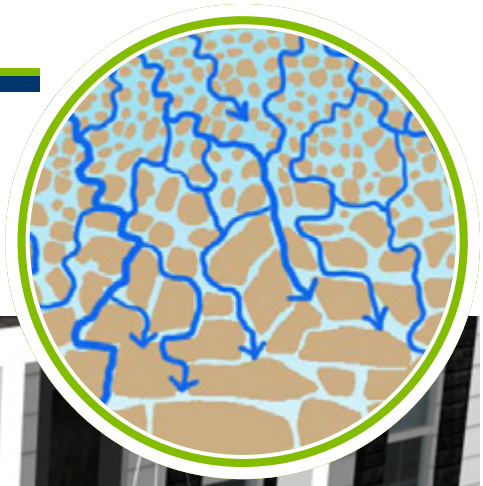
INFILTRATION



DEFINITION

Infiltration is a term used to describe the process of rainwater soaking into the soil. You can utilize various methods of infiltration to get water into the ground faster and to direct water to a certain area in your yard in order to keep it away from your foundation or any other highly trafficked area. There are several methods that are considered infiltration. Be sure that your soil can pass a percolation test before selecting any of these projects.

Go to Soil Testing - click —»

In this section we will focus on infiltration trenches, dry wells, and engineered soils. See the following pages for the **3** options within this Home Project.

