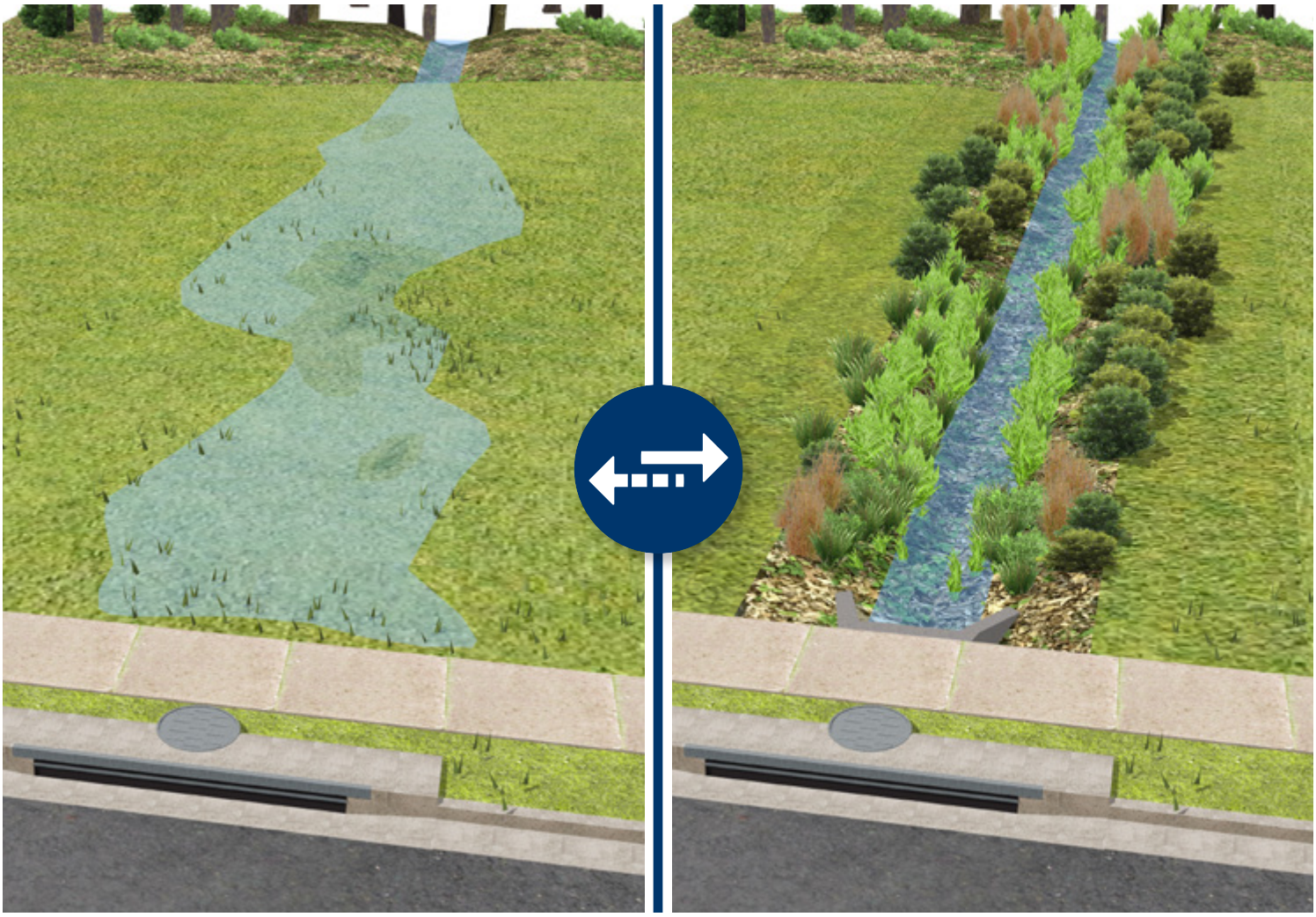
BIOSWALE

DEFINITION

Bioswales are linear landforms sunken into the ground that convey rainwater into a drainage system, similar to a roadside ditch. The key difference is function. Bioswales consist of plants to help remove pollutants and sediment from the collected rainwater. Bioswales also may contain structures to help hold and slow the flow of water such as short walls and grouping of rocks, whereas a ditch simply moves water away from the source as quick as possible with no ecological benefit. The bottom of the bioswale may also infiltrate water and can be comprised of special soil media like a rain garden, or compost amended soils to enhance infiltration and treatment of the water.

