APPENDIX: STORMWATER GUIDELINES

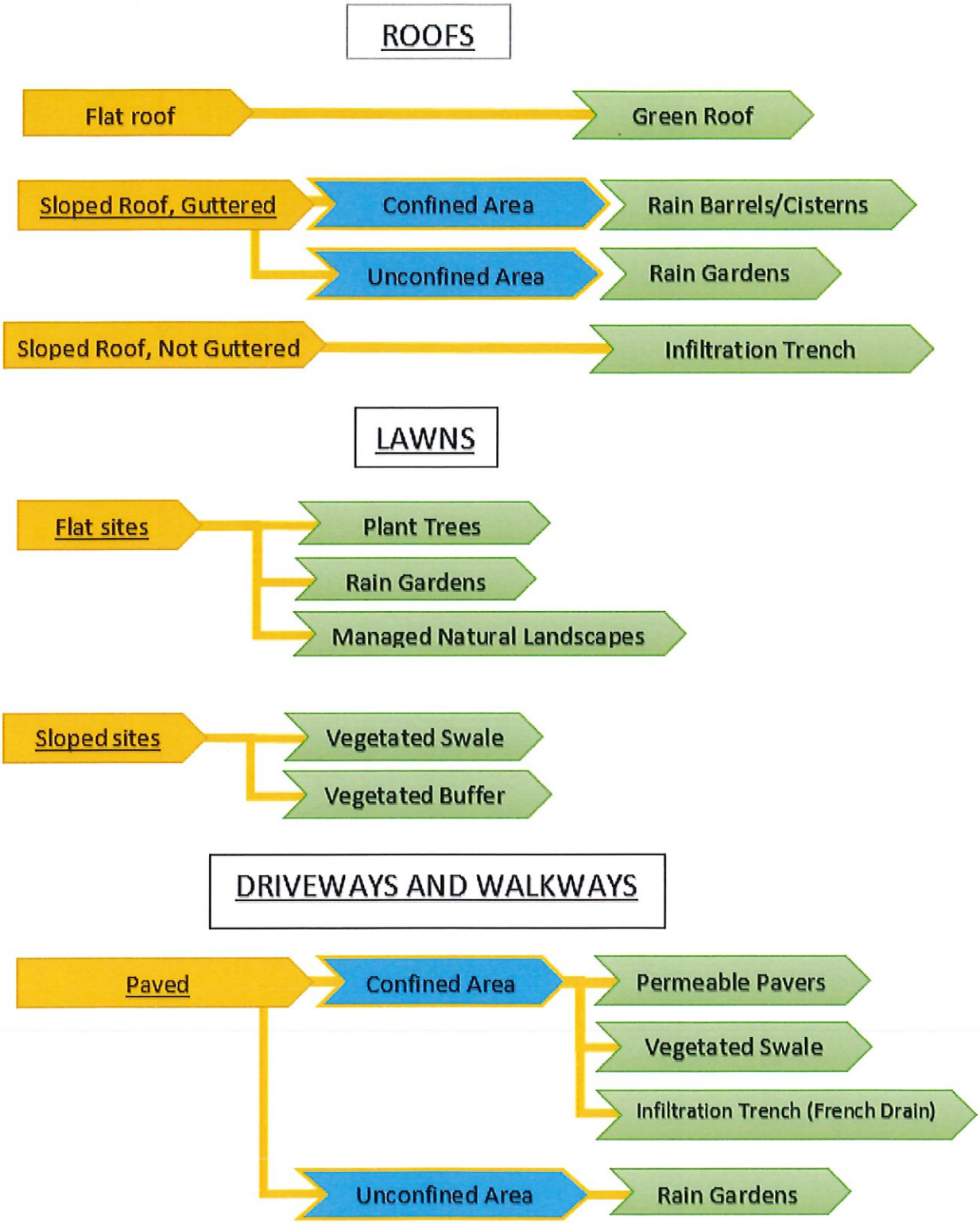
FOR LOW IMPACT DEVELOPMENTS

The waterways surrounding the Village of Yellow Springs are an important part of the community. They provide recreational opportunities, drinking water and habitat for our native plants and animals. As development occurs in the Village, it will cause an increase in stormwater that can potentially contaminate the surrounding waterways and overwhelm the Village's storm sewer collection system. In an effort to help alleviate any negative effects from this increased stormwater, the Village of Yellow Springs is providing a guide to require new developments of less than one acre of impervious surface to follow low cost best management practices.