BEFORE

NO DRAINAGE

AFTER

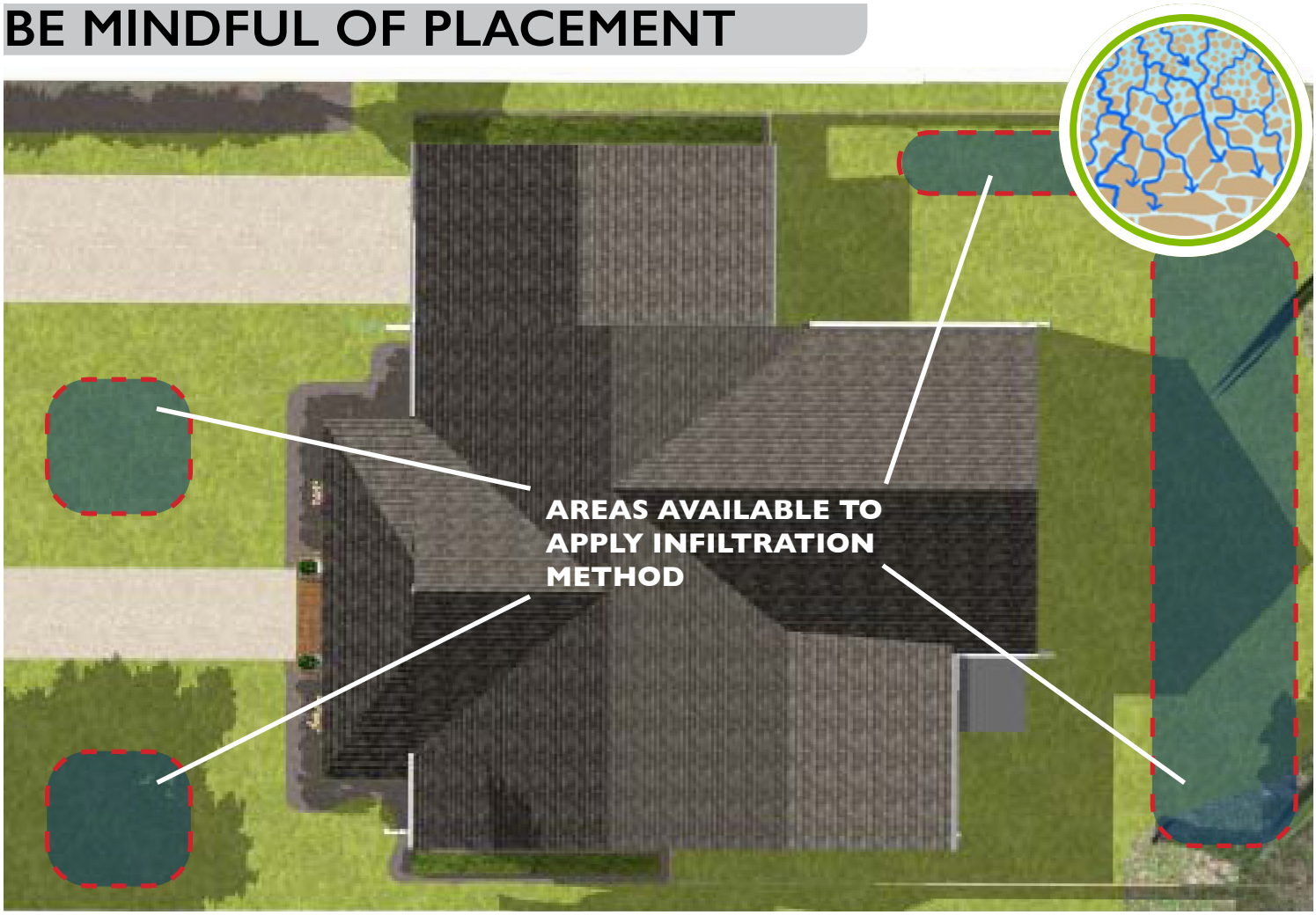
DRAIN CONNECTED TO UNDERGROUND PIPE

EXAMPLES

DRY WELL

INFILTRATION TRENCH

BE MINDFUL OF PLACEMENT



If you have a problem with water leaking into your foundation or basement, or ponding water somewhere in your yard, then you can use infiltration techniques to direct water away from your home or allow water to soak into the ground at a faster rate. Any of these techniques should be located at least **10** feet away from your foundation and sloped away from your house. If there is a low spot in your yard that you want to direct water to, site the infiltration so that it directs overflow to that area. You can also direct your downspouts into an infiltration area.

Most importantly, determine where you want the water to exit and determine if the drainage end is in a suitable location such as a low-lying area of your property away from your house. Be sure that you are not draining water toward your house or onto a neighbor's property.

- Infiltration methods should not be placed where the water table is located within **1.5** feet of the soil surface or where slopes exceed **10**%. They should be located down-slope from any rooftop or paved area that you want to drain.

- Runoff from downspouts will need some sort of pre-treatment before the downspout is discharged to the practice otherwise leaves, sediment and debris will clog the pipes in the practice.

3 Types

INFILTRATION TRENCH

Infiltration trenches or French drains are typically used around foundations or anywhere in your yard where you might have foundation/basement leakage occurring, water ponding, or subsurface moisture. They are shallow, linear excavations backfilled with just gravel or gravel with a perforated pipe within that funnels water away from where you do not want it and allows water to filter into the surrounding soils.

SIZE

The trench for your French Drain should be no less than **12** inches wide by **18**-to-**24** inches deep, depending on your pipe size and your foundation depth, if running it along your foundation. The length will vary depending on where you want your water to go. The pipe should be sloped one inch for every **8** feet in length.

DRY WELL

A dry well is a stormwater storage facility that is placed underground and receives runoff from roofs, gutters, or pavement. It temporarily holds rainwater and slowly discharges it into the surrounding soils. A dry well can be either a pre-made plastic chamber / bucket, a tank with holes or an excavated pit filled with gravel.

SIZE

Dry wells can be as large as you want them to be, but a standard size for a DIY project is about **4** feet by **4** feet. You will also need to dig a trench from your downspout to the well for the downspout connection if you decide to connect to a downspout.

ENGINEERED SOIL

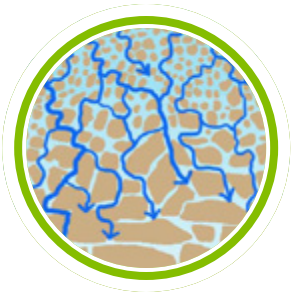
Soil based infiltration systems are amended soils that are applied to areas of your yard that might have compacted soils or soils that do not drain properly. These amended soils can reduce stormwater runoff and may be used along with downspout disconnections, grass channels, and other home projects to infiltrate stormwater into the ground rather than allowing it into the public stormwater system. Due to their relatively small size, they can only handle smaller rainfall events. They can be vegetated with turf grasses, ornamental grasses, shrubs, and other native vegetation. Effectiveness may be enhanced through the addition of an earthen berm at the bottom side of the slope.

SIZE

Compost amendments for soil-based infiltration can be applied to an entire area of yard space or be applied only to select areas. Typically, they are placed downslope from a patio or rooftop in a linear format to capture stormwater runoff before it goes into the street or a body of water. They can be as large or small as you want them to be, but a typical filter strip would run the length of your patio or rooftop, have a depth of **18** inches and a width of **3** feet.

