

TABLE 8. TYPICAL CALCULATION OF PIPE SIZES ON DOWN-FEED RISERS WITH FLUSH TANK WATER-CLOSETS AND URINALS ON TOP FLOOR ONLY

| FLOOR OF BLDG.     | FIXTURES ON FLOOR         | GPM PER FIXT. | MAX. FIXT. GPM | PROBABLE USE (PER CENT) | PROBABLE USE GPM | PROBABLE RISER GPM | ALLOWABLE DROP LB PER 100 FT | PIPE SIZE IN. |
|--------------------|---------------------------|---------------|----------------|-------------------------|------------------|--------------------|------------------------------|---------------|
| <i>Riser No. 1</i> |                           |               |                |                         |                  |                    |                              |               |
| 7th and below      | 12 W. C.                  | 50            | 600            |                         |                  |                    |                              |               |
|                    | 6 U.                      | 40            | 240            |                         |                  |                    |                              |               |
|                    | 18                        |               | 840            | 18                      | 151              |                    |                              |               |
|                    | 19 Lav.<br>3 S. S.        | 3<br>4        | 57<br>12       |                         |                  |                    |                              |               |
|                    | 22                        |               | 69             | 40                      | 28               | 179                | 30                           | 2½            |
| 8th                | 0 W. C.                   | 00            | 000            |                         |                  |                    |                              |               |
|                    | 0 U.                      | 00            | 000            |                         |                  |                    |                              |               |
|                    | 18                        |               | 840            | 18                      | 151              |                    |                              |               |
|                    | 4 W. C.<br>2 U.<br>3 Lav. | 18<br>18<br>3 | 72<br>36<br>9  |                         |                  |                    |                              |               |
|                    | 31                        |               | 186            | 37                      | 69               | 220                | 3.3                          | 4             |
| <i>Riser No. 2</i> |                           |               |                |                         |                  |                    |                              |               |
| 7th and below      | 29 W. C.                  | 50            | 1450           |                         |                  |                    |                              |               |
|                    | 5 U.                      | 40            | 200            |                         |                  |                    |                              |               |
|                    | 34                        |               | 1650           | 10                      | 165              |                    |                              |               |
|                    | 19 Lav.                   | 3             | 57             | 42                      | 24               | 189                | 30                           | 2½            |
| 8th                | 0 W. C.                   | 00            | 000            |                         |                  |                    |                              |               |
|                    | 0 U.                      | 00            | 000            |                         |                  |                    |                              |               |
|                    | 34                        |               | 1650           | 10                      | 165              |                    |                              |               |
|                    | 6 W. C.<br>4 Lav.         | 18<br>3       | 108<br>12      |                         |                  |                    |                              |               |
|                    | 29                        |               | 177            | 38                      | 67               | 232                | 3.3                          | 4             |
| <i>Riser No. 3</i> |                           |               |                |                         |                  |                    |                              |               |
| 7th and below      | 6 W. C.                   | 50            | 300            | 40                      | 120              |                    |                              |               |
|                    | 5 S. S.                   | 4             | 20             |                         |                  |                    |                              |               |
|                    | 4 Lav.                    | 3             | 12             |                         |                  |                    |                              |               |
|                    | 9                         |               | 32             | 50                      | 16               | 136                | 30                           | 2½            |
| 8th                | 0 W. C.                   | 00            | 000            |                         |                  |                    |                              |               |
|                    | 6                         |               | 300            | 40                      | 120              |                    |                              |               |
|                    | 1 S. S.                   | 4             | 4              |                         |                  |                    |                              |               |
|                    | 10                        |               | 36             | 48                      | 17               | 137                | 3.3                          | 3             |

The last method is usually the most satisfactory. (See Fig. 6).

In the first instance the up-feed riser may be sized for the same pressure drop as used for the cold water riser and, from the top of the riser *just below the top fixture connection*, a return circulation line may be carried back to the main return line in the basement and connected through a check valve set on a 45-deg angle and a gate valve; these return circulation lines should never be less than ¾ in., and on the farther half of the risers, not less than 1 in. to favor circulation in the far end. Typical top and bottom connections for such risers are shown in Fig. 7.

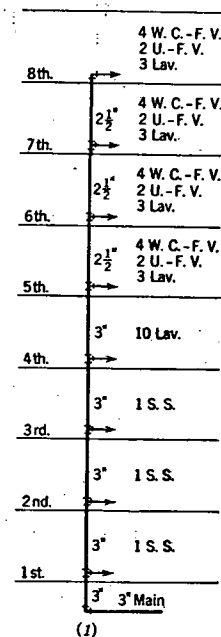


FIG. 5. UP-FEED SYSTEM

For the second arrangement of hot water risers, circulation lines are run back from the last fixture supplied to the main return circulation line in the same manner as just described, using ¾ in. for the near risers and 1 in. for the far risers. The sizing is much more difficult, as it is necessary to start at the bottom floor of the return riser and work back to the top of this riser and then carry the maximum flow across onto the top of the corresponding supply riser and work down on this riser from the top floor to the bottom. Naturally this gives a much greater flow in the supply riser and aids circulation by reducing pipe friction. The allowable loss per 100 ft in such lines must be made about half that used for the cold