TABLE 11. TYPICAL CALCULATION OF PIPE SIZES ON UP-FEED RISER WITH FLUSH VALVE WATER-CLOSETS AND URINALS (SEE FIG. 5)

FLOOR OF BLDG.	FIXTURES ON FLOOR	GPM PER FIXTURE	MAXIMUM GPM ON FLOOR	MAXIMUM GPM ON RISER	PROB. BLE USE (PER CENT)	PROBABLE DEMAND RISER GPM	ALLOWABLE DROP LB PER 100 FT	PIPE SIZE IN.
8th	4 W. C. 2 U. 3 Lav.	45 30 3	180 60 9 249	249	44	109	8.5	2½
7th	4 W. C. 2 U. 3 Lav.	45 30 3	180 60 9 249	498	28	139	8.5	2½
6th	4 W. C. 2 U. 3 Lav.	45 30 3	180 60 9 249	747	22	164	8.5	3
5th	4 W. C. 2 U. 3 Lav.	45 30 3	180 60 9 249	996	18	179	8.5	3
4th	10 Lav.	3	30	1026	18	185	8.5	3
3rd	1 S. S.	4	4	1030	18	186	8.5	3
2nd	1 S. S.	4	4	1034	18	187	8.5	3
1st	1 S. S.	4	4	1038	18	188	8.5	3

TABLE 12. SUGGESTED STORAGE TANK SIZES FOR HOMES AND APARTMENTS

ALL YEAR SERVICE BASED ON BOILER WATER AT 180 F				SERVICE DURING HEATING SEASON BASED ON BOILER WATER AT 215 F			
Tank Capacity Gal	Piping Connections		Number of Baths or Families	Tank Capacity Gal	Piping Connections		Number of Baths or Families
	Boiler, In.	Tank, In.			Boiler, In.	Tank, In.	
30	1	¾	1	30	1	¾	1
35	1¼	¾	1	40	1	¾	1
40	1¼	¾	1–2	52	1	¾	1
50	1¼	¾	1–2	66	1¼	1	1–2
60	1¼	1	1–2	82	1¼	1	2–3
72	1½	1	2–3	100	1¼	1	3
80	2	1	2–3	120	1¼	1	4
100	2	1¼	3–4	144	1½	1	5
125	2	1¼	4–5	160	2	1¼	6
150	2	1¼	5–6	200	2	1¼	6–7
200	2	1½	6–7	250	2	1½	7–9
250	2½	1½	7–9	300	2	1½	9–11
300	2½	1½	9–11	400	2½	2	11–15
400	3	2	11–15	500	2½	2	15–18
500	3	2	15–18	600	3	2½	18–21

water demand can be heated during periods of light demand and stored up for use during the periods of heavy demand. The total water consumption per person usually varies between 100 and 150 gal per day when laundry and culinary operations for the occupants are carried out on the same premises. The maximum hourly demand under these conditions will be found to be about one-tenth of the average daily consumption.

If one-third of the total water used is hot water and 125 gal per day is assumed as a fair average of consumption per person, it is apparent that each person uses about 40 gal of hot water per day. If one-tenth of this represents the peak hourly load, then 4 gph must be allowed per person for the heaviest demand. If the average occupancy of apartments is 3 persons, the peak hour demand per apartment will be about 12 gph. It is customary to allow 10 gph of heating capacity per apartment. Water in excess of this heating capacity drawn out during the peak hours is

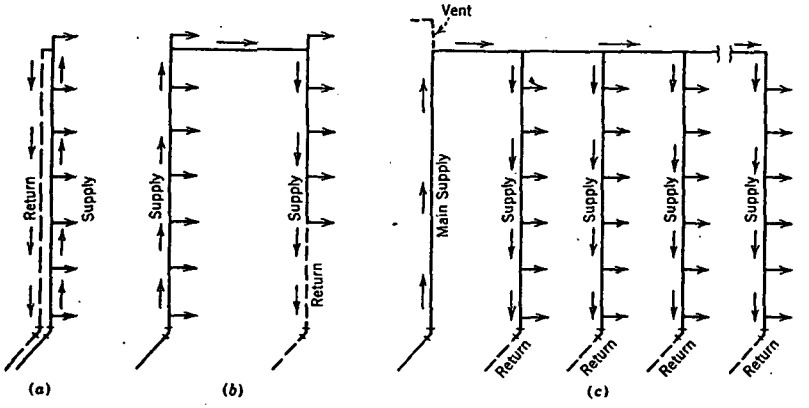

FIG. 7. METHODS OF ARRANGING HOT WATER CIRCULATION LINES

provided for by storage in the hot water tank where this water is heated during hours when the demand is below the average. In single homes, hot water use averages 20 gal per day per person. Table 12 gives suggested storage tank sizes for homes and apartments based on the number of families or baths.

HOT WATER HEATERS

Various types of heaters are available for supplying the hot water for domestic service in buildings. In any hot water supply system the water should be heated to a temperature between 150 and 180 F. Where the hot water requirements include supplies for kitchens, laundries or process work, the higher temperatures are used. In buildings where steam is available throughout the year, the hot water supply is usually taken from this source. In smaller domestic installations the fuel-burning device is generally automatically arranged so that hot water is supplied the entire year and not merely when the boiler is used for heating purposes.