

The minimum practicable size of piping for any water system is governed by the amount of pressure which can be spared in overcoming resistance to flow of a given volume of water per unit of time. After the approximate amount of water required has been computed, a minimum delivery pressure at the highest fixture may be determined. This will be approximately 15 lb per square inch for flush valve closets or 5 lb per square inch for gravity tank closets. It should be remembered that for every foot in height there will be a hydrostatic loss of approximately 0.433 lb.

The pressure loss through a water meter may be significant as may be seen from Table 2. The pressure losses through filters or other water-conditioning apparatus must also be considered. After evaluating the previously mentioned factors, the total allowable friction loss for the

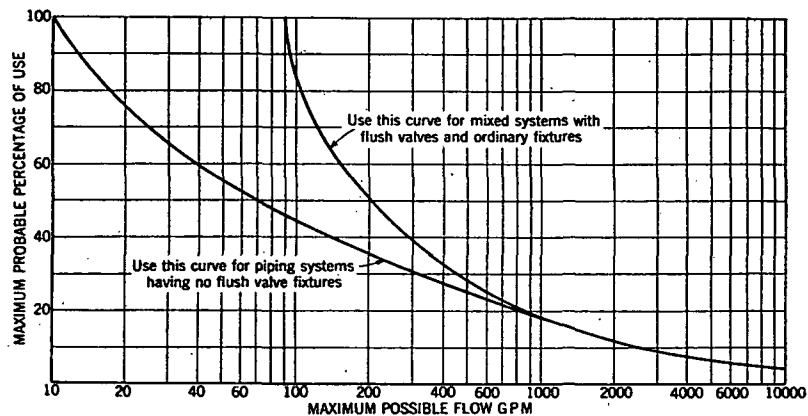


FIG. 1. CHART SHOWING RELATION BETWEEN MAXIMUM FLOW AND PROBABLE USAGE

system may be determined by subtracting from the street main pressure, the sum of the following four items:

1. Minimum allowable pressure at top fixture.
2. Meter loss.
3. $0.433 \times$ height in feet from main to top fixture.
4. Loss for filters, softener, etc.

PIPE MATERIAL

The material used in the water piping affects its carrying capacity. For example, copper or brass pipe is not as likely to retain interior incrustation as is ferrous pipe, and galvanized pipe will not rust as quickly as uncoated pipe. Some waters tend to deposit salts, rust, and the like on the interior surfaces of pipes, greatly reducing their capacity. In some cities it has been found necessary to allow for as much as 50 per cent reduction in carrying capacity after 15 years of service.

The data given in this chapter are based on use of galvanized steel piping and on water which is not notoriously inclined to leave deposit.

If the building is in a zone having untreated water known to carry precipitable solids, the pipe sizes should be increased at least one size and no water pipe should be smaller than $\frac{3}{4}$ in.

TABLE 2. PRESSURE LOSS THROUGH WATER DISC METERS^a
A. W. W. A. Standards

RATE OF FLOW GPM	APPROX. PRESSURE LOSS THROUGH METERS, LB PER SQ IN. PIPE SIZE (IN.)							
	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{2}$	2	3	4	6
5	1.5	0.5	0.2					
10	6.0	2.0	1.0	0.2				
15	14.0	5.0	2.0	0.6	0.2			
20	25.0	9.0	3.5	1.0	0.4			
25		13.5	5.5	1.5	0.6			
30		19.5	8.0	2.0	0.9			
35			11.0	3.0	1.0			
40			14.0	4.0	1.5			
45			18.0	5.0	2.0			
50			22.0	6.0	2.5	0.7		
75				14.0	5.5	1.5		
100				25.0	10.0	2.8	1.0	
125					15.0	4.0	1.5	
150					22.0	6.0	2.2	
175						8.0	3.0	
200						10.4	4.0	1.0
250						16.0	6.0	1.5
300						23.0	9.0	2.2
350							12.0	3.0
400							16.0	4.0
500							25.0	6.5
600								9.0
800								16.0
1000								25.0

MINIMUM SIZE OF SERVICE RECOMMENDED						SAFE MAXIMUM DELIVERY OF METERS	
RATE OF FLOW GPM	APPROX. MINIMUM PIPE SIZE OF SERVICE, MAIN TO METER (IN.) MAXIMUM LENGTH (FT)					METER SIZE IN.	CAPACITY, GPM BASED ON 25 LB LOSS THROUGH METER
	30	75	100	150	200		
1-20	$\frac{3}{4}$	$\frac{3}{4}$	1	1	1	$\frac{5}{8}$	20
20-30	$\frac{3}{4}$	1	1	1 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{3}{4}$	34
30-50	1	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	53
50-100	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2	2	2	2	100
100-150	1 $\frac{1}{2}$	2	2	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3	160
						4	315
						6	500
							1000

^aPressure loss through compound and current meters is less than shown in table. For exact information consult manufacturers.