GETTING STARTED

The tools and materials for installation are similar but have a few key differences among the **3** infiltration methods. Here are a few questions to ask before you start: If you can do the digging yourself? Do you have a place for the removed soil to go? Which method would benefit you the most?



DO IT YOURSELF (DIY)

If you intend to perform this work yourself, see the lists for general tools and materials you may need to help you get started. Note that this is a more labor-intensive project and may take help and time to complete.

Tools & Materials:

- Personal Protective Equipment
- Shovel OR Trenching machine
- Wheelbarrow
- Scissors or Utility knife
- Hammer
- Mason's line/ Line level
- Tarp or canvas
- Tape measure
- Wood stakes
- Rake
- ½" to ¾" coarse washed gravel that is screened (**~4** cubic ft. per **10** ln. ft. of drain)
- Non-woven, Class C geotextile fabric
- Fabric staples
- Pop-up emitter
- **8**" - **12**" Catch basin
- Downspout adapter
- PVC glue
- Pipe connectors **40** gallon prefabricated polyethylene tank (Dry Well)
- Perforated PVC drainpipe (**3-4** inch diameter) OR Corrugated pipe with slits (Infiltration Trench)
- Engineered soil (**50**% sand, **30**% compost, and **20**% topsoil mixture)

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HIRE OUT THE WORK

Contact a CBLPro licensed and bonded landscape or site contractor. Prices will vary on complexity and time needed to complete job.

$$$

KIT or SPECIALTY ITEM

Check online or your local home supply store

$$

MAINTENANCE

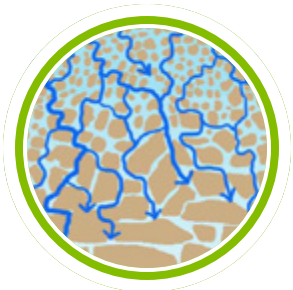
Infiltration trenches & dry wells generally require little maintenance but can sometimes get clogged or damaged. Landscape fabric (filter fabric) acts as a barrier to prevent dirt and debris from entering the pipe or clogging up the gravel. However, regular maintenance is still required to make sure nothing blocks the flow of water.

Engineered soils are intended to be vegetated and left to naturalize.

Seasonal / Yearly

- Inspect your drain. The drain may have an inspection (clean-out) pipe or if it's connected to your downspouts, the downspout can be disconnected to allow access to your drainpipe.
- For clogged PVC pipe, rent an electric sewer snake to clean out the pipe. Do not use with corrugated pipe as it will tear.
- Hose out the drain with a garden hose or pressure washer.
- If you have a severe clog, call a professional.

HOW TO - Infiltration Trench

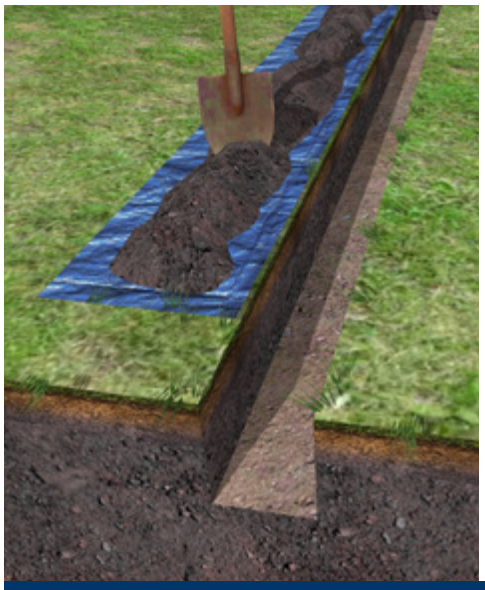


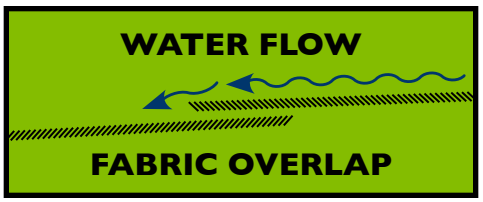
Step 1: Assess & Mark
Verify your drainage will not adversely affect your house foundation, the health and root structure of nearby trees, anyone else's land or any public areas. Mark the trench route with white paint & call **811** before digging.

