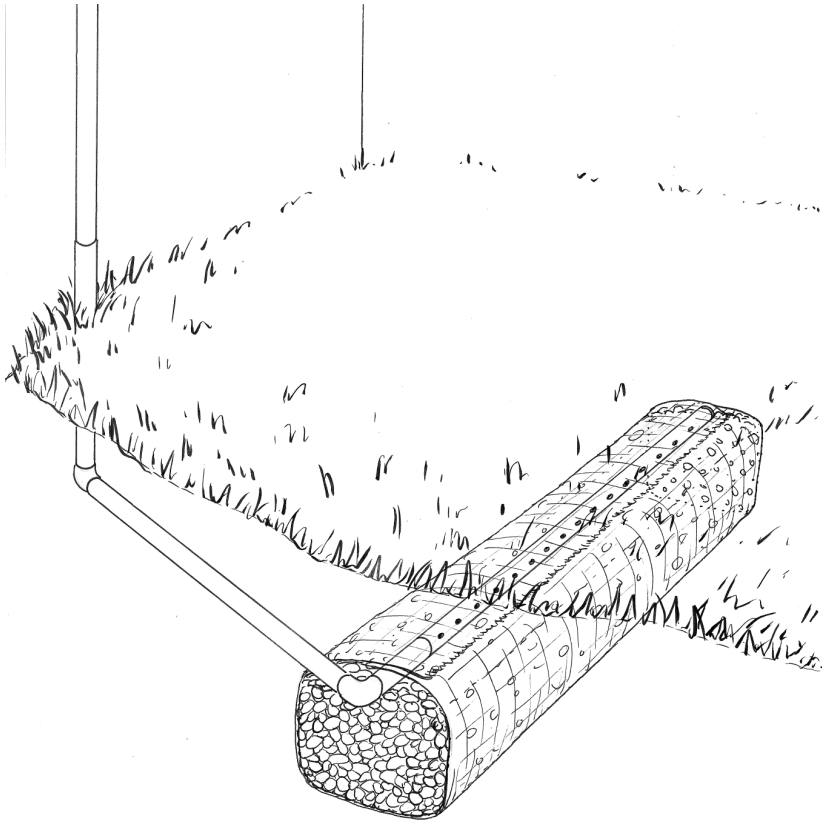


How to Build a Residential Soakage Trench



What is a soakage trench?

A soakage trench, or infiltration trench, is a below ground, shallow, linear trench filled with gravel under an underground perforated pipe.

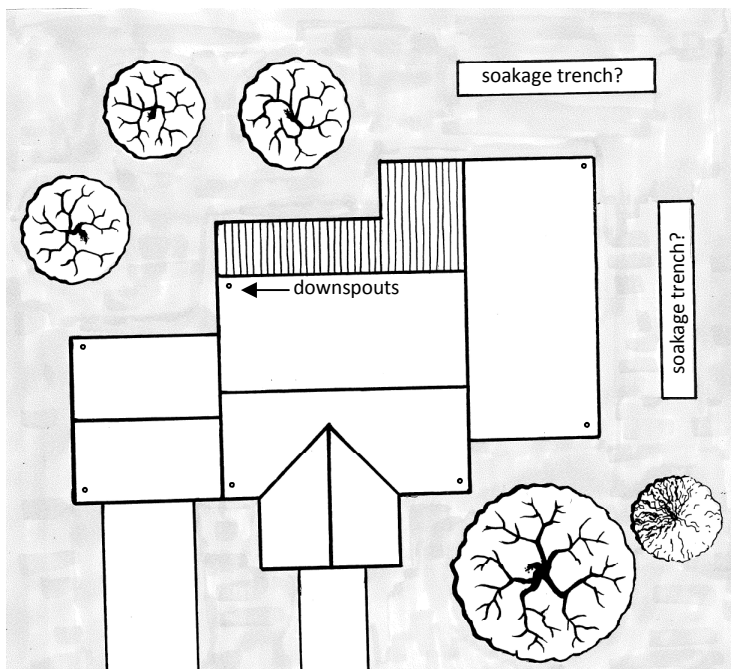
Soakage trenches can help create borders or edges to your existing landscaping, or be completely underground and invisible. You can also use them to capture the overflow from rain gardens or rainwater harvesting systems.

