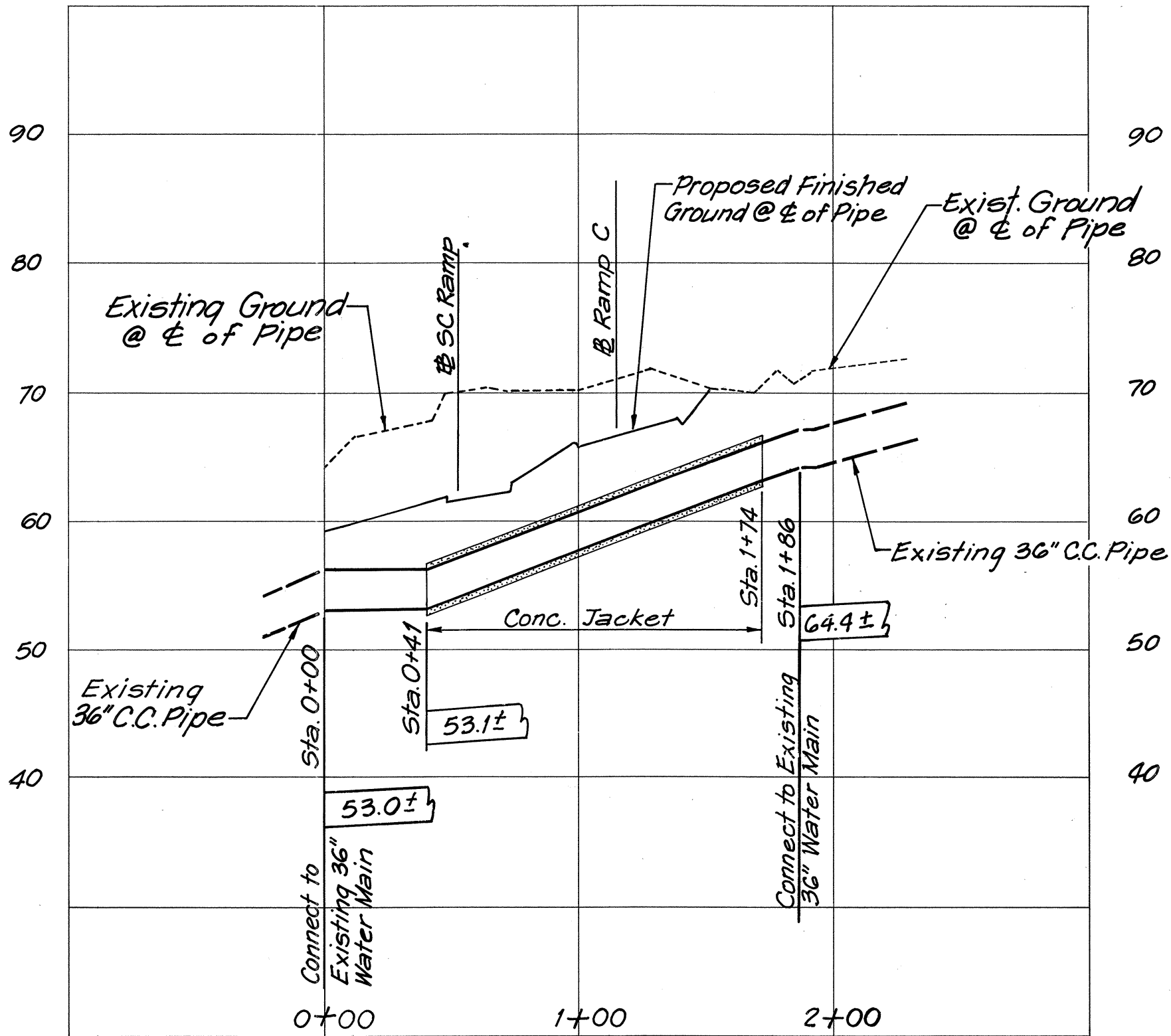


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-(91)-13	1972	102	228



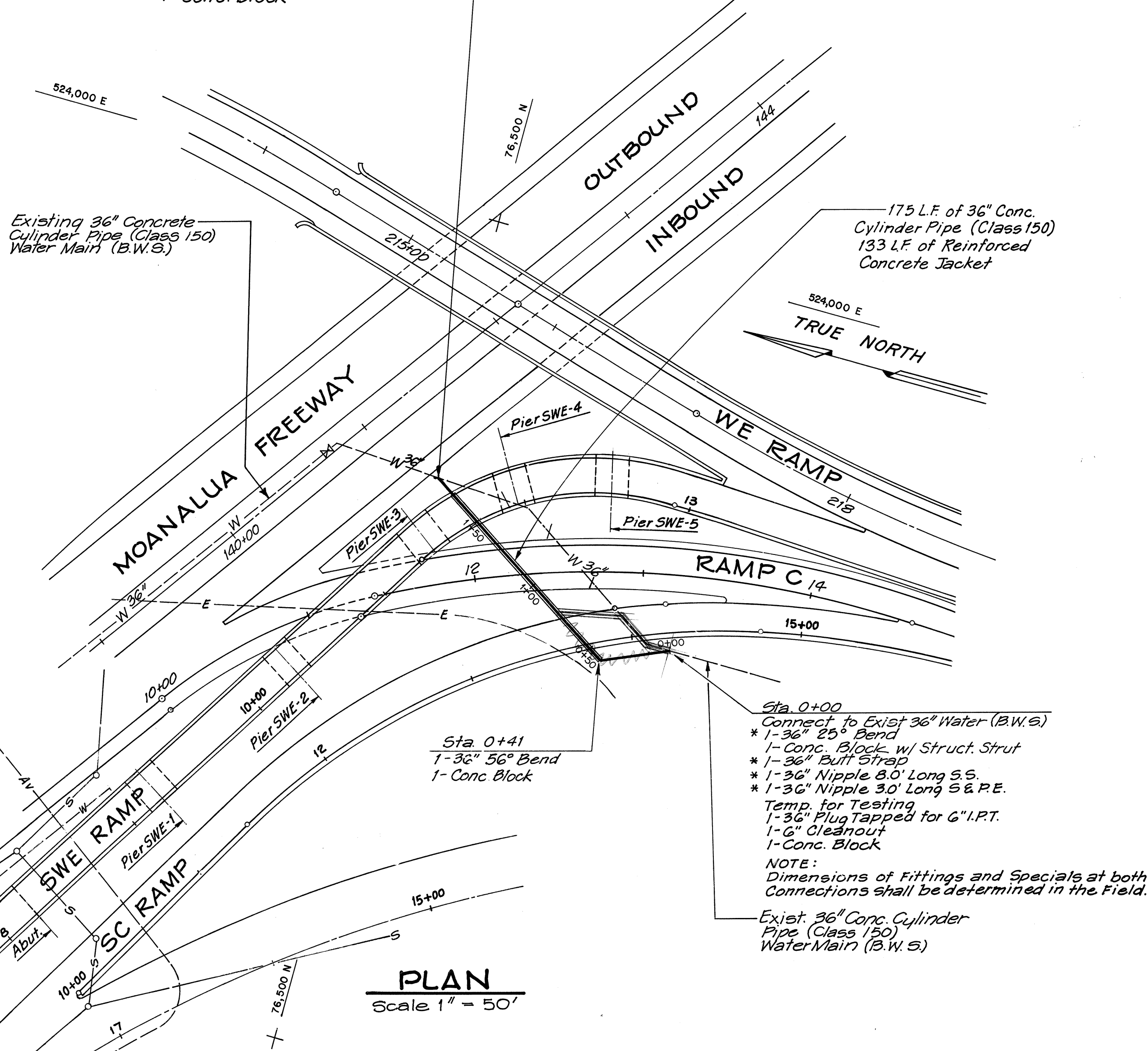
**PROFILE - 36" WATER MAIN UNDER RAMP "C" (STA 12+44±) B.W.S.**

Scale: Horiz. 1" = 50'  
Vert 1" = 10'

**GENERAL WATER NOTES  
(BOARD OF WATER SUPPLY)**

- The Contractor shall notify the Board of Water Supply in writing one week prior to commencing work on the water system.
- Prior to excavation for new drain, sewer and other utility lines, the Contractor shall verify in the field the location of existing water mains and appurtenances.
- Asterisk (\*) includes work to be performed by B.W.S. materials to be furnished by the Contractor unless specified as "Relocated."
- Approval by the Board of Water Supply is only to assure that adjustments to the water system are in conformance with the requirements of the B.W.S. standards. Discrepancies if any, of Alignments, Grades, Fittings, etc., shall be the responsibility of the Engineer who prepares the Plan.
- Unless otherwise specified, all materials and construction of water system facilities and appurtenances shall be in accordance with the Standard Specifications for Road and Bridge Construction, dated 1969, as amended, of the Hawaii Highways Division, Department of Transportation.
- Where the installation of new drains, sewer or other utility lines are to cross over or under existing water mains, the Contractor shall expose the existing water mains prior to trenching. Excavation around water mains shall be done by hand.
- The existence and location of underground Utilities and Structures as shown on the Plans are from the latest available data but are not guaranteed as to the accuracy or that other obstacles may not be encountered in the course of the work. The Contractor shall be responsible and pay for any damages to the existing main.
- Any adjustment to the water mains and appurtenances, whether shown on the Construction Plans or not shall be made a part of the Project.
- The Contractor shall exercise extreme caution when doing work over the 36" main.

Sta 1+86  
Connect to Exist 36" Water (B.W.S.)  
\* 1-36" 30° Bend  
1- Conc. Block w/ Struct. Strut  
\* 1-36" Butt Strap  
\* 1-36" Nipple 8.0' Long S.S.  
\* 1-36" Nipple 3.0' Long S&P.E.  
Temp. for Testing  
1-36" Plug Tapped for G.I.P.T.  
1-6" Cleanout  
1- Conc. Block



**PLAN**

Scale 1" = 50'

**APPROVED**

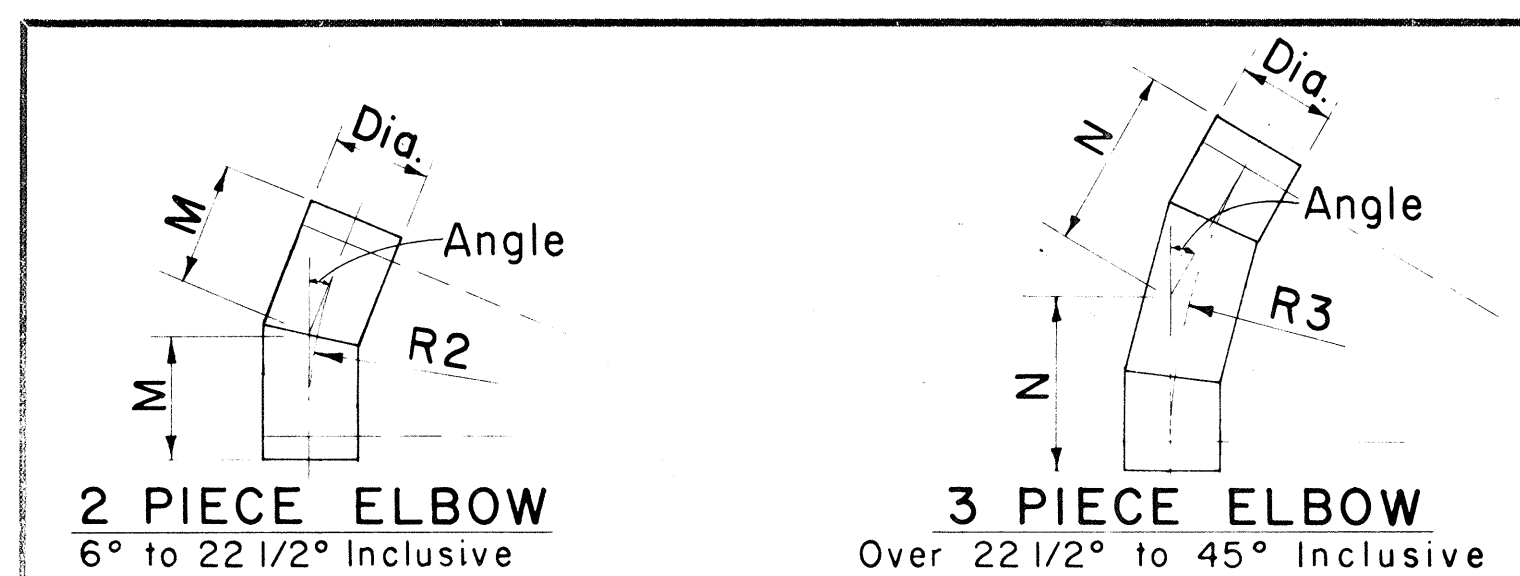
Assist. Chief Engineer, B.W.S.

