



Sanitary Protection of Reservoirs: Hatches

331-249 • Revised 8/31/2022

Finished water storage facilities must have a lockable weathertight roof hatch. Use the hatch to enter the reservoir for maintenance. The hatch also prevents birds, animals, insects, rainfall run-off, excessive dust, and other potential sources of contamination from entering the reservoir. You must correct unprotected reservoir openings as soon as possible.

Use reasonable security measures to protect the reservoir and stored water. Security measures can prevent possible damage and compromise by unauthorized persons. Secure each hatch with a lock to reduce vandalism risks or intentional contamination (WAC 246-290-235(1) and -415(8)).

Construct the hatch frame at least four inches above the surrounding area to prevent surface water from entering the reservoir. Construct the hatch cover of weatherproof durable material with at least a two-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.

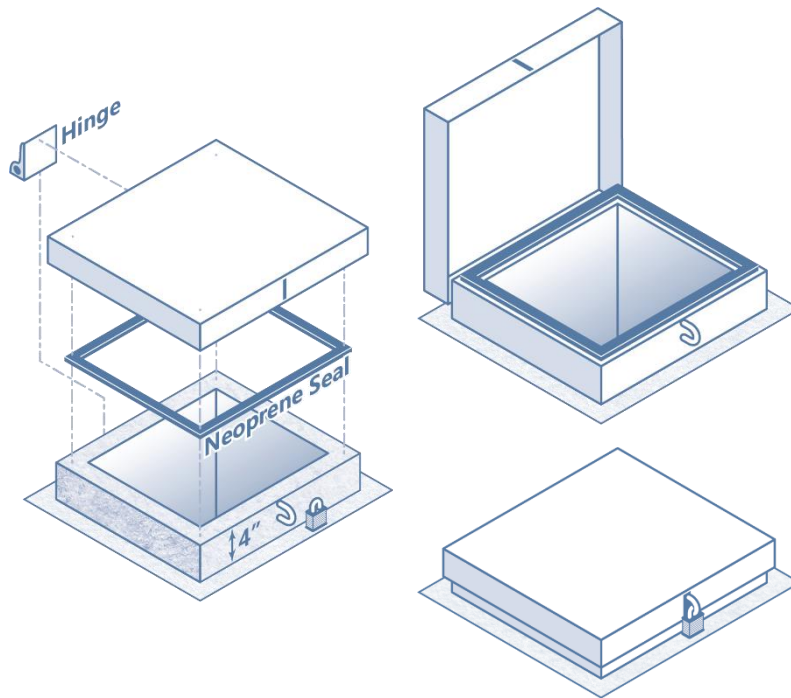
Replace or repair any hatch that is inadequately weatherproofed, lacking proper security, or sealed shut and no longer functional. Good operations and maintenance programs include routine reservoir inspections. Document with photographs and written records the inspections and subsequent maintenance performed.

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 of water or safe nesting. These animals can carry 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 for routine self-inspections and to document the results and follow up work. See [Preventative Maintenance 331-351 \(PDF\)](#) 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

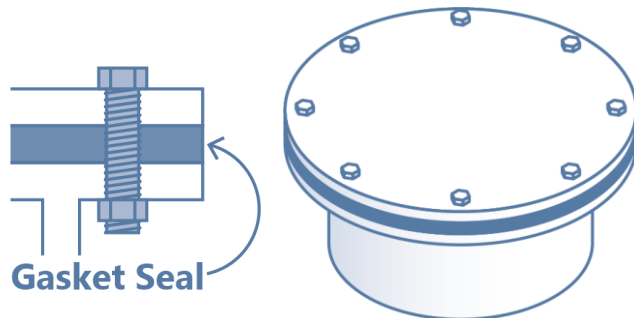


Cast-in-place Hatch Frame with Fabricated Metal Cover

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. Gaskets often must be replaced once the lid is removed.

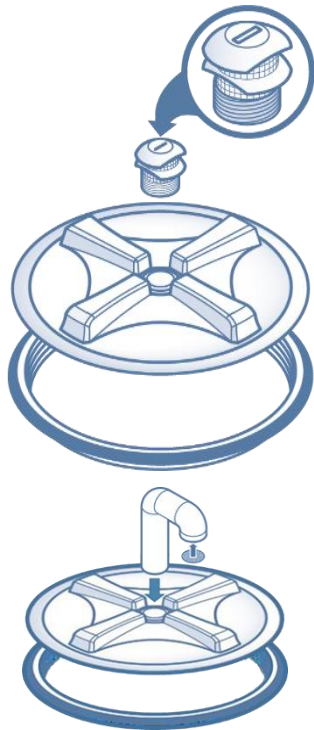


Retrofit Replacement Hatches

Some manufacturers have standard hatches that are designed to fit over the bottom portion of an existing hatch that has been determined to be inadequate. The new hatch has improved construction. They tend to be sturdier, provide a tighter seal and have a built-in latch and lock mechanism. Custom manufacturers also offer retrofit designs that should provide food sanitary protection.



Examples of Problematic Hatch Designs



Plastic Tank Access Hatches—Good and Bad

Most plastic tanks have threaded lids that have a seal gasket around the perimeter. When screwed down this forms a watertight seal. The lid does not have an overhanging lip to prevent water and debris build-up. This must be cleaned carefully before opening hatch. The built-in vent may not be screened and does not keep out contaminated surface water. In an outdoor setting this is a significant sanitary defect.

A properly designed vent can be installed in place of the plug in the center of the plastic screw-on hatch. The retrofit vent should open downward, be equipped with a 24-mesh non-corrodible screen, and sealed tightly to the lid. Any other openings in the lid must be thoroughly sealed to prevent contamination. Installing a new vent on a hatch lid is only applicable to existing plastic tanks. New polyethylene tanks should have a vent installed by the manufacturer that is separate from the hatch, meeting the standards described in [Sanitary Protection of Reservoirs: Vents 331-250 \(PDF\)](#).



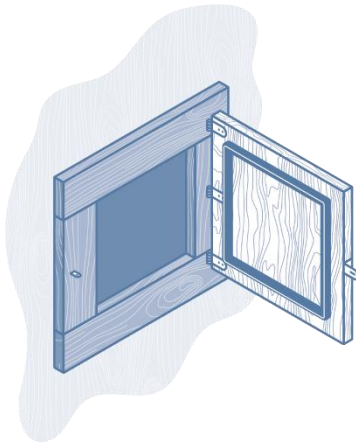
Latch and Locks Poor Durability or Poor Maintenance

Operators are experiencing problems with some commercially available hatches that are generally very well constructed. Most are made of stainless steel. However, the internal rods, locks, screws, and connectors are not. These eventually rust and break under the constant corrosive conditions. Broken latches must be replaced or removed. Replacement parts may not be available. Cement blocks may be needed to hold down the lid. Locks need to be reinstalled.



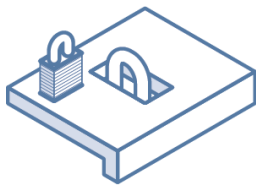
Seal Gaskets with Poor Durability or Poorly Maintained

There are many types of seal and gasket materials available. It is difficult to find the right one with the correct thickness that also holds up with actual use of the hatch. Seals deteriorate, split, become detached and allow insects and spiders to enter the tank. Choose the most durable grade of gasket and install carefully. Some operators install whole sheets of gasket material on the inside surface of the hatch lid. This avoids seams and cracks and holds up longer than pasting strips around the perimeter.



Side-Entry Hatch on Gable End of Wood Truss Roof

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



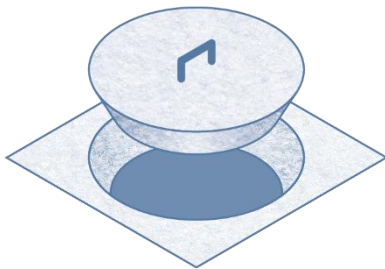
Hatch covers cut for lock hasp

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. Move the lock to the side of the hatch and seal the hole. Replacing the hatch with a better design that has a built-in lock and latch may be the best option.



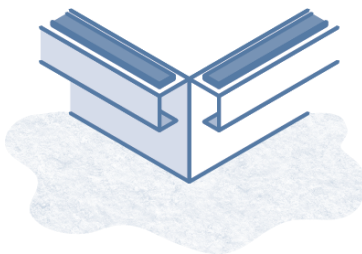
Cast Iron Manhole Frames and Covers

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.

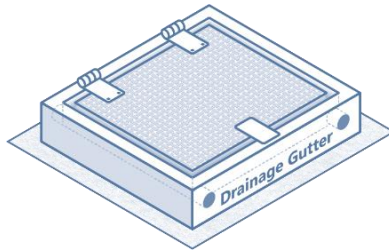


Failure to Provide a Continuous Seal Between Frame and Cover

This is a common problem for many existing hatches. Insects and spiders can enter the reservoir through gaps between the frame and cover. Ensure a continuous surface around the frame. Fit the cover with a neoprene gasket to form a weather-proof seal. Make sure the gasket seals around the entire perimeter of the frame and cover.

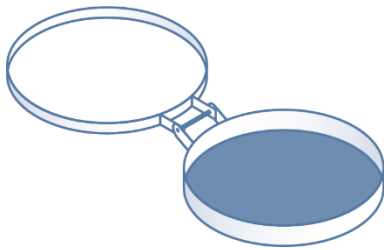
High-Maintenance Designs

Gutter Type Access Hatches

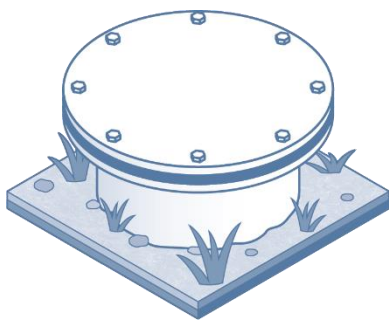


These are typically constructed on a raised concrete curb. These hatches have an internal gutter beneath the cover that drains to an external outlet. The cover system itself is not waterproof. A noncorrodible screen should cover the drain outlet, to prevent animals or insects from entering the internal gutter. The gutter and screen should be cleaned on a regular basis, otherwise drainage may back up into the internal gutter and spill over into the reservoir. These types of hatches must be well constructed and maintained (i.e., include maintenance in reservoir standard operating procedures) to minimize the risk of contamination (WAC 46-290-235(1)).

Large Steel Tank Access Hatches



These 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.



Buried Storage Tank Access Hatches

These should be at least 24 inches above ground and the area around it kept clear of vegetation and debris. This requires routine inspection and maintenance. Grade the area around the tank to prevent surface water from ponding.

For more information

Our publications are online at 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.

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