



# Grassed Bio-Infiltration Swales in Residential Developments

# SW-2

Spokane County Public Works/Water and Environment Programs

## What is a grassed bio-infiltration swale?

Bio-infiltration swales are grassed depressions in the ground designed to collect stormwater runoff from impervious surfaces such as streets, driveways, rooftops and parking lots. The grass in the swale helps filter the Stormwater, while soil helps remove pollutants as it infiltrates to the sub surface. The treated water recharges groundwater supplies including the Spokane Valley - Rathdrum Prairie Aquifer. The Aquifer is the sole source of drinking water for the greater Spokane and Coeur d'Alene metropolitan areas.

## Why are swales different sizes and shapes?

When a new subdivision is planned, the developer's engineer evaluates the development site. Using the Spokane Regional Stormwater Manual, the engineer designs a system of swales to handle runoff from the planned development. The design specifies the number and size of swales, and the appropriate locations for them. Swales are sized to handle a volume of runoff from a storm with a 10-year recurrence and are designed to treat the first one-half inch of runoff from the impervious surface draining to the swale.

## Who is responsible for the swale?

### 1) Developer:

The developer of a subdivision is responsible for installing drywells and curb cuts, and for rough grading the drainage swale.

### 2) Builder (Building Permit Applicant):

Responsibility for the swale transfers to the builder upon application for a building permit. The builder is responsible for protecting the swale area from compaction and other harmful activities during home construction. The builder is also responsible for fine-grading the swale, installing sod and conducting a performance test. The builder is required to deposit a security with Spokane County to guarantee that the work and testing are accepted.

### 3) Property Owner:

The property owner is responsible for the swale after the security is released back to the builder. The owner is responsible for perpetually maintaining, repairing and restoring the swale to keep it in good working order.

## How does the process work while a home is being built? What does a builder need to do to get the security released?

The builder must complete the fine grading and establish grass in the swale no later than 6 months after final building inspection approval. The builder calls the County at 477-3600 to request a swale inspection. An inspector will inspect the swale to ensure it is the correct size (according to the engineered plans) and that it is finished with established sod. The County will contact the builder to explain the deficiencies or schedule a time to have the swale flood tested in the presence of a Stormwater Technician. During the flood test, the technician will evaluate whether the swale is working properly. If the swale conforms to the accepted plans on file with Spokane County, and performs as designed during the field test, Spokane County will release the security back to the builder.

## When is grass "established?"

Grass is considered established when the sod can be grabbed and no layer pulls away from the ground. More technically, it is the time when the root structure is established within the soil. The time period for establishment varies with site and seasonal conditions, but generally happens 1 to 2 weeks after the sod has been placed.

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## How long does a builder have to fine grade, sod, and test the swale?

The builder has up to six months (weather permitting) from the date of "final" building inspection approval to complete the swale and perform the flood test. This means the builder needs to get the sod established while the swale can be flood tested, i.e. before the ground freezes in the winter.

## How does a builder get enough water to adequately test a swale?

- 1) Check to see if there is a fire hydrant nearby that may be used. (Note: A permit may be required.)
- 2) Use a water trailer or truck owned by the builder or offered for rent by a private company.

## How does a builder test a linear swale or one that lies between two parcels?

Sandbags can be used to block off the part of the swale not to be tested. The swale can then be filled with water to the required depth. Plastic should be wrapped around the sand bags to prevent any seepage.

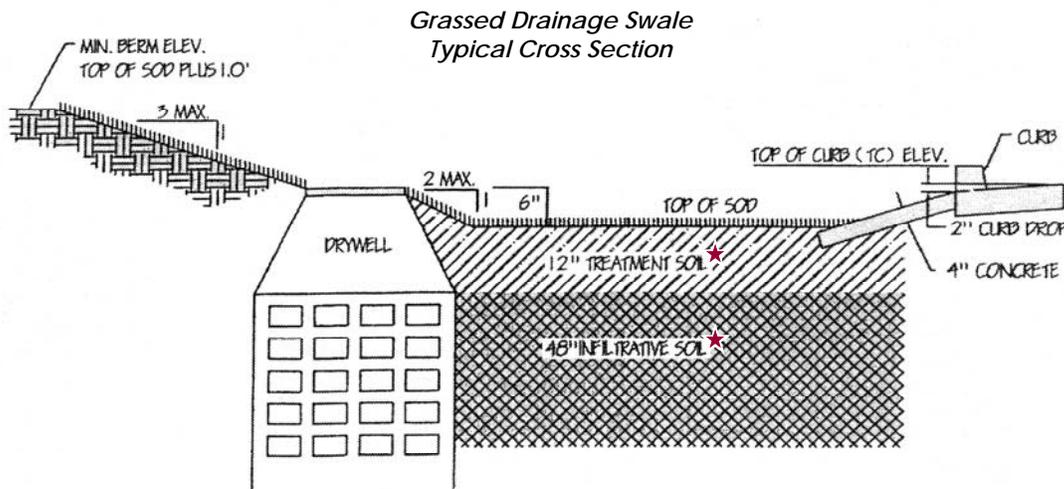
## What happens if a builder does not complete the swale work and testing within the 6-month time limit?

If weather conditions cause delays, the builder can request an extension of time from Spokane County. If the swale is not completed promptly, the entire security may be forfeited to Spokane County. The County may have the option of completing and testing the swale. If the costs for swale installation and testing exceed the security, the building permit applicant will be billed for the additional costs.

## How can a homeowner get help with a swale that doesn't drain properly?

Contact the County's Stormwater Utility (477-3600) for suggestions about what may be done to get the swale to function better.

For more information, or to schedule an appointment, contact:  
Spokane County Water and Environment Programs  
1026 W. Broadway Avenue, 2nd Floor  
Spokane, WA 99260-0170  
(509)477-3600



### ★ Notes:

- 1) Twelve-inch (12") treatment soil layer shall meet the following criteria:
  - Infiltration rate between 0.25 in/hr and 0.50 in/hr
  - Average Cation Exchange Capacity (CEC) at least 15 meq/100g
  - Organic matter content at least 2% by weight
  - When treatment is required, sand and coarser soils are not suitable to be used as topsoil
- 2) Forty-eight-inch (48") subgrade infiltrative soil layer shall meet the following criteria:
  - Infiltration rate at least 0.15 in/hr
  - Facility must completely drain within 72 hours
  - Infiltration testing which demonstrates the facility's conformance to the infiltration rate may be required prior to construction certification