2/29/72  
Date

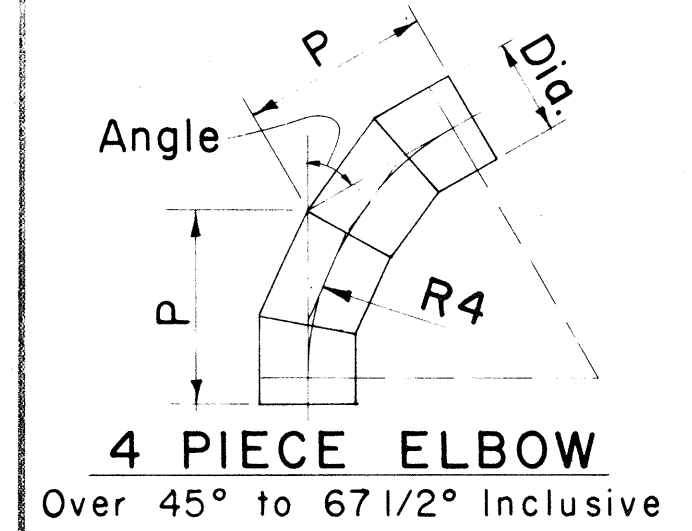
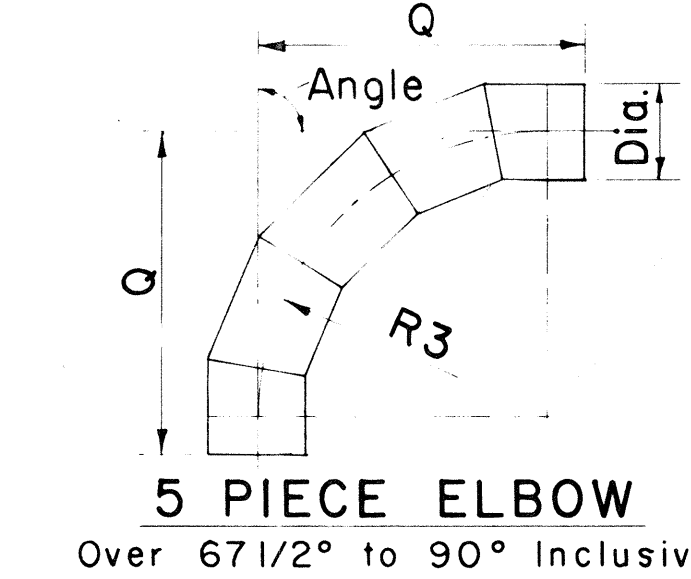
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**B.W.S. 36" WATER MAIN  
RELOCATION AT HALE STREET**  
INTERSTATE ROUTE H-1  
PROJECT NO I-HI-(91)-13

SCALE: AS SHOWN DATE: FEB. 3, 1972  
SHEET No. 10 OF 4 SHEETS

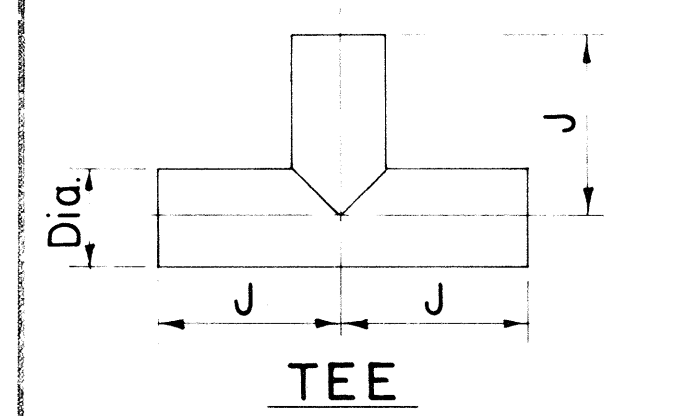
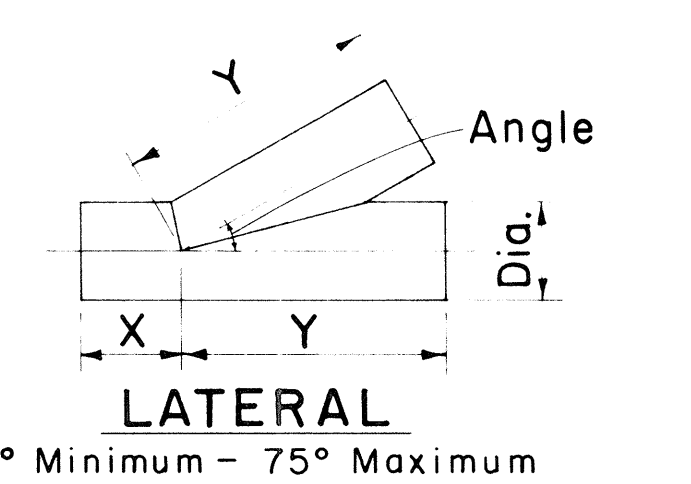
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	FH-1(9)13	1972	103	228



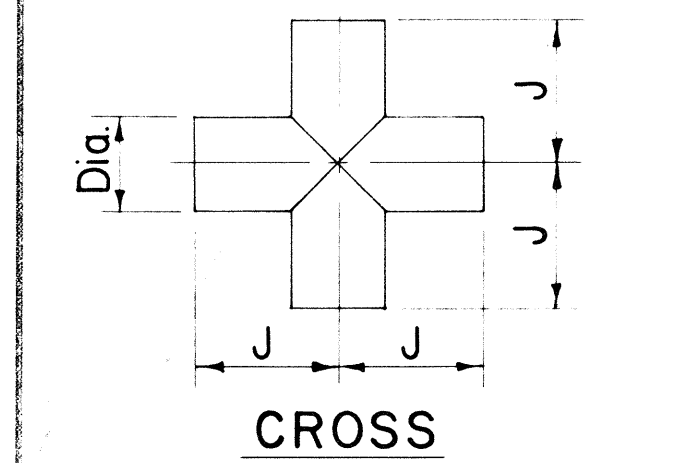
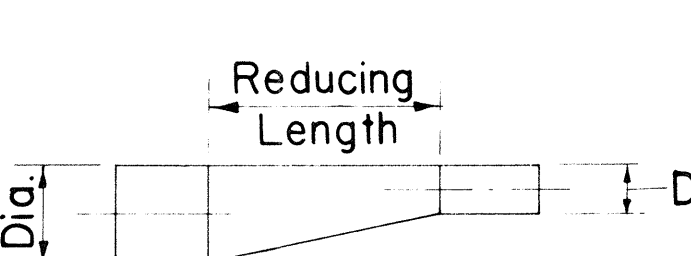
3 PIECE ELBOW Over 22 1/2° to 45° Inclusive



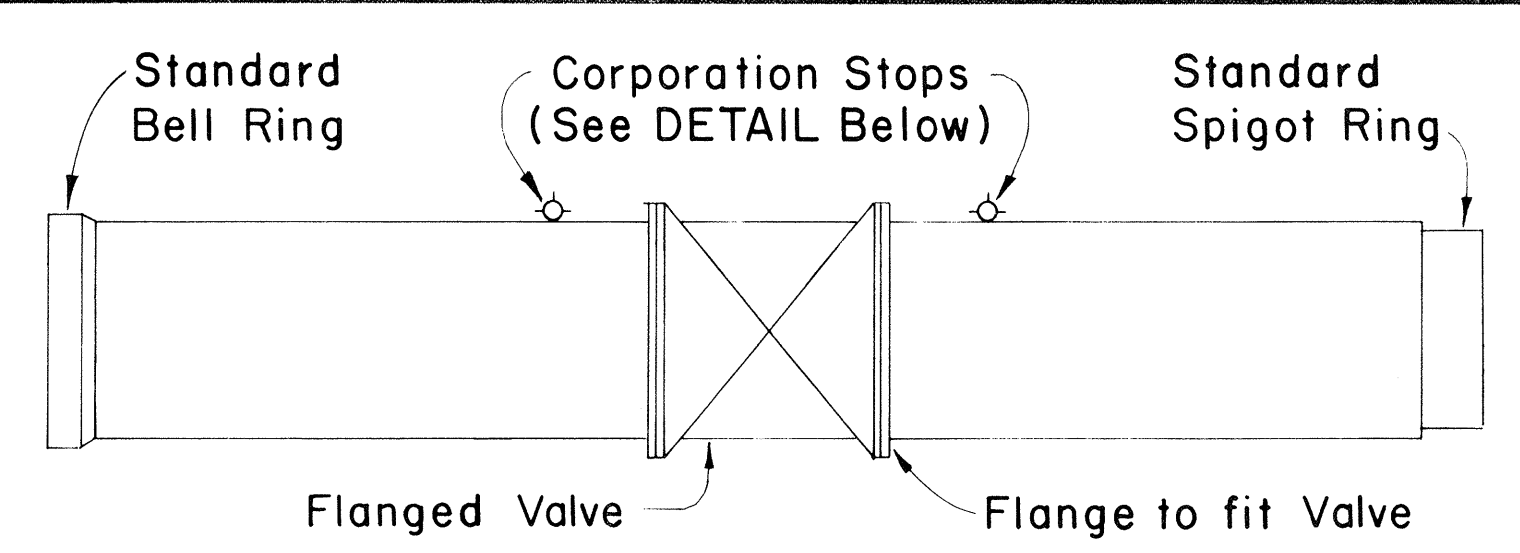
5 PIECE ELBOW Over 67 1/2° to 90° Inclusive



