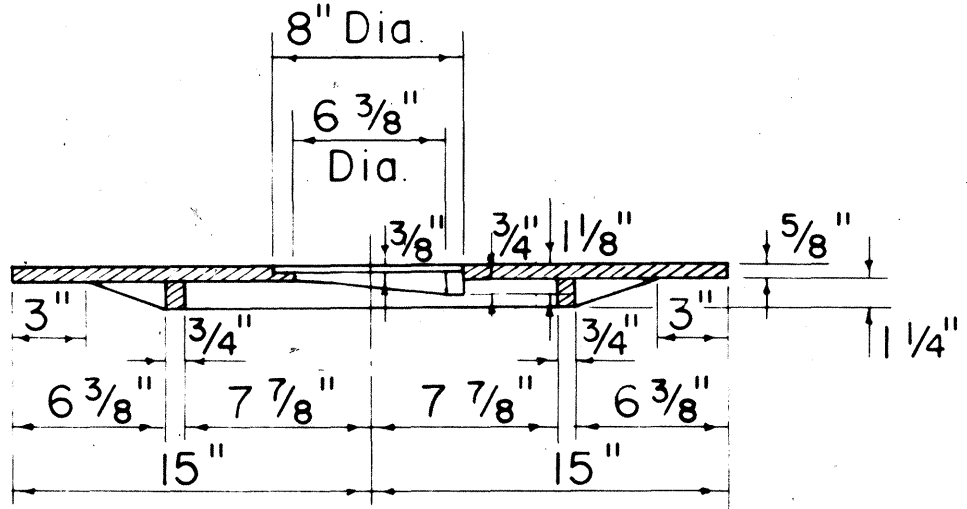
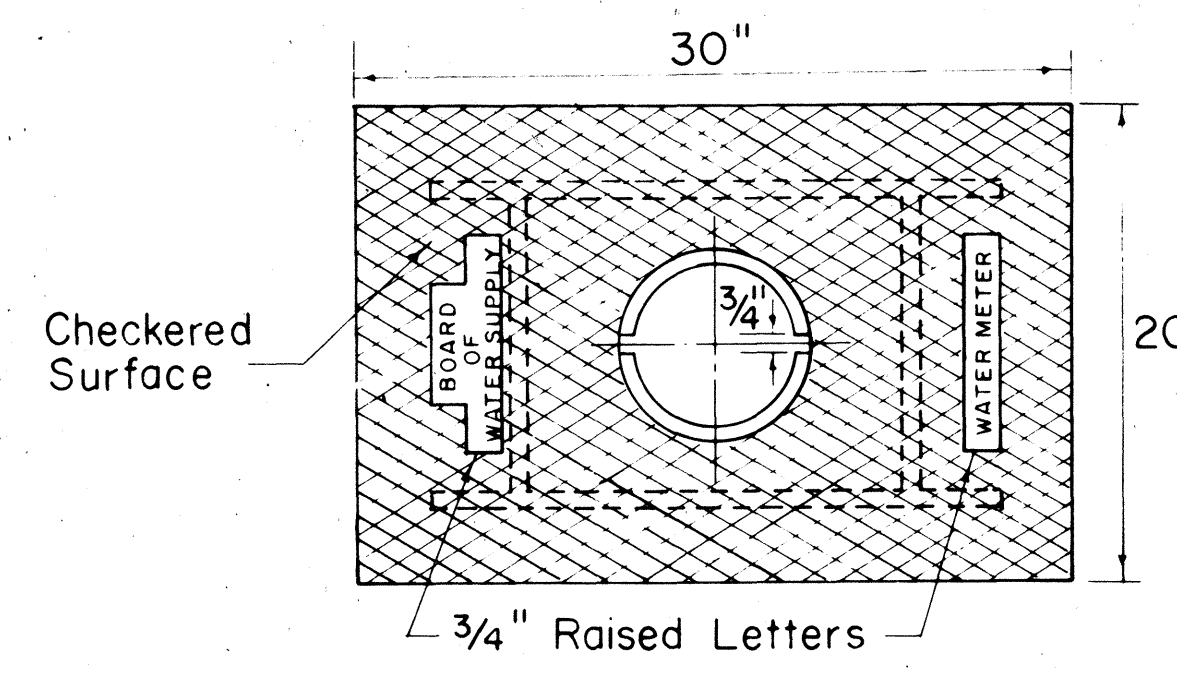
DETAIL OF
TEMPORARY 2" CLEANOUT
Not to Scale