Are there incentives to build a soakage trench?

When rain falls, it washes over roofs, driveways and other impervious surfaces. If storm water runoff isn't managed properly, it can wash dirt, oil and chemicals into rivers, streams and groundwater, as well as cause flooding.

Where do I begin?

Prepare a good plan to ensure that the storm water soaks into the ground without damaging your building or neighboring buildings. This brochure describes an easy, four-step process to help you create your soakage trench.



Observe your site

Determine the direction the runoff from your roof downspouts, patios, and driveway flows. Are your downspouts disconnected to your lawn or are they still connected to the sewer system? Does your driveway runoff go into your yard or the street? Locate your soakage trench where it will safely intercept and collect the most runoff from downspouts and drains.

Test Your Soils

Once you have selected your site, determine whether or not the soil will be able to infiltrate the rain water runoff. To test the drainage of the soil, dig a hole two feet wide and two feet deep where you want to locate your soakage trench. Fill the hole with water and let it drain completely. Fill it again and monitor how fast the water drains. If it drains within 24 hours (approximately 1" per hour), this is a good spot to locate a soakage trench. It's a good idea to dig a couple of holes to see if drainage in your yard is uniform.

Draw What You See

- Sketch a site plan. To get started, you can print an aerial view of your property from <http://earth.google.com/>. If this is unavailable, try your local tax assessment office for parcel maps and information, or take measurements and sketch out the site on your own.
- Mark the locations of downspouts and paved areas. Keep in mind that you can move a downspout and re-grade gutters so that the rain drains to a suitable location for your soakage trench.
- Estimate the square footage of your roof area that drains to each downspout.
- Map out areas in your yard downslope of buildings where you might construct a soakage trench.
- The trench needs to be installed level and parallel to the contour of the finished grade.

Safety Considerations

- Because soakage trenches are underground, it's important to make sure they do not negatively affect your or your neighbors' property. Soakage trenches should be located:
 - At least 10 feet away from buildings.
 - At least 5 feet away from all property lines.
 - At least 5 feet away from all utility lines.
 - **NOT** within 20 feet of a septic system or drain field, or above an underground oil tank that has not been decommissioned.
- **Call Miss Utility (dial 811) at least 48 hours before you dig.** Make sure you don't damage underground utilities by digging the trench. This is a free service. For more information, visit www.call811.com.
- You may need a permit to construct a residential soakage trench. Contact your local Department of Public Works, Planning or County Administrators office for more information.

- Keep in mind that soakage trenches may not be appropriate for all sites. If your site has the following conditions, a soakage trench may not be suitable:
 - Your property has slopes greater than 20%.
 - Your property is within 50 feet of a wetland or water body.
 - Your property is in a floodplain.
 - Your property has high groundwater, seeps or springs.

If any of these conditions apply to your property, you may need to include additional options to safely manage storm water.

Design your Soakage Trench

Mark the location of your soakage trench on your site plan. Calculate how large your soakage trench needs to be.

- *Where soils generally drain well (perform the infiltration test on page three), the soakage trench needs to be 20 linear feet for every 1,000 square feet of impervious area draining to it (sizing factor of 0.020).*
- *If the soils generally do not drain as well, the soakage trench needs to be 30 linear feet for every 1,000 square feet of impervious area (sizing factor of 0.030).*

Sizing Example for well drained soils:

For a house with well-draining soils and 750 square feet of rooftop to be managed, the soakage trench should be 15 feet long.