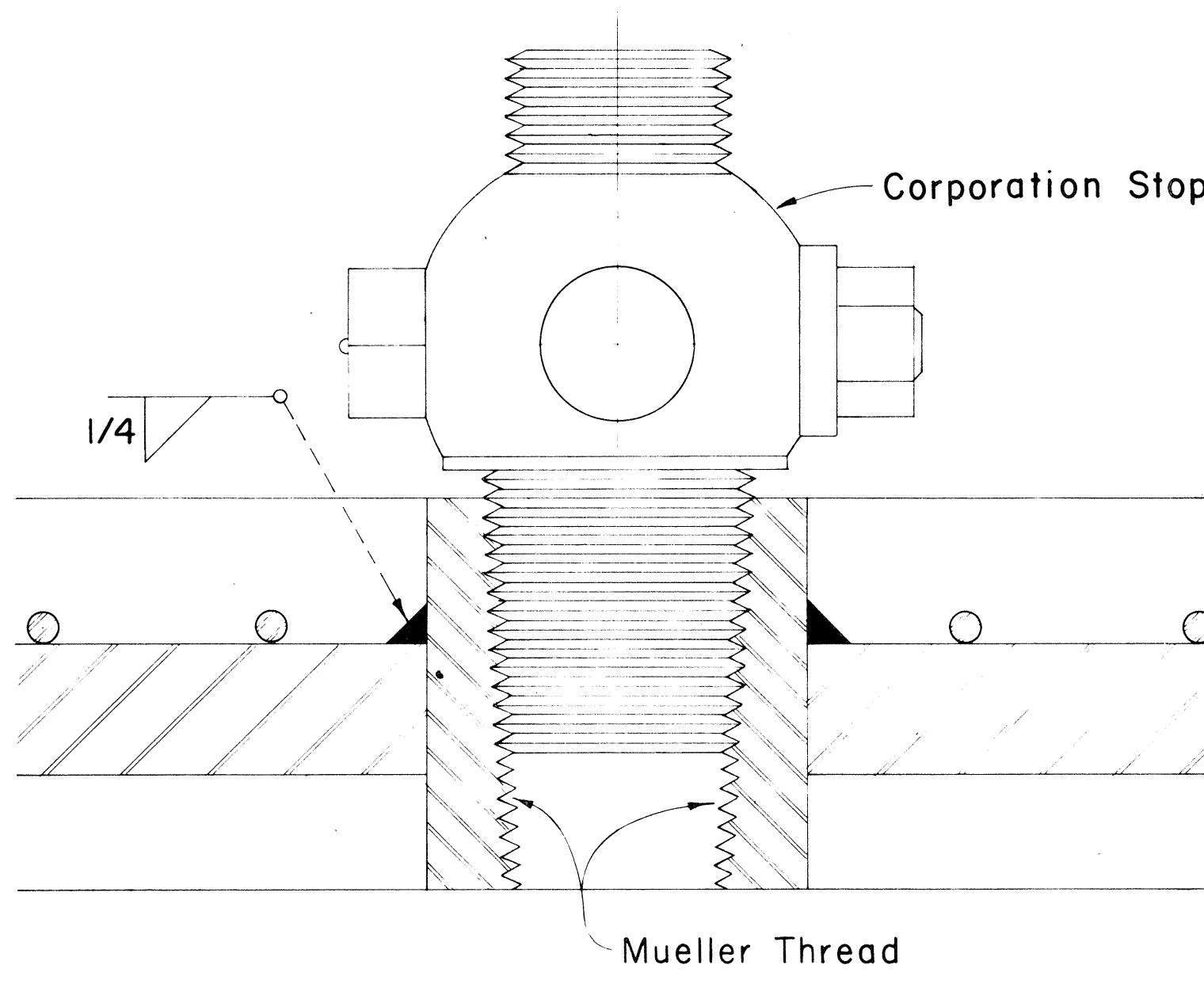
LATERAL 30° Minimum - 75° Maximum



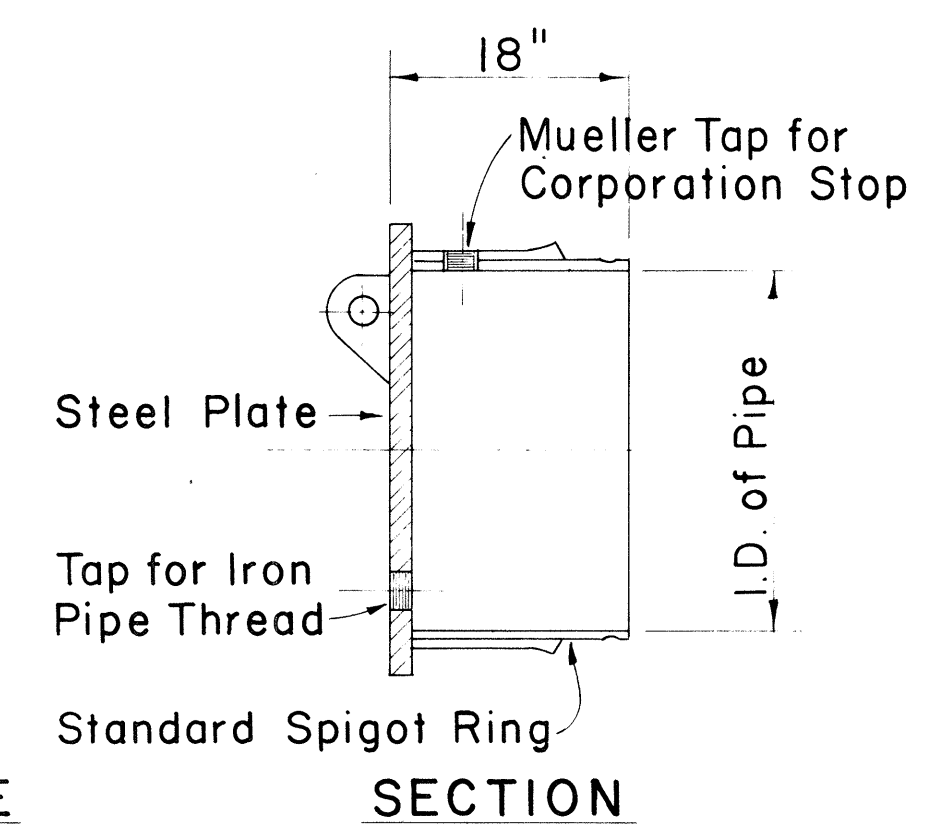
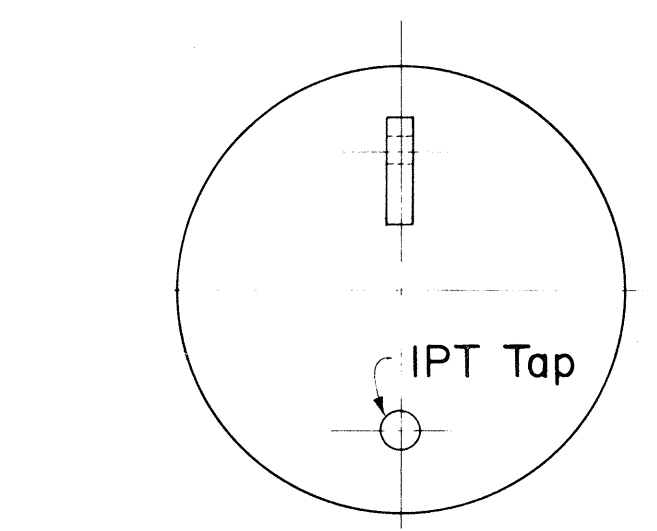
REDUCER



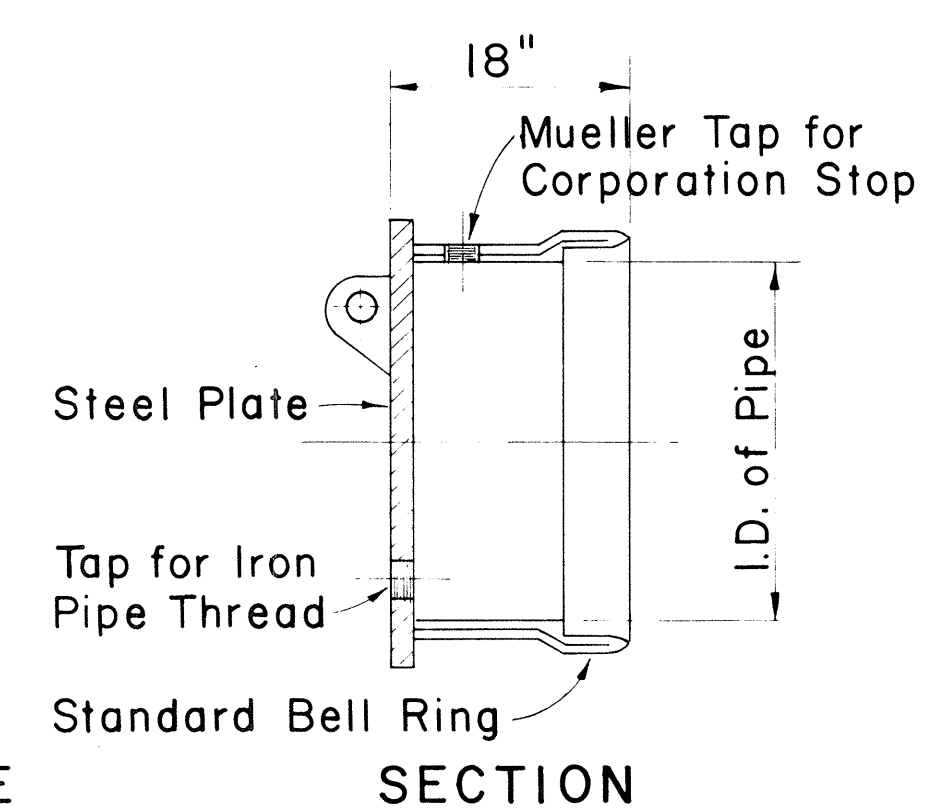
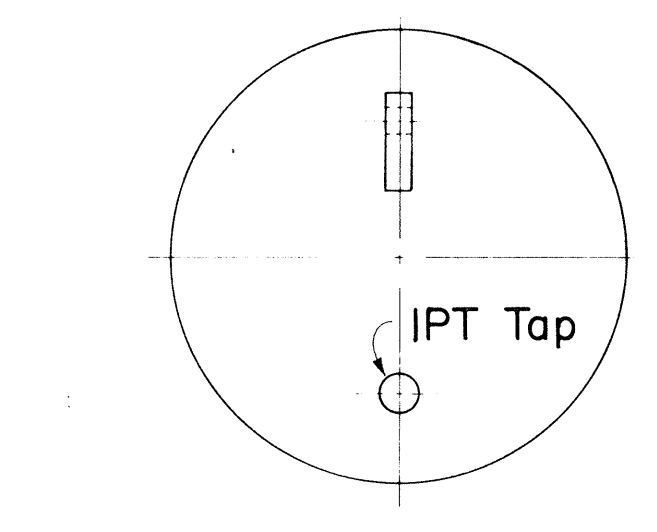
ELEVATION



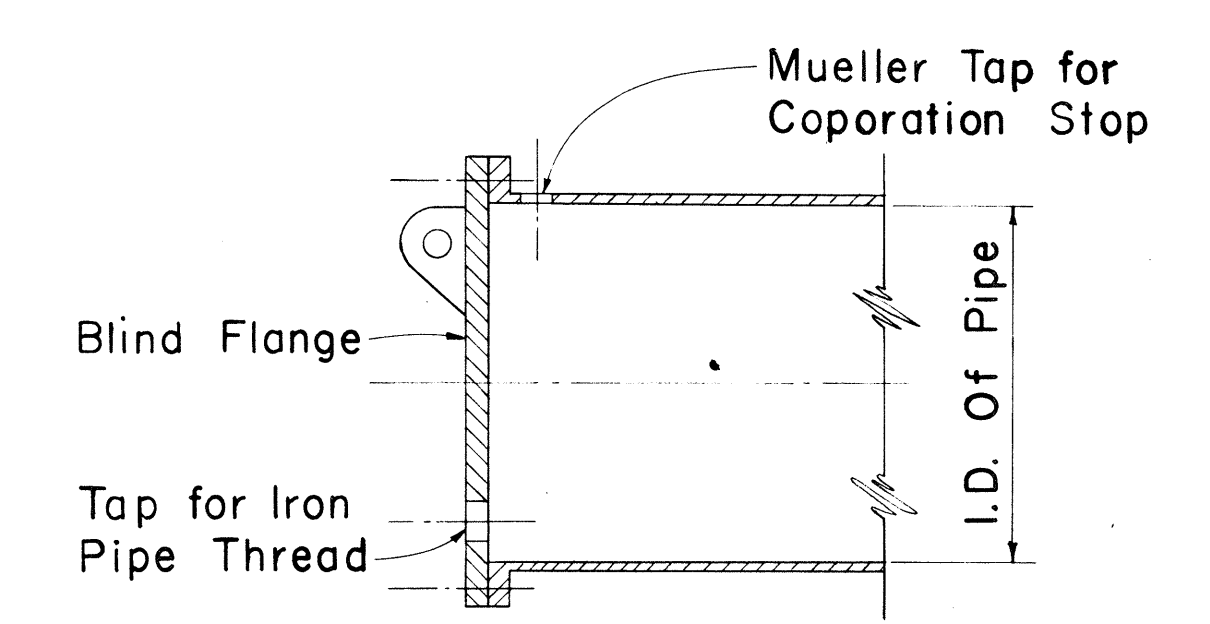
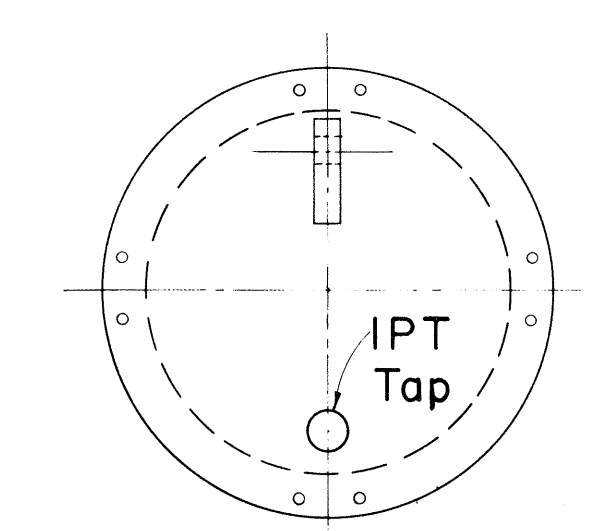
TYPICAL SECTION THRU CONCRETE PIPE AT CORPORATION STOP



