

# Drainage FACTSHEET



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COLUMBIA

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## SUBSURFACE DRAINAGE SYSTEM INSTALLATION

### (WHAT TO EXPECT FROM YOUR DRAINAGE CONTRACTOR)

#### Selecting a Contractor

Once installed, subsurface drainage pipe problems are difficult and expensive to correct. Therefore, find a reliable contractor.

The drainage contractor is a specialist. He should be able to do the required drain layout pre-construction planning or refer you to someone who can. A plan prepared before beginning the work is essential. (Refer to [Factsheet #532.000-1 Subsurface Drainage Plan](#)).

Subdrain pipe can be installed with a chain or wheel trencher, or pipe can be plowed in with a trenchless plow. Either method is satisfactory with conscientious machinery operators.

Once you have selected the contractor, walk over the fields with him and point out the problem areas.

Obtain a cost estimate from him, making sure that you understand the basis for the estimate. A cost per acre can be deceptive. The cost estimate should itemize unit costs of the pipe (with or without filter sock), installation, backfilling and all fittings as required by the drainage plan.

#### Installation Timing

Today, with the use of expensive specialized drain installation equipment, contractors must rely on a steady flow of work throughout the year to run a viable business.

Even though drain installation machines are equipped with sophisticated laser controls to ensure

accurate placement of the drain pipes, field conditions do affect the quality of the job. Subdrain equipment is heavy. A firm, smooth field in sod provides better traction and flotation conditions than a plowed or cultivated field. Drains should be installed when conditions are right for easy digging and when the water table is below the drain level. Often, the best conditions exist when the field is growing a crop. If done during this period, there is a better chance that the pipe will be installed properly with less risk of damage to the soil structure. Avoid saturated field conditions if possible. The small yield loss of installation in a standing crop is a small price to pay to ensure a good job.

#### Inspection During Construction

Observe the contractor throughout the installation to ensure that the drains are being placed properly and according to plan.

##### 1. Trencher Installation

Plastic drain pipe laid in the bottom of an open trench must be backfilled immediately with at least 6" of soil to ensure that it is held properly in place. If the water table is higher than the trench bottom, the plastic pipe will float!

The pipe grade cannot be inspected by eye. An engineer's level must be used. If you suspect problems, obtain a level or the services of qualified surveyor.

Inspect the pipe before it is backfilled to ensure that the couplers are secure, any connections are properly made and end caps are in place.

At the end of each day's installation, the completed trenches should be completely backfilled and the end of the drain line stoppered to prevent sediment or debris from entering the line in the event of an overnight rainstorm. Large stones, clods and heavy direct loading during backfill should be avoided.

## 2. Trenchless Plow Installation

The trenchless plow blade is designed to lift and fracture the soil in its path as it moves forward. The slot should be fractured and loosened not compacted and smeared. Compaction and smearing of the plow slot can occur and depend upon the design of the plow shoe, the soil type, and the soil moisture content. Soils ranging from sands to clay-loams usually fracture readily when plowed. Caution must be used in wet soils with high clay contents. High clay content soils should be plowed when dry. This can result in a high degree of fracturing and cracking which will improve water movement to the drains. Don't pack down the raised land surface following installation. Let the soil dry and then disc it.

## 3. Plastic Pipe Stretch

Plastic tubing is prone to stretching during installation. Stretch reduces the strength of the pipe and should be limited to less than 5%. Trenchers and trenchless plows should have power feeders to reduce the tendency to stretch during installation.

## Guarantee of Workmanship

Ask for a written guarantee of workmanship from the contractor for at least one year following installation. A reputable contractor is happy to back his work up.

Most installation problems will show up within the first year. The kinds of problems to watch for are:

### 1. Wet Spots:

If wet spots show up in the field there may be a problem with the system installation. Wet spots can occur as a result of poor pipe connections or drain grade reversals.

### 2. Sedimentation:

The drain outlets should be checked each spring. Some fine sediment may be evident during the first months of operation, but should clear quickly. The presence of sand in the pipe indicates that a filter should have been used in installation.

## 3. Outlets:

A permanent outlet should have been installed by the contractor consisting of a rigid steel or concrete-asbestos pipe at least 3 meters long extending into the outlet ditch or stream should have installed a permanent outlet. Check regularly to ensure that the outlet pipe is clear of any blockage. Repair erosion damage immediately. The outlet must always have a free outfall.

## Follow-Up

Request an "as-built" plan from the contractor following installation. This can be done by making changes, if any, to the construction plan or by preparing a new plan showing dimensions and locations of all drains.

The effectiveness of the drainage system is very dependent upon the soil and its subsequent management cropping. In some soils, drainage improvements may be evident immediately. In soils with heavy clay contents, the drainage effect develops slowly as the soil develops new cracks and improved soil structure.

Improved soil structure results in improved effectiveness of subsurface drainage systems. Soil structure formation can be encouraged through addition of organic materials, crop rotations and subsoiling.

An apparent "failure" of a subsurface drainage system may actually be as a result of poor soils management by the landowner. This occurs primarily through excessive cultivation for annual crops and the lack of crop rotation. In the Fraser Valley, refer to the Ministry of Agriculture and Food [Factsheet #610.000-1 Soil Management Handbook for the Lower Fraser Valley](#) for recommendations on soil management practices.

For further information on related topics, please visit our website

### Resource Management Branch

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#### FOR FURTHER INFORMATION, CONTACT:

Janine Nyvall, Water Management Engineer  
Phone: (604) 556-3113 Email: [Janine.Nyvall@gems5.gov.bc.ca](mailto:Janine.Nyvall@gems5.gov.bc.ca)  
Ted Van der Gulik, Senior Engineer  
Phone: (606) 556-3112 Email: [Ted.vanderGulik@gems8.gov.bc.ca](mailto:Ted.vanderGulik@gems8.gov.bc.ca)

#### RESOURCE MANAGEMENT BRANCH

Ministry of Agriculture and Food  
1767 Angus Campbell Road  
Abbotsford, British Columbia  
CANADA V3G 2M3