BEFORE

AFTER



BIOWALE WITH NO PLANTING

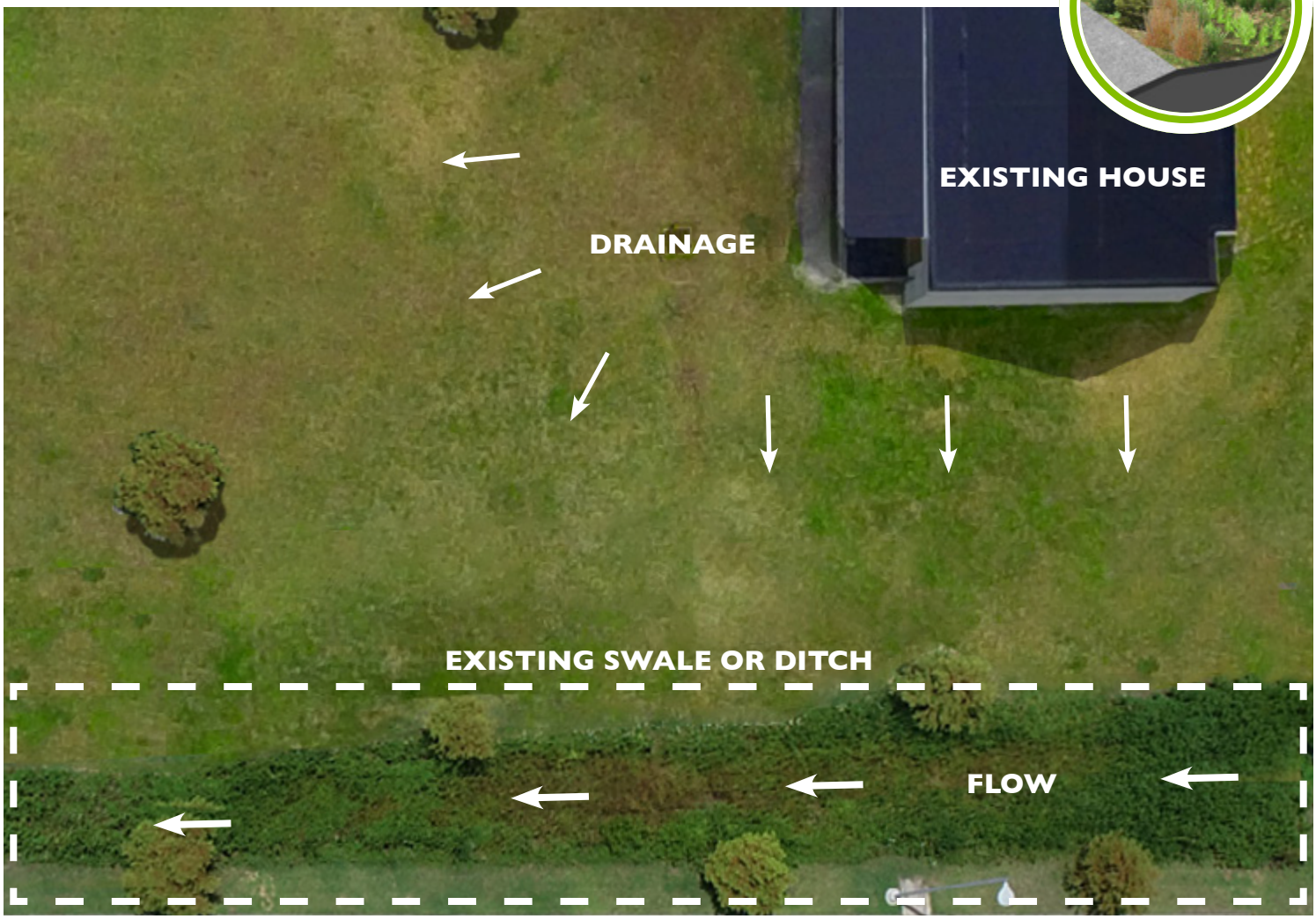
BIOSWALE WITH PLANTS ADDED

EXAMPLES

TURF BIOSWALE

PLANTED BIOSWALE

CONSIDERATIONS



An existing ditch may be the best location for a bio-swale. Ditches typically reside in the public right-of-way space and will need an appropriate permit with approval from the city to install.

Other locations might be in your side yard to convey rainwater from your back yard to your front yard or vice versa if you have any drainage issues that you want to convey to a lower part of your yard, out into the street, or to an existing drainage system.

Ensure that the location you select is at least **6** feet away from your house and **5** feet away from your property line. This will help you avoid any water damage in case of future drainage issues.

Bioswales convey water from one area to another, therefore the slope should be fairly flat but enough that water will move from one end to the other. The minimum slope from one end to the other should be **1**%.

The side slopes should be at a ratio of no steeper than **3**:**1** and if possible, planted with native plant species. It is best to follow the contour of the land for the bioswale to capture rainwater.

GETTING STARTED

The cost of an bioswale project is determined by the length of trench, whether an underdrain is needed, and amount of plants used. Here are a few questions to ask before you start: If you can do the digging yourself? Have a place for the removed soil to go? Is an underdrain needed?

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.

Tools & Materials:

- Personal Protective Equipment (PPE)
- Paint, hose, or sticks for marking the ground
- Shovel
- Rake
- Garden hose or bucket
- Tape measure
- Wheelbarrow
- Soil
- Non-woven geotextile fabric
- Plants
- Rocks (if needed)
- Perforated drain pipe (**4**")
- Heavy equipment rental

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HIRE OUT THE WORK

Contact a CBLPro licensed and bonded landscape or site contractor. Prices will vary on amount of digging and length of pipes.

