

TABLE 4. APARTMENT HOUSES. SIZES OF WATER SUPPLY MAINS AND METERS
Based upon pressure drop of 10 lb. per 100 ft. run

FOR 4 AND 5 STORIES

Apartments per Floor

	Four		Six		Eight		Ten	
	Gal.	Main	Gal.	Main	Gal.	Main	Gal.	Main
1 bath.....	120	2½"	160	3"	200	3"	240	3"
2 baths.....	160	3"	200	3"	240	3"	280	3"
3 baths.....	200	3"	240	3"	280	3"	320	3½"

FOR 6, 7 AND 8 STORIES

	Gal.	Main	Gal.	Main	Gal.	Main	Gal.	Main
1 bath.....	150	2½"	190	3"	230	3"	270	3"
2 baths.....	190	3"	230	3"	270	3"	310	3½"
3 baths.....	230	3"	270	3"	310	3½"	350	3½"

FOR 9, 10, 11 AND 12 STORIES

	Gal.	Main	Gal.	Main	Gal.	Main	Gal.	Main
1 bath.....	200	3"	250	3"	300	3½"	350	3½"
2 baths.....	250	3"	300	3½"	350	3½"	400	3½"
3 baths.....	300	3½"	350	3½"	400	3½"	450	4"

Note.—The gallons per minute given above are approximated maximum demand for conditions stated.

Example.—What is the required size of water main for apartment house eight stories high, six apartments per floor, each having three baths?

Answer from Table 4 is 3 in.

Example.—What is the required size of main for a ten-story apartment house with six apartments per floor, each having two baths?

Answer from Table 4 is 3½ in. main.

Note.—Table 4 gives the sizes of mains for apartment houses of one, two or three baths for each apartment, and with four, six, eight or ten apartments per floor and from four to twelve stories in height.

TABLE 5. PIPES MAY BE SIZED FOR GIVING ANY DESIRED PRESSURE DROP PER 100 FT. OF RUN

FRICTION PRESSURE DROP LB. PER SQ. IN. PER 100 FT. RUN	PIPE SIZES IN INCHES									
	¾	1	1¼	1½	2	2½	3	3½	4	
	Gallons per Minute									
5	5.4	11	19	30	62	109	171	252	353	
7	6.4	13	23	36	74	129	203	298	418	
10	7.6	15	27	43	88	154	242	357	499	
20	10.8	22	38	61	125	218	343	504	706	
30	13.2	27	47	76	153	267	420	618	864	
40	15.0	31	54	86	176	308	485	714	998	
50	17.0	35	60	96	197	345	542	800	1115	
75	21.0	43	74	117	242	423	665	978	1365	
100	24.0	49	85	136	278	485	769	1130	1578	
125	27.0	55	96	152	311	544	858	1260	1765	
150	30.0	60	105	166	341	598	939	1380	1930	

TABLE 6. SHOWING WATER PRESSURE REQUIRED TO DELIVER WATER TO TOP OF VERTICAL RISER WITH 15 LB. PRESSURE AT THE TOP BRANCH AND TO GIVE ADEQUATE SERVICE AT VERTICAL HEIGHTS GIVEN

