



Sanitary Protection of Reservoirs: Hatches

331-249 • 1/30/2017

Finished water storage facilities must have a lockable weathertight roof hatch to enter the reservoir for maintenance to prevent entry by birds, animals, insects, rainfall run-off, excessive dust and other potential sources of contamination. Unprotected reservoir openings must be corrected as soon as possible.

Employ reasonable security measures to assure the reservoir and stored water are protected from possible damage and compromise by unauthorized persons. Secure each hatch with a lock to reduce the risk of vandalism or intentional contamination (WAC 246-290-235(1) and -415(8)).

Construct the hatch frame at least 4 inches above the surrounding area to prevent surface water from entering the reservoir. The hatch cover should be constructed of a weatherproof durable material with at least a 2-inch overlap around the perimeter of the frame. A flexible neoprene type gasket is critical to creating a watertight seal. Good designs have latches that force the lid down against the gasket for a tighter seal.

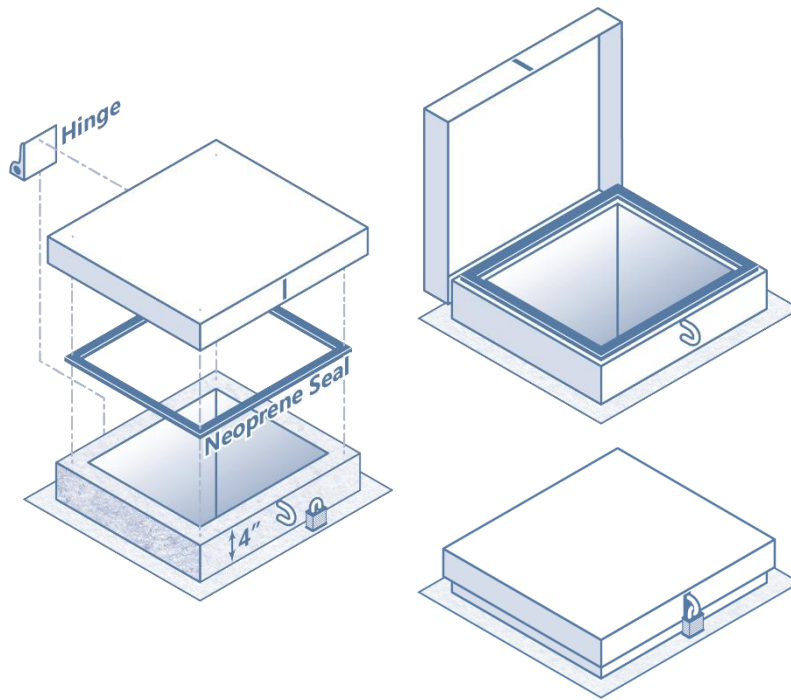
Replace or repair any hatch that is inadequately weatherproofed, lacking proper security, or sealed shut and no longer functional. Good Operations and Maintenance programs include routine reservoir inspections. Document the inspections and subsequent maintenance performed with photographs and written records.

Excellent retrofit hatches are now available that fit most existing concrete storage tanks. Contact our regional office for further information.

General Principles

- Water storage tanks must be free of sanitary defects. Sanitary defects are risks to public health that include pathways for contaminants to enter the water system. These pathways of contamination are known to increase the risk of illness, unsatisfactory coliform samples, more frequent sanitary surveys, boil water notices, additional sampling and/or treatment requirements, public notice, and legal liability.
- Bird droppings on a reservoir roof are a source of *E. coli* and *Salmonella* sp.
- Bats and rodents can squeeze into very small spaces in search for water or safe nesting. These animals can be carriers of disease-causing organisms.
- Insects or spider webs inside the hatch demonstrate an inadequate hatch seal.
- All systems must have an active Operations and Maintenance Program to do routine self-inspections and to document the results and follow up work. See DOH 331-351 for guidance on Routine Preventative Maintenance. Routine inspections detect damage by corrosion, vandals, severe weather, animal activity, etc.
- Do not use any material or compound containing hazardous chemicals, including sealers, epoxy, or foam that may come in contact with drinking water.
- Some storage tanks have reached the end of their useful lives and need to be replaced. Start planning!

Examples of Good Roof Hatch Designs

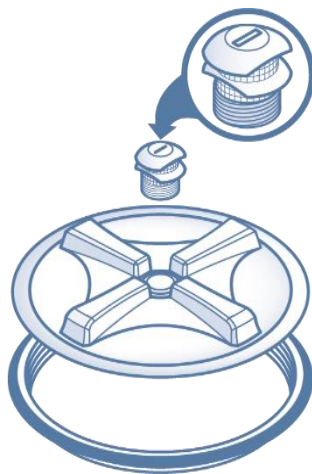
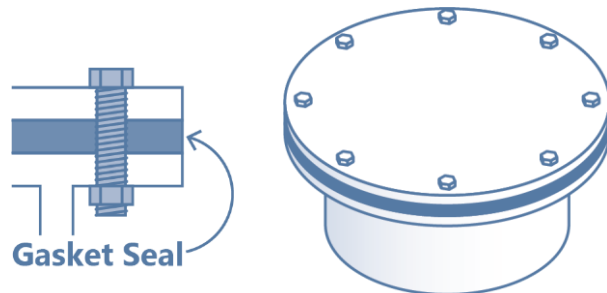


Cast-in-place Hatch Frame with Fabricated Metal Cover

A cast-in-place hatch frame is framed at least 4" above the roof and has a continuous neoprene seal along all four sides. The solid, water-tight cover overlaps the framed opening on all four sides, and includes a locking device to secure the hatch. The neoprene seal may be affixed to either the cover or the frame of the hatch.

Steel Tanks

Cylindrical steel storage tanks often have bolted access hatch lids with rubber seals or gaskets. The bolts will provide a watertight seal and typically no over-hanging lip is provided. Bolts must be present and tightened.



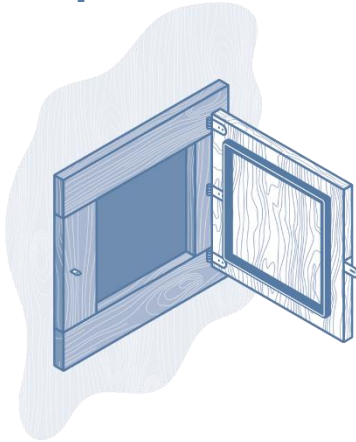
Plastic Hatches

Vent inserts can be installed in place of the plug in the center of the plastic screw-on hatch. The vent insert should be equipped with a 24-mesh non-corrodible screen and be equipped with shielding to protect against surface splatter or entry through the vent screen of precipitation that has come into contact with the vent, hatch, or reservoir roof. Installing a vent insert on a hatch is only applicable to existing plastic tanks. New polyethylene tanks should have a vent installed that is separate from the hatch, meeting the standards described in 331-250.

Commercial Hatches

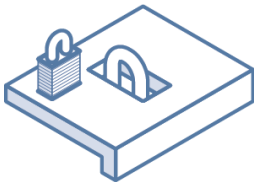
Excellent retrofit hatches are now commercially available that fit over existing hatch frames for many existing concrete storage tanks. Contact our regional office for further information.

Examples of Poor Hatch Designs



Side-Entry Hatch on Gable End of Wood Truss Roof

It is nearly impossible to adequately seal the wooden access doors. Long term plans should address replacement of the roof. Before that, the door and interior should be inspected on a regular basis as part of an O&M Program.



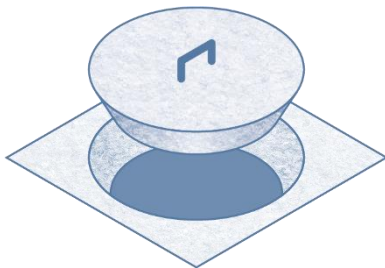
Hatch covers cut for lock hasp

Hatch lids with holes cut out to install a lock can allow surface water to enter along with contaminants such as bird and animal waste. The lock should be moved to the side of the hatch and the hole sealed. Replacing the hatch with a better design that has a built-in lock and latch may be the best option.



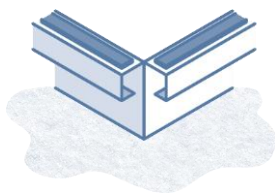
Cast iron manhole frames and covers

Manhole covers usually do not provide a watertight seal that prevents contaminated surface water from entering the tank or vault. The covers do not overlap the framed opening and extend downward. They are not easily removed in a sanitary manner.



Concrete Slabs

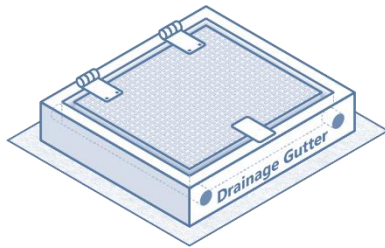
Flat or shaped concrete covers are not considered weatherproof, even with gasket. These concrete covers are heavy and difficult to lock.



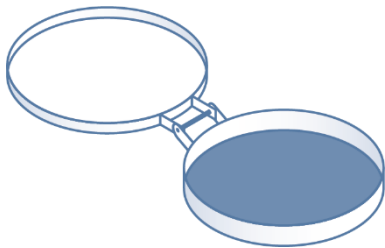
Failure to Provide a Continuous Seal Between Frame and Cover

This is a common problem for many existing hatches. Insects and spiders can enter the reservoir through gaps between the frame and cover. Make sure there is a continuous surface around the frame on which the cover can squeeze a neoprene gasket to form a weather-proof seal round the entire perimeter.

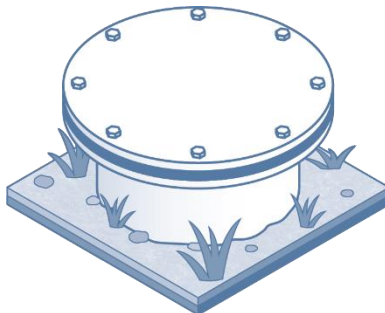
High-Maintenance Designs



Gutter type access hatches are commercially available. Water and debris falling on the hatch cover drain to perimeter gutters and discharge through holes in the hatch curb. When these hatches are installed flush with the reservoir roof, or they become blocked by debris there's no place for captured debris and precipitation to go except into the reservoir, bringing with it contamination. Gutter drain holes must be screened and kept clear or they become a sanitary risk.



Large steel tank access hatches are constructed out of heavy gauge steel with a hinged lid welded from the same material. The lids usually have overhanging sides. Seal gaskets must be very durable and thick enough to provide a tight seal. Gaskets may be installed both around the edge of the frame and the lid. Even small gaps between the lid and frame can allow bats inside. The heavy lids can damage seals along the steel edge of the frame.



Access hatches for buried storage tanks should be at least 24 inches above ground and the area around it kept clear of vegetation and debris. The area around the tank should be graded to prevent surface water from ponding.

For more information

Our publications are online at <http://www.doh.wa.gov/drinkingwater>.

Contact our nearest regional office from 8 a.m. to 5 p.m. Monday through Friday. If you have an after-hours emergency, call (877) 481-4901.

Eastern Region, Spokane Valley (509) 329-2100 Adams, Asotin, Benton, Chelan, Columbia, Douglas, Ferry, Franklin, Garfield, Grant, Kittitas, Klickitat, Lincoln, Okanogan, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman, and Yakima counties.

Northwest Region, Kent (253) 395-6750 Island, King, Pierce, San Juan, Skagit, Snohomish, and Whatcom counties.

Southwest Region, Tumwater (360) 236-3030 Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Kitsap, Lewis, Mason, Pacific, Skamania, Thurston, and Wahkiakum counties.