



# INSTALLING WATER HYDRANTS

can enhance property, make life MUCH easier

*Scott Cotton*

Frost-free water hydrants next to gardens, corrals, flowerbeds and other working areas add convenience, efficiency, and economic value to properties.

Frost-free hydrants operate in freezing temperatures because when fully shut off, water in the riser pipe drains out into the bottom of the hole through a bleed off valve leaving nothing to freeze above the frost line. Partially closing the handle doesn't allow water drainage, and the hydrant may freeze.

## **Laying Out Your Plan**

The first step to installing a pipeline and hydrants is fairly intuitive. Decide where you want and need more convenient water. Then evaluate if the water source can handle the extra demand such as the size of the pressure tank, pump capacity, availability of water rights and, in some cases, if the extra water use is worth the installation cost, maintenance, and extra power/water bill.

Mark where the hydrant will be located. I suggest marking all the locations you may need since you only want to trench once. Extra hydrants are cheaper if installed at the same time. Determine how many hydrants are needed.

## **Doing the Homework**

Homework is essential. Look into what presently exists below ground in the pipeline route. Make sure the pipeline trenching is not going to hit buried powerlines, gas lines, fiber-optic trunks, other utilities (such as phone, sewer, gas, water lines). One Call of Wyoming is a collaborative utility service that will check to see if you would hit anything. Call 8-1-1 or (800) 849-2476 at least two business days before digging, and this group of utility companies will send a technician to map underground utilities with paint or flags. It's free since it can save them expensive repairs and down time, and you are financially responsible for damage to underground utilities if you did not notify One Call. You can also contact them at <http://www.onecallwyoming.com>.

Determine the frost line, the depth within the soil at which the ground ceases to freeze. This frost line depth varies quite a bit from site-to-site. Remember, soil that holds high moisture year-round such as the edges of ponds and rivers will freeze deeper since moisture conducts cold well. In many areas of Wyoming, the frost line is 45-60 inches below ground level on an average year. Make sure pipelines and the bottom of frost-free hydrants are below the frost line to prevent freezing and breakage.

Trenching or laying in pipeline is much easier if the ground is not frozen. It can be done in winter but requires heavier equipment, more time, and more expense. If the water table is high due to flood irrigation or other causes, wait until the water level drops below the frost line to install a pipeline and hydrant. Getting a good installation is really difficult if there is water standing in the trench.

## Buying Materials

When shopping for hydrants and pipe, compare a number of vendors for prices and quality. Some internal parts in the cheaper hydrants can't be changed if they fail. Buying a hydrant that can be repaired in place will cost more up front but won't have to be dug to be replaced.

Get the correct length when buying a hydrant. Hydrants may be sold by bury depth or overall length (see diagram page 17). For example, if your bury depth is 60 inches or 5 feet, buy a hydrant at least 90 inches long. A side note is that whatever bury depth you choose will be how deep you trench your pipeline since it all needs to be the same depth.

Black plastic poly is one of the most durable, economical, and practical types of pipe to buy for running hydrant line. The pipe comes in a number of diameters such as 1/2", 3/4", 1" and 1.25" and comes in 50', 100', and 250' rolls. Grey insert connectors used with hose clamps and adapters help splice the pipe for long runs and for attachment to water sources and hydrants.

Don't let the rolls of pipe intimidate you; the roll will make the job easier. Consider buying extra splices and adapters in case one is damaged. The inlet on the hydrant foot will provide some guidance as to what size of pipe works well with

most properties using either 3/4" or 1" diameter poly pipe. Metal pipe and PVC pipe are subject to rusting and breaking more easily than black poly pipe and are more expensive to buy and maintain.

In some cases, branching out and running more than one hydrant simultaneously can use 1.25" pipe and then reduce the size on each branch to keep flow and pressure up. If using less than three hydrants at a time, 1" pipe works fine as long as there is a decent water supply. If the pipeline route is exactly the same as a roll – buy a little extra.

You are going to need about 10 gallons of clean gravel for each hydrant site.

Trenching in pipeline is a fairly simple but time-consuming task. Use a trencher, which can often be rented by the day from local companies. Some are designed for walking behind, and others are tractor mounted. Remember you will need a trench as deep as your bury depth for the



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hydrant and only three to four times as wide as the pipe. A backhoe is another option.