DETAIL OF PLUG



DETAIL OF CAP



SECTION

DETAIL OF BLIND FLANGE

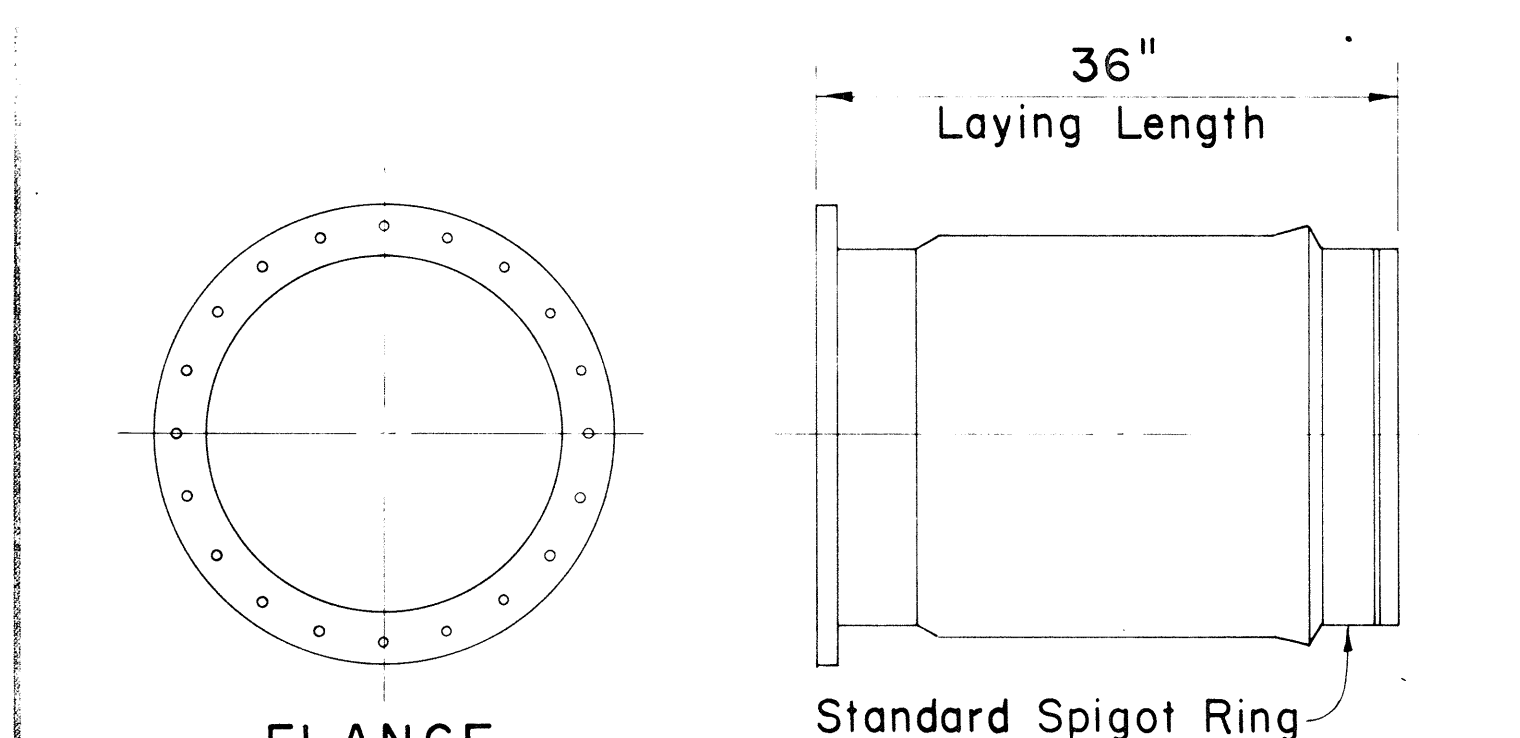
STANDARD FITTING DIMENSIONS													
DIAMETER	TEE		CROSS (Both Ways) J+J	LATERAL (30° to 75°) Run X+Y Outlet Y		ELBOWS (Center to End)							
	Run J+J	Outlet J		Run X+Y	Outlet Y	2 Piece (up to 22 1/2°)		3 Piece (22 1/2° to 45°)		4 Piece (45° to 67 1/2°)		5 Piece (67 1/2° to 90°)	
	M	R2	N	R3	P	R4	Q	R5					
16"	34"	17"	34"	62"	52"	12"	60"	18"	44"	26"	39"	44"	40"
18"	36"	18"	36"	66"	56"	12"	60"	19"	47"	27"	41"	36"	32"
20"	38"	19"	38"	72"	60"	13"	65"	20"	49"	28"	42"	54"	50"
22"	40"	20"	40"	78"	66"	13"	65"	21"	51"	30"	45"	41"	37"
24"	42"	21"	42"	84"	72"	14"	70"	22"	54"	32"	48"	64"	60"
30"	60"	30"	60"	96"	84"	15"	75"	25"	61"	37"	51"	79"	75"
36"	66"	33"	66"	110"	96"	16"	80"	27"	66"	40"	60"	94"	90"
42"	72"	36"	72"	124"	108"	17"	85"	30"	71"	49"	69"	109"	105"

DIMENSIONS FOR ECCENTRIC REDUCER REDUCING SECTION

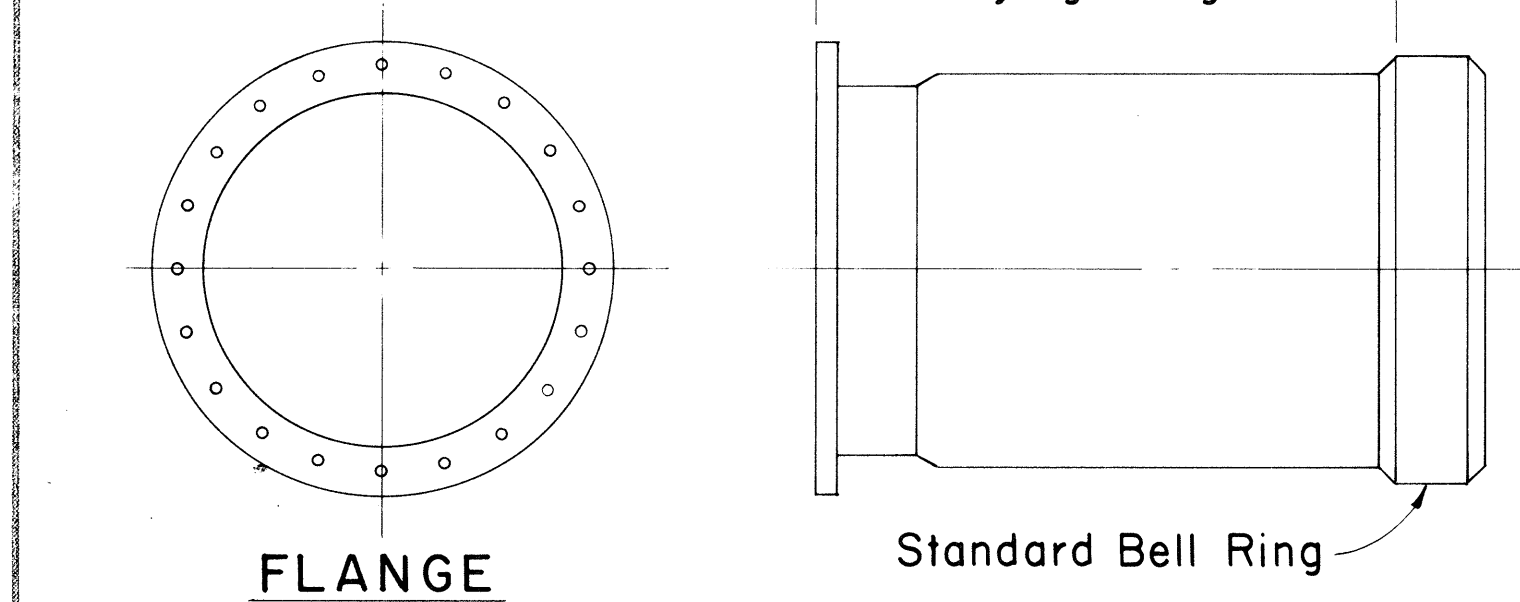
- 36" x 30" Eccentric Reducer - Length 66"
- 30" x 24" Eccentric Reducer - Length 66"
- 24" x 20" Eccentric Reducer - Length 26"
- 20" x 16" Eccentric Reducer - Length 26"
- 42" x 36" Eccentric Reducer - Length 66"
- 42" x 30" Eccentric Reducer - Length 66"

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.

