

Proper air venting of a circulated system is extremely important, particularly if gravity circulation is employed. In Fig. 6a and 6b this is

TABLE 9. SCHEDULE OF SIZES FOR DOWN-FEED RISER (SEE FIG. 5)

Posi- tion of Riser	Allow- able Drop Per 100 Ft.	Probable Flow, Gallons Per Minute																
		5	10	15	20	25	30	40	50	60	70	80	90	100	125	150	200	250
T	3.5	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/2	2	2	2 1/4	2 1/4	2 1/4	2 1/4	3	3	3	3 1/4	3 1/4
S	20	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2	2	2 1/4	3
R	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4
Q	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4
P	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4
O	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4
N	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4
M	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4
L	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4
K	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4
J	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4
I	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4
H	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4
G	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4
F	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4
E	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4
D	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4
C	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4
B	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4
A	30	3/4	3/4	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2 1/4	2 1/4

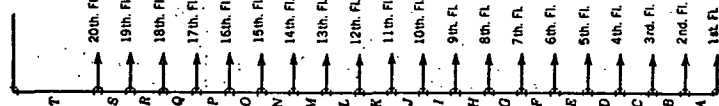


FIG. 5. TYPICAL RISER FOR 20-STORY BUILDING

accomplished by connecting the circulating line below the top fixture supply. Air is thus eliminated from the system each time the top fixture is opened. Where an overhead main is located above the highest fixture,

as in Fig. 6c an automatic float type air vent is installed at the highest point of the system or a fixture branch is taken off the top of the main where air venting is desired and then dropped down to the fixture outlet.

The supply riser in Fig. 6a would be sized exactly the same as an up-feed cold water riser. The sizing of Fig. 6b and 6c would involve calculations for both up-feed and down-feed risers. Pressure loss in the overhead main would have to be considered in sizing the up-feed risers.

The return line for a gravity circulating system should never be less than 3/4 in. Where supply risers are large or lines are long, larger circulating lines may be indicated. Pumps are frequently used in large systems to provide positive circulation.

It is sometimes necessary to make an allowance for pressure drop in the

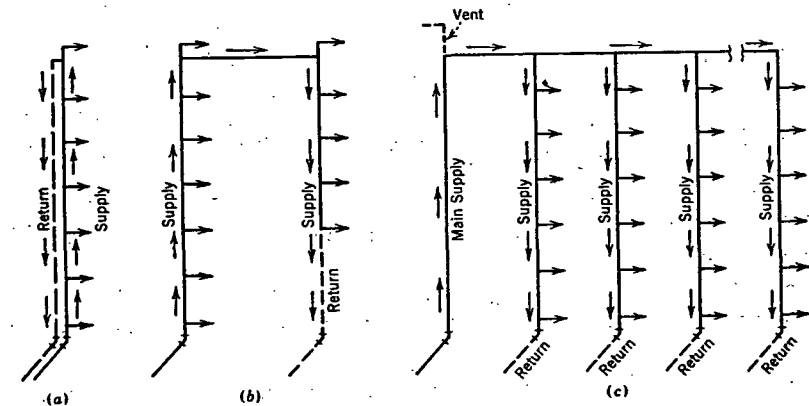


FIG. 6. METHODS OF ARRANGING HOT WATER CIRCULATION LINES

heater when sizing hot water lines. This is particularly true where instantaneous heaters are used.

STORAGE CAPACITY AND HEATING LOAD

In estimating the size of hot water storage tank required and the heating capacity to be provided either from the boiler or from an independent domestic hot water heater, it is necessary to know the total quantity of water to be heated per day, and the maximum amount which will be used in any one hour, as well as the duration of the peak load.

In cases where the requirements for hot water are reasonably uniform, as in residences, apartment buildings, hotels, and the like, smaller storage capacity is required than in the case of factories, schools, office buildings, etc., where practically the entire day's usage of hot water occurs during a very short period. Correspondingly, the heating capacity must be proportionately greater with uniform usage of hot water than with intermittent usage where there may be several hours between peak demands during which the water in the storage tank can be brought up to temperature. As a general rule it is desirable to have a large storage capacity in