

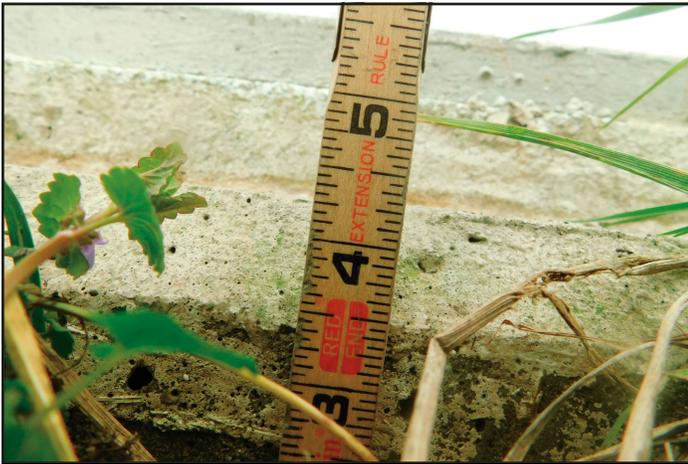
ASSOCIATE MEMBER SPOTLIGHT

IS YOUR TANK UP TO CODE?

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Water is a valuable resource. Having quality drinking water is of the utmost importance to sustain life. Water is also needed for everything from irrigating crops to fire protection. Since it's such a vital commodity, it should come as no surprise that there are many rules and regulations written to help water meet quality standards. Several rules center around ensuring that water storage tanks are up to code.

Water tanks should have a solid foundation, unobstructed from vegetation such as grass, weeds or shrubbery. The tops of concrete foundations must be at least 6" above the finished grade, unless otherwise specified, according to AWWA D100-11



Height should be 6' but isn't.

(12.7.1). Items should also not be stacked up next to the tank's foundation. Inspectors have found everything from woodpiles to lawn chairs stacked up against the tank's foundation, not to mention shrubbery that's overtaken the concrete base. Maintenance workers should mow around the tank to keep the greenery at an acceptable level. If the tank starts looking like a jungle or woods, it's probably a good idea to contact an excavating company and let the experts sort it out.

Water tanks and towers are tall, often metal, structures. They are magnets for lightning. Water tanks are equipped with Supervisory Control and Data Acquisition – or SCADA – which keeps track of water levels or other measures. A lightning strike can damage the SCADA. Water tanks often house more than just water. Because of their height, they make excellent communication towers and may be equipped with cell phone

or 911 communication antennas. A lightning strike on the tower can cause these systems to fail, leaving communities without critical communication. A tank or tower should be grounded in accordance with the OSH Act of 1970 Section 5. A relatively simple way to accomplish this is via a ground rod. The ground rod should not be less than ½ inch in diameter and 8 feet long, according to NFPA 4.13.2.1.

Exposed to the elements and sitting high in the sky, water towers must be able to brace for strong winds. Windage rods can help do this. Windage rods are the primary member to resist and stabilize towers against wind and seismic loads combined with



Vegetation growth around tank

dead and live loads. The rods should be tensioned to withstand 100 mph winds in any direction, as required by AWWA D100-11 3.1.4. Windage rods can be adjusted as needed. If they are too loose, a collapse can occur if strong enough winds are sustained.

Anchor bolts should also be able to withstand 100 mph winds blowing in any directions, according to AWWA D100-11 3.8. Imagine that anchor bolts are like the screws holding a shelf together. If they are too rusty or corroded the structural integrity of that shelf – or water tank – becomes compromised and is susceptible to deterioration. Anchor bolts and the area around the bolts should be cleaned to help prevent rust. They should also be tightened when deemed necessary.

Water towers and tanks must be scaled from time to time for everything from inspection to routine maintenance or repairs. Workers who climb these towers should have a safe walking area,



Handrail is compliant

complete with handrails and guardrails for fall protection. OSHA 1910.28(b)(1)(1) states, "... the employer must ensure that each employee on a walking-working surface with an unprotected side or edge that is 4 feet or more above a lower level is protected from falling by one more of the following:" guardrail systems, safety net systems, or personal fall protection systems.

If an owner has an aboveground water storage tank, for example, installing an OSHA compliant 42" high handrail system around the circumference of the tank roof, complete with an intermediate rail, toeboard and swing gate would help provide fall protection. An anti-skid floor on the existing access tower ladder standoff platform could also be installed to provide for a better grip.

Ladders should be secure and wide enough to not be hazardous. Fixed ladders must be at least 16" wide in order to be in compliance with OSHA 1910 23 and AWWA D100-11 5.4.2.

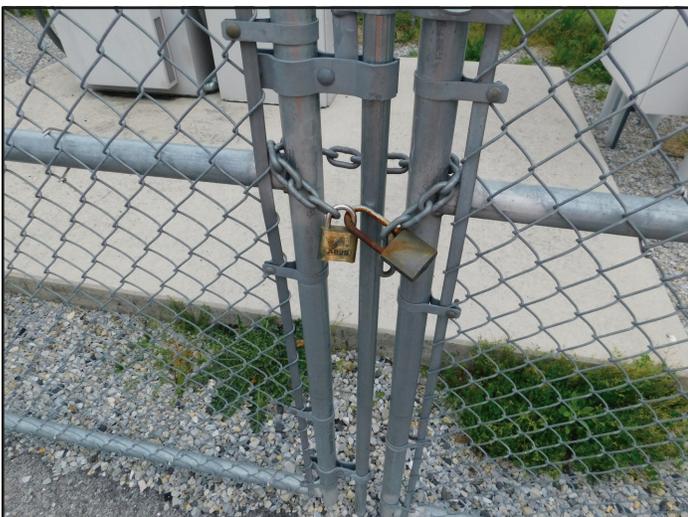
According to OSHA 1910.146(C)(2), employers must evaluate their workplace to determine if spaces are permit

spaces. If they are, the employer must notify employees about their existence, location and any hazards they pose. It would be wise to post a confined space entry sign on a tank to warn people that it's a permit-required confined space for authorized entrants only.

Overflow helps protect the tank from overpressure and overload. The overflow pipe system should be equipped with a flapper valve, as required by AWWA D100-11 5.3. The overflow system should also project at least 12 inches beyond the tank shell.

Riveted tanks have that classic "tin man" design. Think of the famed Warner Brothers water tower – it's a riveted tank. Iconic though they may be the old tanks aren't designed to be up to 21st century standards. For one thing, riveted tanks were equipped with finial balls that don't provide adequate ventilation. An improperly vented tank can cause external pressure to act on the tank, which can then cause buckling. Replacing the existing finial ball with a vacuum-pressure, frost-proof vent should guard against that potential problem. Actually, AWWA D100-11 7.5 states that pressure-vacuum screened vent or a separate pressure-vacuum relief mechanism must be provided for vents in case the screens frost over or become clogged.

There are many codes and regulations, but the ones described in the previous paragraphs are some of the most probable to appear on an inspections report. If these are met, it's more likely your tanks will be up to code. 💧💧



Locks in place