

How Water Works

ILLUSTRATED PROCESSES, EQUIPMENT, AND TECHNOLOGY

Water Storage Structures Meet Diverse Needs

This installment of How Water Works examines water storage structures. Water storage is essential for meeting all of the domestic, industrial, and fire demands of most public water systems. Water may be stored before and after treatment. The type and capacity of water storage a distribution system requires will vary with the size of the system, the topography of the area, how the water system is laid out, and various other considerations. Next month, How Water Works will explore distribution system design.

1. Many elevated tanks are constructed of steel. The thickness of the steel varies within the tank, depending on the pressure exerted on the tank walls. The upper walls may be relatively thin, but the lower walls may have a thickness of 2 in. or more.
2. A riser pipe is generally used as both the inlet and outlet pipe on an elevated tank. In cold climates, risers are typically 6 ft in diameter or larger to allow for some freezing around the edge and for expansion when water turns to ice.
3. An overflow pipe is necessary on all tanks to safeguard the tank if water-level controls fail. The pipe discharges to a splash plate or drainage inlet structure to prevent soil erosion.
4. A drain connection empties the tank for maintenance and inspection.
5. Air vents allow air to enter and leave the tank as the water level falls and rises. The water level is measured either by a pressure sensor at the tank base or a level sensor inside.
6. Hatches are installed for entry and ventilation during maintenance and inspection.
7. Multicolumn tanks generally have a ladder that runs from the ground to the balcony (7a) and another that goes up through the access tube to the top of the tank (7b).
8. Obstruction lights or strobe lights on an elevated tank may be required by the Federal Aviation Administration to warn aircraft in the tank's vicinity, depending on the tank's height and location.
9. The same general comments for elevated tanks also apply to ground-level tanks.

Some illustration elements exaggerated for emphasis.

