

Culverts: General Information

Ditches and small streams are often positioned at the most inopportune places “out here.” Even though they may remain dry most of the year, the steep banks still may prevent vehicles from crossing. The safest and most simple way to cross, while protecting the stream, is to install a culvert and backfill with dirt to create a bridge.

Culverts are manufactured from Corrugated Galvanized Steel (CSP) or High-Density Polyethylene (HDPE) pipe and are positioned to allow water to pass through without damaging the fill placed to create the bridge. The corrugated design provides a greater strength-to-weight ratio than smooth pipe. This helps support the weight of the vehicle, while keeping the weight of the culvert low enough to handle with smaller farm or excavating equipment.

The most common diameters for small streams and ditches are 12, 15, 18, and 24 inch (measurements are inside diameter). Standard lengths for corrugated steel and HDPE pipes are 10ft and 20ft. Customer preference plays the main role when choosing between the two types of culverts offered by Tractor Supply (CSP and HDPE). Both items are durable and offer long term drainage solutions.

Determining Size Prior to Installation

There are many methods used to determine a culvert’s correct size, some of which are very complex and may require engineering advice. However, depending on your situation, you need to consider the dynamics of the stream flow and how it changes throughout the year. Peak water flow is usually during the spring, typically due to run off of larger amounts of rain. Late summer, as the weather is much warmer and dry, water flow typically reaches the lowest point of the year. Pay close attention to the constant stream size (if any) and notice high water marks along the banks. Taking all of this into consideration, the right size culvert can typically be chosen.

Seeking professional advice for swift streams with extreme water flow fluctuations is always recommended.

Determining Length Prior to Installation

Culvert lengths are determined by your desired roadbed width. As mentioned earlier, standard pipe sizes are 10’ and 20’, but galvanized bands can be purchased to connect pipes together if a wider roadway is desired. HDPE pipe comes complete with a “bell and spigot” allowing pipe to be joined together by simply sliding the spigot end of one pipe into the bell end of another.

To calculate the length of the culvert you will calculate the sum of the roadbed width, the width of the two side slopes, and 1-foot of extended culvert on each side of the slope.

Culvert Installation Steps

Culverts can be purchased at www.tractorsupply.com

A backhoe, or comparable excavating equipment, and a soil compactor are recommended when installing a culvert. Excavate the stream bed to make space for the fill on which the culvert will set. As you excavate, follow the existing stream bed gradient (slope), which typically runs between 2 and 6

percent. A slope with less than 2 percent can result in excess buildup of sediment and debris inside culvert, so be careful to get this right. If the culvert is set too high on either end, water will work its way under the pipe, ultimately causing the bridge to wash out. If the culvert is set too deep it will plug with debris, causing it to flood and erode the driveway.

After excavation, spread a bed of rock-free soil or sand over the bottom and compact it with a soil compactor or a blunt ended, long handle compacting tool. When compacted, the fill will be about 4 inches deep; allowing the culvert to set slightly below the stream grade so the water will drop a bit as it enters. Now, place and center your culvert, being careful to minimize any abrasions to the pipe's protective exterior coating.

Next, fill around the culvert with 6-inch layers of dirt, compacting before another is added. Rock-free soil is highly recommended. Continue adding fill to a depth of at least 1 foot above the culvert; this will protect from failure due to the weight of road traffic

Finally, seed the bare fill slopes with native grass purchased at your local Tractor Supply Company store.

Sizing and installing your own culvert can be a rewarding experience. However, it is recommended to seek the advice of a local extension agent, state forester, or professional consultant if you are unsure of yourself when choosing the correct size, or the installation procedure.