Let's lay this out in simple steps:

1. Dig a hole wide enough to climb down into at the connection point of the water source, at each hydrant location, and at any locations where a shutoff valve is desired. These holes should be large enough to stand at the bottom and deep enough you can reach down and make pipe connections. A 6' bury connection or hydrant hole is usually 7' deep, 3' wide at the bottom and flared out to about 6' wide at the top so soil is stable and you don't get trapped at the bottom. This is pretty much shovel work since the trencher will not dig holes. It's a good idea to dig connection holes before renting the trencher. Place barricades around the holes to keep children and animals out until done.
2. Shut down the water system and install a pipe connector (called a nipple at the store) to the existing system. Adding a shutoff valve to isolate the new line will allow you to power up the original system as soon as the shutoff is installed and allows completion of the new expansion without inconveniencing the family for extended periods. Installing the shutoff either down a pipe or inside a structure makes it accessible when needed.
3. Set the trencher depth according to the pre-determined "bury depth." Make sure to clear the pipeline path, inform family, and have a person act as a safety spotter while you operate the equipment. Trench from the connection location to and past each

pre-dug hydrant hole. If you have equipment with a blade, you can return the trencher as soon as the trench is complete and possibly save funds.

4. Unroll the poly pipe with enough length to reach the connection in the first hole. Place a board or beam over the remainder of the pipe to keep it from unrolling or following you into the hole.
5. Use a hacksaw or poly pipe cutter to trim the end of the pipe squarely then use a pocket knife to clear the edges. Slide a heavy hose clamp sized for the pipe over the pipe and then insert the adapter or nipple into the pipe. It helps to heat the end of the pipe with a portable propane torch – be careful. Many installers prefer using a “union,” which allows mounting half on the water source firmly, mounting the other half on the pipe firmly, and then the two parts connect securely but can be disconnected if needed.
6. Unroll some of the pipe into the trench moving away from the connection for about 6-8 feet. Place the beam, board, or weight across the trench to keep the roll in place. Then throw enough dirt into the connection hole to weigh down the pipe and fill about one quarter of the hole. Little by little, unroll the pipe into the trench stopping about every 8 feet to add enough dirt to keep the pipeline on the bottom and level. Usually, about 5 gallons of fill every 8 feet will keep the line secure.

7. At each hydrant location, cut the pipe and connect the bottom of the hydrant to the water line with an appropriate connection. It is recommended to use Teflon plumbing thread tape on the connections and a clamp with a hex head so a nutdriver can make the clamp very secure. You may use plastic or brass connectors and/or tees. Brass units will resist cracking from people or animals pushing or pulling on the top of the hydrant. If more hydrants are further along, you will need to install a “tee” connection to allow the pipeline to continue. Place a rock or board at the bottom of the hole to keep the hydrant off the bottom to allow drainage. Continue the pipeline installation to the rest of your hydrants. Do not backfill any of your connections until you charge the system and check for leaks.
8. When all the clamps have been tightened, open the last hydrant and turn on the water supply. Flush out air and any debris from the pipeline. Shut off the hydrant and check for leaks. Water should run out of the drain hole when



the hydrant is closed. This drains the riser to keep it from freezing. Continue checking pipeline connections and the other hydrants. Tighten any leaking connections.

9. Once sure everything is working properly and there are no leaks, place about 10 gallons of medium-sized clean gravel in the bottom of the hole around the “bleed off” valve at the bottom of the hydrant. Fill with enough dirt to cover the gravel by 6 inches and tamp the hole firmly. Place a protective pipe or a post in the hole alongside the hydrant and attach with clamps or mounting hardware to position the hydrant upright. Once you have repeated this process for all hydrants, fill the holes, tamping soil securely to stabilize hydrants and support posts.

## Closing It Up

Now you need to fill the narrow trench. A small blade set diagonally on a lawn tractor or ATV can sluff the fill dirt back into the trench. Trenches can be filled by hand with sufficient time and energy. Pack the dirt in by foot and then by wheel if possible. Mound all soil back onto the trench path leaving a depth of 6 to 8 inches above the soil. This excess soil will prevent water from entering the trench and will eventually settle to near level. Fill and tamp any depressions that occur; they will collect water and drop the “freeze line” lower into the soil.

## Recovery and Maintenance

The trench will need reseeded with the ground cover of your choice to make it less apparent and avoid weed and erosion problems.