Step 2: Dig
Use a trenching machine or shovel to dig trench at minimum, **12** inches wide by **18** inches deep. Use the mason's line and a level to check the slope of the trench. Your trench and pipe should slope **1** inch for every **8** feet of distance at a minimum.

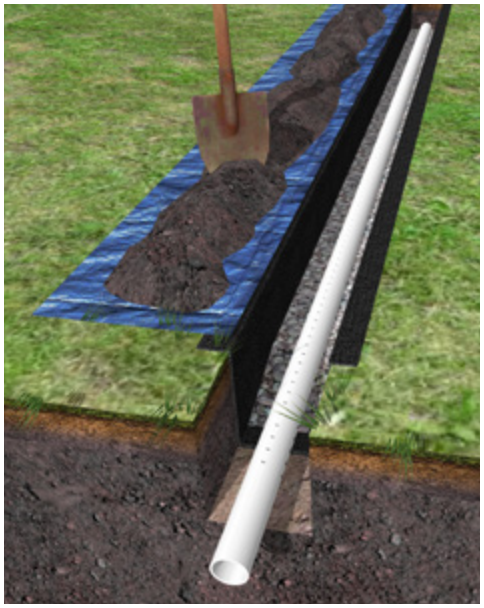
- Perform soil test. If encounter water in the hole, the water table is too shallow to install.

Step 3: Line the trench
Use a continuous swath of landscape fabric, if possible, to line the sides and top. Overlap pieces of fabric by at least **12** inches at the ends and secure with fabric staples driven into the ground with a hammer. Fold back the excess fabric to each side of the trench.



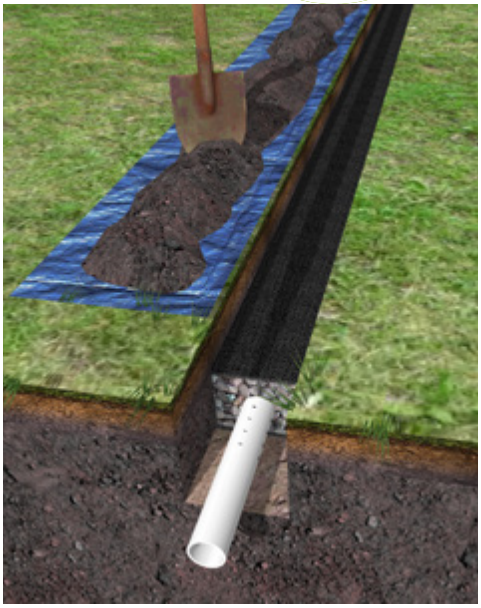


Landscape fabric ends needs to overlap in the direction of the desired flow of water.



Step 4: Gravel & Pipe
Fill the bottom of the trench with coarse washed gravel so that it is about **2** to **3** inches deep. Place the perforated drainpipe into the trench on top of the gravel. Make sure the drain holes are facing down.

Pro Tip: Test fit your parts before glueing!



Step 5: Fill & Wrap
Cover the pipe with gravel until there's about **3** to **5** inches of space between the gravel and the top of the trench. Then take the landscape fabric and fold it over the layer of gravel like a burrito.

Step 6: Cover up
Fill the top of the trench with the displaced soil. You can then lay sod on top, reseed, or use decorative river rocks or rounded stones to create a decorative landscape feature.

Project Completion!

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HOW TO - Dry well

Step 1: Assess & Mark
Verify your drainage will not adversely affect your house foundation, the health and root structure of nearby trees, anyone else's land or any public areas. Mark the trench route with white paint & call **811** before digging.

Measure the distance from your downspout to the middle of your dry well to figure out how much PVC pipe length and connections you will need.

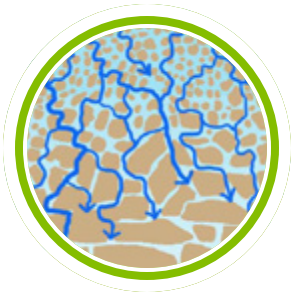
Step 2: Dig
Using a machine or a shovel to dig a circluar hole that is sized so that it is approximately **6** inches wider on all sides than your barrel. Depth will depend on the slope of your pipe and where you want the dry well to go as well as what material you want on top of your well. Try to dig the walls straight down. Depending on what kind of dry well you select will depend on the size of the hole you end up with.