COVER PLATE

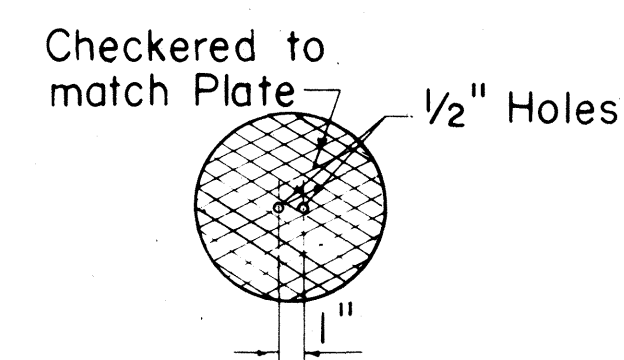


FRAME
CAST IRON FRAME AND PLATE
TYPE II
Scale: 1 1/2" = 1'-0"



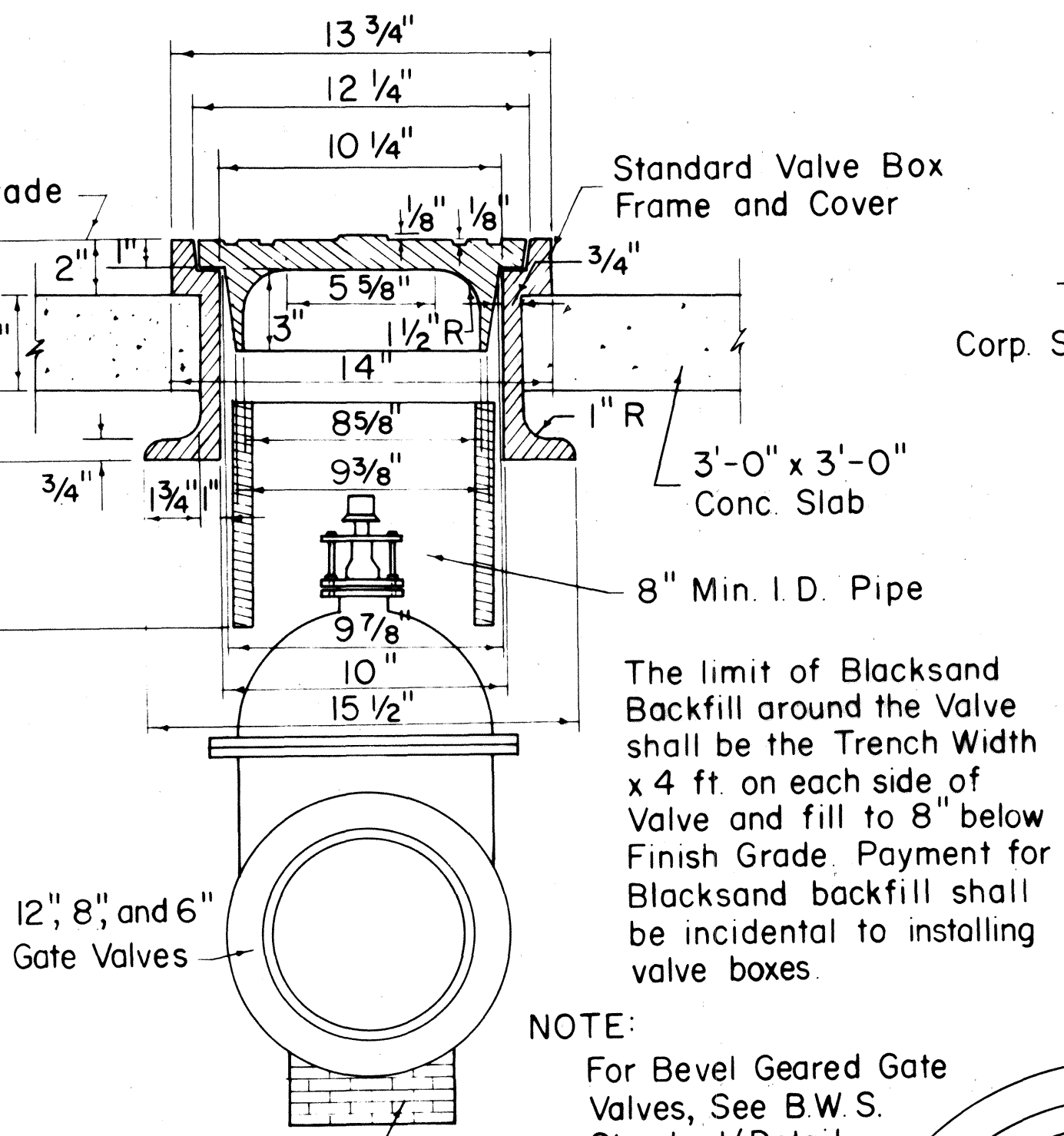
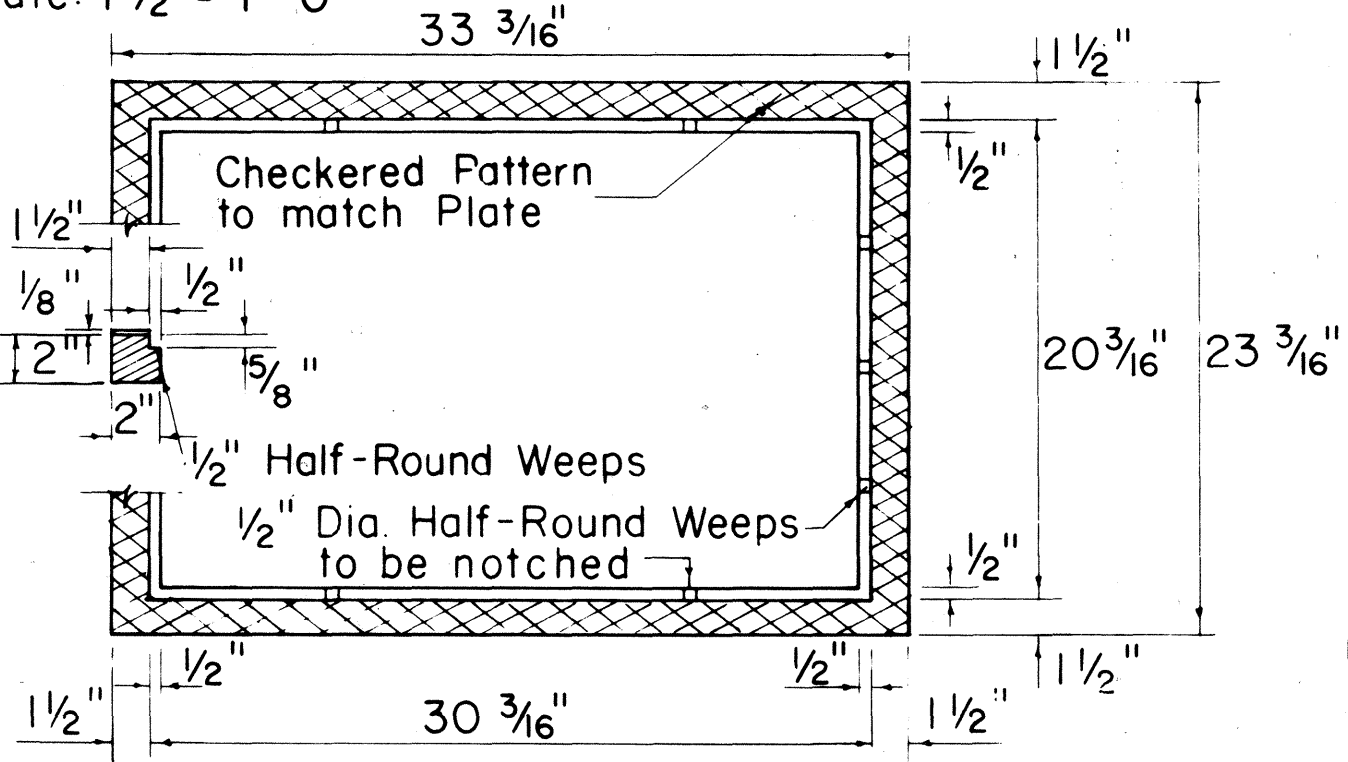
COVER PLATE