The Village encourages sustainable stormwater management solutions in the design phase and encourages the preservation and protection of natural assets to be treated as amenities of homes, entryways, and play areas.

This guide will help homeowners, business owners and contractors to improve and protect water quality and manage their stormwater runoff. These practices prevent runoff from occurring by helping to slow down, filter and infiltrate the stormwater into the ground, minimizing the negative effects of new development on the Village's storm sewer collection system and the surrounding tributaries.

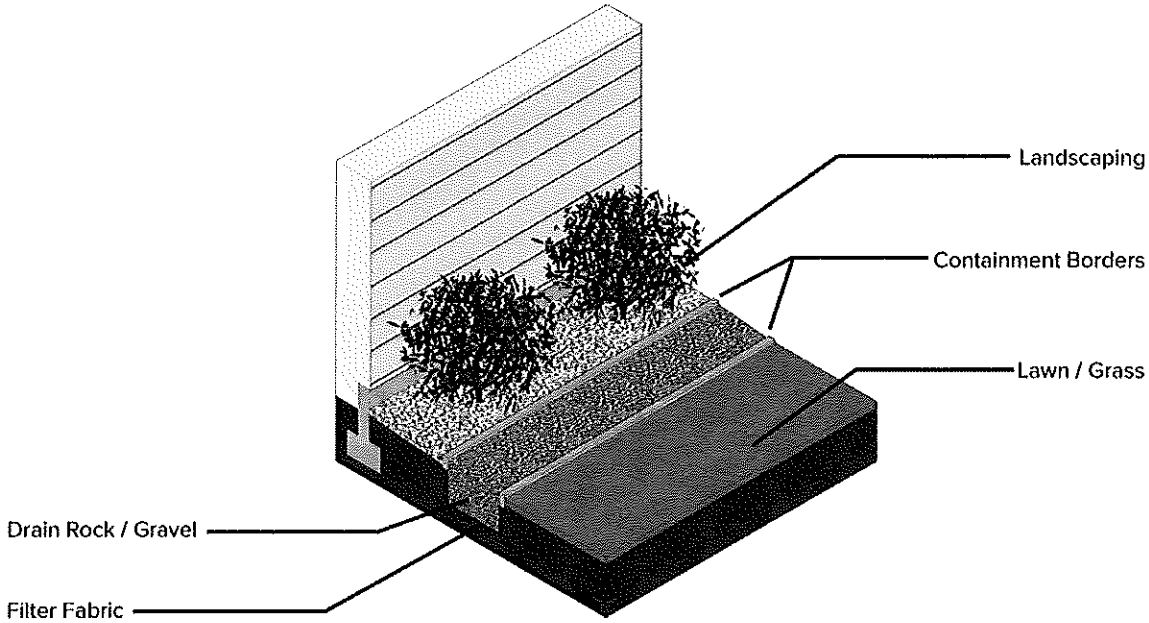
BEST PRACTICES FOR STORMWATER MANAGEMENT FLOW CHART



DEFINITIONS

