

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER 9(3)	1979	16	89

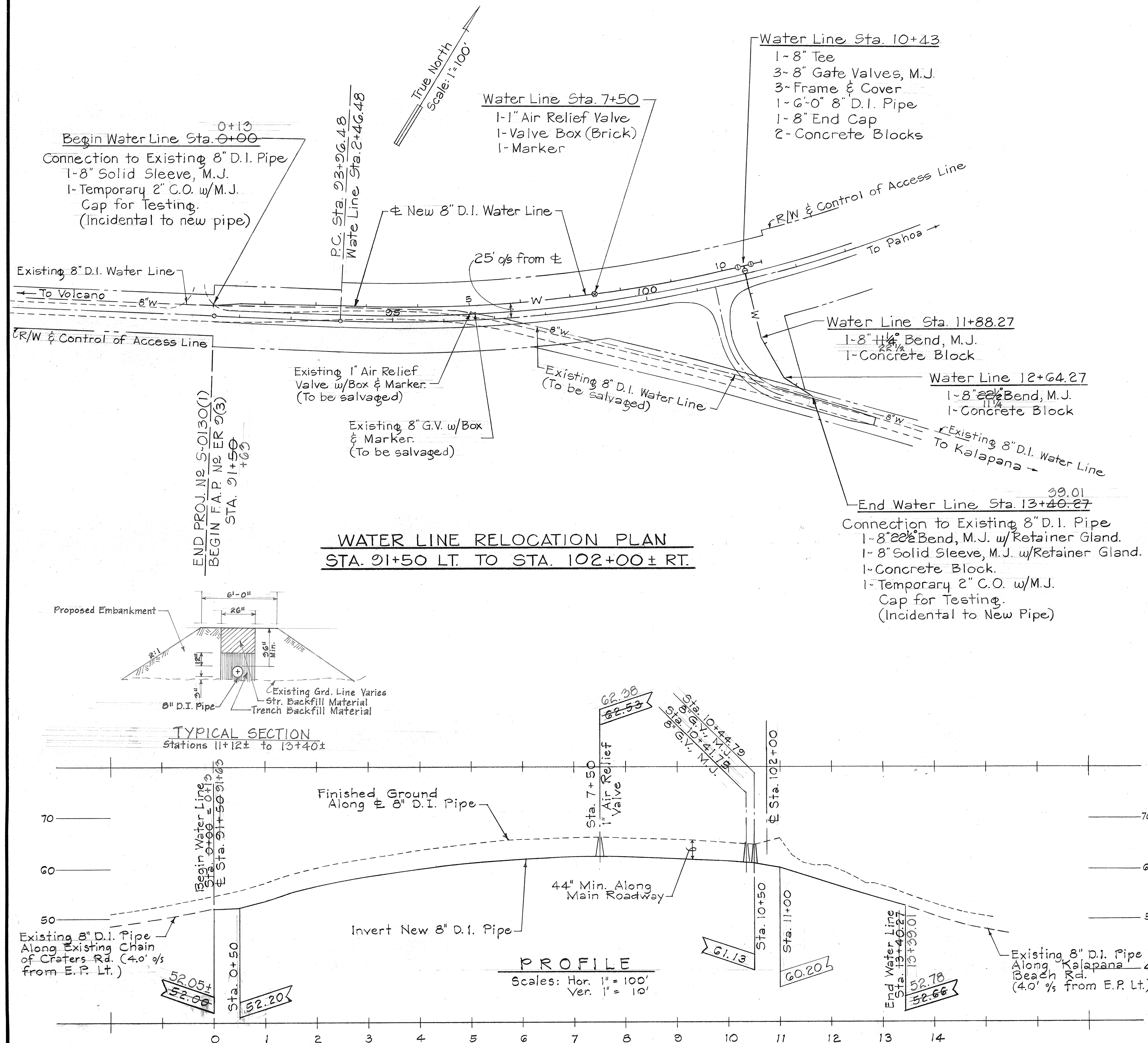
WATERLINE NOTES

- All work shall be done in accordance with the County of Hawaii Department of Water Supply Standards for Water System dated March, 1965, as amended.
- The Contractor shall notify the Department of Water Supply one (1) week in advance of any water shut-off, including customer service shut-off, so that the Department can properly coordinate the shut-off. Water shut-off shall not exceed a period of 3 hours in any one day.
- Water Shut-off may exceed 3 hours if the contractor provides a by-pass facility approved by the DWS and the Engineer. This work shall not be measured nor paid for directly but shall be considered incidental to the various bid items. Size of by-pass shall be as determined by the Department of Water Supply Engineer.
- Contractor shall coordinate the work so as to create a minimum amount of disturbance to the water service.
- Contractor shall notify D.W.S. 72 hours prior to commencement of any pipeline work, including trenching.
- Any work done by the Department of Water Supply's field crew shall be paid for by the Contractor.
- Minimum test pressure shall be 225 p.s.i. at the low point.
- Contractor shall work with the D.W.S. maintenance crew to locate and mark the exact location of the pipeline before commencing with construction. Contractor shall be responsible for any damages to the existing pipeline caused during construction.
- The location and depth of all underground utility pipes shown on the plans are approximate only. The Contractor shall make a personal investigation of the utilities concerned supplemented by actual digging in the field if necessary to determine the actual location and depth of utilities with their branch and service lines, whether indicated on the plans or not. The Contractor shall be responsible for the support, protection, relocation and reconstruction of any utility pipes where necessary and such work shall not be measured nor paid for directly but shall be considered incidental to the various bid items.
- Contractor shall be responsible for the chlorination of the new pipeline and any by-pass lines before connection to existing pipeline is made. Chlorination Company must be authorized by the State Department of Health.
- Contractor shall do all connection work as coordinated and supervised by D.W.S. inspector. No connection work shall be done without the presence of the D.W.S. inspector.
- All D.W.S. existing 8" D.I. pipes and appurtenances to be replaced shall be salvaged. Salvaged material shall be cleaned and hauled to D.W.S. County Baseyard at 889 Leilani St., Hilo, Hawaii. (Work shall be incidental to new pipe installation)

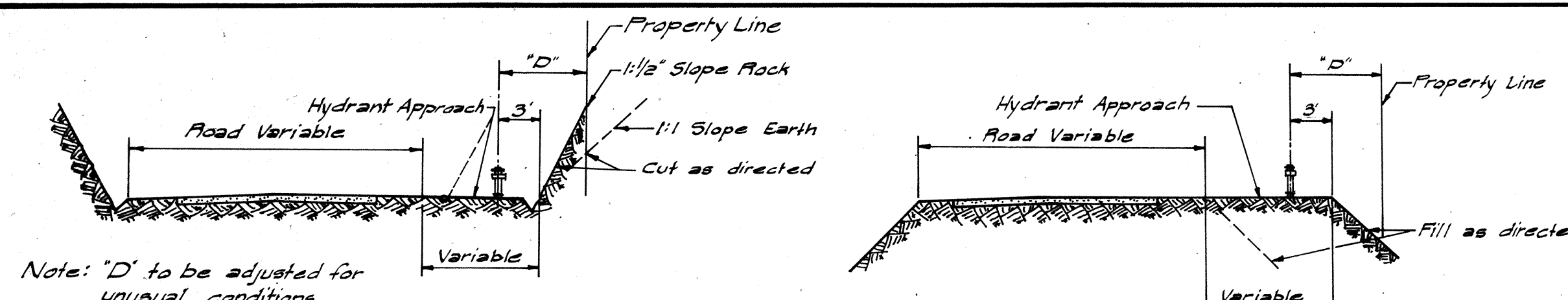
APPROVED:

Adrijan 5/15/78
MANAGER, DEPARTMENT OF WATER SUPPLY DATE

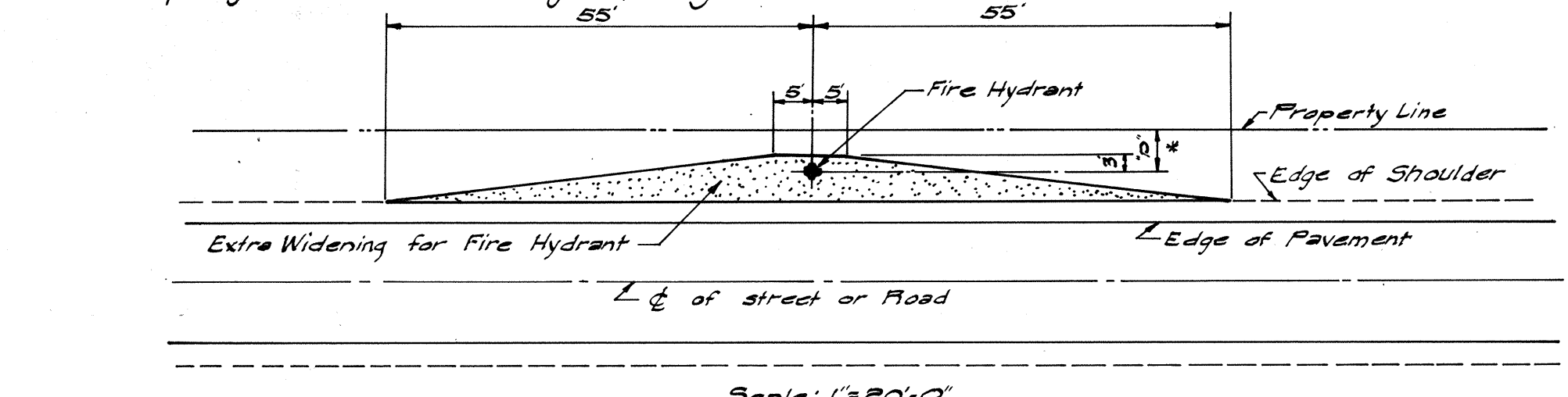
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION	
WATER LINE RELOCATION PLAN STA. 91+50 LT. TO STA. 102+00 RT.	
KAIMU-CHAIN OF CRATERS RD. F.A.P. NO. ER 9(3)	
Scale: As Noted	Date: April, 1978
SHEET NO. 1 OF 3 SHEETS	