CAST IRON FRAME, PLATE AND COVER
TYPE III
Scale: 1 1/2" = 1'-0"



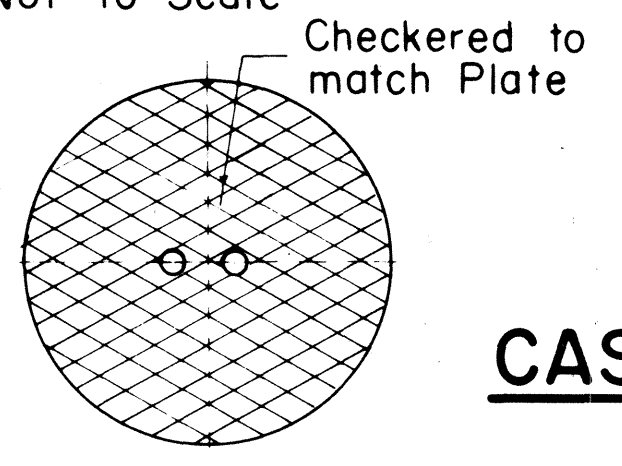
READING COVER

FRAME



NOTE:
For Bevel Geared Gate Valves, See B.W.S. Standard (Detail Sheet filed in B.W.S. Engr. Division)

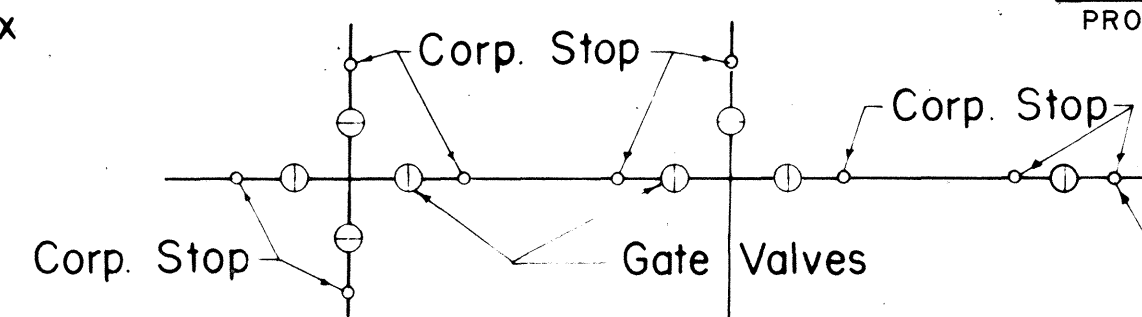
INSTALLATION OF VALVE
BOX FOR GATE VALVES
Not to Scale