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SPECIALTY ITEM or KITS

Specialty items or drainage supplies can be ordered Online or found at a landscape supply store.

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MAINTENANCE

It is very important to maintain storage capacity and functional integrity of a bio-swale. Regular monitoring of infiltration capacity, structures, and management of vegetaion are key in having a successful bio-swale.

Annually

- Soil infiltration test
- Maintain at least a **6** inch depression
- Replace or add plants

Seasonally

- Trimming of vegetation
- Fix areas of erosion
- Replace or add plants
- Remove undesired plants such as volunteer tree sapplings

As needed

- Remove trash and undesired debris
- Remove any undesired blockage

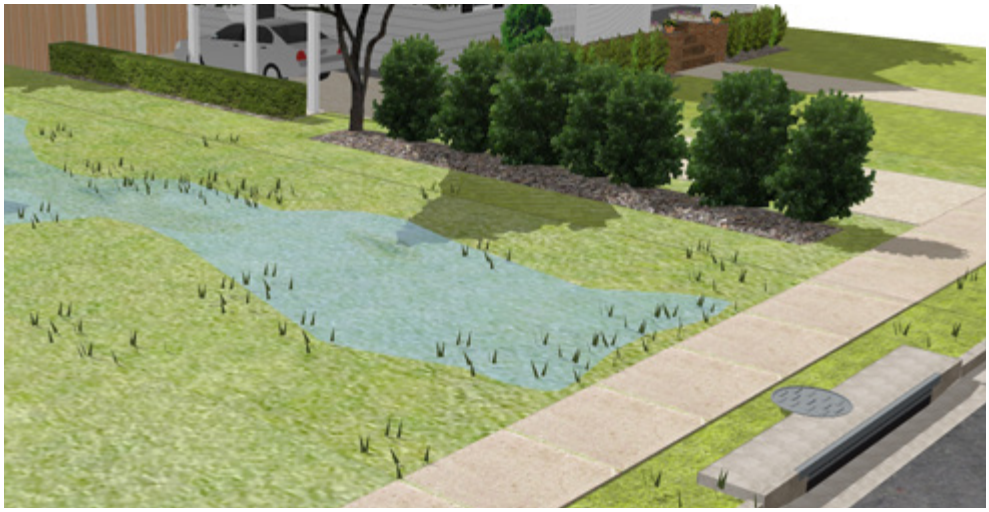
HOW TO

Unlike a rain garden, bioswales carry water from one area to another and typically include a drain at one end to take away water that doesn't infiltrate. It is important to consider where water will move to during very large rainfalls. It could spill over into a natural area, a rain garden, or tie into a storm sewer system.

It is recommended to enlist the help of professionals before changing the drainage on your property. Landscape architects, engineers, and contractors who specialize in grading and drainage can survey your property to determine the best way to direct water while keeping your house and your neighbor's property safe.

Check local codes and permit requirements and always mark the area with white paint & call **811** before digging.

Step 1: Measure & Mark
Select a site and determine the size, shape, and length of your bioswale. 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.



Step 2: Remove Lawn & Topsoil
Strip away any lawn by slicing off the roots with a sharp spade directed at a low angle to cut **2-3** inch thick chunks of sod.

- You can also use a sod cutter, which you can rent for about **$80** a day to aid in removal. Reuse or dispose of extra sod in a lawful manner.

Step 3: Digging
The sides of the bioswale should be constructed with slopes of **3**:**1** or less. The bottom of the longitudinal slope can range from **1**% to **4**%. Anything higher than **4**% would require the use of a weir or check dam. These may be constructed of any resilient or waterproof material including rock gabions, earth berms, or stones.

- Be sure that you leave a minimum of **6** to **12** inches for ponding and that you keep the bottom of your trench **2** feet above the high water table.

- The depth should be added up by considering the ponding area (**6** to **12** inches), **3** inches of mulch, and **12** to **24** inches of tilled or amended soil. This would equal a total of **21** to **39** inches deep.

Step 4: Fill
Fill all but the top **6** inches of the excavated area back up with tilled or amended soil.

- If you need a pipe for overflow purposes or to connect to the public stormwater system, see the Infiltration **Home Projects** section on Infiltration Trench for instructions.
- Additional overflow connections to the drain pipe may be needed or added at the end of the bioswale where it can drain into a natural area or storm system. Raise the overflow drain system approximately **6** inches above the finished soil surface.
- Ensure that runoff can enter from the sides and that grading slopes towards the bioswale.

Step 5: Planting
See Rain Garden Home Project for Choosing & Placing Plants per water tolerance zone. See Appendix for Plant List.

- Holes should be as wide as the plant's root structure and deep enough so that the surface of soil in the pot or top of root ball is level with the soil in the garden.
- If the plants are root-bound, loosen up the roots before planting them.

Step 6: Mulching & Water
Add about **2-3** inches of mulch on the ground in the swale area, being careful not to put the mulch too close to the plant's stem or trunk.

- Thoroughly water your plants immediately after planting and add one inch of water per week (unless it rains) for the next **3-4** weeks.

As an alternative groundcover, river stones can be used to create the look of a dry river bed.

Project Completion!

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