DATE	BY
DESIGNED BY	
DRAWN BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
ORIGINAL PLAN	



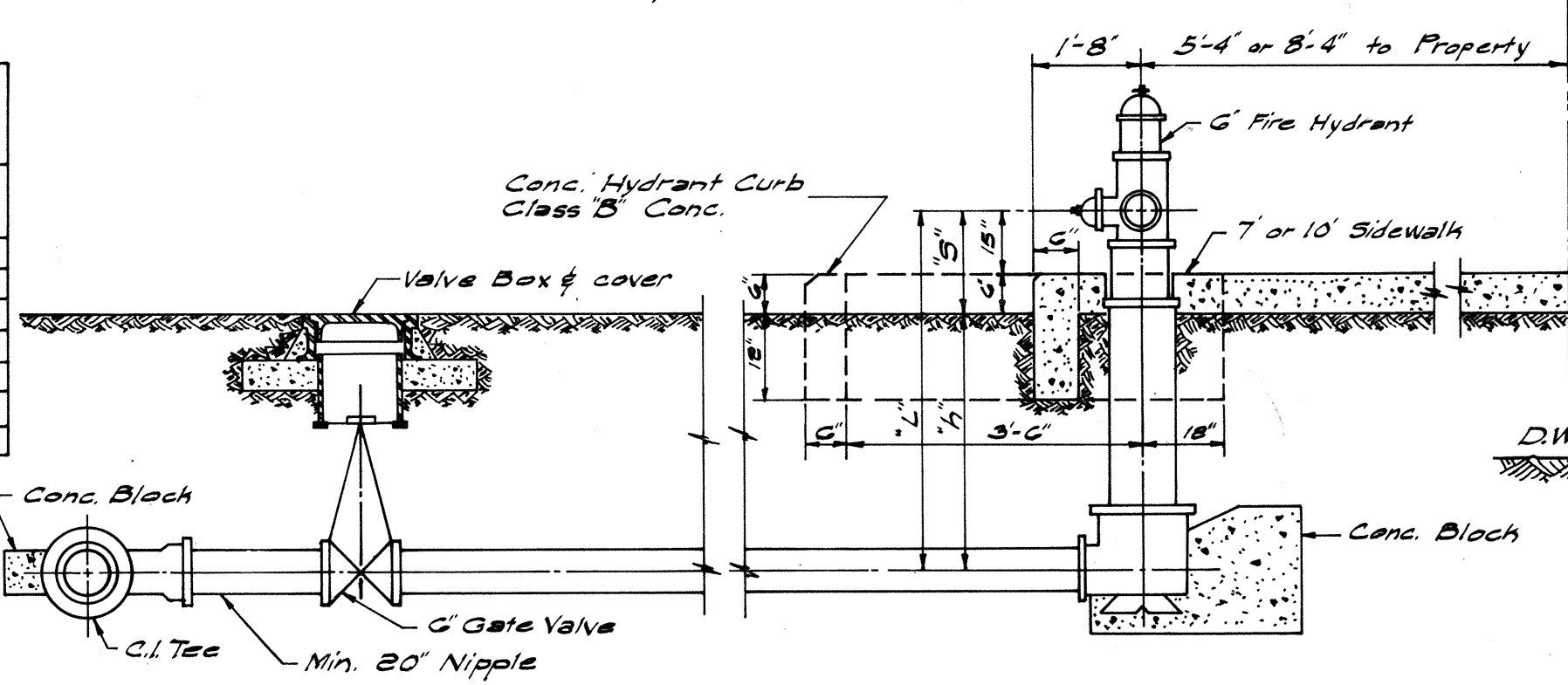
Distance "D" = 5'-4" for 50' STREET, 8'-4" for 60' STREET & 6'-4" for 80' STREET FOR COUNTY R/W
 Note: Fire Hydrant shall be installed on Property line within State Right of Way.
 Scale: 1"=10'-0"



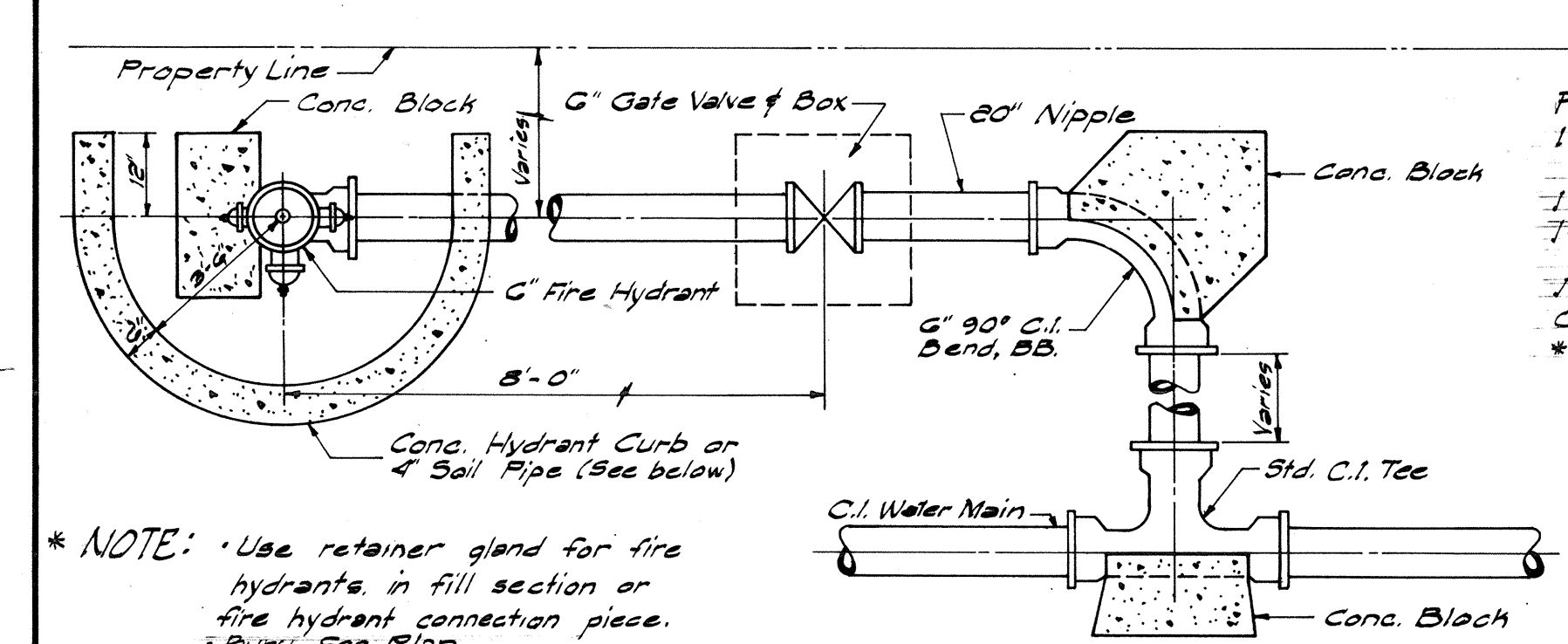
HYDRANT APPROACHES AT CUTS & FILLS

TABLE OF HYDRANT LENGTH MEASURED FROM 1/4 OF PIPE TO 1/4 OF STEAMER OUTLET

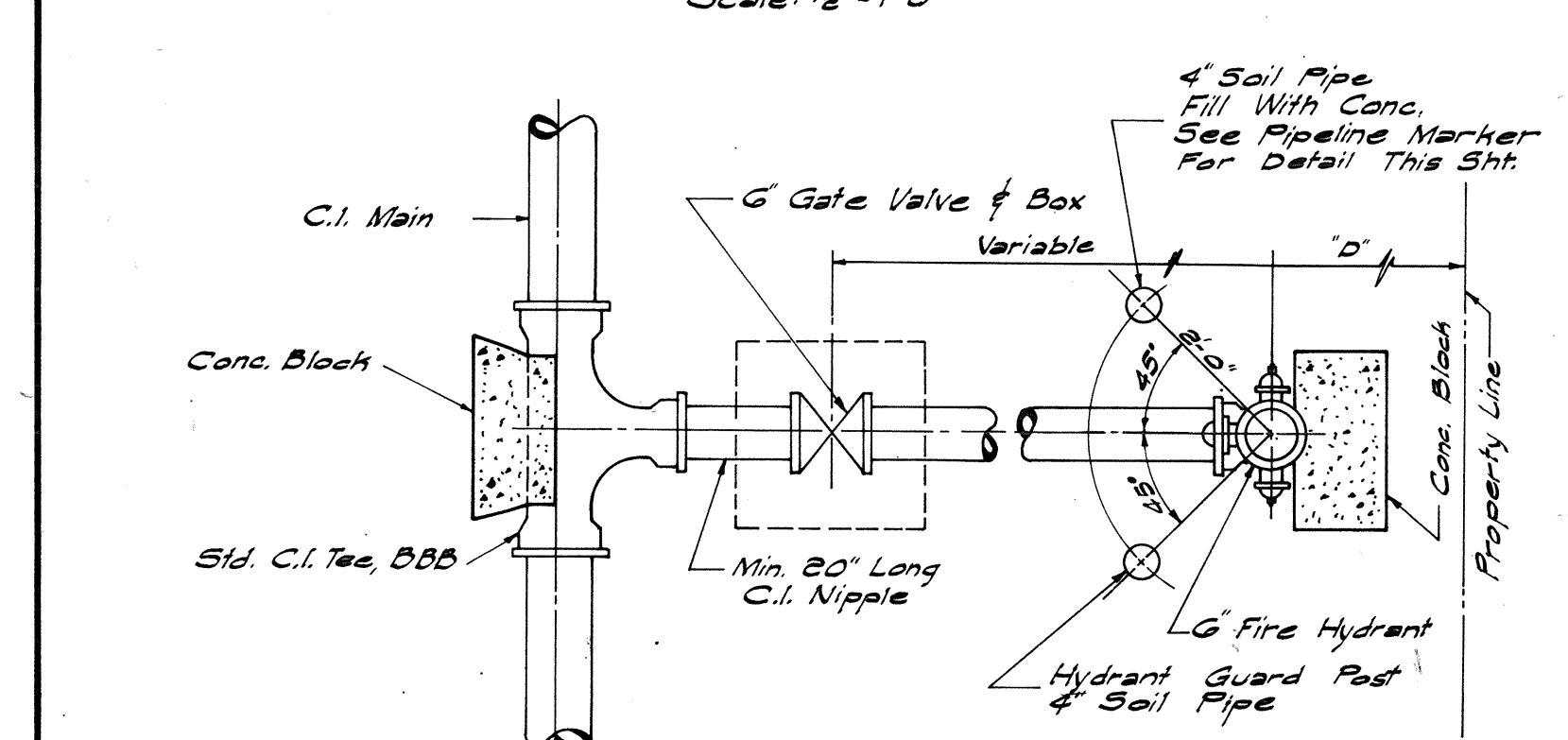
DIA OF PIPE IN INCHES	"H"	"S"	"L"
4"	20"	21"	41"
6"	24"	21"	45"
8"	28"	21"	49"
10"	32"	21"	53"
12"	36"	21"	57"
14"	40"	21"	61"
16"	44"	21"	65"