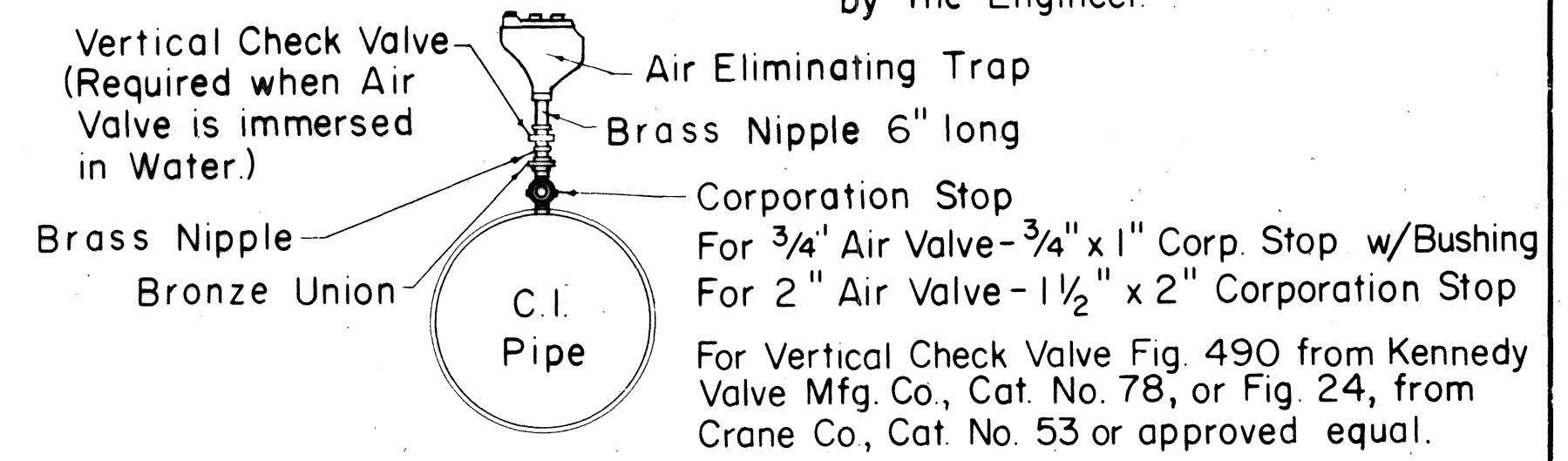
READING COVER

CHECKERED PATTERN

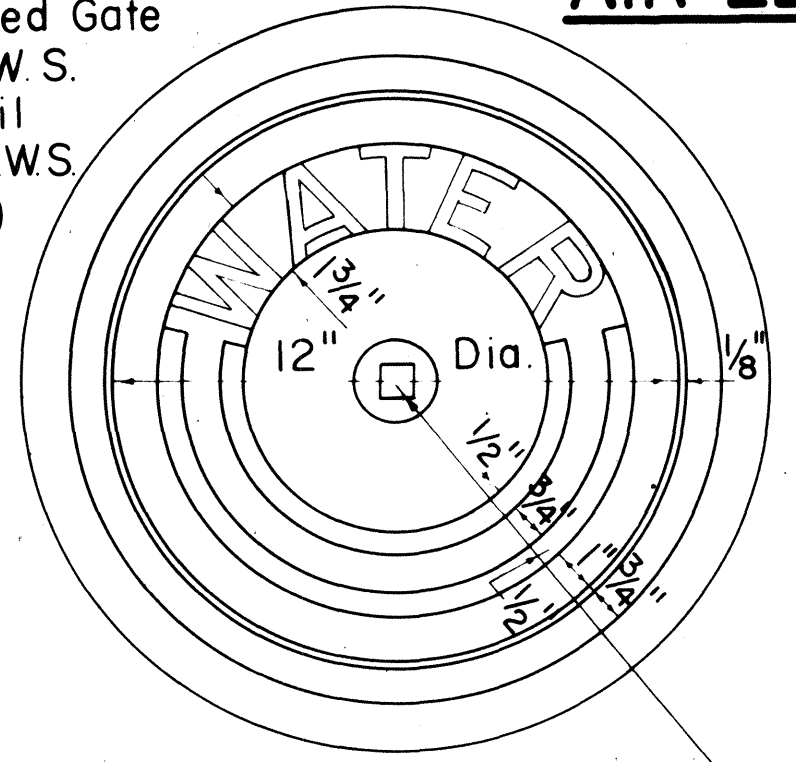
CAST IRON COVER FOR
TYPE II FRAME
Not to Scale



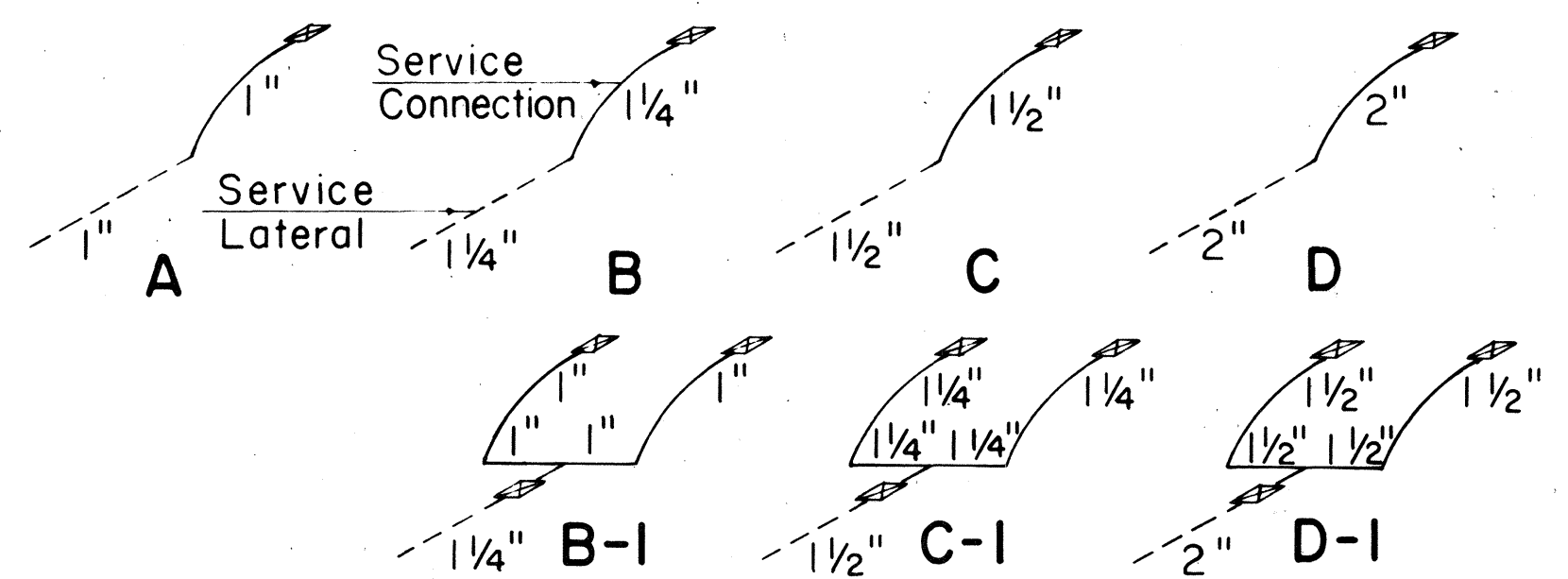
CORP. STOP LAYOUT
Not to Scale



DETAIL OF CONNECTION FOR
AIR ELIMINATING TRAP
Not to Scale



CAST IRON FRAME AND COVER
Scale: 3" = 1'-0"