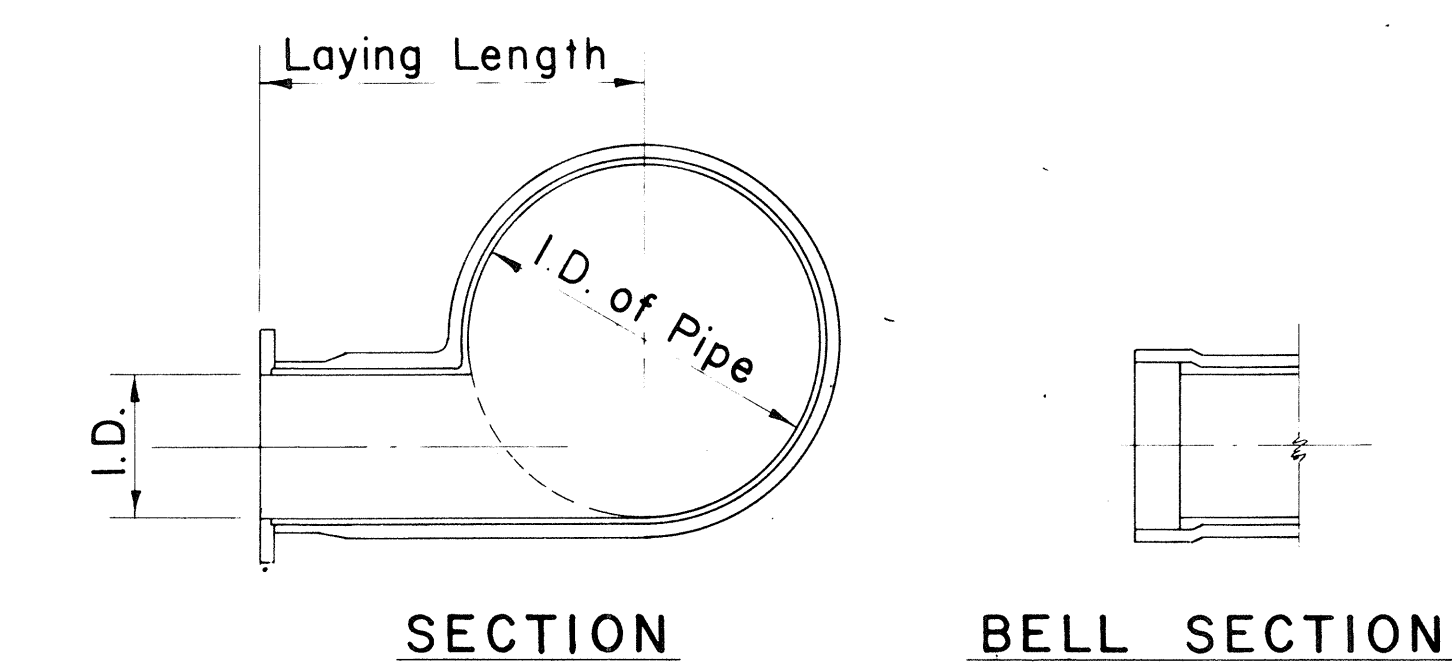


FLANGE See Specs. for Flange Class



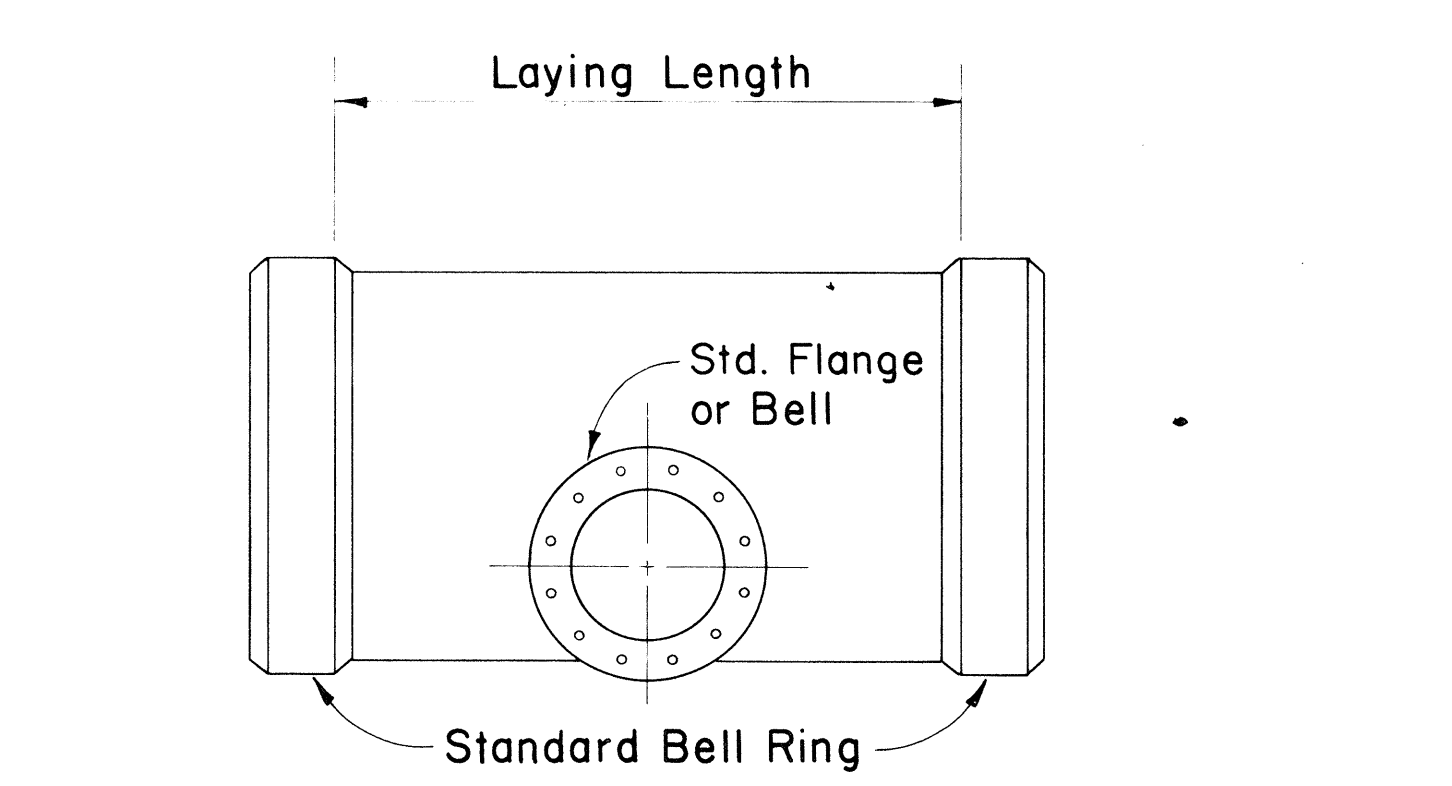
FLANGE See Specs. for Flange Class

TYPICAL DETAIL OF ADAPTER



SECTION

BELL SECTION



TYPICAL DETAIL OF BLOW-OFF TEE

APPROVED :  
*A. Kawakami* 4/15/71  
ASSISTANT CHIEF ENGINEER  
BOARD OF WATER SUPPLY  
SHEET NO. 1 OF 2 SHEETS

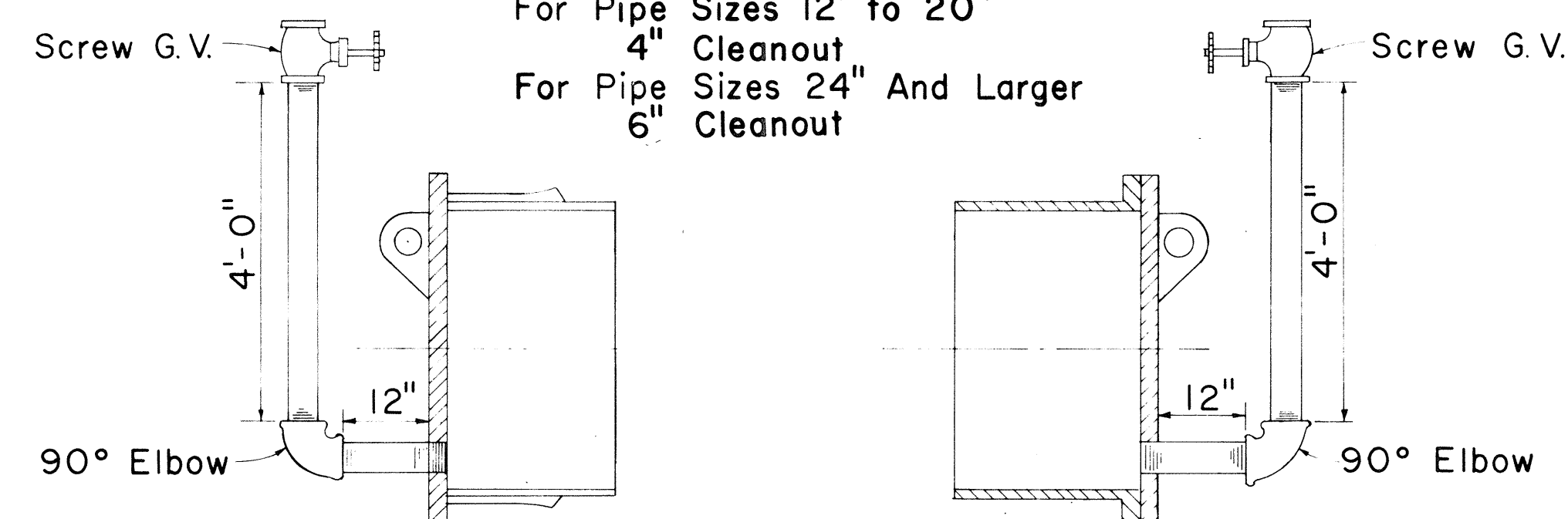
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
BOARD OF WATER SUPPLY  
CITY & COUNTY OF HONOLULU  
**CONCRETE CYLINDER PIPE  
MISCELLANEOUS DETAILS**  
Scale: No Scale Date: APR 15, 1971  
SHEET No. 20 OF 4 SHEETS



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7-11-1(9)13	1972	104	228

NOTE:

For Pipe Sizes 8" And Smaller  
2 1/2" Cleanout  
For Pipe Sizes 12" to 20"  
4" Cleanout  
For Pipe Sizes 24" And Larger  
6" Cleanout



TYPICAL SECTION OF TEMPORARY CLEANOUT

NOTE:

For Pipe Sizes 24" And  
Larger 2 Handholes Required.

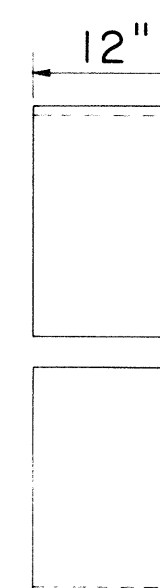
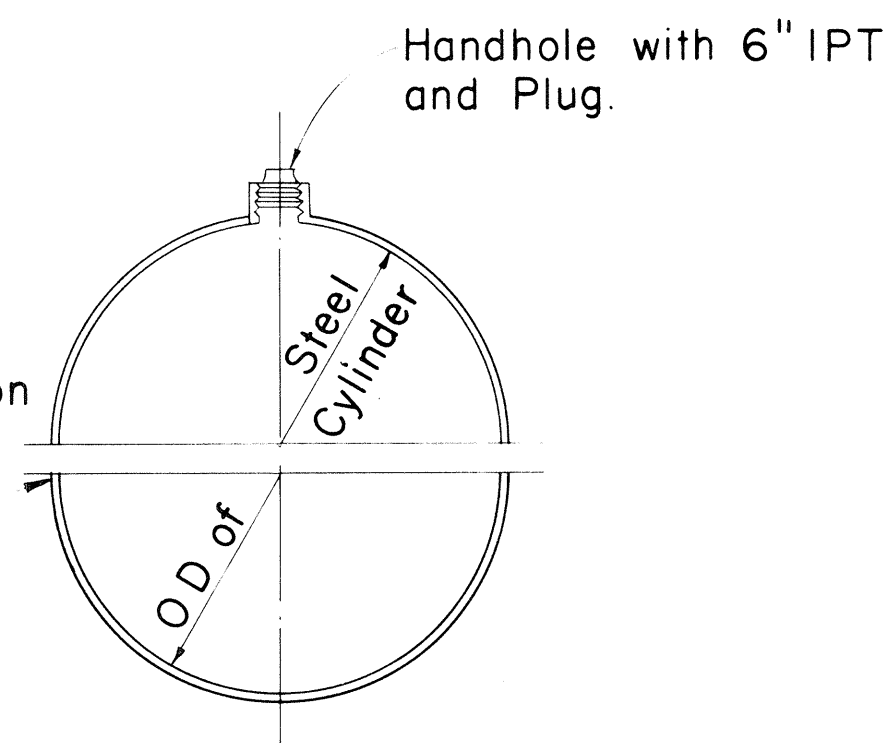
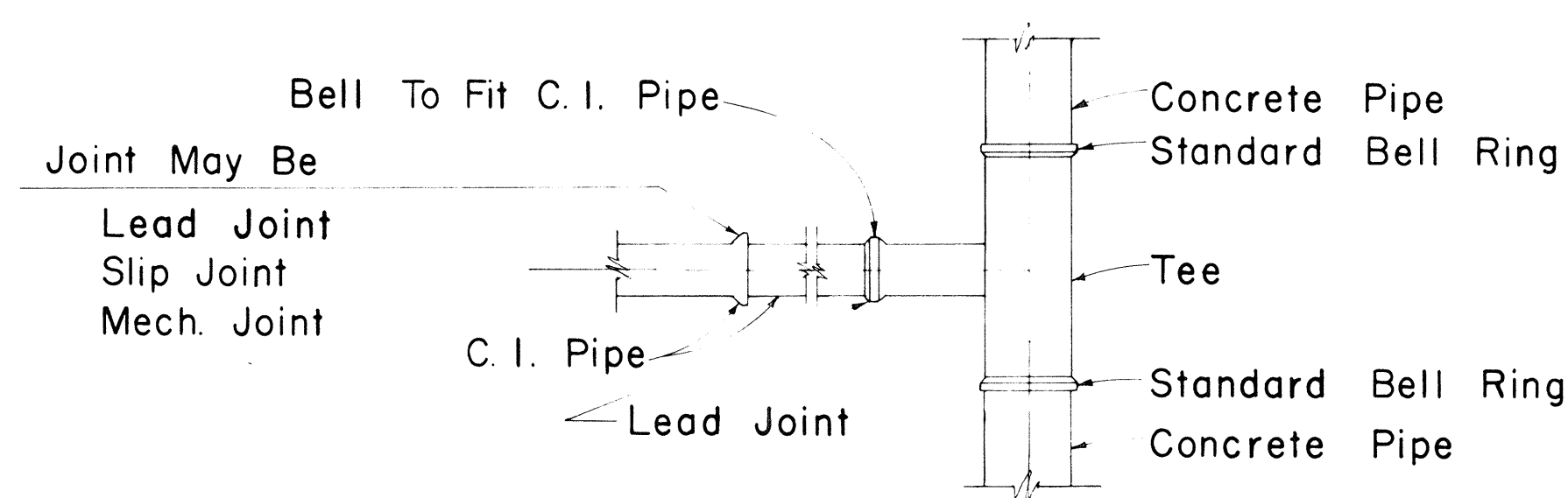