DETAILS OF FIRE HYDRANT INSTALLATION

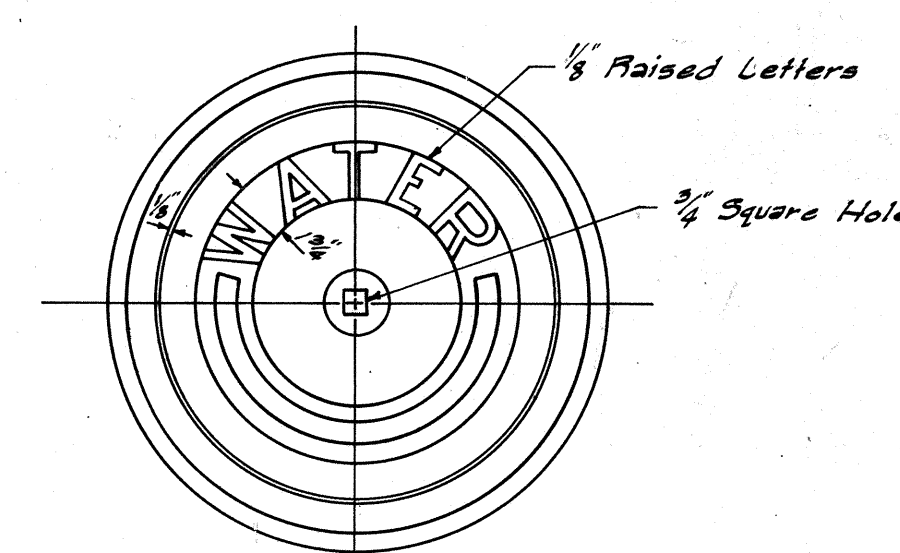


FIRE HYDRANT LAYOUT "A"

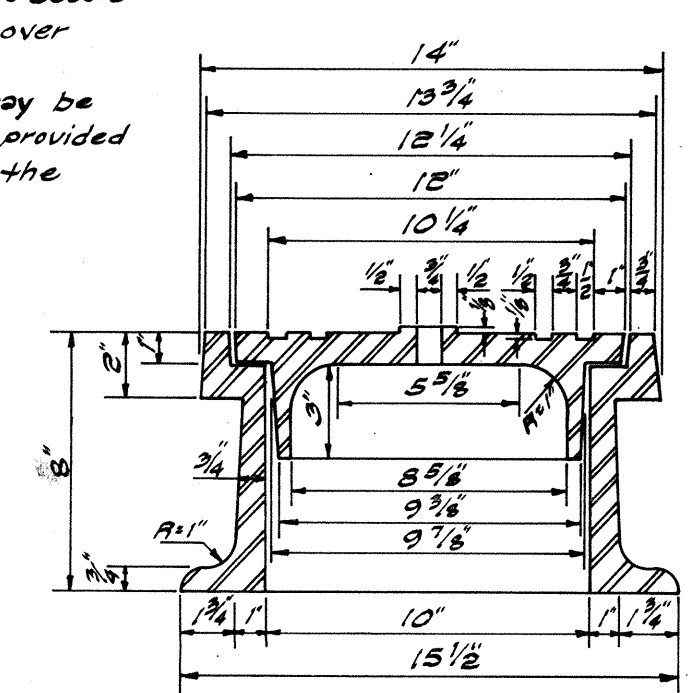


FIRE HYDRANT LAYOUT "B"

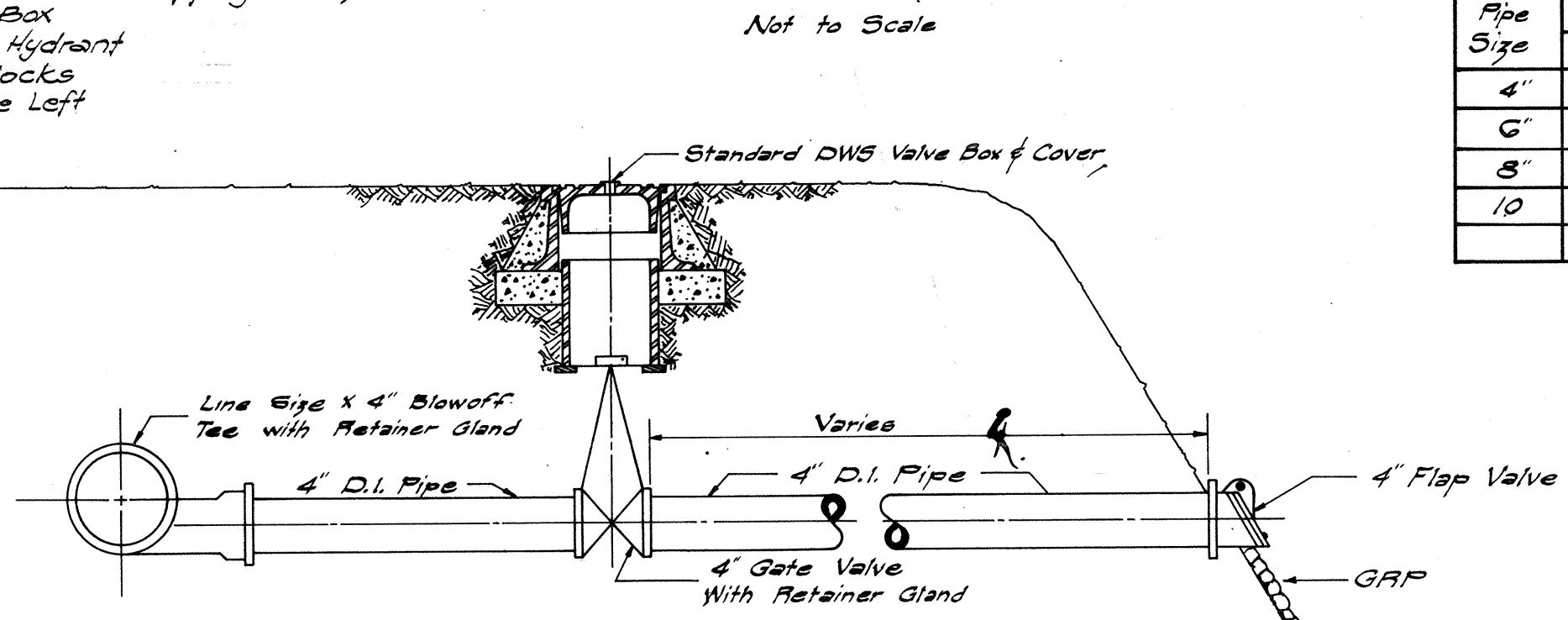
NOTE:
 All casting shall be made accurately to the dimensions shown. Seat and cover shall be machined, not ground to secure flat and true surfaces. The cover shall not rattle in any position.
 Minor changes in dimensions may be made to suit foundry conditions provided such changes are approved by the Dept. of Water Supply.