TYPICAL LAYOUT OF SERVICE
LATERALS AND CONNECTIONS
Not to Scale

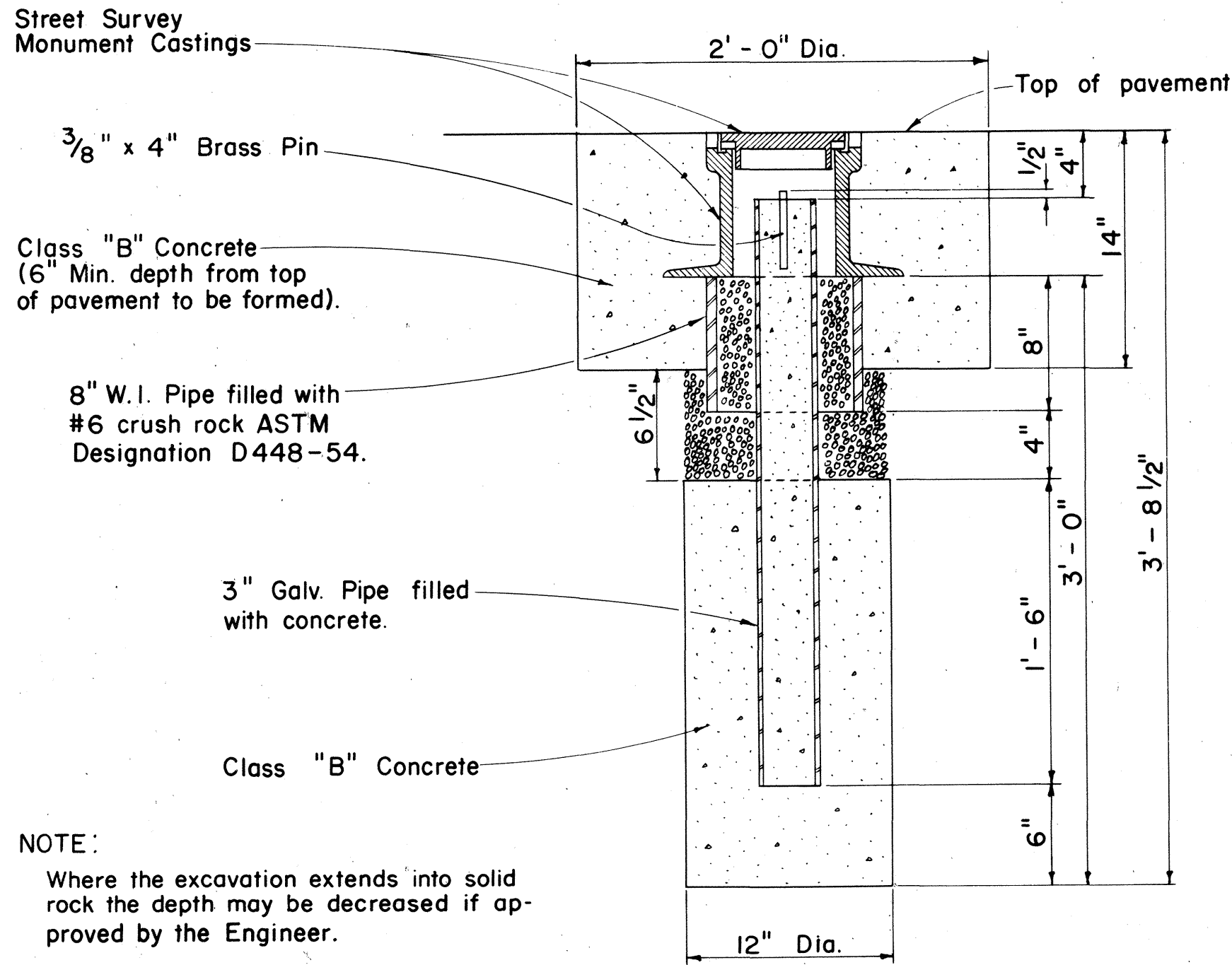
APPROVED:
[Signature] 10/3/67
CHIEF, ENGINEERING DIVISION
BOARD OF WATER SUPPLY

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU

STANDARD DETAILS
Scale: As Noted
Date:

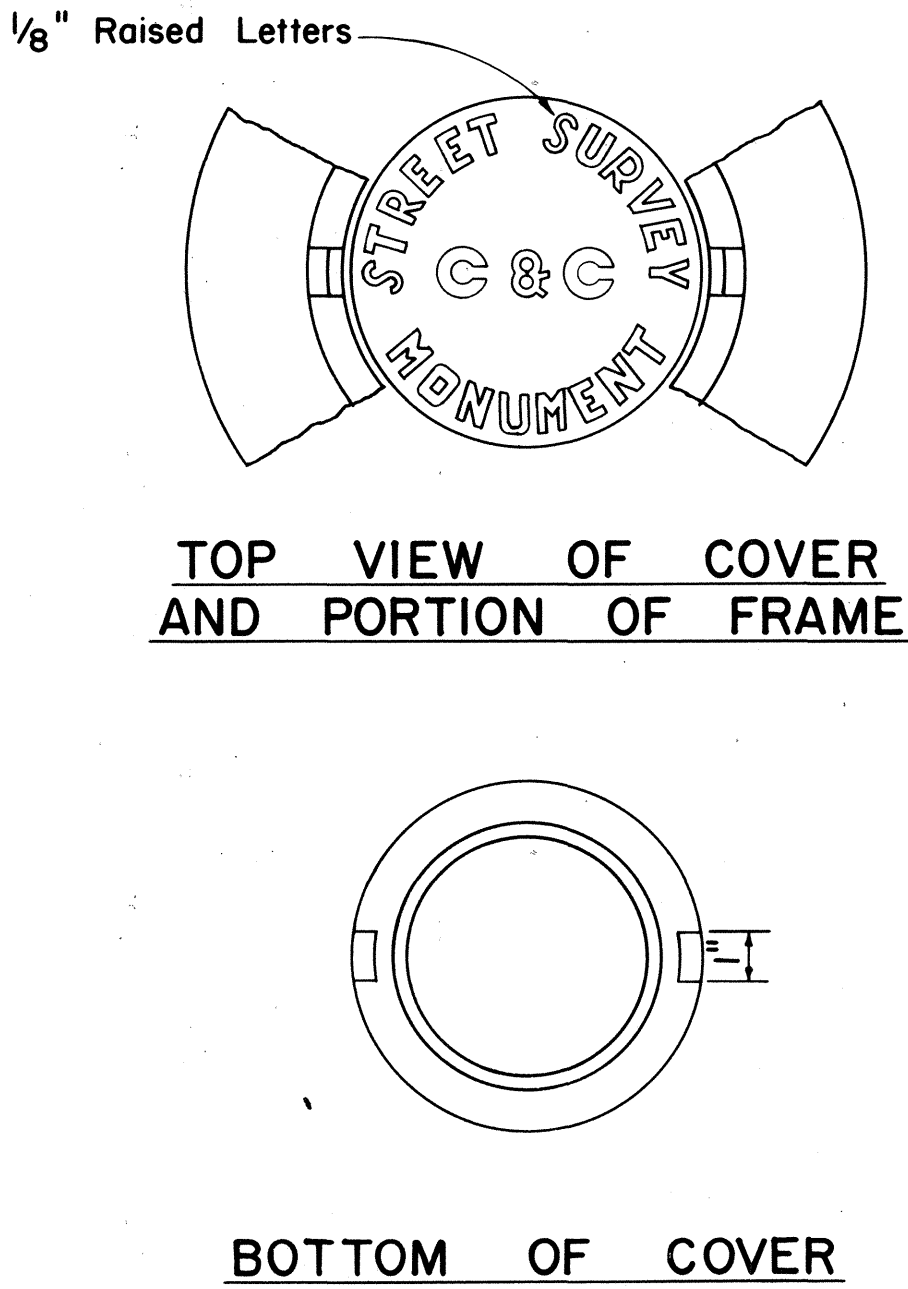
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW		1968	66	95