Dripline Infiltration Trench

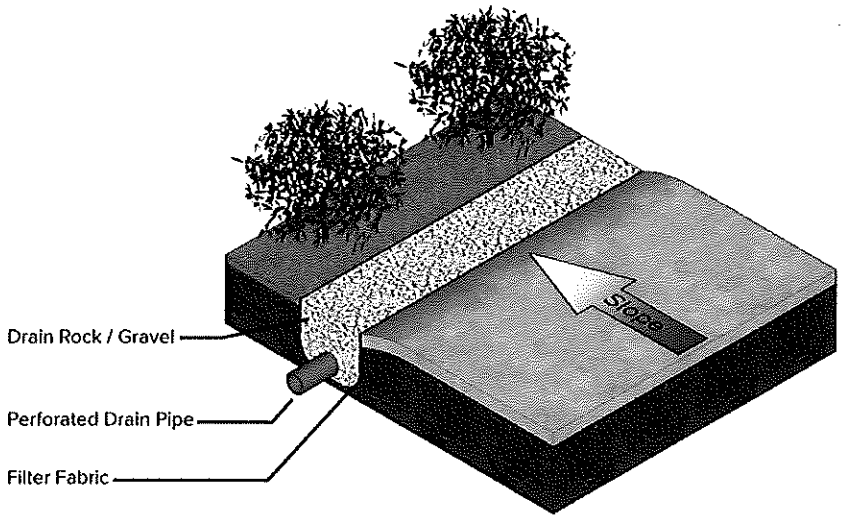
A trench that collects and infiltrates stormwater from the roof until it soaks into the ground. Typically, 8-12 inches deep and 2-3 feet wide of crushed stone placed wherever runoff falls from the roof.



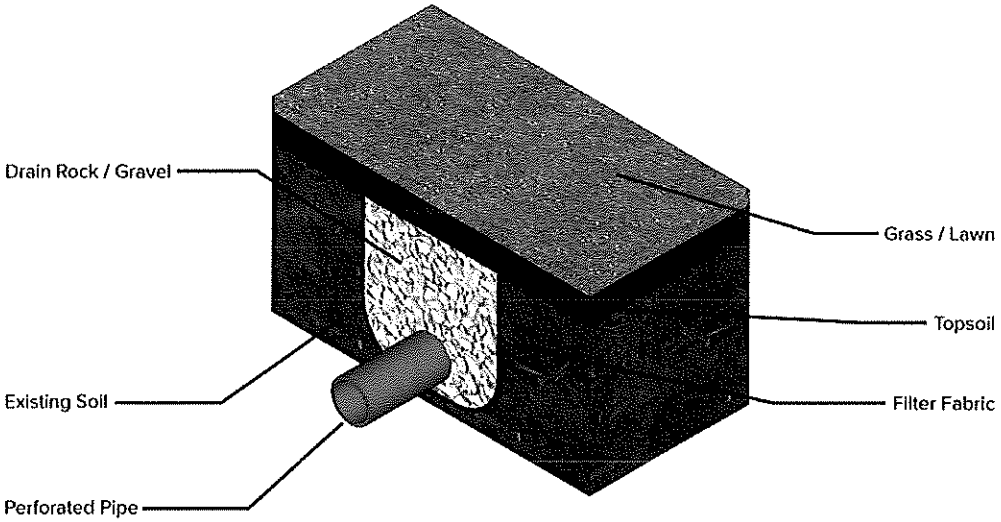
Dripline Infiltration Trench

Driveway Infiltration Trench/French Drain

A trench along the side of a driveway that collects and infiltrates stormwater runoff, allowing it to soak into the ground. Dig along the side of the driveway at least 8 inches deep and 2-3 feet wide. Place fill with crushed stone for well-draining soils and place 4 inch perforated pipe in the bottom for slowly draining soils.



