

Chapter 10

Stockwater Pipeline Installation

CHAPTER 10 STOCKWATER PIPELINE INSTALLATION

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Chapter 10

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10.1 TRENCHING

10.1.1 Trencher Constructed Trenches

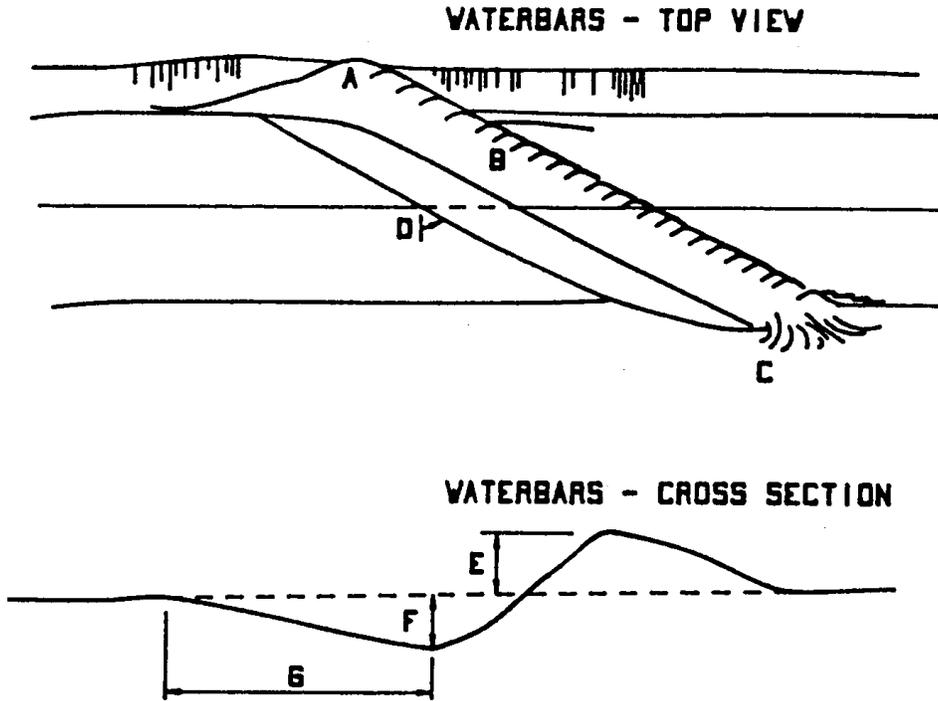
When conditions permit, trenching for pipelines which are buried from 5 to 6 feet are usually done with a narrow 4-to 6-inch wide chain trencher. Where there is little gravel, and the ground is not too wet, these trenchers bring up well pulverized soil that makes good backfill material. The material is usually bulldozed back in the trench with a trencher mounted blade. Where rocks are not present, any of this material may be backfilled directly around the pipe.

There is no practical way to compact the fill in these narrow trenches. Within two to five years the backfill material will usually consolidate to the maximum extent. There will be low spots in the trench backfill when the material consolidates. These can be a hazard to livestock, humans, and equipment and are frequently a starting point for gully erosion.

There are three things that always should be done to minimize these problems:

1. Make it clearly understood by the landowner that there must be maintenance of the backfill each year for several years. This maintenance will consist of adding fill to low spots and repairing any erosion that may occur.
2. When backfilling, mound the soil over the trench to the maximum extent possible.
3. Construct "water bars" at right angles to the trench at periodic intervals. These are simply very small diversion dikes across the trench at locations where the trench is traveling up or down the slope. The purpose of these diversions is to prevent concentration of water in the trench and erosion of the backfill. Figure 10.1 illustrates a water bar.

Figure 10.1
WATER BAR



1. Waterbar construction for forest or ranch roads, firebreaks, & stocktrails & walkways. Specifications are average, and may be adjusted to conditions.
2. A--Bank tie-in point, out 6" to 1 foot into the roadbed.
3. B--Cross drain bars height 1 to 2 feet above the roadbed.
4. C--Drain outlet cut 8° to 16° into roadbed.
5. Angle drain 30 to 45 degrees downgrade with road centerline.--D
6. E--up to 2 feet in height.
7. F--Depth to 18 inches.
8. G--3 to 4 feet.
9. Remember energy dissipator, waterpreaders.

10.1.2 Backhoe Constructed Trench

Backhoe trenches are usually a minimum of 12 inches wide. The material frequently comes out of the trench as clods, large chunks and rocks.

It is important to backfill immediately over the pipe with 4 to 6 inches of soil that is free of large rocks and clods. This sometimes can be done by carefully selecting from the excavated material.

If adequate excavated material isn't available, then material such as sand or fine gravel should be imported and placed around the pipe to a depth of 4 to 6 inches over the top of the pipe.

10.1.3 Road Crossings

All backfill material must be compacted by some adequate means at road crossings. It may be easiest to import sand or fine gravel to fill the trench at road crossings. Rodding and hand tamping can be used to consolidate this granular material. Saturating the material will assist in compaction.

10.2 PIPE JOINTS

Experience has shown that the most common cause of pipeline failure is joint failure. Particular care must be taken to make joints in the manner specified in the specifications and as recommended by the manufacturer. Only materials approved for use with the specific type and rating of pipe must be used.

Polyvinyl chloride (PVC) and other rigid plastic pipes are usually joined using glued joints. Only solvents and glues designed for the specific plastic type must be used. A solvent cleaning and preparation process should always be done if recommended. Connections must be stabbed full depth into fittings.

Polyethylene and other flexible plastic pipe is often connected with "stab" joints. Stab joints must be properly clamped. Two stainless steel band clamps are recommended per joint. Snaking the pipe in the trench helps keep pipe from pulling apart.

Plastic pipe connected together and placed in a trench while warm will contract as it cools off. This can pull joints apart and is the reason that care should be taken to place pipe when it is cool or allow for the contraction by snaking or other means. Backfill should never be placed when the pipe is warm.

Plastic becomes brittle when cold. The amount of brittleness will depend on the material. Pipe should not be handled or backfill placed when the weather is significantly below freezing.

10.3 INSPECTION DURING CONSTRUCTION

Frequent inspection during construction of stockwater pipelines cannot usually be performed by the SCS. We should make a point though to view each contractor's work while pipe is actively being laid at least once during the construction season. If there are an unusual number of

problems occurring from job to job, then more frequent visits must be made. We must provide enough inspection to assure ourselves that pipe is being installed in accordance with the drawings and specifications.

A good way to get more inspection is to enlist the aid of the landuser. The landuser has a vested interest in seeing that a good job is being done. Spending some time with the landuser explaining exactly what to look for during construction can pay big dividends.

10.4 MEASUREMENT FOR PAYMENT

Contractors usually keep track of the number of pipe lengths that are installed and then base their measurement of the installed length of pipeline on the total pipe lengths counted. The laid length is not the same as the total of nominal pipe lengths. Pipe section lengths are not consistently the same and there are length differences caused by couplings and fittings. Damaged or broken sections also seem to end up in the count.

The final payment length should always be measured when the pipe is in place. Frequently this is done with a measuring wheel. Sometimes a tape or chain is used. If a wheel is used, measurements should always be run up the line and then back again. If the two measurements do not agree within two percent, the length should be remeasured. The pipeline total should be the average of at least two measurements. If a contractor's measurements are accepted, it should be on the basis of actual measurement, not a count of pipe sections.