<i>Roof area</i>	<i>sizing factor</i>	<i>soakage trench length</i>
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750 sq ft x 0.020 = 15 feet long

Direct Water Away From Your House

Locate your soakage trench where water from your downspouts or rainwater harvesting system will drain into it, at a low point in your yard and downslope from building foundations. Make sure that all materials are sturdy and made to handle outdoor conditions. Suggested pipe materials include cast iron, or Schedule 40 ABS or PVC pipe. Ask your local hardware store for these kinds of supplies. If you are draining less than 1,500 square feet of roof to your soakage trench, you should use 3” pipe. If you are draining more roof area, use 4” pipe.

Permits

Once you've located your soakage trench, you may also need to apply for a permit before you start digging. Take a clear copy of your site plan to City or Town Hall. The plan should show where you want to locate your soakage trench, including distances to buildings, property lines, and other structures. The plan should show your pipe size, length and material and describe the soil infiltration rate. Contact your local Department of Public Works, Planning or County Administrator office for more specific requirements. Ensure that you have all the necessary documentation to avoid multiple trips to the permitting office.

Build the Trench

Materials & Supplies: String, stakes, shovel, wheel barrow, filter fabric, drain rock, 3" or 4" PVC pipe, PVC pipe cap.

Step by Step

- Use string and stakes to outline the area you're going to dig.
- Dig up existing grass and plants.
- Set aside any shallow-rooted plants you might be able to replant above your soakage trench.
- Well-drained soils: dig a trench at least 34" deep and 30" wide. Less well-drained soils: dig a trench at least 28" deep and 36" wide. Utilize the sizing equation with your dimensions on page four for exact measurements.
- Line the bottom and sides of the trench with filter fabric. Use filter fabric 8' wide and the length of your trench.
- Well-drained soil soakage trenches: fill the trench with 18" of clean, 3/4" to 2.5" drain rock.
- Less well-drained soil trenches: fill the trench with 12" of clean, 3/4" to 2.5" drain rock.
- Fold one side of the filter fabric over the rock.
- Place the perforated pipe as level as possible on top of the drain rock. Cap the downslope end of the perforated pipe.
- Fold the other side of the filter fabric over the perforated pipe.

Direct Runoff to the Trench

Disconnect your downspouts or connect your rainwater harvesting system to your soakage trench with a solid conveyance pipe. Install the pipe at a slope of at least 1/4" per foot to allow the rainwater to drain to the soakage trench. Locate the pipe 12" underneath the surface of your yard.

Consider installing a y-junction standpipe cleanout to filter out debris. Another option is to install a silt basin or washer between the rainwater source and the soakage trench to trap debris and allow for cleanout.

Get It Inspected

Call the local permit inspector to inspect your work prior to covering your pipe. The instructions you received with your permit should walk you through the inspection request process. If there are any concerns about your construction, the inspector will tell you what to do in order to pass the next time you request inspection.

Cover It

Following a successful inspection, cover the soakage trench with the original soil from the trench or with gravel. There should be about 12" of soil or gravel covering the perforated pipe and the surface of your yard. You can cover the soakage trench with grass, small shrubs, rock or gravel.

Maintenance

- Cleaning and maintaining your downspouts and gutters keeps leaves and debris from clogging your soakage trench.
- Tree roots can damage subsurface systems and pipes, so avoid planting trees over or near the soakage trench.
- Some moss cleaners contain pesticides, which can harm soil microbes that filter and break down pollutants. Use earth-friendly moss cleaners or scrub moss off roofs.
- Clean out the leaf trap or silt basin on a regular basis. Organic material (dirt, leaves) can be composted or used in your yard.

For More Information...

City of Portland Bureau of Development Services. 2010. *Private Soakage Trench*.

<http://www.portlandonline.com/bds/index.cfm?a=79038&c=40878>

United States Environmental Protection Agency. 2006. *Infiltration Trench*.

http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=70

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James River Association
9 South 12th Street, 4th Floor
Richmond, Virginia 23219
(804) 788-8811
www.jamesriverassociation.org

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