Dry Fire Hydrants

Snow Plow 1 - Dry Hydrant 0
A Not So Simple Repair!
Lineboro, Maryland

Facts & Figures…

- January and February of 2010 was pretty brutal on the Mid-Atlantic region in terms of record-setting snow fall.
- Fire departments throughout the entire region faced tough challenges even getting to incident scenes, let alone figuring out water supply operations.
- With snowfall accumulation in feet, clearing the snow became an issue and the snow plows and loaders proved deadly for numerous guard rails, highway signs, and DRY HYDRANTS.
- Since GBW Associates, LLC designs, installs, and REPAIRS dry fire hydrants – we were naturally called into action once the Spring thaw occurred.
- This presentation covers the saga of one of our repair jobs.

Lineboro Dry Hydrant Repair

The site was a 30,000 gallon underground tank located in a small housing development outside of Lineboro, Maryland. The tank had been installed to provide water for fire protection. The suction pipe was reported to have been damaged by a front-end loader.

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Our initial inspection clearly revealed that the suction pipe was a bit catawampus and probably sheared off below ground. The questions of course were: “Where was it sheared, was the flange damaged, and was the tank damaged?”

Unfortunately, the tank had been installed before the local ordinance was enacted that addressed the design. In addition, there were no drawings available and the contractor who installed the tank could not be located. So…there was much guess work as to what was to be found underground.

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So, the inspection crew confirmed that the suction pipe was sheared off pretty far down and quite possibly at the flange. The top of the tank would have to be exposed in order to assess all damage.

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Looking down the vent pipe, we could see misalignment at the water level which meant that the vent pipe was also broken.

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With the snow all gone and a purchase order secured and underground utilities indentified and marked, it was time to begin the repairs.

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Because of the need to expose the top of the tank, we elected to use a mini excavator to handle most of the digging. These small machines have really made it so much easier to work on dry hydrants.

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The goal was to dig as little as possible and to get close to the flanges and then dig by hand. As with anything, that plan went sour when we found more damage than initially thought – so…much more digging was needed.

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Once we got near the top of the tank we found that the fill pipe was also sheared at, or near the flange. That now meant three of the four pipes were broken…a bit different than just the suction pipe being cracked.

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The broken fill pipe and vent pipe. Both had radial types of shears that most likely indicate a striking and lifting motion by some type of shovel/bucket machine – a front-end loader most likely.

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The suction pipe was clearly the most damaged of the three but all required the same repair – complete replacement – including the flanges.

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Of course, another challenge was to keep dirt and rocks from falling down into the tank. With the pipes already sheared, gravel most likely had already fallen in, so the goal was to limit additional gravel and dirt from making the same journey.

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The three broken pipes were all broken at the flange – which meant that the flanges had to be replaced as well. FORTUNATELY – the tank flanges were not broken.

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With the arrival of new flanges, work was started on cutting and gluing and installing the suction and fill pipes. However, the unexpected damage to the fill pipe would require a special order which would delay completion of the project until another day.

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With the new suction pipe installed, the site was prepared for several days of no activity. The concern was security, vandalism, rainfall, and dirt falling in. Fortunately, the hole was less than 4-ft deep so shoring operations were not needed. A simple wooden box was built and the flanges were covered with wood blanks and dirt was backfilled in the void spots.

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Sediment control and some warning fence were used to secure the site.

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When the fill pipe connections and site-vent assembly arrived a few days later, it was back to work in the hole.

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First up was the installation of the site vent unit. We like to use these assemblies on underground tanks because they provide a visual indicator above ground if the tank is full or not.

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We brought one of our “skinnier” associates to help make that final flange connection because the space was rather tight.

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With all of the new pipes and flanges now in place, it was time to install the fill connection and then fill in the hole.

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The good thing about this repair is that it brought the fittings up to the current county standard.

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The next step in the repair process was to flow test the tank to ensure that everything worked right. Actually – given the type of damage found, flow testing could have been done before the hole was filled back in – just in case there was a problem with the suction pipe inside the tank – something that could not be seen from outside of the tank.

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The tank flow tested right around 1,000 gpm with some debris found in the pipe. The debris was small pea gravel and most likely entered the tank when the pipe was pulled out of the tank when struck by the loader. Oh – did we mention that a neighbor stopped by during the flow test and said that the loader had ripped the pipe out and that he put the pipe back into the hole a couple days later. Thus – the gravel falling into the tank.

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Some of the gravel found after the strainer was removed. Fortunately, a second flow test showed marked improvement after the cleanout.

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With all repairs complete – now it was time to plant some grass seed and paint the new pipes.

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We find painting PVC pipe to be an important part of protecting the final project. The UV rays from sunlight will eventually cause breakdown of the PVC. To minimize that UV damage, we use spray paint specially designed for use on plastics. The paint can be found at many hardware stores and is relatively in expensive.

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The pipes and fittings were painted to comply with the standard color scheme according to the local ordinance. Grass seed was planted and the project was “a wrap.”

Summary

- This repair project is a good example of the need for complete inspection of damaged fire protection equipment.
- At first glance, the repair appeared to be simple and quick.
- However, the process quickly grew into a pretty significant repair project requiring additional parts and labor hours.
- Remember – there is never a small crack in a pipe!

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This program was developed by
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