CAST IRON FRAME & COVER



2" CLEANOUT AT DEAD ENDS

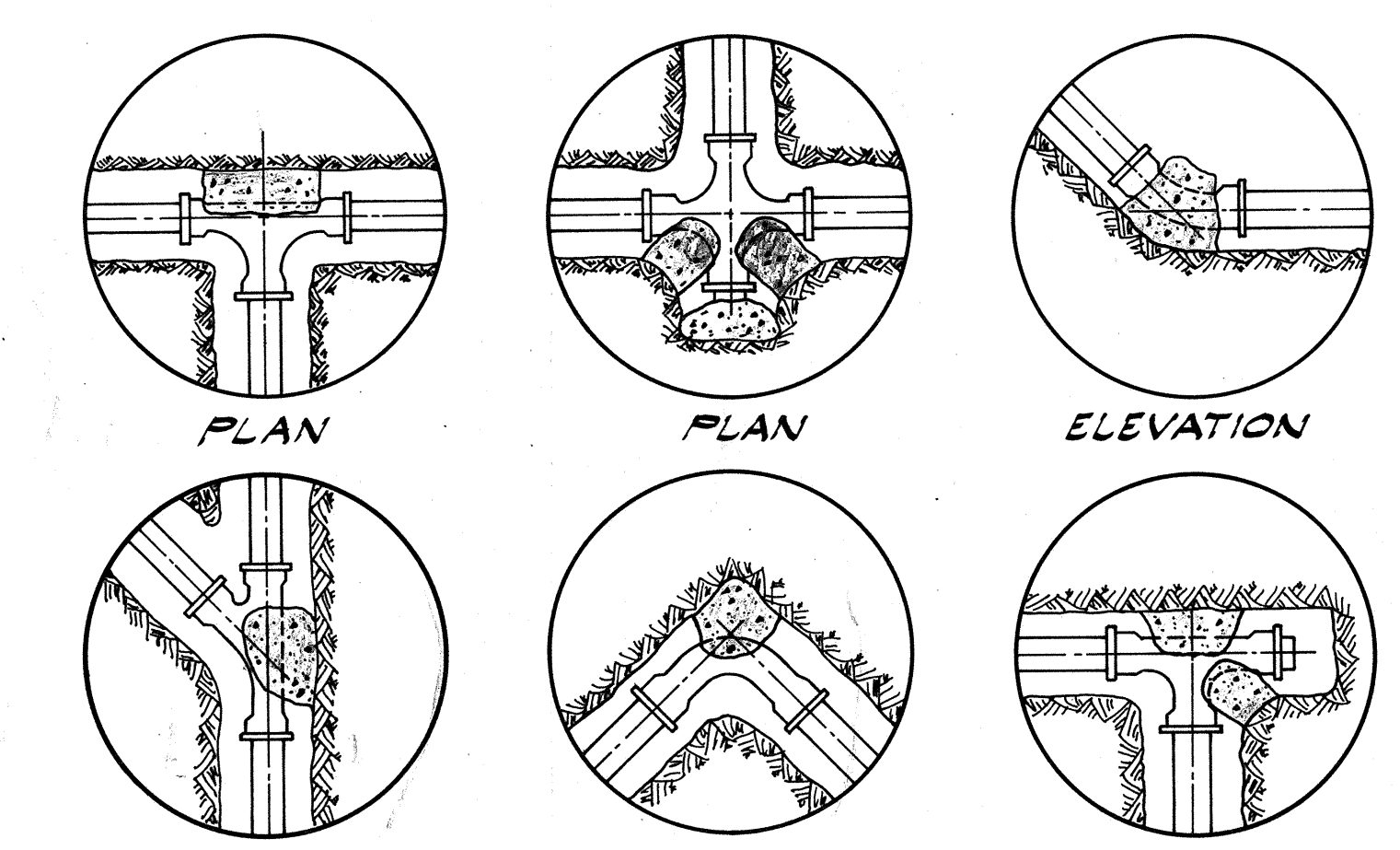
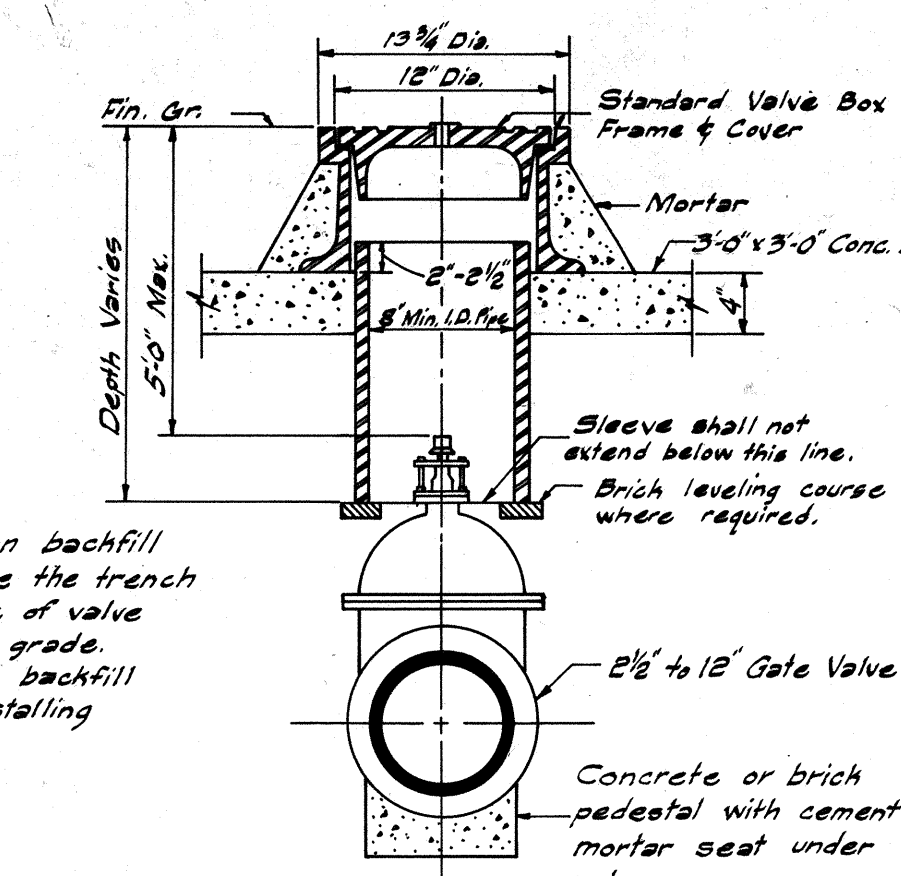


BLOWOFF UNIT

FIRE HYDRANT LAYOUT "B"
 1- Pipe Size X 6" Tee or Tapping Sleeve
 1- 6" Gate Valve or Tapping Valve, 200" & Box
 1- 6" Fire Hydrant Conc. Blocks
 *See Note Left
 Tapping Sleeves and Tapping Valve shall not be used when main line size is 6" diameter.

NOTE:
 The limit of pipe cushion 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 pipe cushion backfill shall be incidental to installing valve box.

CAST IRON VALVE FRAME & COVER

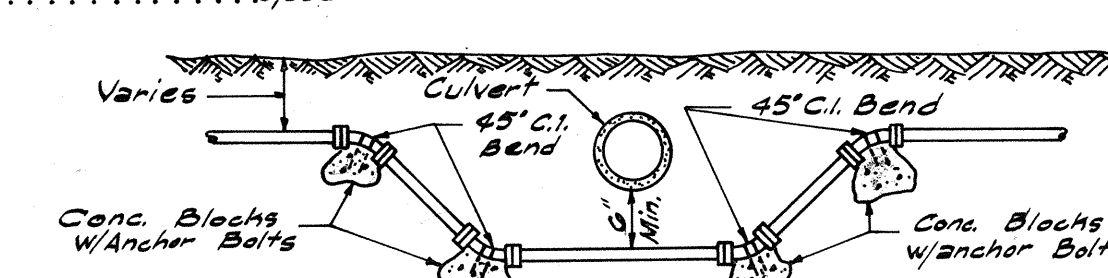


CONCRETE THRUST BLOCKS FOR WATER MAINS

Table of areas in square feet at thrust block in vertical contact with soil of Varying bearing values, water pressure 150 pounds per square inch.

Table of areas in square feet at thrust block in vertical contact with soil Varying bearing Valves, water pressure 150 pounds per square inch																	
Pipe Size	Tees, Bend Ends				90° Bend				45° Bend				22½° Bend				
	a	b	c	d	a	b	c	d	a	b	c	d	a	b	c	d	
4"	2.5	1.5	1.0	1.0	3.5	2.0	1.5	1.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
6"	5.0	2.5	2.0	1.5	7.0	3.5	2.5	2.0	4.0	2.0	1.5	1.0	2.0	1.0	1.0	1.0	1.0
8"	9.0	4.5	3.5	2.0	12.0	6.0	4.5	3.0	7.0	3.5	2.5	1.5	4.0	2.0	1.5	1.0	1.0
10"	14.0	7.0	5.5	3.5	20.0	10.0	7.5	5.0	11.0	5.5	4.0	3.0	6.0	3.0	2.0	1.5	1.5

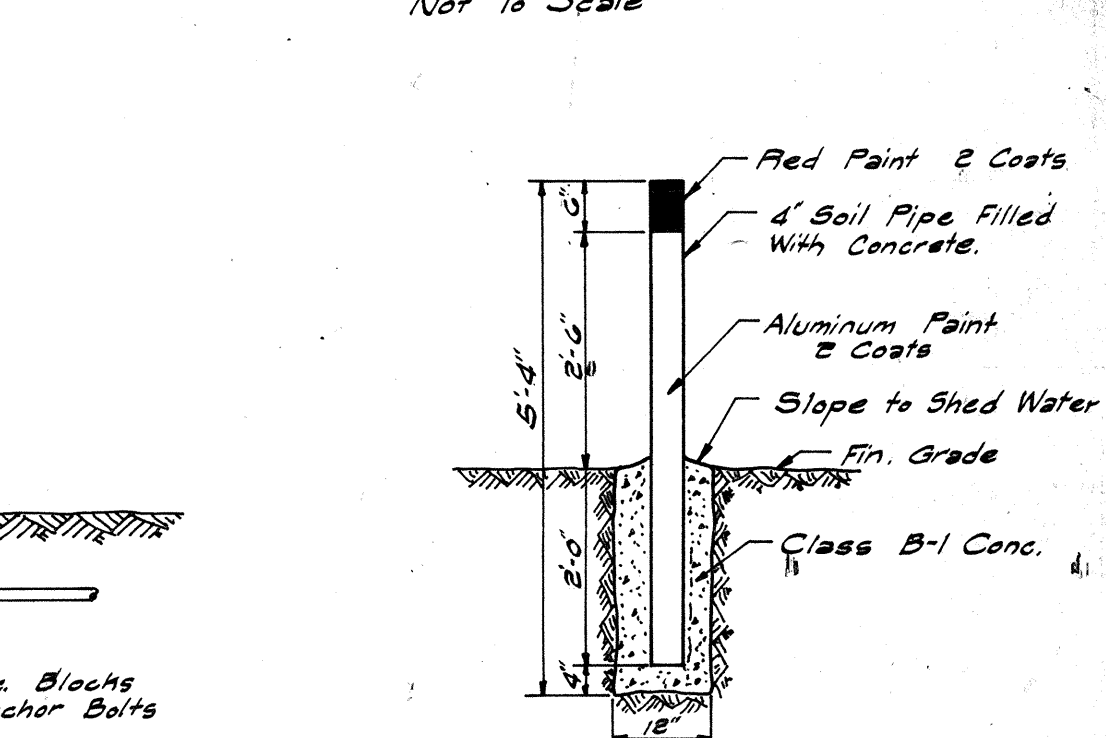
CONDITION OF SOIL
 a-Sand.....1900 Lbs. Per Sq. Ft.
 b-Sand & Gravel.....3000 " " "
 c-Sand Gravel & Cemented Clay.....4000 " " "
 d-Shale.....5000 " " "