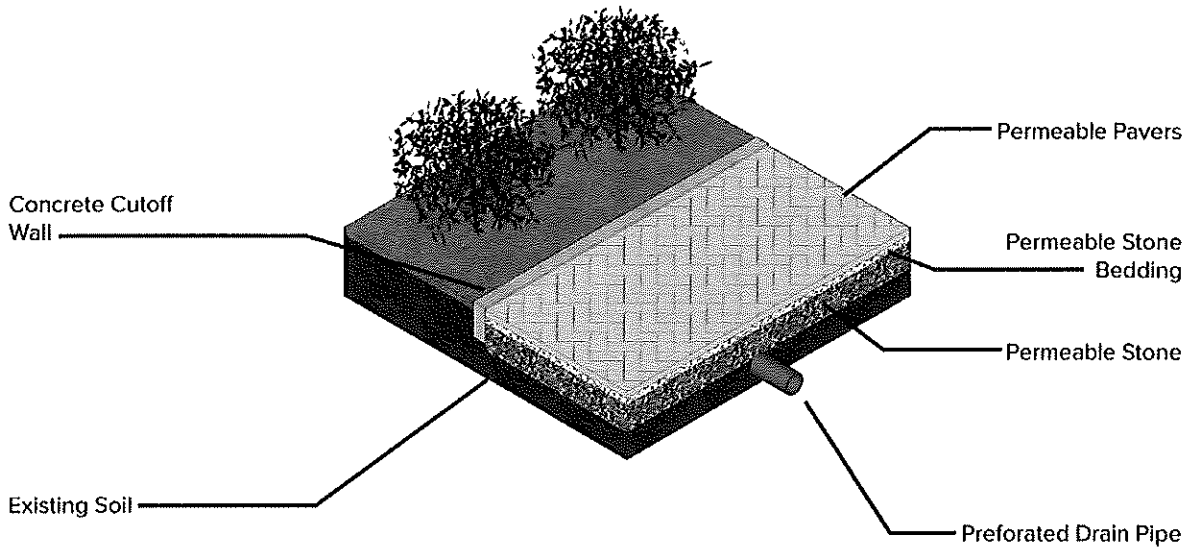
Driveway Infiltration Trench



French Drain

Pervious Pavers

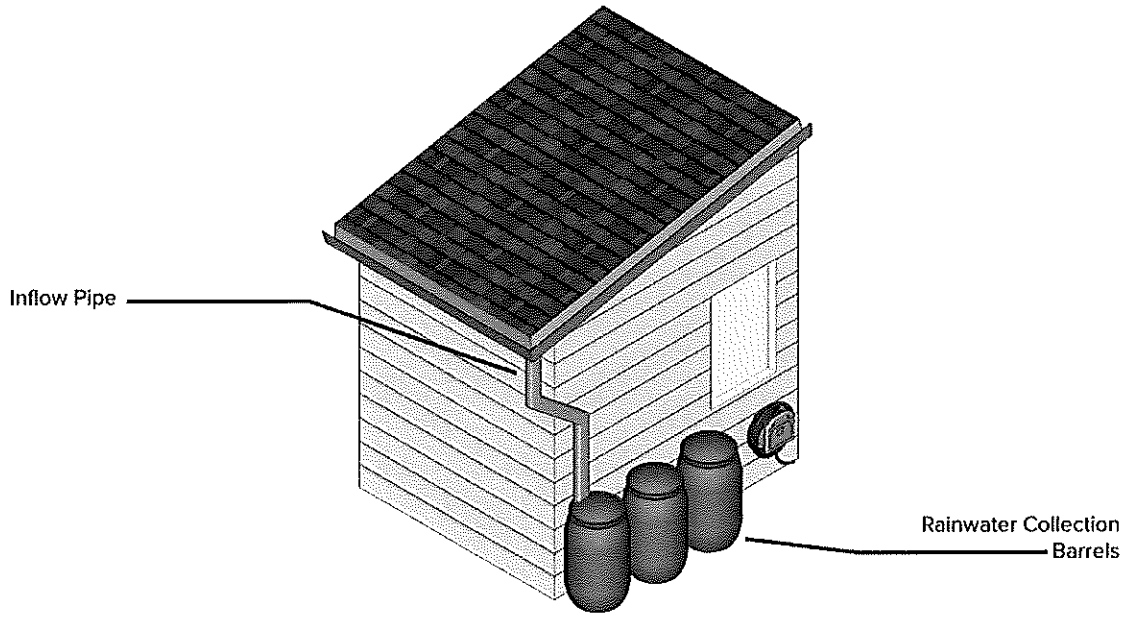
Have the appearance of traditional pavers, but are able to absorb and store rain and snow runoff. Sub base materials below pavers are typically 12 inches of crushed stone and 6 inches of pea gravel. Fill voids with sand.