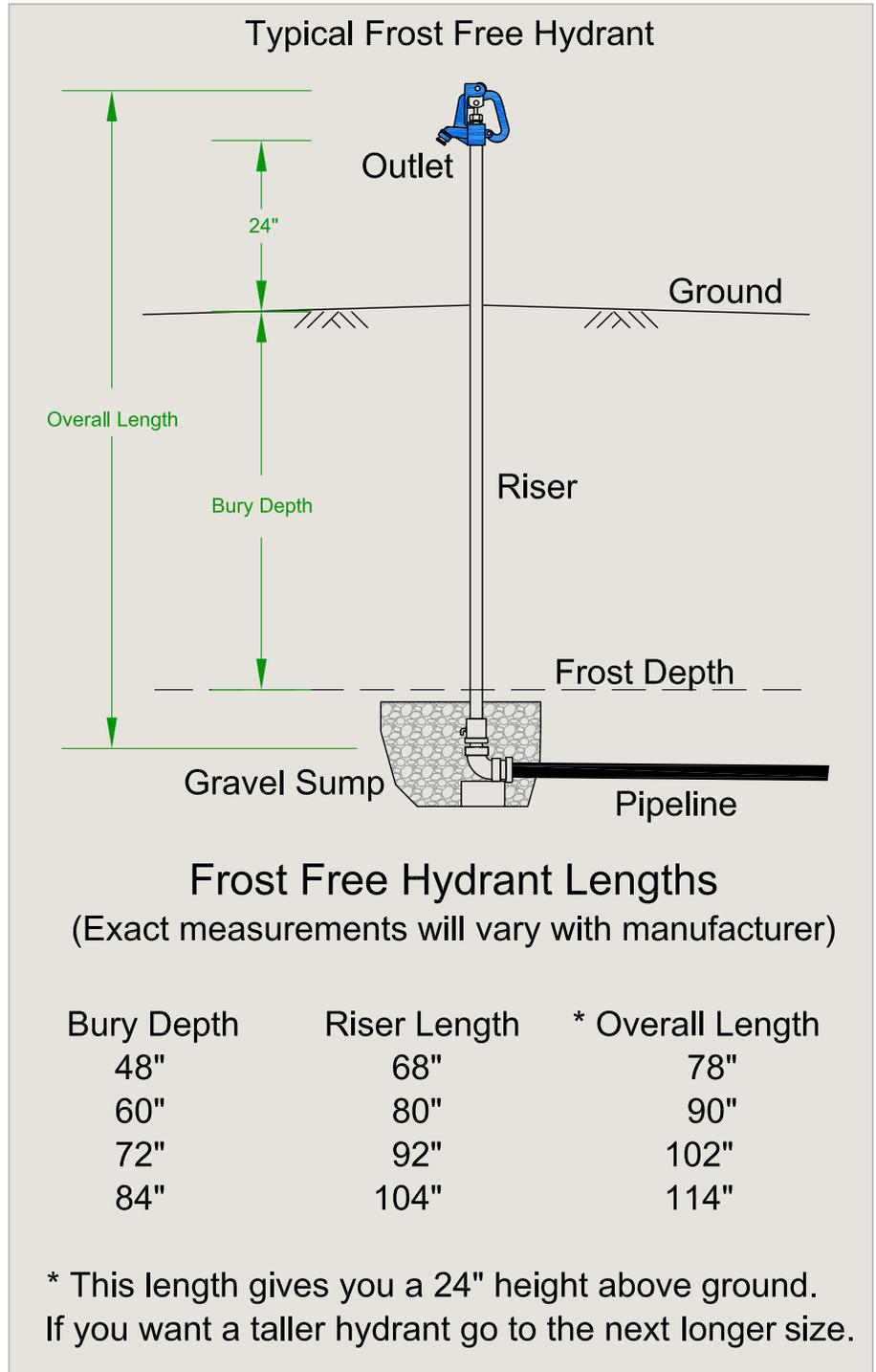
Hydrants require a little annual maintenance including greasing the valve stem if dried, adjusting the bolt tension on the handle appropriately, and making sure the hydrant is not bent over or damaged. Other than those risks, these units can last decades with no other issues. Avoid forcing the valve open or closed. If they do not operate with normal hand pressure (and they are lubricated), they may not have drained and have frozen.

Remember to remove hoses and attachments from the hydrants after each use in the winter, since they can generate a vacuum stopping the hydrant from draining. It is possible to install heat tape around the top of a hydrant with insulation to provide a thaw out over 24 hours. Some landowners close off and use air to blow out their hydrant lines when not in use. If you have a line of more than 500', there are some more considerations that you can get help with at your local USDA Natural Resources Conservation Service office or at your local extension office.

If a hydrant does break or fail, shut off the water source and replace the internal part or, if repairable hydrants weren't purchased, dig up and replace that individual hydrant.

### Enjoy

Once all steps are completed, you can fill tanks and carry fewer water-filled buckets. Now give yourself a pat on the back. But be warned – you will probably start thinking about new projects.



**Scott Cotton** is always looking for ways to make life easier. He is the University of Wyoming Extension educator in the Natrona County office and also serves Converse and Niobrara counties. He can be reached at (307) 235-9400 or at [secotton@natronacounty-wy.gov](mailto:secotton@natronacounty-wy.gov).