DET.-CULVERT UNDERPASS

TYPICAL SECTION OF PIPELINE TRENCH

Not To Scale



PIPELINE MARKER

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 LAND TRANSPORTATION FACILITIES DIVISION

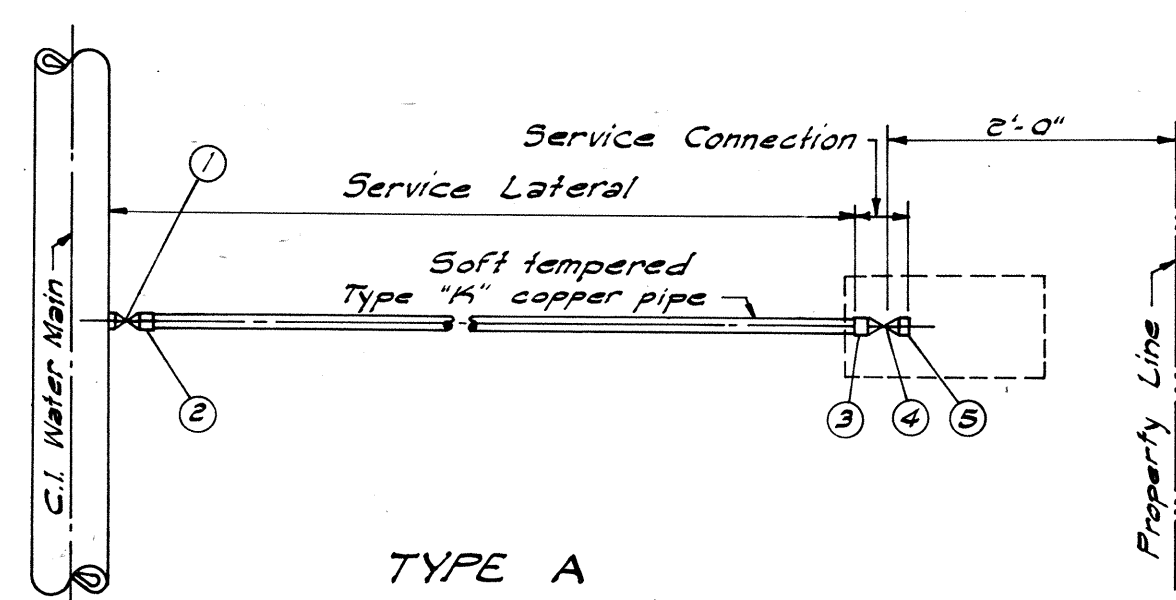
DEPARTMENT OF WATER SUPPLY
 COUNTY OF HAWAII
 STANDARD DETAILS

SCALE: AS SHOWN DATE: DECEMBER, 1974

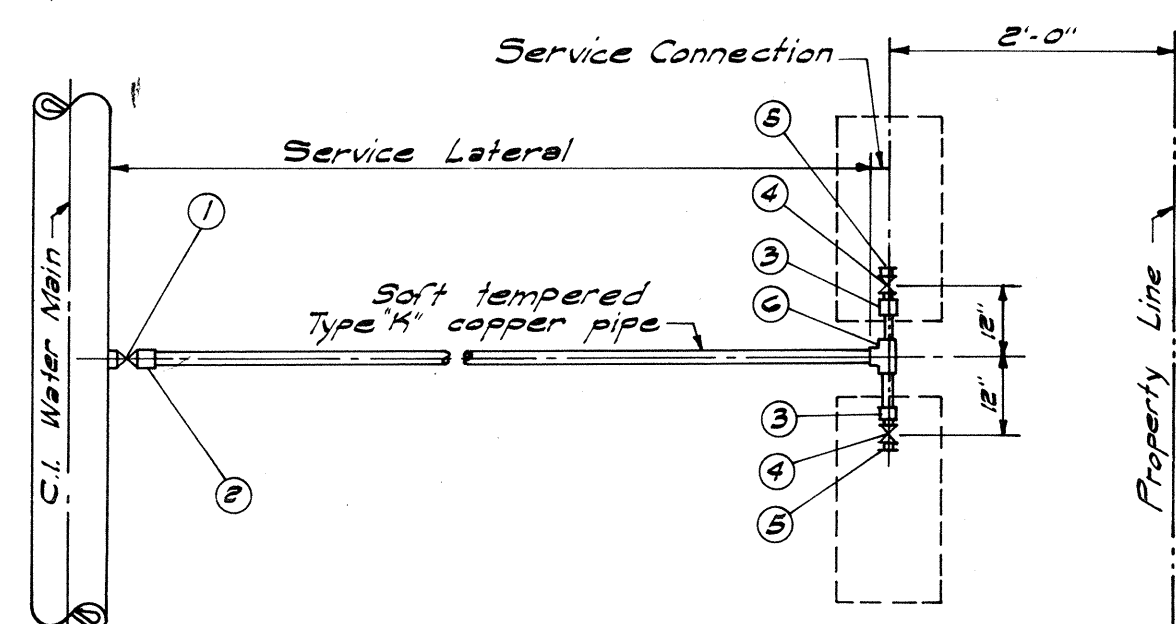
APPROVED: *[Signature]*
 MANAGER, DEPT. OF WATER SUPPLY