Pro Tip: Test fit your parts before glueing!

Step 3: Trench
If you are connecting your downspouts to the dry well, dig a trench from where your downspout is located to the dry well. For more info about digging an infiltration trench return to the previous page.

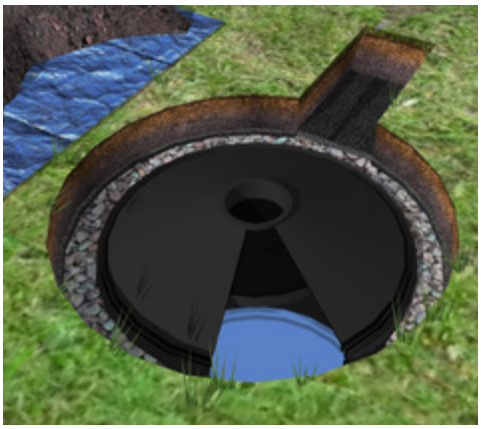
Step 4: Fabric & Gravel
Line the sides with a layer of landscape fabric. Secure the sides with stakes to hold up the fabric until you fill the hole with gravel. Use a wheelbarrow to pour the first **2** to **3** inches of washed gravel over the bottom of your well hole. Tamp down the gravel.

Step 5: Connect
Make sure that leaf screens are installed at the roof gutter so that debris from the roof won't enter the downspouts and clog any pipes. Connect your downspout to a downspout adaptor and elbow. Use PVC glue to connect each one. Place the PVC pipe in your trench



and connect the elbow to the PVC pipe that you will be using to direct water to your dry well. Lower your tank into the hole and make sure the opening at the top lines up with your PVC drainpipe and the lawn surface.

Step 7: Fill
Use a wheelbarrow to pour **4** to **6** inches of washed gravel around the tank at a time. Tamp down the gravel between each load. Repeat till fill the hole. Take care not to pull fabric down as you fill in.



Step 8: Cover
Fold the landscape fabric to cover the top of the gravel and cut around the PVC pipe. Spread soil on top of the gravel and landscape fabric if you want to grow grass on top of it. Otherwise, you can put decorative stone on top.

Project Completion!

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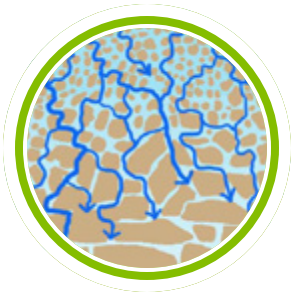
HOW TO - Engineered Soil



Engineered soils are amended soils that are applied to areas of your yard that might have compacted soils or soils that do not drain properly. These amended soils can reduce stormwater runoff and may be used along with downspout disconnections, grass channels, and other home projects to infiltrate stormwater into the ground rather than allowing it into the public stormwater system. Due to their relatively small size, they can only handle smaller rainfall events. They can be vegetated with turf grasses, ornamental grasses, shrubs, and other native vegetation. Effectiveness may be enhanced through the addition of an earthen berm at the bottom side of the slope.

Step 1: Assess & Mark
Engineered soil filter strips should be placed parallel to a downward slope in your yard. The standard size for a filter strip is **3** feet wide by the length of the area that you are trying to capture runoff from. Mark the area with white spray paint and call **811** before digging.

Step 2: Clear
Clear and grub site as needed. Care should be taken to disturb as little existing vegetation as possible and to avoid soil compaction.

Step 3: Surface Prep
Rough grade the filter strip area including the berm at the bottom of the slope, if proposed. The berm should be about **3** inches in height by **18** inches in width.

Step 4: Dig
Trench approximately **18** inches deep and **3** feet wide upslope from the berm.

Step 5: Fill
Dump soil mixture (**50**% sand, **30**% compost, and **20**% topsoil mixture) into trench and fine grade the filter strip area.

Step 6: Plant
Seed, sod, or plant the area with shrubs, grasses or groundcover. If using plants other than turf grass, be sure to add **3** inches to **4** inches of mulch on top of the compost mixture. Water regularly.

Step 7: Follow up
The soil-based infiltration area should be inspected at least once after each storm event that exceeds ½ inch of rainfall. Look for bare or eroding areas and make sure that they are stabilized with grass cover or mulch. Water once every three days for the first month and then weekly for the first year to establish turf grass or other vegetation.

Project Completion!

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