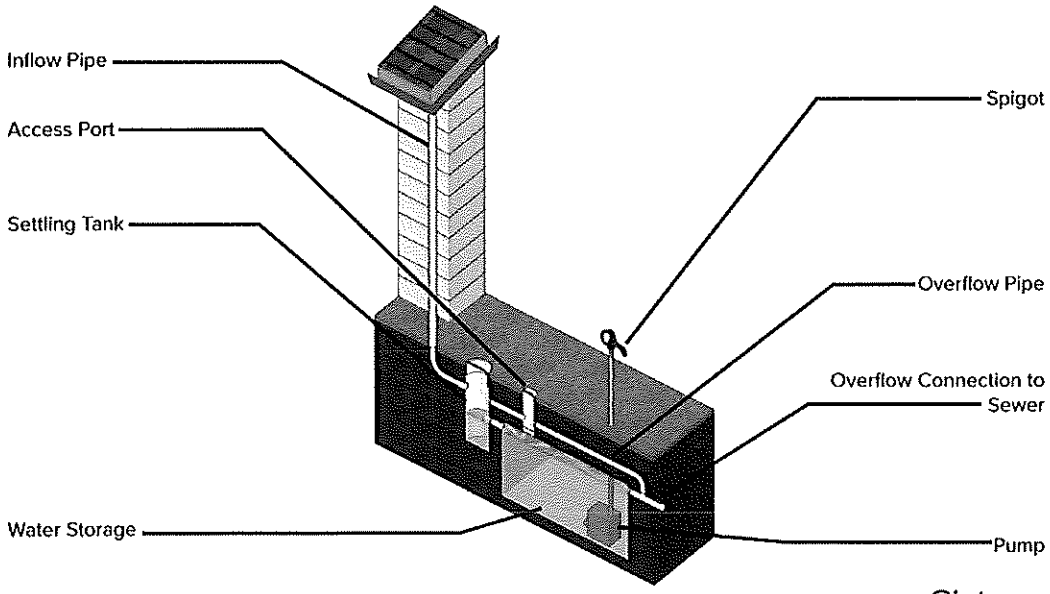
Pervious Pavers

Rain Barrels/Cisterns

Captures rainwater from your roof or downspout, to allow you to use water later for lawns, gardens, etc. Cisterns may be installed underground.



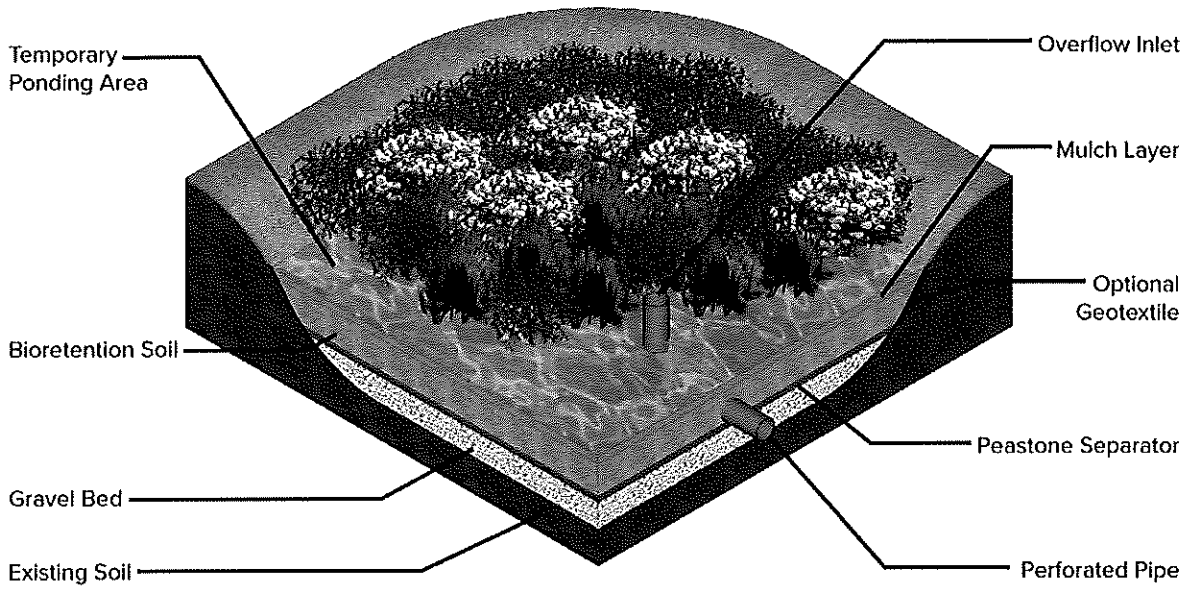
Rain Barrels



Cistern

Rain Garden

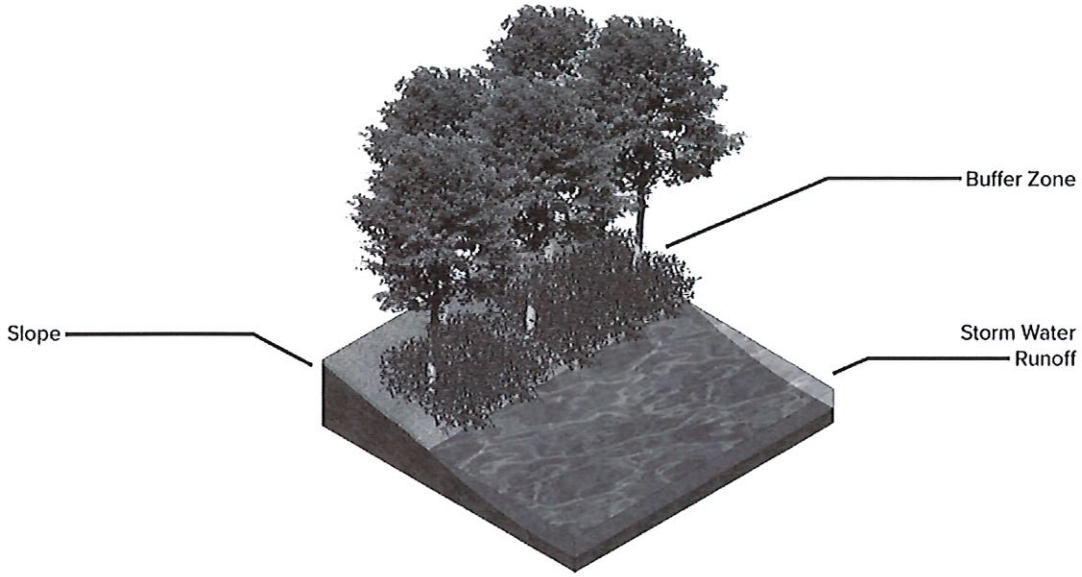
Sunken, flat bottomed garden that uses specific soils and plants to absorb and treat stormwater. Must be located at least ten (10) feet from foundations.



Rain Garden

Vegetated Buffer

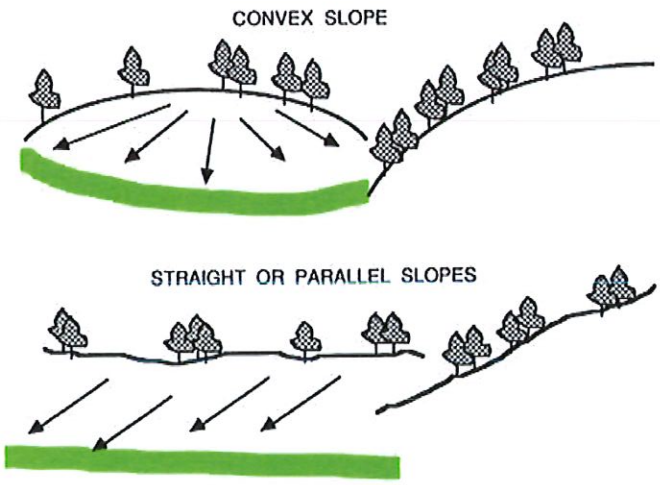
Planted along a body of water, or runoff area that stabilizes slopes, helps slow down and clean stormwater runoff.



Vegetated Buffer

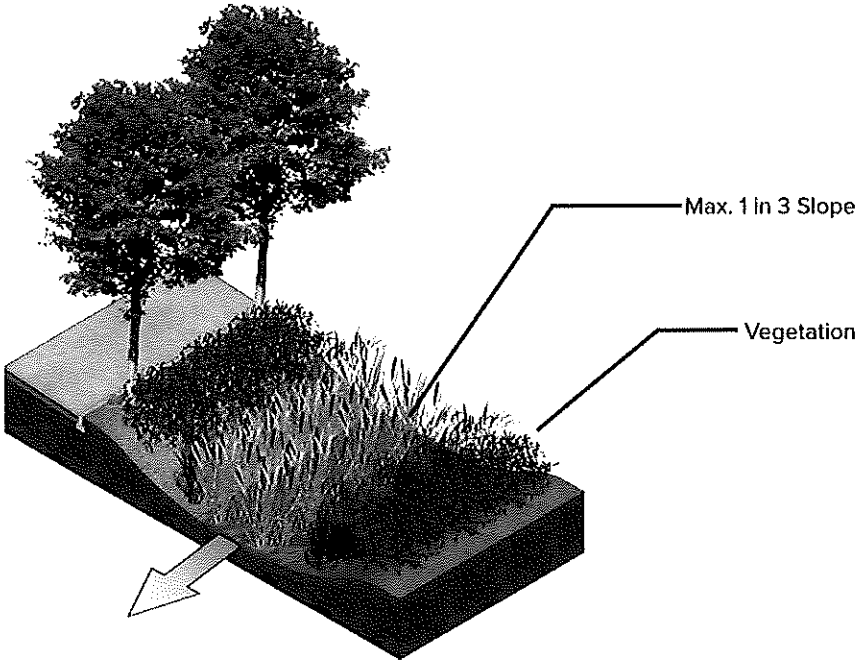
Examples of Vegetated Buffers:

1) If the property is 90 feet long and it is a flat property (along the length) but slopes front to back, the length of the vegetated buffer is 90 feet. (As shown in the two images below, with the green line being the length of the vegetated buffer).



Vegetated Swale

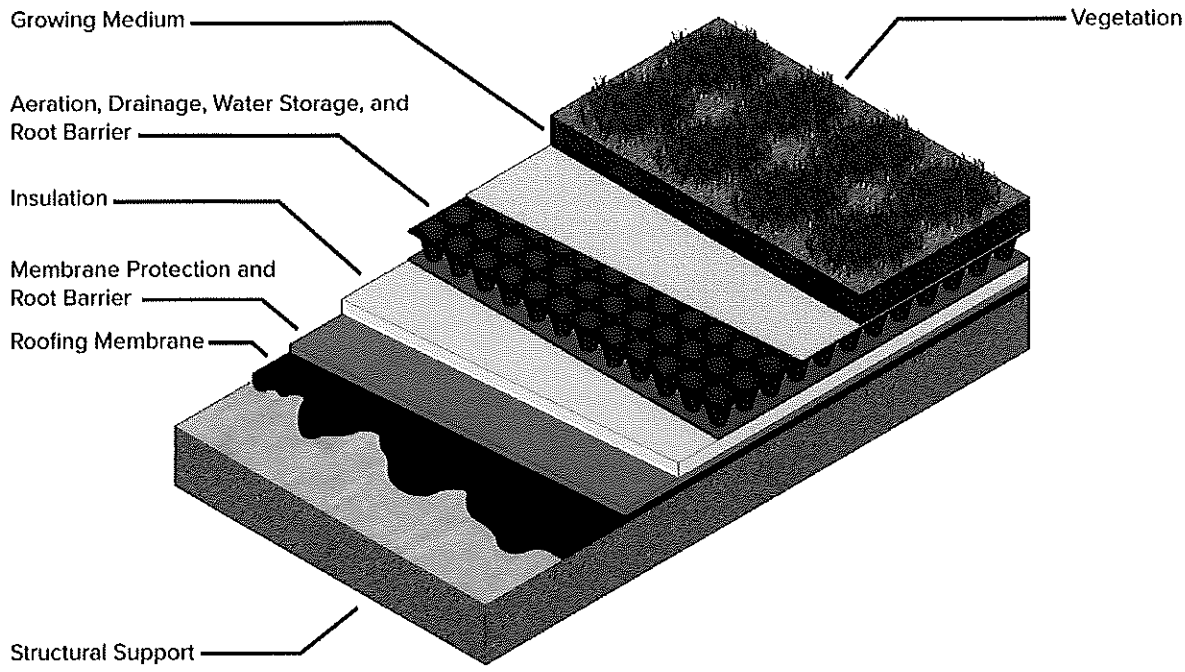
Shallow channel that slows runoff and directs it to an area where it can infiltrate. Minimum 3 feet wide.



Vegetated Swale

Green Roof

A living roof of a building or home that is partially or completely covered with a layer of growing medium, planted over a waterproofing membrane. Green roofs may also contain additional layers, such as a root barrier and drainage systems.



Green Roof

Managed Natural Landscape

A designated area with intentionally planted and maintained areas, kept free of noxious weeds, to allow for slow infiltration of stormwater.

STORMWATER CALCULATION WORK SHEET

Impervious Area (Square Feet)	Stormwater Treatment Volume (Gallons)	Stormwater Treatment Volume (Cubic Feet)
100	62	8.3
200	124	16.6
300	186	24.9
400	248	33.2
500	310	41.4
600	372	49.7
700	434	58.0
800	496	66.3
900	558	74.6
1000	620	82.9
1100	682	91.2
1200	744	99.5
1300	806	107.8
1400	868	116.0
1500	930	124.3

If your square footage exceeds the chart above, use the following formula to determine the stormwater treatment volume in gallons:

(total square feet of impervious area) × .0833 × 7.48 = gallons of runoff

(.0833 converts inches to feet) (7.48 = number of gallons per cubic foot)

Selected stormwater management method: _____

Required stormwater volume to be managed (show calculation): _____

Volume capacity of stormwater management method: _____

CALCULATIONS BY STORMWATER MANAGEMENT TYPE

Tree Planting: 1 Tree = 150 Gallons. Determine the SW Volume. Determine the number of trees needed with the following calculation. SW Volume ÷ 150 = # of Trees

Driveway Infiltration Trench: Trench Length × Trench Width × Trench Depth = Trench Volume (C.F.). Determine the SW Volume. Vary the design of the trench length, width and depth to achieve an equivalent trench volume.

Infiltration Trench: Trench Length × Trench Width × Trench Depth = Trench Volume (C.F.) Determine the SW Volume. Vary the design of the trench length, width and depth to achieve an equivalent trench volume.

Rain Garden: SW Volume (Gallons) ÷ 7.48 = Sq. Ft. of Rain Garden (at 12" deep). Determine the SW Volume. Vary the length and width of the rain garden design to achieve an equivalent square footage.

Rain Barrel/Cistern: SW Volume (Gallons) ÷ Rain Barrel/Cistern storage capacity = Number of Rain Barrels/Cisterns needed. Determine the SW Volume. Vary the size and number of Rain Barrels or Cisterns to achieve an equivalent storage volume.

Vegetated Buffer: Determine slope percentage draining into buffer. 0-1% = 25' Buffer width, 2-5% =35' wide, 6-9% = 50' wide, 10-12% = 65' wide, 13-15%= 75' wide. Length is determined by length of property.

Vegetated Swale: SW Volume (Gallons) ÷ 7.48 = Square feet of swale (at 12" deep). Determine the SW Volume. Vary the length and width of the swale design to achieve an equivalent square footage.

Pervious Pavers: (Gallons of water × 2) ÷ 7.48= Square feet of space (at 12" gravel depth). Determine the SW Volume and multiply by 2 to get the required treatment volume. Divide by 7.48 to get the required square footage of pervious pavers. Vary the length and width of the pervious paver area design to achieve an equivalent square footage.

Green Roof: Equal to the amount of new development square footage. Subtract this amount of impervious area when determining the required SW Volume.

Managed Natural Landscape: Equal to half the amount of new development square footage