

TABLE 1. DEMAND WEIGHTS OF FIXTURES IN FIXTURE UNITS^a

FIXTURE OR GROUP ^b	OCCUPANCY	TYPE OF SUPPLY CONTROL	WEIGHT IN FIXTURE UNITS ^c
Water closet	Public	Flush valve	10
Water closet	Public	Flush tank	5
Pedestal urinal	Public	Flush valve	10
Stall or wall urinal	Public	Flush valve	5
Stall or wall urinal	Public	Flush tank	3
Lavatory	Public	Faucet	2
Bathtub	Public	Faucet	4
Shower head	Public	Mixing valve	1
Service sink	Office, etc.	Faucet	3
Kitchen sink	Hotel or restaurant	Faucet	4
Water closet	Private	Flush valve	6
Water closet	Private	Flush tank	3
Lavatory	Private	Faucet	1
Bathtub	Private	Faucet	2
Shower head	Private	Mixing valve	2
Bathroom group	Private	Flush valve for closet	8
Bathroom group	Private	Flush tank for closet	6
Separate shower	Private	Mixing valve	2
Kitchen sink	Private	Faucet	2
Laundry trays (1-3)	Private	Faucet	3
Combination fixture	Private	Faucet	3

^aFor supply outlets likely to impose continuous demands, estimate continuous supply separately and add to total demand for fixtures.

^bFor fixtures not listed, weights may be assumed by comparing the fixture to a listed one using water in similar quantities and at similar rates.

^cThe given weights are for total demand. For fixtures with both hot and cold water supplies, the weights for maximum separate demands may be taken as $\frac{1}{2}$ the listed demand for the supply.

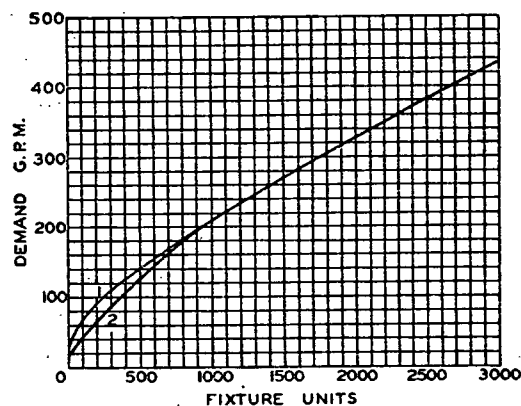


FIG. 1. ESTIMATE CURVES FOR DEMAND LOAD

No. 1 for system predominantly for flush valves.

No. 2 for system predominantly for flush tanks.

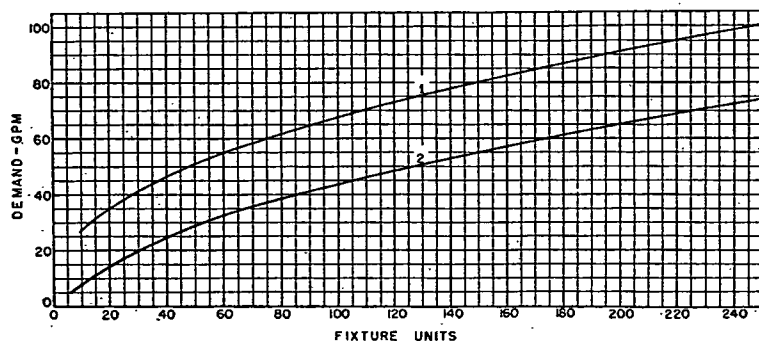


FIG. 2. SECTION OF FIG. 1 ON ENLARGED SCALE

TABLE 2. PERFORMANCE REQUIREMENTS OF WATER METERS^a

SIZE IN.	NORMAL TEST-FLOW LIMITS GPM	MINIMUM TEST-FLOW GPM
$\frac{1}{8}$	1 to 20	$\frac{1}{8}$
$\frac{1}{4}$	2 to 34	$\frac{1}{4}$
$\frac{1}{2}$	3 to 53	$\frac{1}{2}$
$1\frac{1}{4}$	5 to 100	$1\frac{1}{4}$
2	8 to 160	2
3	16 to 315	4
4	28 to 500	7
6	48 to 1,000	12

^aAmerican Water Works Association Standards.

Registration. The registration on the meter dial shall indicate the quantity recorded to be not less than 98 per cent nor more than 102 per cent of the water actually passed through the meter while it is being tested at rates of flow within the specified limits herein under normal test flow limits. There shall be not less than 90 per cent of the actual flow recorded when a test is made at the rate of flow set forth under minimum test flow.

serious extent, Fig. 5 may be used safely to estimate carrying capacity of copper tubing².

SIZING OF COLD WATER SUPPLY PIPING

In order to apply the foregoing principles to the sizing of the supply pipes in the usual up-feed system, it is necessary to ascertain the minimum pressure in the street main, and from this should be subtracted the minimum pressure required for the operation of the topmost fixture. (A pressure of 15 psi is ample for flush valves but reference should be made to the manufacturers' requirements. A minimum of 8 psi should be allowed for other fixtures.) The pressure differential thus obtained will be available for overcoming pressure losses in the distributing system and in overcoming the difference in elevation between the water main and the highest fixture.

The pressure losses in the distributing system will consist of the pressure losses in the piping itself, the pressure losses in the pipe fittings, and the pressure losses in the water meter, if any. Estimated pressure losses for disc-type meters for various rates of flow are given in Fig. 6. Flow limits for disc-type meters, which may be regarded as the limits of recommended ranges in capacities, are given in Table 2. For information on other types of meters the manufacturers should be consulted.

TABLE 3. ALLOWANCE IN EQUIVALENT LENGTH OF PIPE FOR FRICTION LOSS IN VALVES AND THREADED FITTINGS

DIAMETER OF FITTING IN.	EQUIVALENT LENGTH OF PIPE FOR VARIOUS FITTINGS						
	90 Deg Standard Ell Ft	45 Deg Standard Ell Ft	90 Deg Side Tee Ft	Coupling or Straight Run of Tee Ft	Gate Valve Ft	Globe Valve Ft	Angle Valve Ft
$\frac{1}{8}$	1	0.6	1.5	0.3	0.2	8	4
$\frac{1}{4}$	2	1.2	3	0.6	0.4	15	8
$\frac{3}{8}$	2.5	1.5	4	0.8	0.5	20	12
$\frac{1}{2}$	3	1.8	5	0.9	0.6	25	15
$1\frac{1}{4}$	4	2.4	6	1.2	0.8	35	18
$1\frac{1}{2}$	5	3	7	1.5	1.0	45	22
2	7	4	10	2	1.3	55	28
$2\frac{1}{2}$	8	5	12	2.5	1.6	65	34
3	10	6	15	3	2	80	40
$3\frac{1}{2}$	12	7	18	3.6	2.4	100	50
4	14	8	21	4.0	2.7	125	55
5	17	10	25	5	3.3	140	70
6	20	12	30	6	4	165	80