*WATER PRESSURE IN LB. REQUIRED TO DELIVER WATER TO TOP OF RISER WITH 15 LB. TERMINAL PRESSURE				STATIC HEAD IN LB. PER SQ. IN.	VERTICAL RISE OF WATER FROM MAIN TO HIGHEST FIXTURE BRANCH	**WATER PRESSURE IN LB. REQUIRED TO GIVE ADEQUATE SERVICE AT VERTICAL HEIGHTS GIVEN			
Pressure Drop per 100 Ft.						Horizontal Run from Supply to Riser			
5 lb.	7 lb.	10 lb.	20 lb.			25' 0"	50' 0"	75' 0"	100' 0"
15	15	15	15	0	0	22.8 lb.	25.3 lb.	27.8 lb.	30.3 lb.
20.5	20.7	21	22	4.33	10	28.1 "	30.6 "	33.1 "	35.6 "
25	25.4	26	28	8.66	20	33.5 "	36 "	38.5 "	41 "
29.5	30.1	31	34	12.99	30	38.8 "	41.3 "	43.8 "	46.3 "
35	35.8	37	41	17.32	40	44.1 "	46.6 "	49.1 "	51.6 "
39.5	40.5	42	47	21.65	50	49.5 "	52 "	54.5 "	57 "
44	45.2	47	53	25.99	60	54.8 "	57.3 "	59.8 "	62.3 "
49.5	50.9	53	60	30.32	70	60.1 "	62.6 "	65.1 "	67.6 "
54	55.6	58	64	34.65	80	65.2 "	67.7 "	70.2 "	72.7 "
58.5	60.3	63	72	38.98	90	70.8 "	73.3 "	75.8 "	78.3 "
64	66	69	79	43.31	100	76.1 "	78.6 "	81.1 "	83.6 "
68.5	70.7	74	85	47.64	110	81.5 "	84 "	86.5 "	89 "
73	75.4	79	91	51.97	120	86.8 "	89.3 "	91.8 "	94.3 "
77.5	80.1	84	97	56.30	130	92.1 "	94.6 "	97.1 "	99.6 "
83	85.9	90	104	60.63	140	97.5 "	100 "	102.5 "	105 "
87.5	90.5	95	110	64.96	150				

*Note.—The water pressures given in above table are the pressures at the base of the riser, necessary to deliver water to top of riser with a terminal pressure of 15 lb. when discharging the number of gallons per minute called for in Table 5, at the pressure drop indicated.

**Note.—Based upon 10 lb. pressure drop per 100 ft. run of pipe and a terminal pressure of 15 lb. at the uppermost fixture. A terminal pressure of 15 lb. has been selected for operation of flush valves. For terminal pressure of 10 lb., deduct 5 lb. from the figures given above; or for a terminal pressure of 5 lb. deduct 10 lb. from above values.

Example.—What are the sizes required for mains and branches in a building 100 ft. high, supplied with a water pressure of 75 lb. per sq. in. with 100 gal. of water per minute required on each floor?

This is worked out in Table 2 and gives the pipe sizes for the main riser with a 10 lb. drop for 100 ft. of run and shows that a 3 in. main, reduced to 2 in., would be required; branches to the various groups of fixtures can be taken from Tables 5 and 6. On the top floor it will be necessary to use a 1½ in. branch to carry 60 gal. per min. with a pressure drop of 30 lb. but that at 30 ft. vertically from the supply, a 1¼ in. branch pipe will carry 60 gal. per minute, therefore 1¼ in. pipe could be selected for this branch. Assuming that the pressure drop in the main riser is 10 lb. per 100 ft. run and the pressure drop on the top floor in the branch does not exceed 15 lb. in all and the static head for building 100 ft. as given in column 2 of Table 6 is 43.31 lb. making a total of 58.31 lb.; it will be seen that 75 lb.—58.31 lb., which equals 16.59 lb., is the amount of pressure over and above that required, and that this pressure can be utilized to overcome the friction drop in the main feed line running from the source of supply to the base of the riser.

From Table 2 it is found that 240 gal. per min. will flow at the first floor, and assuming that this water supply is to be brought in a main 300 ft. long; Table 5 will show that a 3½ in. supply would be necessary.

Example.—What pressure is required in the water supply main to give 15 lb. pressure at the uppermost fixture in a building where the riser is 100 ft. high and is located 75 ft. from the water main in a horizontal direction, when the other fixtures within the building are in use to their estimated average capacity?

Answer is found to be 75.8 lb. at the intersection of 100 ft. vertical height and 75 ft. horizontal run.

Note.—If only 10 lb. be required at the uppermost fixture, then 70.8 lb. would be the answer.

WHEN TANK IS ON ROOF

If tank is elevated about 35 ft. above highest fixture, which would be about 25 ft. above the roof, similar computations will apply for branch connections and main risers except that the main riser will have its