SHEET 2 OF 3 SHEETS

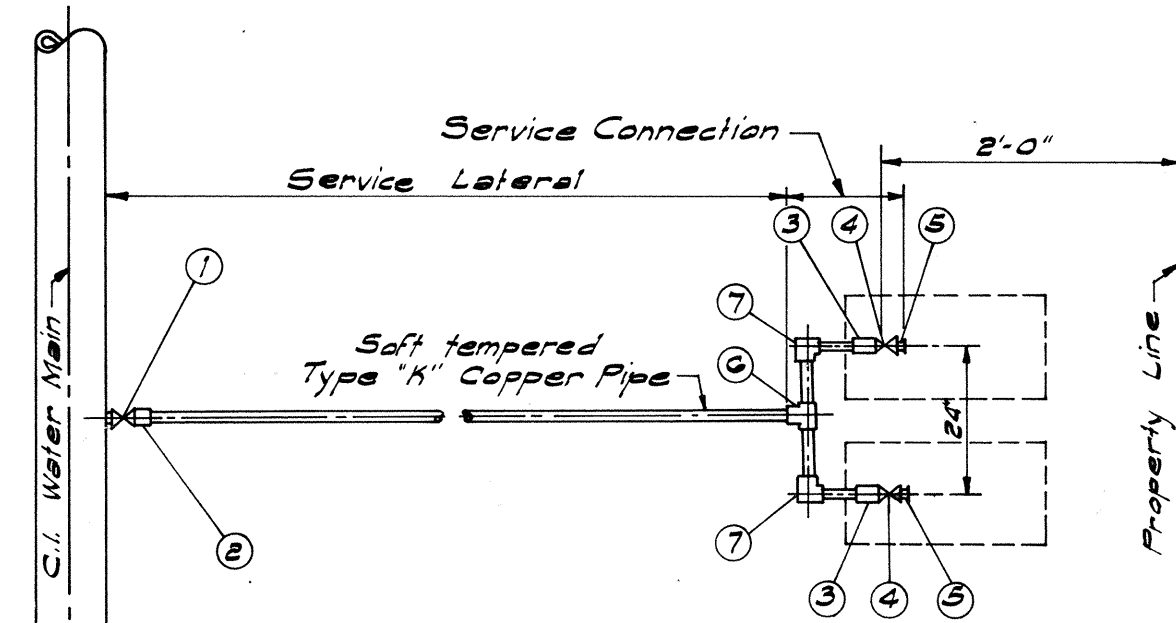
USE DETAILS WHERE APPLICABLE



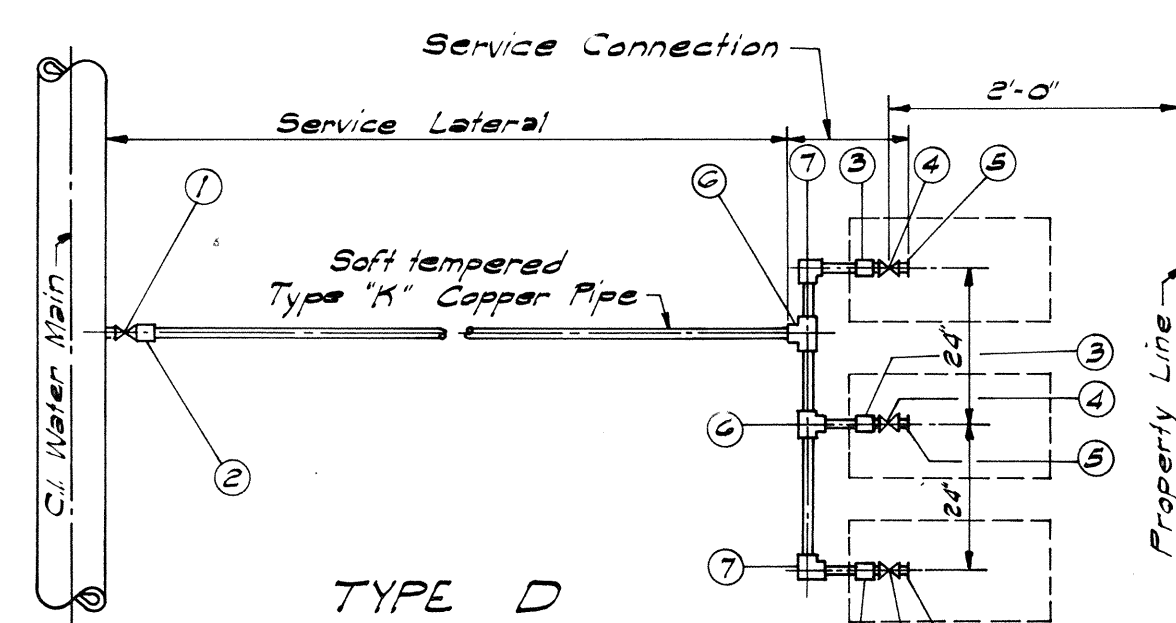
TYPE A



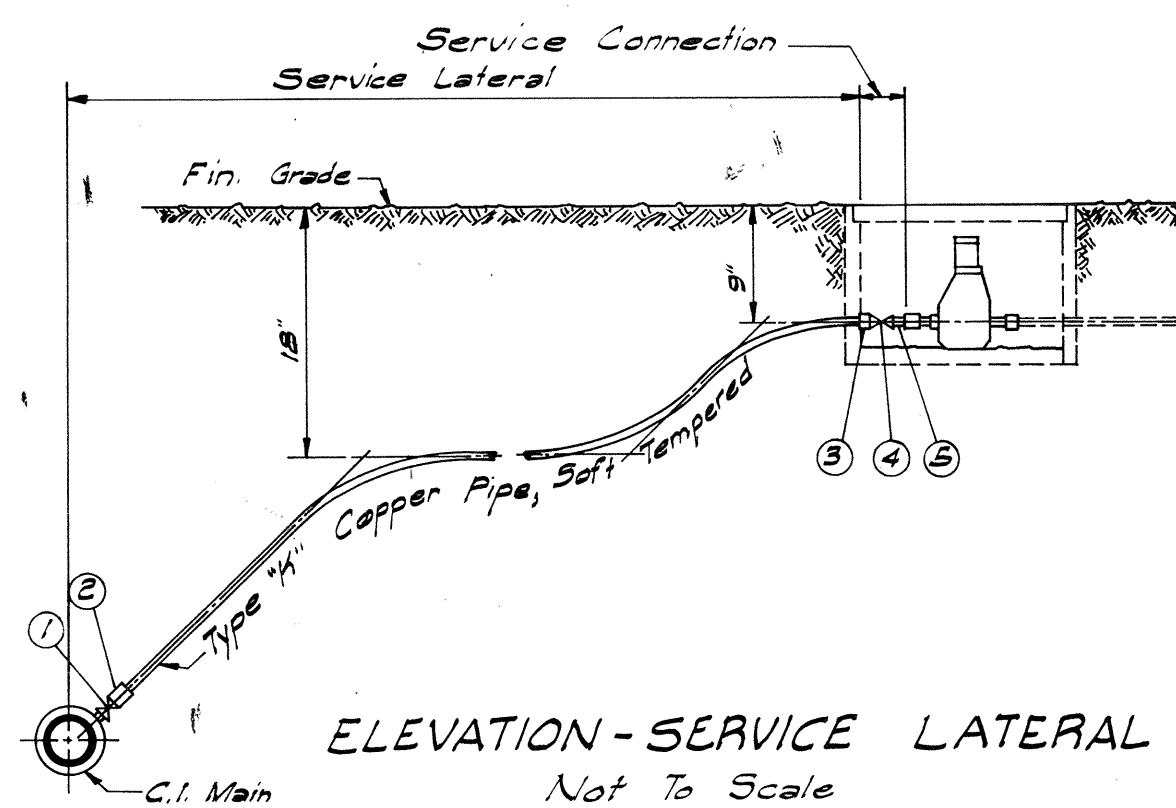
TYPE B



TYPE C



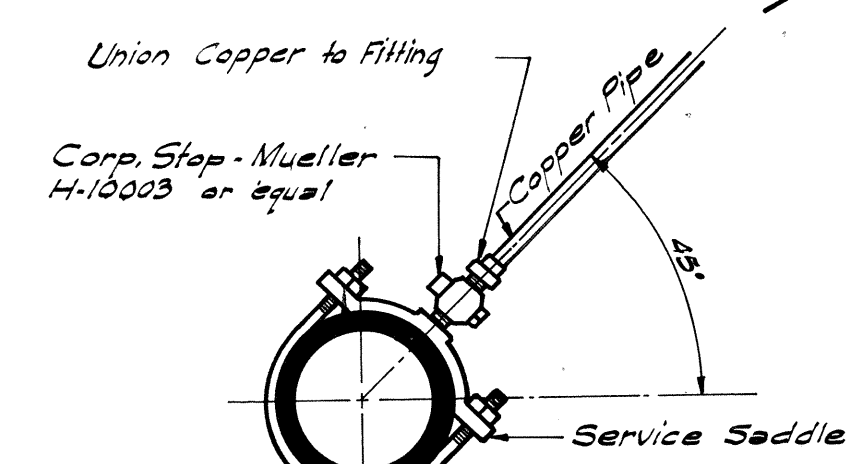
TYPE D



ELEVATION - SERVICE LATERAL
Not To Scale

NOTE:
The Dept. of Water Supply reserves the right to relocate the Service laterals to a location other than that shown on the plans due to the unusual ground condition and to change the size & type of service lateral due to this relocation.

NOTE:
The contractor shall excavate the area at the end of the service connection for the installation of the meter box. This area shall be of sufficient depth, length and width to receive the standard Dept. of Water Supply meter box.

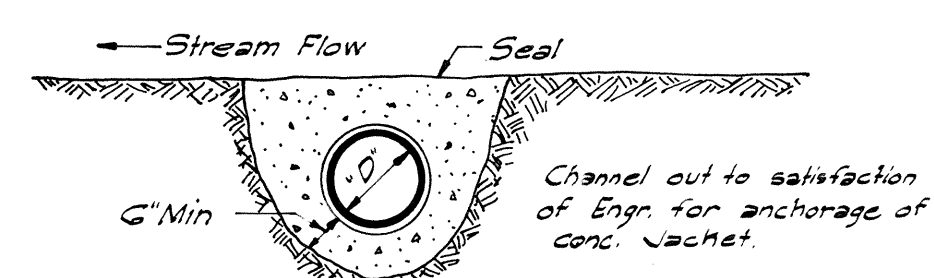


TYPICAL DETAIL - INSTALLATION OF SERVICE SADDLE
Not to Scale

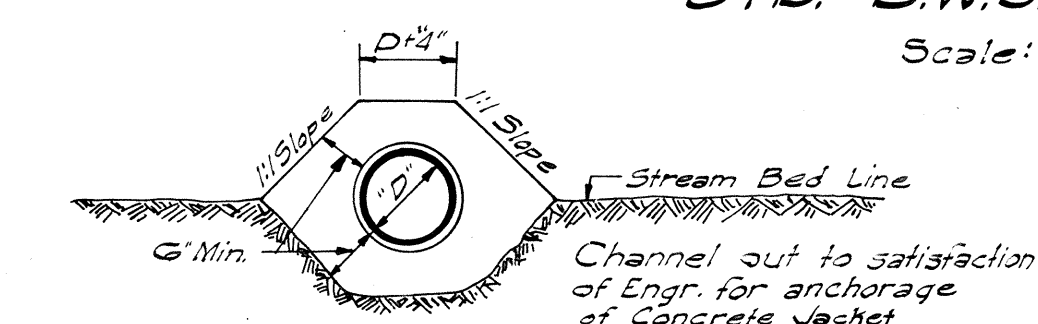
Note: Service Saddle requirement see Standard for Water System Sec. 205.G

SERVICE LATERAL & SERVICE CONNECTION MATERIAL SCHEDULE												
TYPE	SIZE	SERVICE LATERALS				SERVICE CONNECTIONS						
		Corp. Stop Mueller H-10003	Union Copper to Fitting	Copper Pipe - Type "K"	Male Adapter Copper to Fitting	Curb Stop Mueller H-10203	Brass Bushing	Red Tee, Copper to Copper	90° Elbow, Copper to Copper			
		SIZE	QUANT.	SIZE	QUANT.	SIZE	QUANT.	SIZE	QUANT.	SIZE	QUANT.	SIZE
A	1"	3/4" x 1"	1	1"	1	1"	1	1"	1	1"	1	1"
	1 1/4"	1" x 1 1/4"	1	1 1/4"	1	1 1/4"	1	1 1/4"	1	1 1/4"	1	1 1/4"
	1 1/2"	1 1/4" x 1 1/2"	1	1 1/2"	1	1 1/2"	1	1 1/2"	1	1 1/2"	1	1 1/2"
	2"	1 1/2" x 2"	1	2"	1	2"	1	2"	1	2"	1	2"
B	1 1/4"	1" x 1 1/4"	1	1 1/4"	1	1 1/4"	1	1 1/4"	1	1 1/4"	1	1 1/4"
	1 1/2"	1 1/4" x 1 1/2"	1	1 1/2"	1	1 1/2"	1	1 1/2"	1	1 1/2"	1	1 1/2"
	2"	1 1/2" x 2"	1	2"	1	2"	1	2"	1	2"	1	2"
	2 1/2"	2" x 2 1/2"	1	2 1/2"	1	2 1/2"	1	2 1/2"	1	2 1/2"	1	2 1/2"
C	1 1/4"	1" x 1 1/4"	1	1 1/4"	1	1 1/4"	1	1 1/4"	1	1 1/4"	1	1 1/4"
	1 1/2"	1 1/4" x 1 1/2"	1	1 1/2"	1	1 1/2"	1	1 1/2"	1	1 1/2"	1	1 1/2"
	2"	1 1/2" x 2"	1	2"	1	2"	1	2"	1	2"	1	2"
	2 1/2"	2" x 2 1/2"	1	2 1/2"	1	2 1/2"	1	2 1/2"	1	2 1/2"	1	2 1/2"
D	1 1/2"	1 1/4" x 1 1/2"	1	1 1/2"	1	1 1/2"	1	1 1/2"	1	1 1/2"	1	1 1/2"
	2"	1 1/2" x 2"	1	2"	1	2"	1	2"	1	2"	1	2"
ITEM NO.		①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪

METER SCHEDULE		
TYPE	NO. OF METERS	METER SIZE
A	1	5/8", 1", 1 1/2", 2"
B	2	5/8", 1", 1 1/2"
C	2	5/8", 1", 1 1/2"
D	3	5/8"

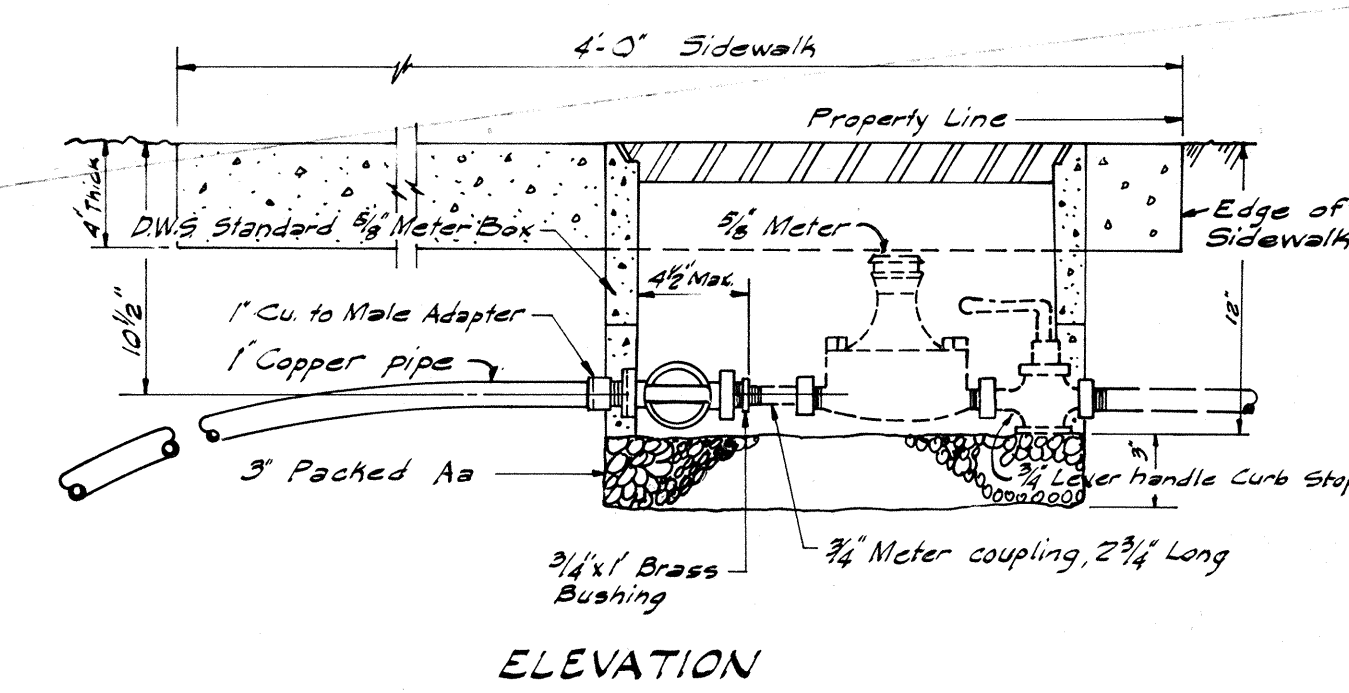


TYPICAL DETAIL OF CONCRETE JACKET FOR PROTECTION OF PIPE BELOW STREAMBED
Scale: 1/2" = 1'-0"

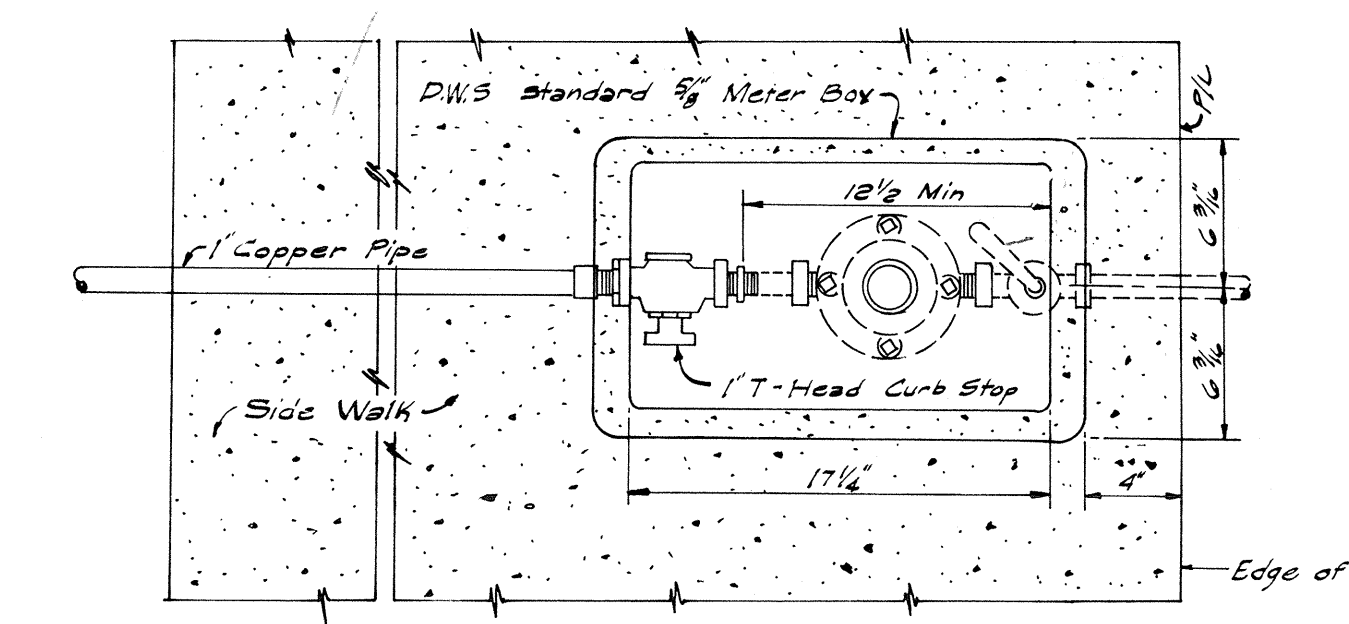


TYPICAL DETAIL OF CONCRETE JACKET FOR PROTECTION OF PIPE ABOVE STREAMBED
Scale: 1/2" = 1'-0"

USE DETAILS WHERE APPLICABLE



ELEVATION



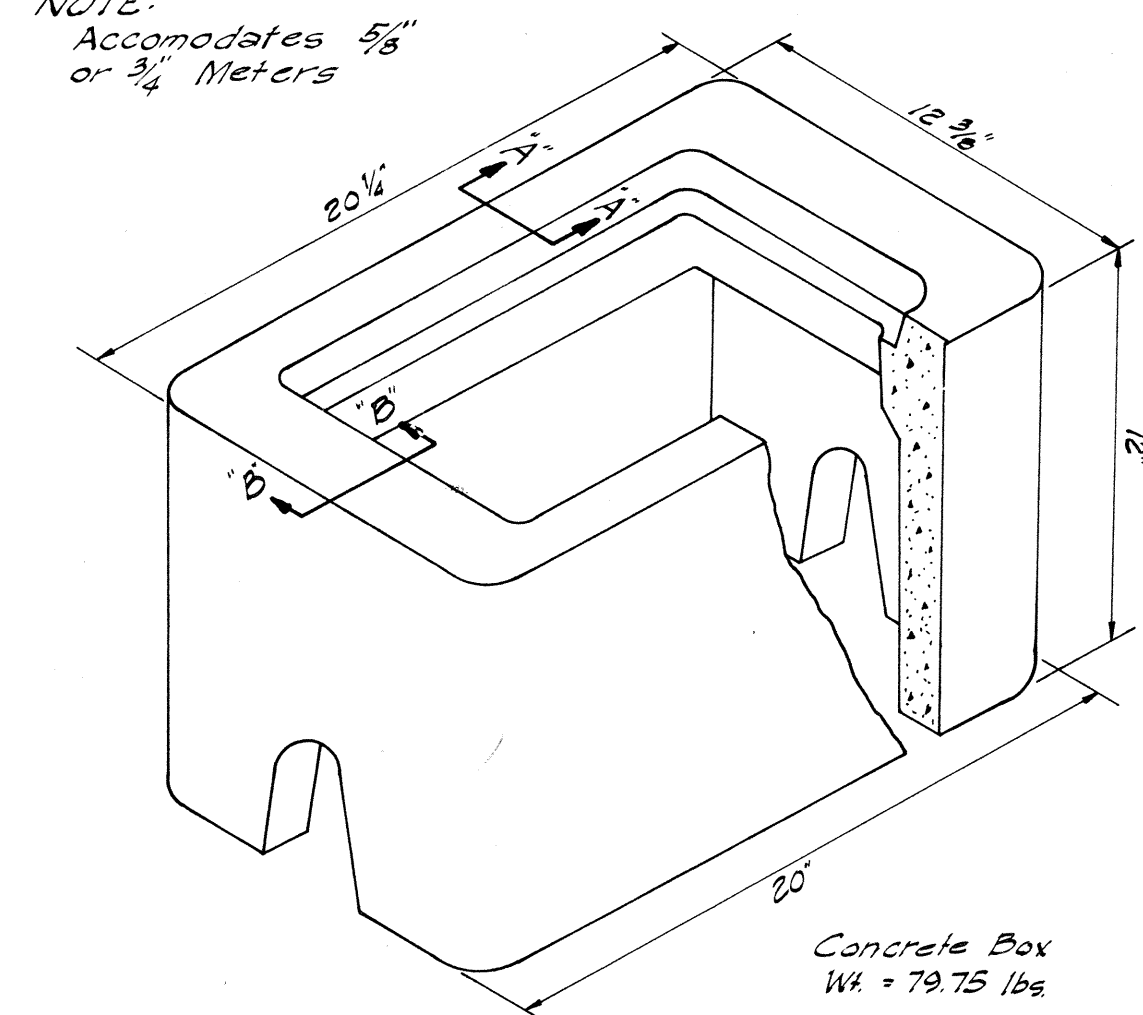
PLAN

5/8" METER INSTALLATION
Scale: 1 1/2" = 1'-0"

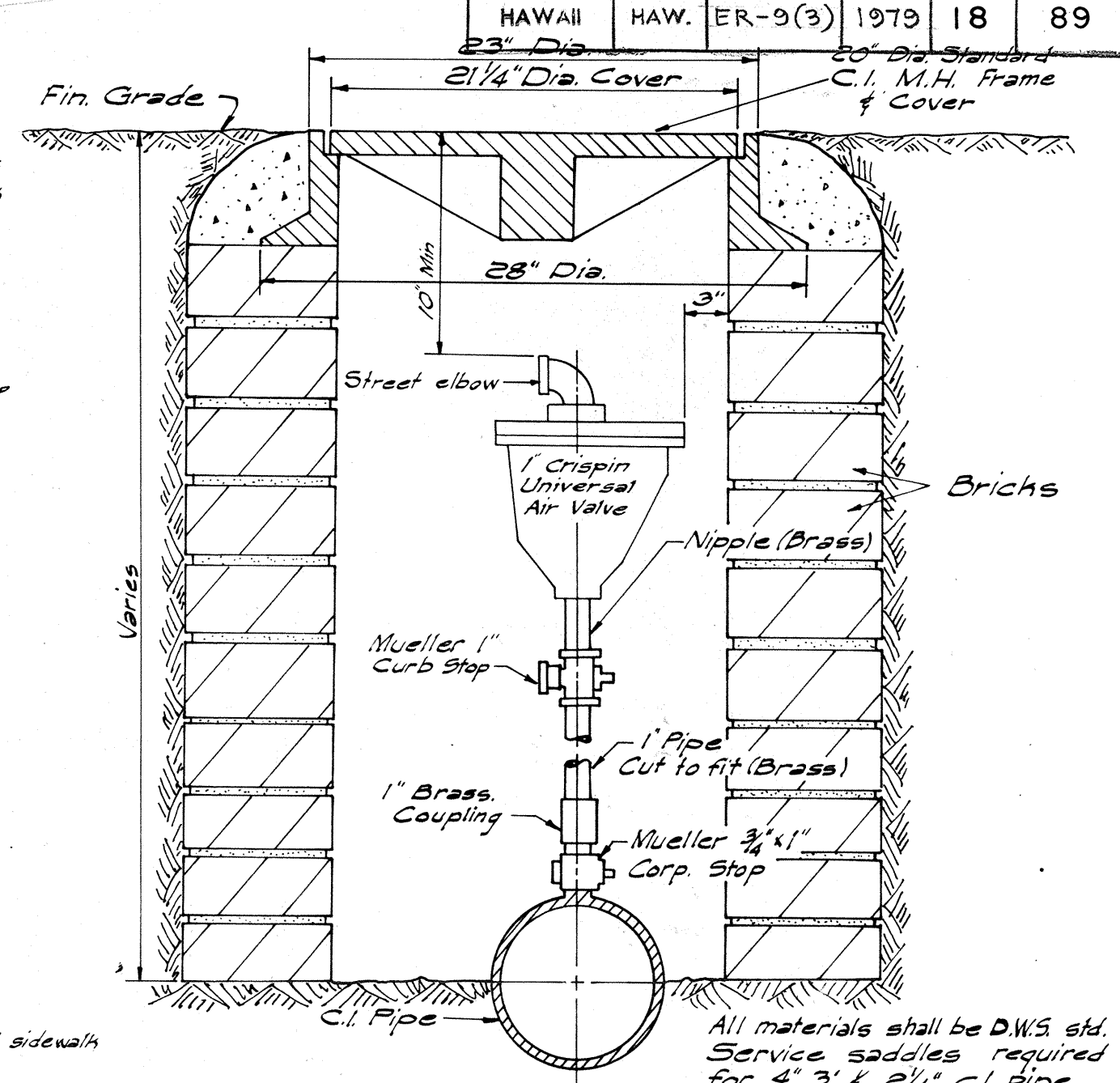
SECTION "A-A"
Scale: 2" = 1'-0"

SECTION "B-B"
Scale: 2" = 1'-0"

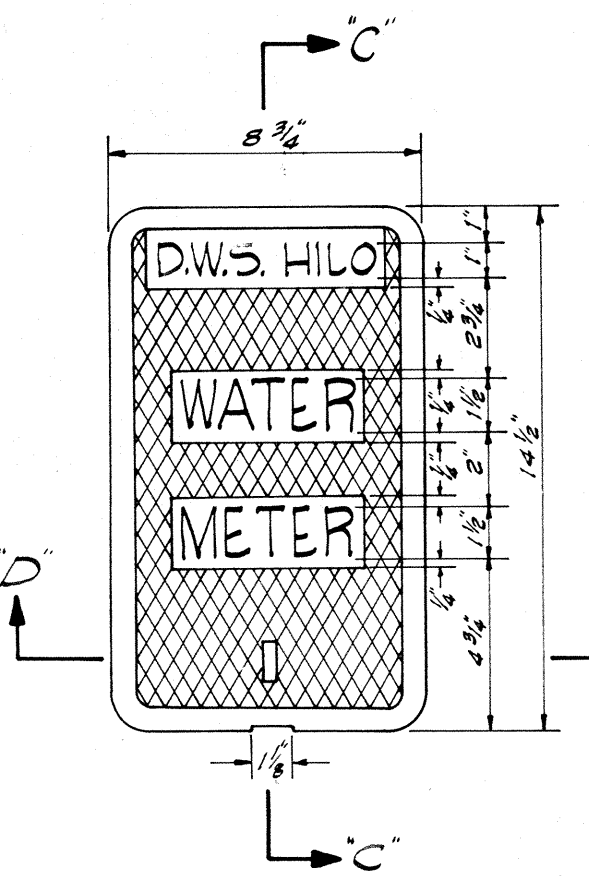
NOTE:
Accommodates 5/8" or 3/4" Meters



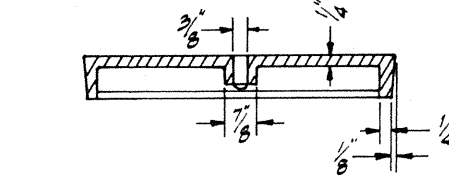
STD. D.W.S. METER BOX
Scale: 2" = 1'-0"



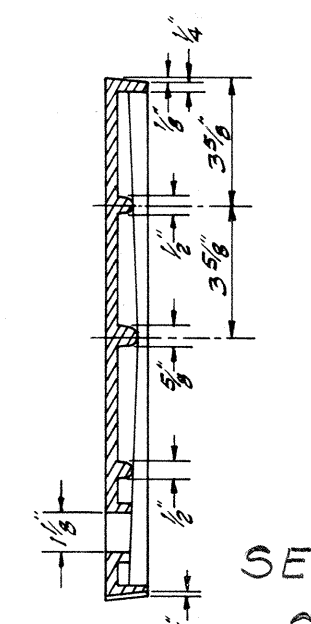
AIR VALVE BOX
Not to Scale



TYPE "B" METER BOX C.I. COVER
Scale: 3/16" = 1"



SECTION "D-D"
Scale: 3/16" = 1"



SECTION "C-C"
Scale: 3/16" = 1"

Note:
Thickness dimensions are net. Add 1/8" for raised surface. Words "D.W.S. HILO" shall be 1" high vertical letters. Words "WATER METER" shall be 1/2" high vertical letters. Meter box cover shall be gray cast iron, free from blister, blowholes, warpage and cold shuts.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

DEPARTMENT OF WATER SUPPLY
COUNTY OF HAWAII

STANDARD DETAILS

SCALE: AS SHOWN DATE: DECEMBER, 1974
APPROVED: *[Signature]*
MANAGER, DEPT. OF WATER SUPPLY