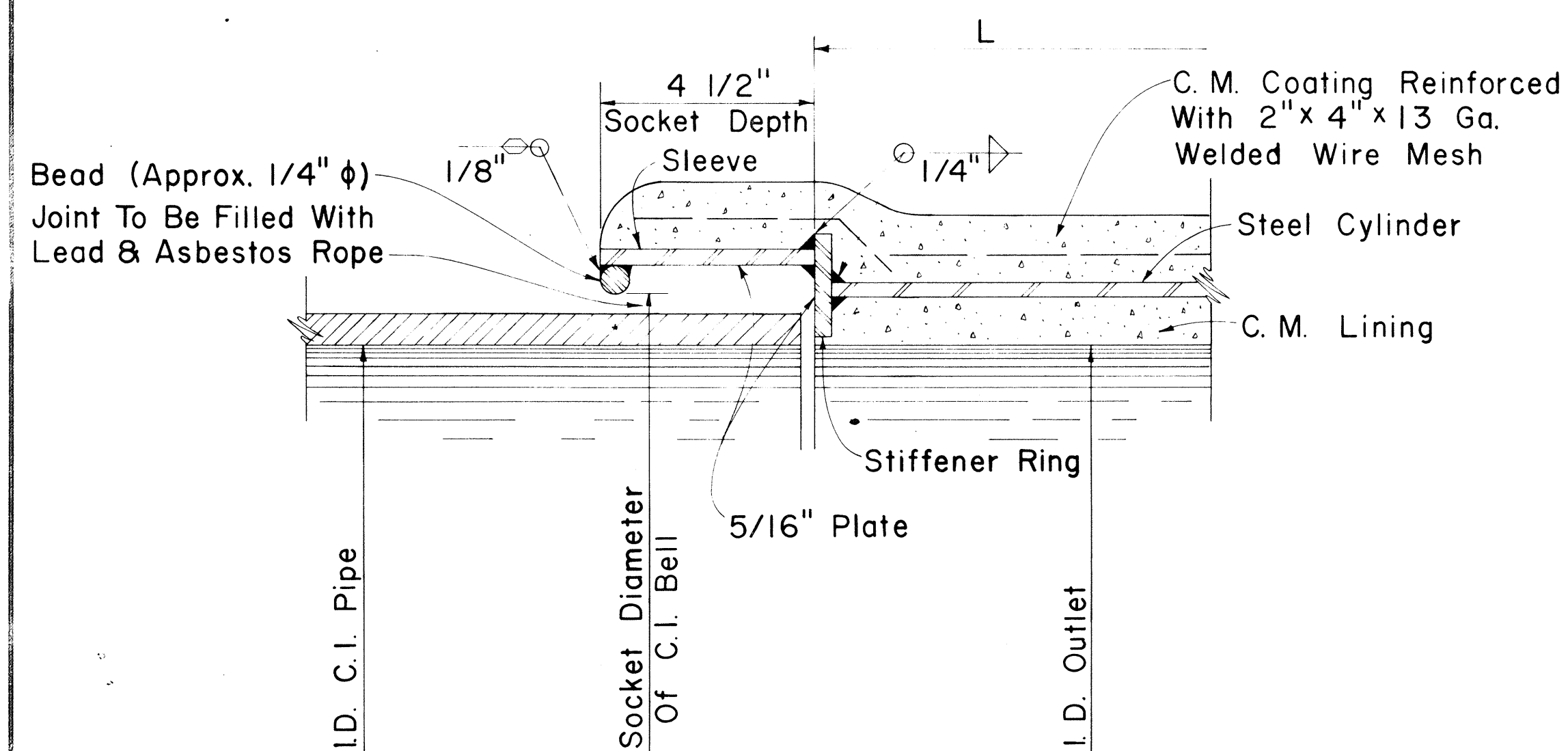
Plate Thickness To  
Provide Minimum  
Total As Per Ft. As  
Shown in Specification  
For Conc. Cylinder  
Pipe.



DETAIL OF SPLIT BUTT STRAP



TYPICAL CAST IRON PIPE CONNECTION  
TO CONCRETE CYLINDER PIPE



DETAIL OF C.I. ADAPTER

APPROVED:

*S. Kawakami* 4/23/71  
ASSISTANT CHIEF ENGINEER  
BOARD OF WATER SUPPLY

SHEET NO. 2 OF 2 SHEETS

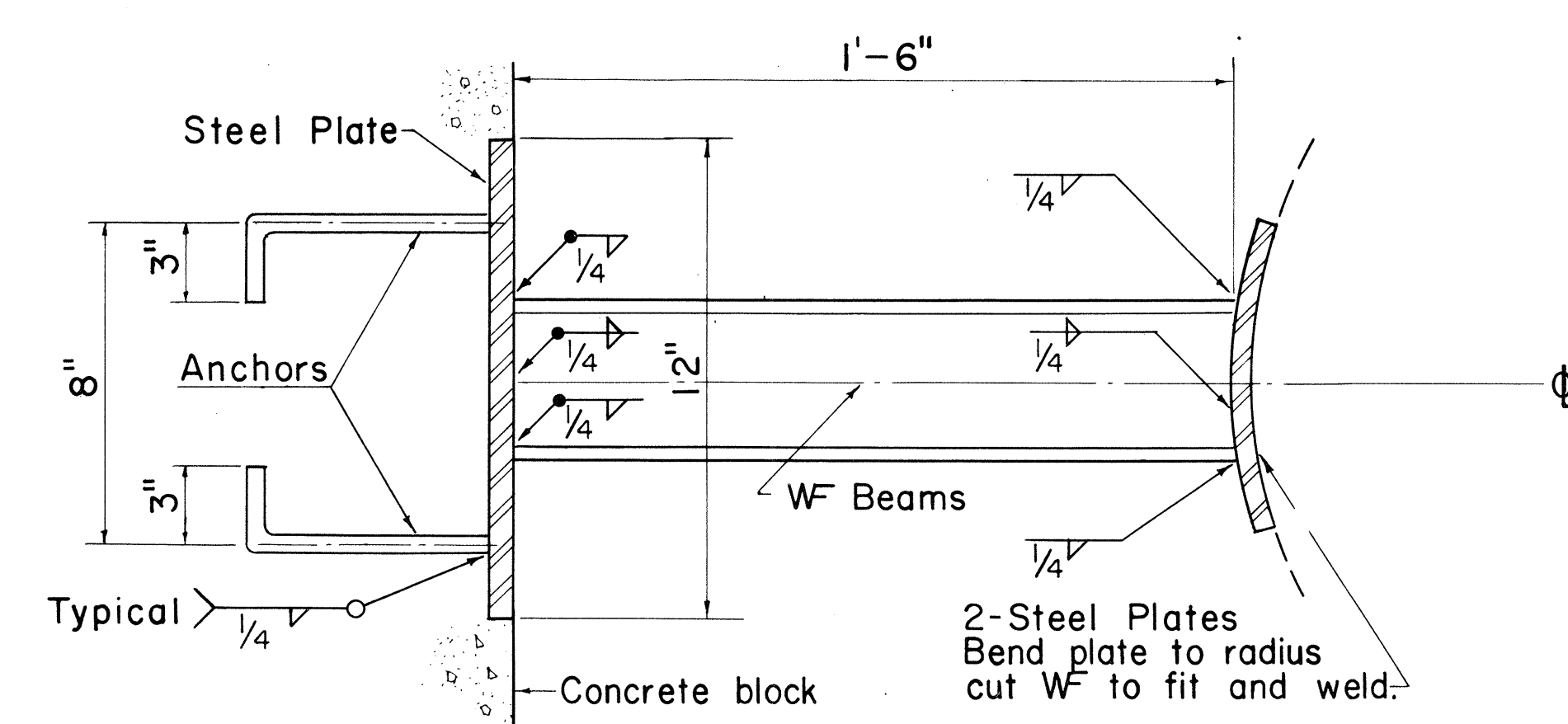
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
BOARD OF WATER SUPPLY  
CITY & COUNTY OF HONOLULU  
CONCRETE CYLINDER PIPE  
MISCELLANEOUS DETAILS

Scale: No Scale Date: APR 15, 1971

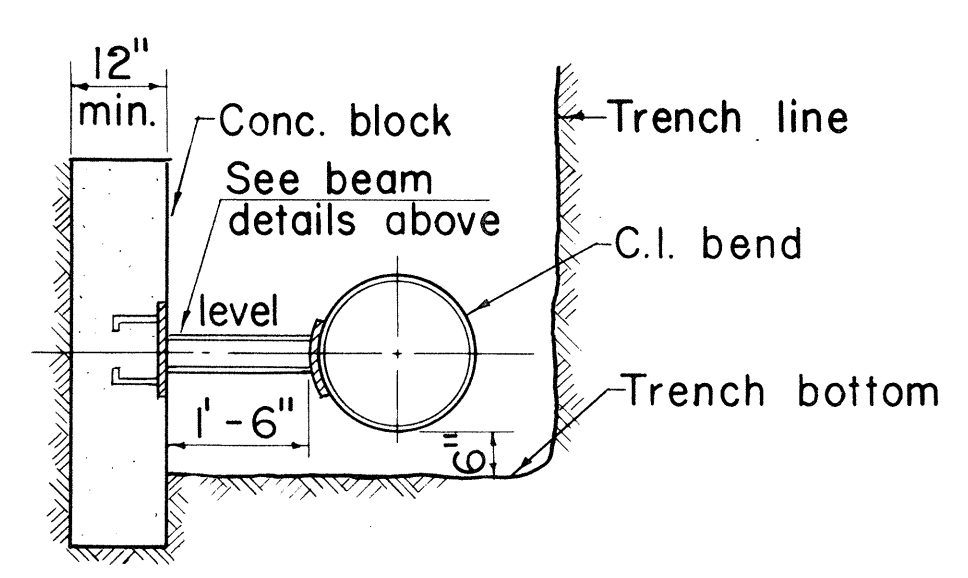
SHEET No. 34 OF 4 SHEETS

104

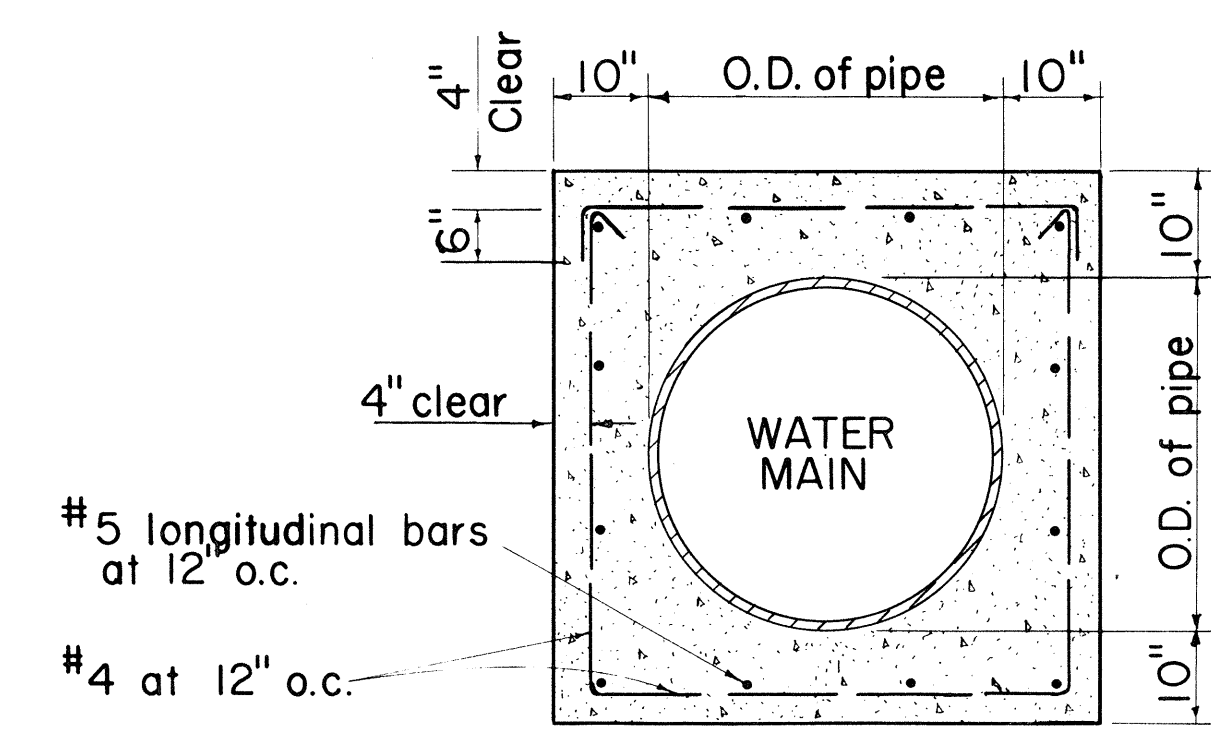
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	111-1(91)-13	1972	105	220