PROJECT NO. B-900-01-64 UNIT II



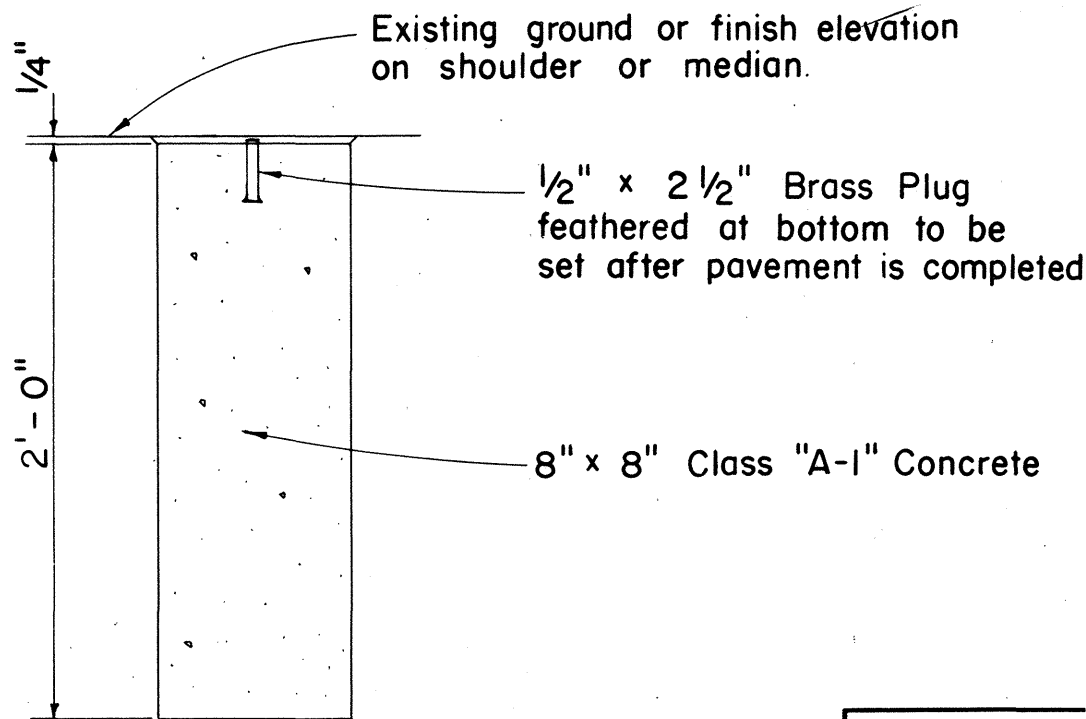
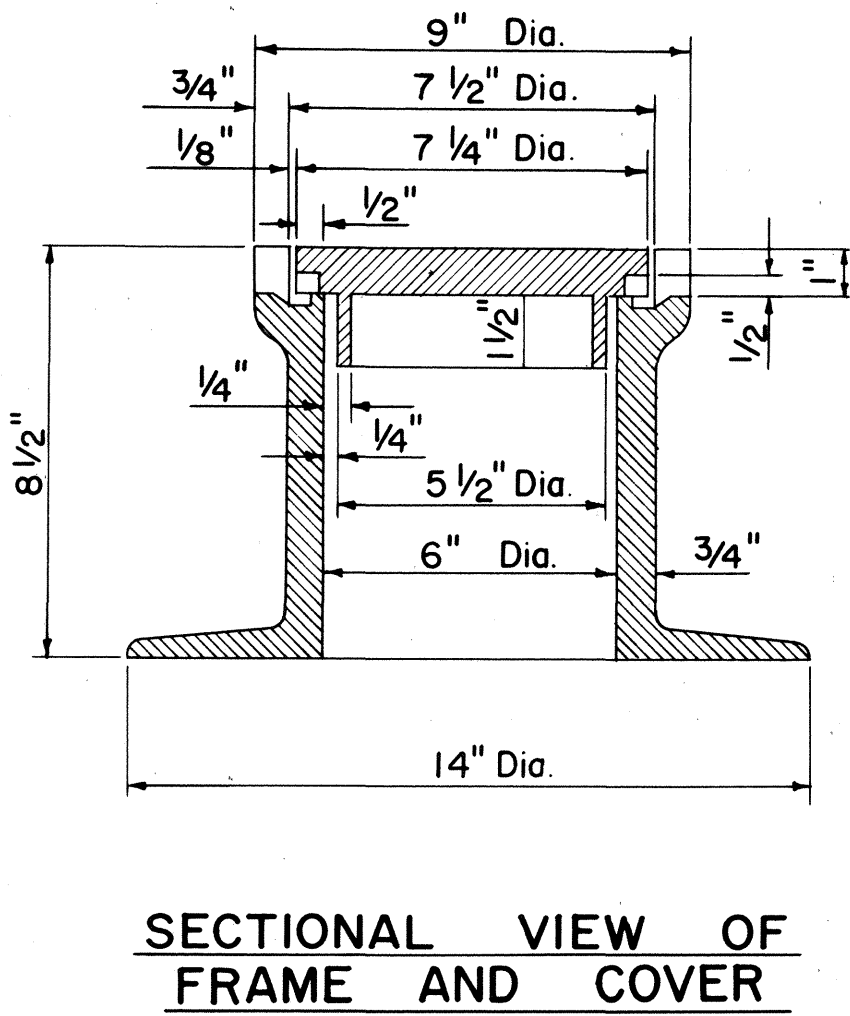
STREET SURVEY MONUMENT

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



STREET SURVEY MONUMENT CASTINGS

Scale: 3" = 1' - 0"



DETAIL FOR AND REFERENCE SURVEY MONUMENT

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS