

# **Guidance for R309-545. Facility Design and Operation: Drinking Water Storage Tanks.**

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## **R309-545-6. Tank Material and Structural Adequacy.**

### **Structural Design.**

- *Division review of plans and specifications for storage tanks does not include an evaluation of structural suitability. Certification of structural adequacy may be requested from the design engineer before approval is granted.*

## **R309-545-7. Location of Tanks.**

### **Pressure Considerations.**

- *The expected water level variation in the tank should be taken into account when considering minimum and maximum distribution system pressures. The maximum variation between high and low water levels in storage tanks that provide pressure to a distribution system should not exceed 30 feet.*

### **Earthquake and Landslide Risks.**

- *The design may include special shut-off or isolation valves designed to react in the event of an earthquake.*

### **Security.**

- *Fencing is advisable where the tank is highly accessible to the public or livestock. Where electricity or telemetry is available, consideration should be given to the installation of electronic security equipment.*

## **R309-545-8. Tank Elevation and Burial.**

### **Ground Water.**

- *It is recommended that a French drain system be considered around any buried storage tank, but especially if the ground water table elevation is unknown or may exhibit seasonal variations.*

## **R309-545-9. Tank Roof and Sidewalls.**

### **Openings.**

- *Valves and controls should be located outside the storage tank so that the valve stems and similar projections will not pass through the roof or top of the tank.*

## **R309-545-10. Internal Features.**

### **Drains.**

- *A “means” to drain the storage tank can include a separate drain line, the ability to drain through a downstream hydrant or at a location with a significant elevation difference from the tank floor, or pumping out the water. It is recommended that the drain line be screened with No. 4 screen.*

### **Inlet and Outlet.**

- *Internal baffling, special spray nozzles, bends, or mixing valves may also be needed in order to minimize the possibility of short circuiting through the tank depending on the size and shape of the tank and the flow.*

## **R309-545-11. Internal Surfaces and Coatings**

### **VOC Analysis Prior to Placing a Tank into Service.**

- *If any volatile organic compounds are detectable, increased monitoring may be required in accordance with R309-205-6(2)(j)*

## **R309-545-12. Steel Tanks.**

### **Cathodic Protection.**

- *Cathodic protection should be considered if an external structure, such as a communication tower, is added to the tank.*

## **R309-545-14. Access Openings.**

### **Access to Interior for Cleaning and Maintenance.**

- *When considering what is reasonably convenient, it may be necessary for one individual to open the access. The access should be hinged at one side, and counter-weighted if the lid is in excess of 60 pounds. The safety of the operator should be considered when designing and locating access openings. Factors to be considered should include the placement of the locking mechanism, the location of the hinges for the hatch, etc.*

### **Height.**

- *It is preferable that access openings are framed higher than the 4 inches required above, and more if located in areas subject to heavy snow.*

### **Shoebox Lid.**

- *Those wishing to utilize pre-manufactured roof hatches as access lids for drinking water storage tanks should contact the distributor of such and make clear that*

*any penetrations through the lid is not acceptable.*

### **R309-545-15. Venting.**

#### **Open Venting - Height.**

- *In areas of heavy snowfall, it is recommended that the vent discharge be raised.*

### **R309-545-17. Level Controls.**

#### **Level Controls to Maintain Water Levels in Storage Tanks.**

- *Some tanks should have automatic flow control devices because of the size and complexity of the system, while other smaller systems may monitor the tank levels manually. Level controls should be adequate to assure that the distribution system and tank will not run out of water.*