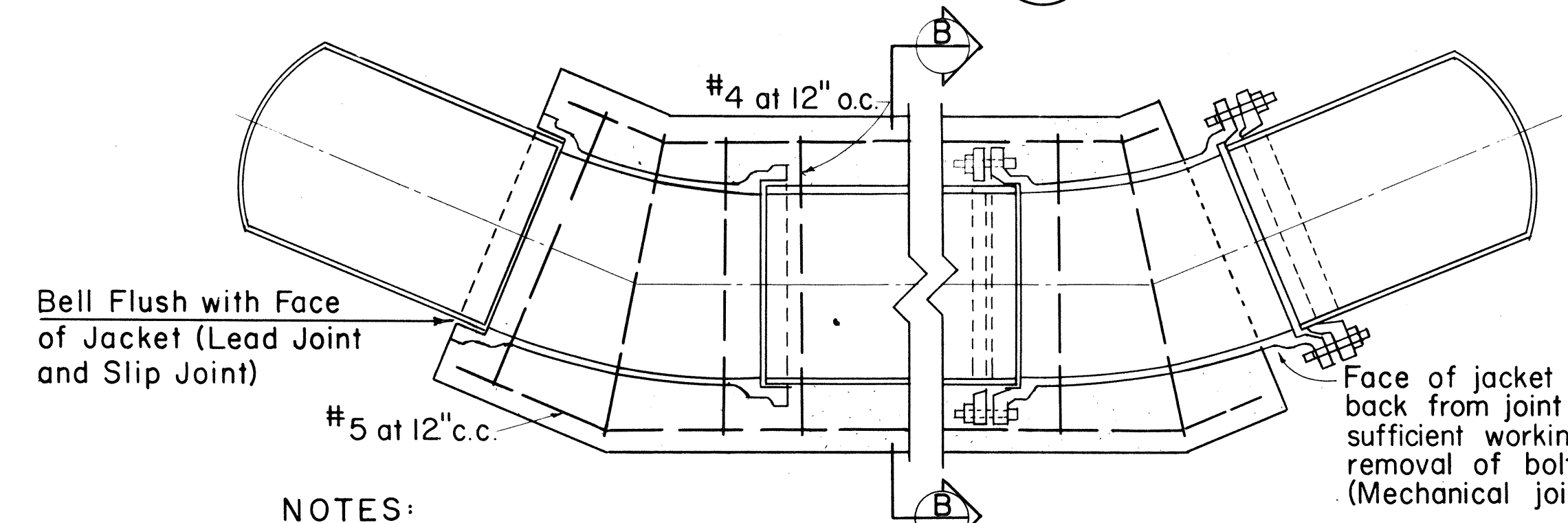
**BEAM DETAIL**  
Scale: 3" = 1'-0"



**SECTION C**  
Scale: 1/2" = 1'-0"



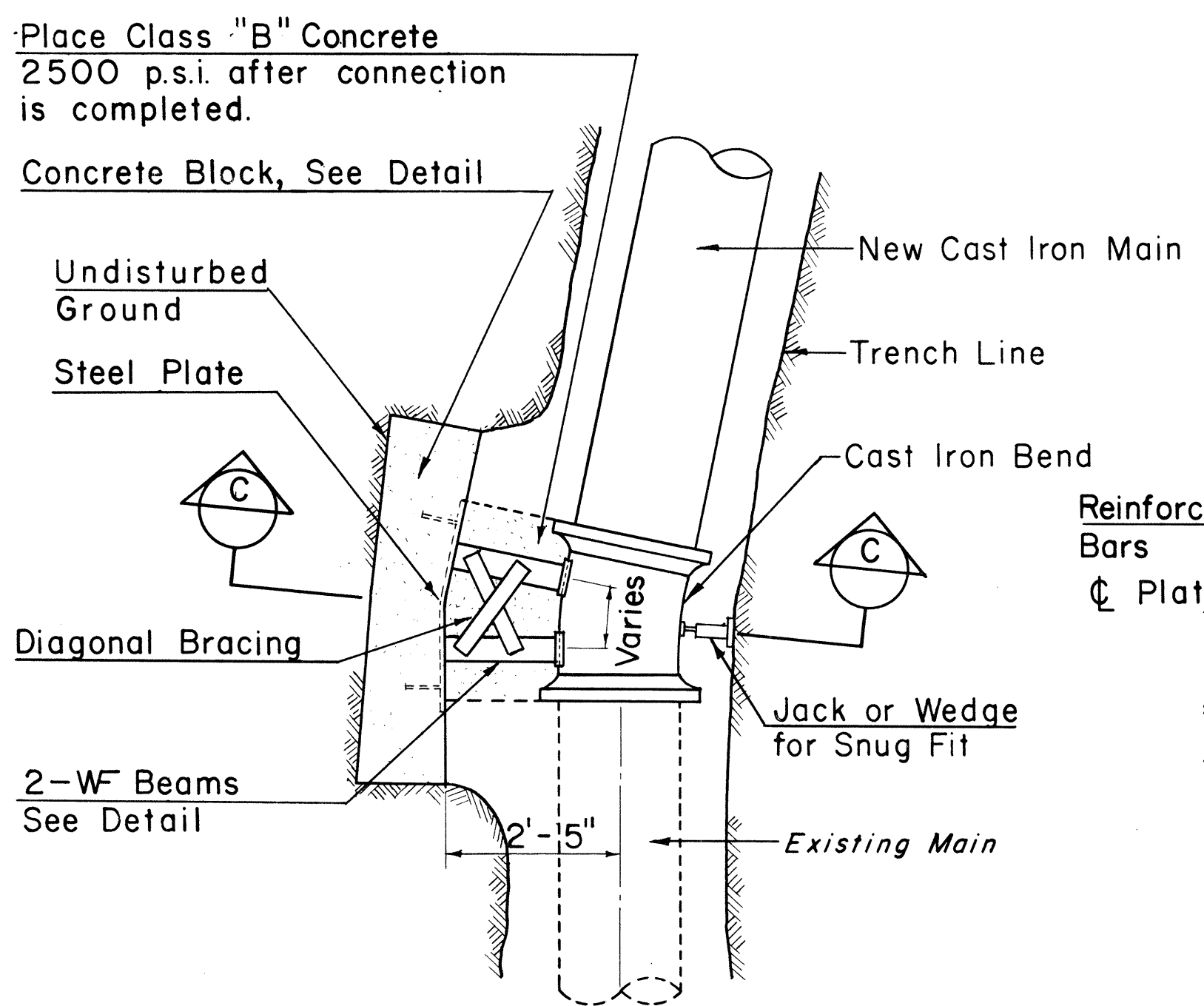
**SECTION B**



- NOTES:**
- Jacket to be poured after completion of test unless otherwise approved by the Engineer.
  - 2 1/2" depth of lead for lead joint pipe required at all embedded joints.
  - 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.

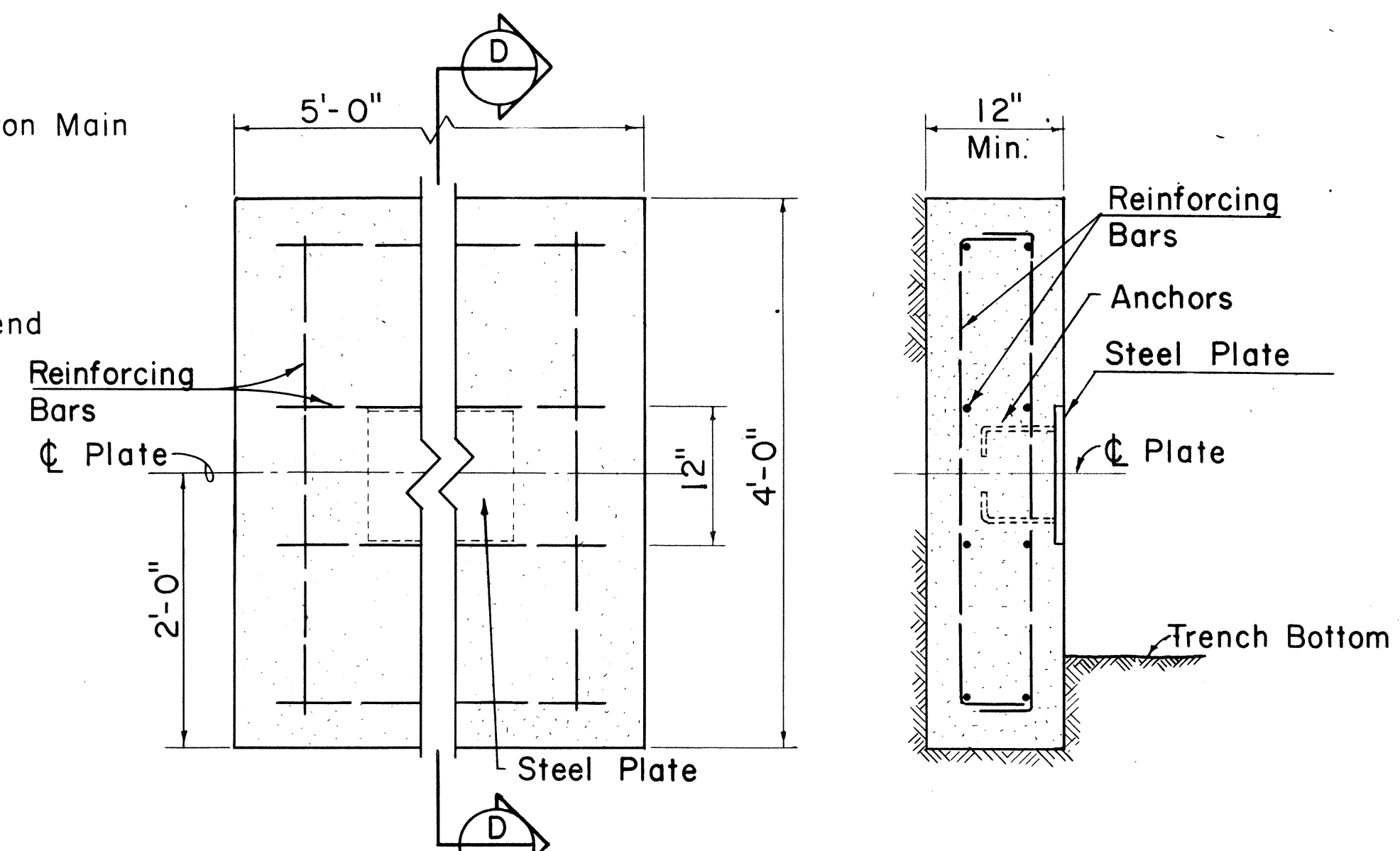
**REINFORCED CONCRETE JACKET**

Scale: Not to Scale

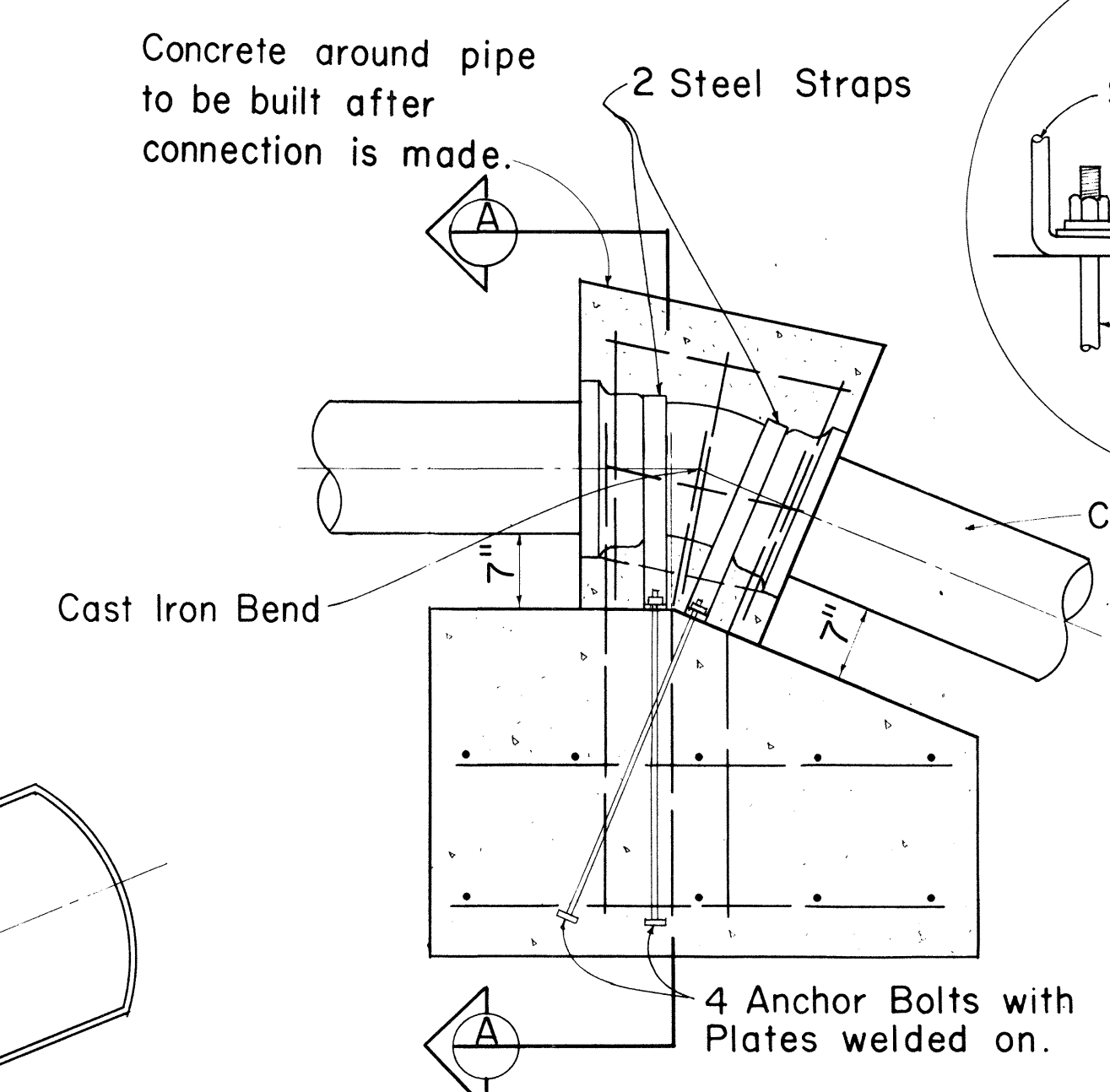


**PLAN**  
Scale: 1/2" = 1'-0"

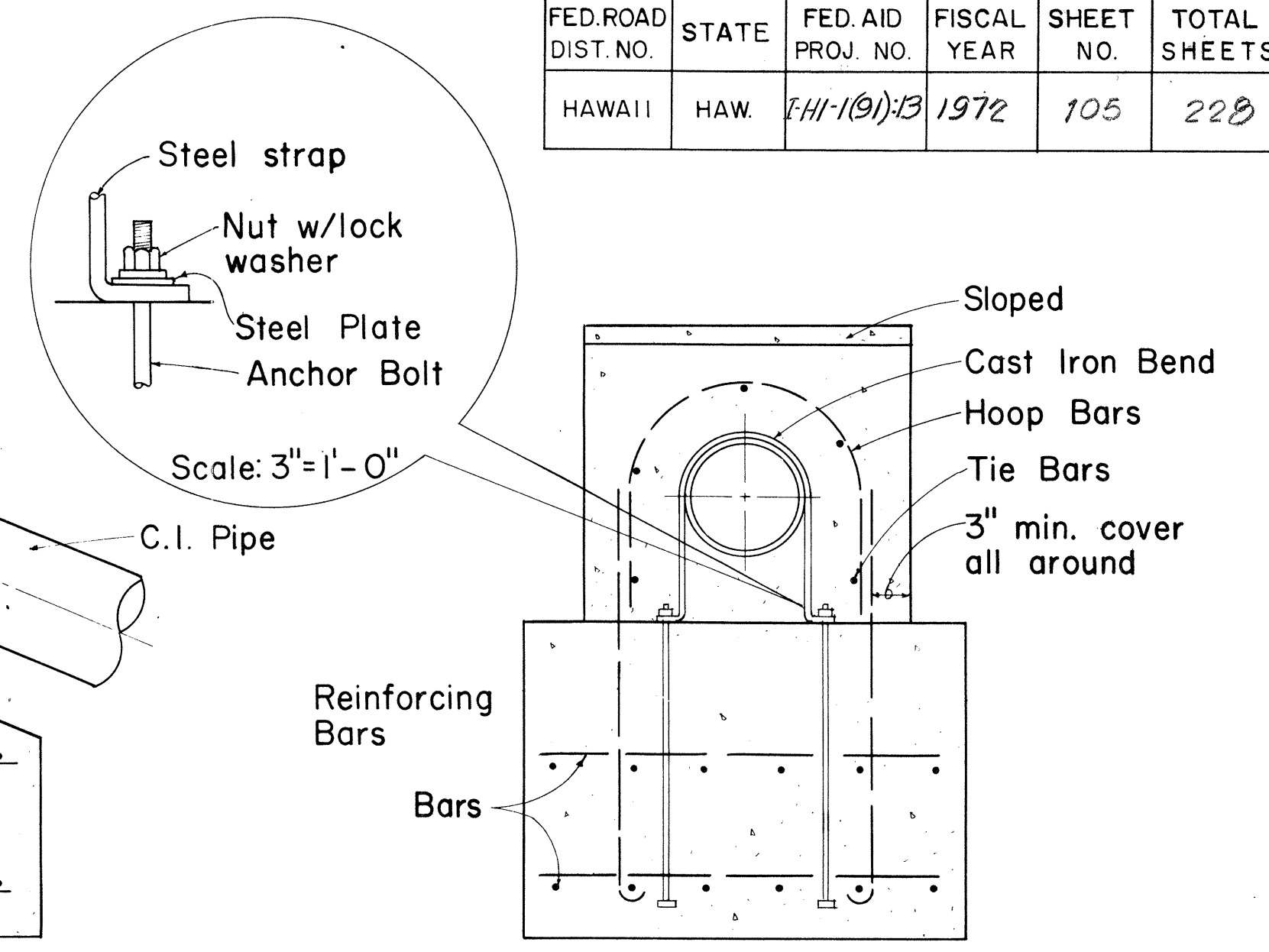
**NOTE:**  
Concrete Block with structural strut shall be used for bends at connections or for tee connections.



**ELEVATION SECTION D**  
**DETAILS OF CONCRETE BLOCK**  
Scale: 1" = 1'-0"



**ELEVATION**



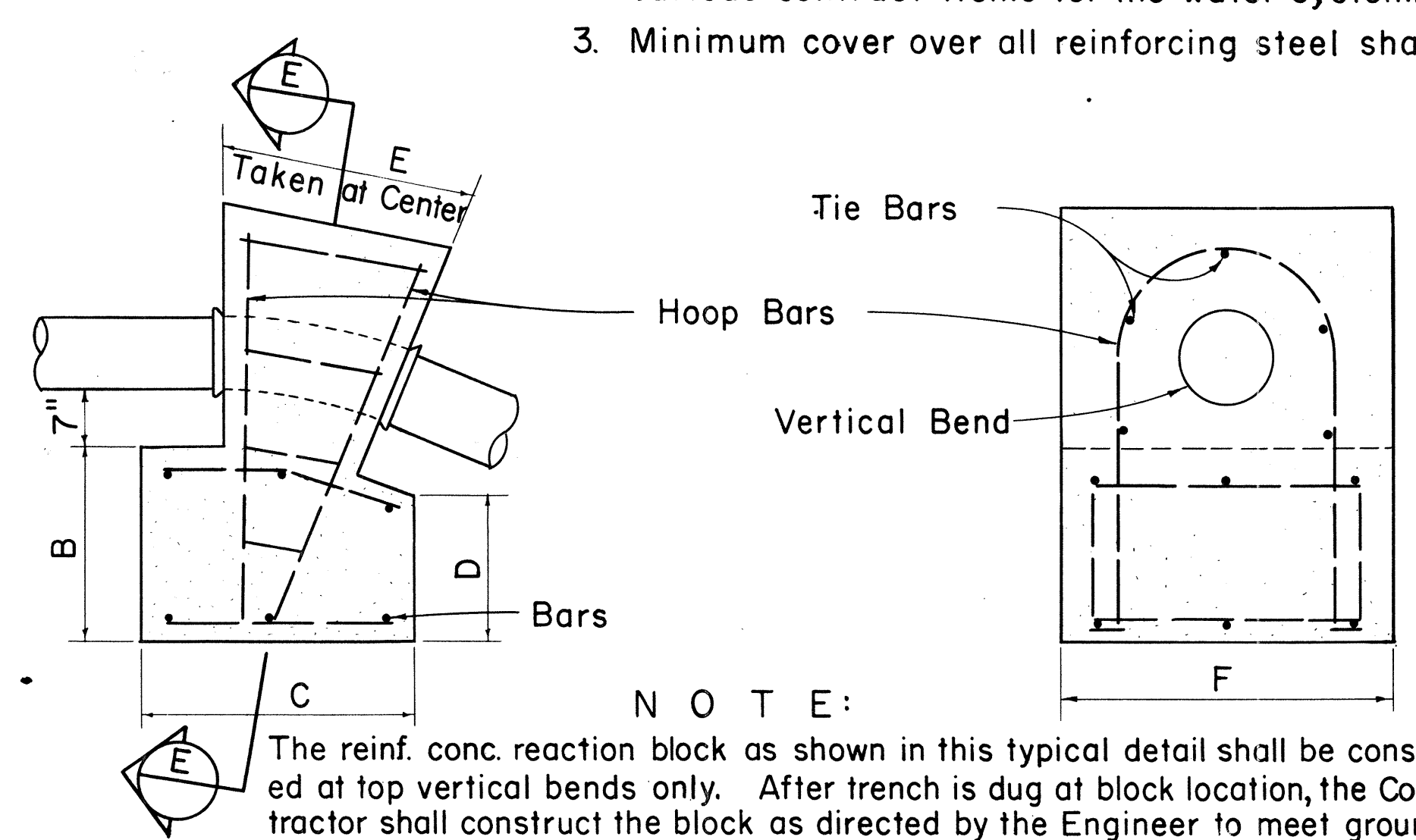
**SECTION A**

**TYPICAL DETAIL OF CONCRETE REACTION BLOCK WITH STRAPS**

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

**GENERAL NOTES:**

- Detail drawings of actual blocks to be used, shall be furnished during construction by B.W.S. and or State.
- 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.
- Minimum cover over all reinforcing steel shall be 3 inches.



**ELEVATION SECTION E**  
**TYPICAL DETAIL OF REINFORCED CONCRETE REACTION BLOCK FOR TOP VERTICAL BENDS**

Scale: Not to Scale

**APPROVED:**  
*A. Kawakami*  
ASSISTANT CHIEF ENGINEER  
BOARD OF WATER SUPPLY  
DATE: 9/23/71

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

Scale: As Shown  
DATE: APR. 15, 1971  
SHEET No. 40 OF 4 SHEETS

**TYPICAL DETAIL OF CONCRETE BLOCK WITH STRUCTURAL STRUT**