

INSIGHT

Can a water tower be a symbol of safety?

Safety measure for four key risk situations on water and wastewater projects

Water towers serve as more than just a practical fixture for communities across the Midwest. As one travels across the plains, these often-iconic water towers take you on a journey—illustrating what is valuable to the area's residents and leaving you wanting to know more about the communities they represent. Whether it is decorated as a hot air balloon, pumpkin, ear of corn, catsup bottle, peach or lists state football champions, they enrich the landscapes they inhabit with color, stories and maybe even a touch of humor. Underneath the painted exterior, however, lies the core purpose of why these structures exist—providing quality drinking water for their district or city. Valuing safety when working in and around water and construction sites is of utmost importance. Water towers should be a source of pride, not the reminder of an accident or tragic event.

While most of us are aware of the Occupational Safety and Health Administration's (OSHA) presence since 1970, what some may not realize is that during the past decade they have been reviewing and updating standards for the same four risk areas, which are working in a confined space, working from heights, exposure to working in or around trenches and using cranes on a project. As staff works on water and wastewater projects, these are situations that require additional training due to the heightened risks involved.

Confined Spaces

Confined spaces cause 100 deaths per year on average. Specific examples of confined spaces cited in OSHA standards include, but are not limited to, manholes, pipelines, culverts, underground utility vaults, lift stations, storage tanks, tunnels, septic tanks and pits more than 4-feet deep. It is important to remember that every space is unique and each requires careful evaluation.

It is estimated that 60 percent of fatalities that occur in confined spaces involve the "would be" rescuers. Perhaps the spotter who dove into the tank was rescued but could have become the second victim in this incident for a myriad of reasons, such as a hazardous atmosphere above the water level due to oxygen deficiency. This condition frequently occurs when a metal tank rusts and uses up oxygen. Entering a confined space without testing is risky, but when you add welding, sand blasting, painting and sealing operations taking up room in the space, it adds even more hazards. Who is responsible for ensuring workers, contractors and others on your site do not enter a confined space? It is important to know how to handle these types of situations.

Identify your spaces. It's important to identify all potential hazards, and then eliminate each one. If elimination is not possible, steps must be taken to control the hazard and ensure worker safety. Consider the following:

- The space should be large enough to enter
- It should have limited or restricted means for entry
- It should not be designed for continuous worker occupancy

Develop a plan. Proper and advanced planning and instituting safety measures can help prevent a tragic event. Consider the following when developing your plan:

- Steps taken to prevent unauthorized entry
- Communicate and coordinate with other employers at the site
- Identify and evaluate all hazards
- Develop the means, procedures and practices necessary for safe entry

- Plan for providing, maintaining and ensuring proper use of safety equipment
- Continually evaluate the space while entry operations are underway
- Provide an attendant outside the space
- Designate the person who will have an active role in entry operations (the entry supervisor)
- Develop a system for using entry permits
- Develop an emergency rescue plan

If an emergency does occur, it is important to also have a rescue plan. Provide appropriate rescue and emergency services so that retrieval of injured entrants is not delayed. Non-entry retrieval systems, such as tripods, anklets and wristlets are the preferred methods of rescue. The reason is simple: no one has to go into the hazardous space to make the rescue.

Train your staff. Make sure to provide adequate training for all staff, ensuring they have the knowledge and skills to follow all safety procedures. This can include:

- Entry supervisor
- Attendant(s)
- Entrant(s)
- Atmospheric monitoring personnel
- Rescue team

Identify and eliminate all hazards.

- **Atmospheric hazards** include too little oxygen (oxygen deficiency), too much oxygen (oxygen enriched), flammable gases or vapors (examples are methane and natural gas) or toxic substances (examples are hydrogen sulfide and carbon monoxide)
- **Physical hazards** include engulfment, falling or tripping, poor visibility, noise, temperature extremes, biological hazards, energy sources, insects, rodents and reptiles
- **Psychological hazards** include claustrophobia, fear of heights, fear of darkness, poor physical condition or restrictions of the worker. Even a mild level of claustrophobia or fear of heights can be problematic. There is not a lot one can do for psychological hazards except not put affected workers into spaces that cause them such problems

Trenching

Trenching hazards are preventable but are often overlooked. Tragically, trench collapses are rarely survivable, and injuries and deaths associated with trenches continue to happen. From

2003 to 2017 there were a total of 373 trenching fatalities, with more than 80 percent of them in the construction industry. Although often forgotten, tools and resources to prevent a trench collapse are readily available. Many water and wastewater projects include trenching and excavating. What steps are needed to prevent trenching hazards?

- Assign and train individuals who have the necessary skills to perform tasks with safety in mind
- Call 811 to identify and mark underground utility lines
- Dig a minimum of 5 feet away from utility lines
- Evaluate the soil to determine its stability
- Plan the job layout to identify safe locations for spoil piles and heavy equipment routes
- Before the job starts, if the trench will be five feet or deeper set up a protective system
- If the trench will be 20 feet or deeper, provide additional engineering protections
- Have a traffic control plan and lane closure permits
- Develop a trench emergency action plan

Falls

In the last decade, falls are one of the leading causes of both non-fatal and fatal accidents. When walking through a water/wastewater plant or reviewing maintenance and/or construction on a water tower, you will see a lot of fall protection systems and devices in place. Despite this, falls are also the most cited OSHA standard in construction. In fact, when you travel to a site with construction in this industry, these are top ten cited activities:

- Fall protection
- Hazard communication
- Respiratory protection
- Scaffolding general requirements
- Ladders
- Control of hazardous energy
- Powered industrial trucks
- Fall protection
- Eye and face protection
- Machinery and machine guarding

Crane Related Injuries

From 2011 to 2017, the Census of Fatal Occupational Injuries (CFOI) reported 297 total crane-related deaths, an average of 42 per year during this seven-year period. OSHA has recently updated their standards on cranes, so if a crane is going to be on site it is important to know when each part of the standards will take effect. Items addressed in the standard are:

- Operator competency requirements
- Operator certification requirement
- Certification by crane rated lifting capacity

Conclusion

Whether your project has one or all four of the mentioned safety hazards, here are four vital questions to ask yourself that will help ensure safety as you look toward your next project.

- Who would be responsible for ensuring workers, contractors and others on-site do not enter a confined space?
- Who would be responsible for ensuring workers, contractors and others on-site are not at risk for a trenching hazard?
- Who would be responsible for ensuring workers, contractors and others on-site are not at risk for a fall hazard?
- Who would be responsible for ensuring workers, contractors and others on-site are not at risk for a crane mishap?

If you find yourself not being able to answer those four questions, please let us know how we can help you navigate your project safely. You can be a champion of safety in the water and wastewater industry.

Bartlett & West can provide constructability reviews, site safety plans and contract language guidance for any project. We also have an accredited Certified Safety Professional with more than 20 years in the safety industry on our staff.