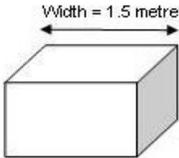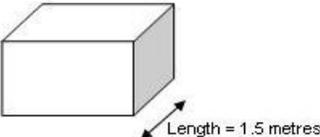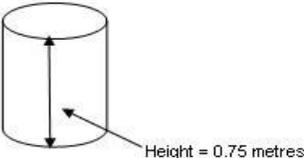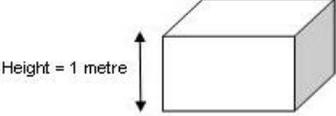This document contains all the information you should need to calculate the water volume for each of the approved stormwater best management practices (BMPs).

Rain Barrel and Cisterns

A typical rain barrel (similar to the ones purchased or received from the Region of Waterloo or other home and garden stores) can hold 200 litres (L) of stormwater. In general, rain barrels can range from 150-300 litres in size. Cisterns generally hold between 350-5,200 litres of water.

If you aren't sure the size of your rain barrel or cistern, you can calculate the volume of water it can store using Table 1. If you have a cylinder shaped tank follow the example using the column on the left, and if you have a rectangular shaped tank follow the example using the column on the right.

Steps to Calculate The Volume of a Cylinder Shaped Rain Barrel or Cistern	Steps to Calculate The Volume of a Rectangular Shaped Rain Barrel or Cistern
1. Measure the radius in metres (m). The radius is a distance measured from the edge of the circle to the centre point. Radius = 0.305 metres	1. Measure the width of the rainwater tank in metres (m). Width = 1.5 metres
2. Multiply that number by itself. i.e. 0.305m x 0.305m = 0.093 square metres (m2)	2. Measure the length of the rainwater tank in metres (m). Length = 1.5 metres
3. Multiply that number by 3.1416 to find the base area in square metres (m2). i.e. 0.093 m2 x 3.1416 = 0.292 square metres (m2)	3. Multiply those two measurements to find the base area in square metres (m2). i.e. 1.5m x 1.5m = 2.25 square metres (m2)
4. Measure the height in metres (m). Height = 0.75 metres	4. Measure the height in metres (m). Height = 1 metre
5. Multiply the base area by the height to find the volume in cubic metres (m3). i.e. 0.292 m2 x 0.75 m = 0.219 cubic metres (m3)	5. Multiply the base area by the height to find the volume in cubic metres (m3). i.e. 2.25 m2 x 1 m = 2.25 cubic metres (m3)
6. Multiply the volume in cubic metres (m3) by 1,000 (1 cubic metre of water is equal to 1,000 litres) to find the volume in litres (L). i.e. 0.219 m3 x 1,000 (L/m3) = 219 Litres (L) In this example, the rain barrel or cistern can hold 219 litres of water.	6. Multiply the volume in cubic metres (m3) by 1,000 (1 cubic metre of water is equal to 1,000 litres) to find the volume in litres (L). i.e. 2.25 m3 x 1,000 (L/m3) = 2,250 Litres (L) In this example, the rain barrel or cistern can hold 2,250 litres of water.

Infiltration Gallery

An infiltration gallery is a dug out area, located near a house and connected to the downspout. Infiltration galleries are filled with gravel or similar material that temporarily holds water, allowing it to soak slowly into the ground instead of running off into the storm sewer. (see figure 1)
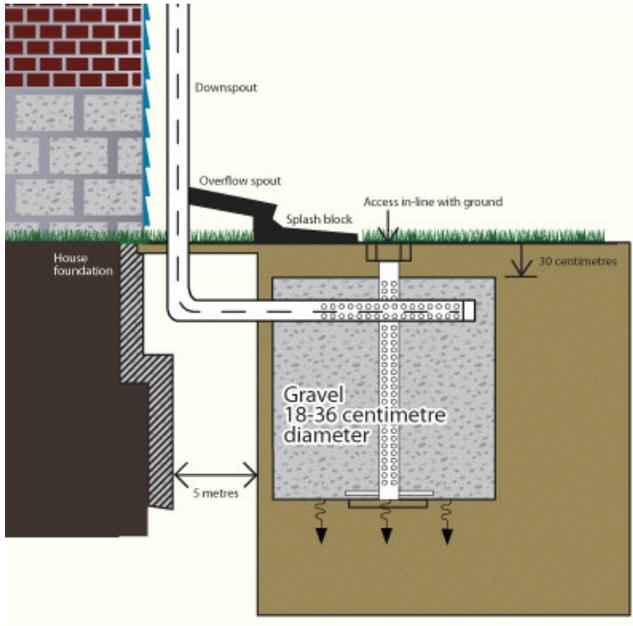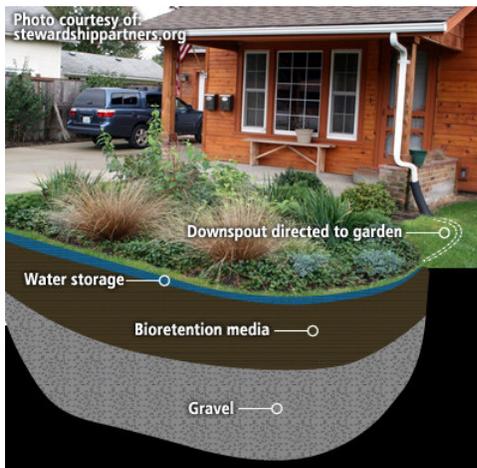

When filling out the application you will need to know the length, width and depth dimensions of the infiltration gallery (see figure 2).
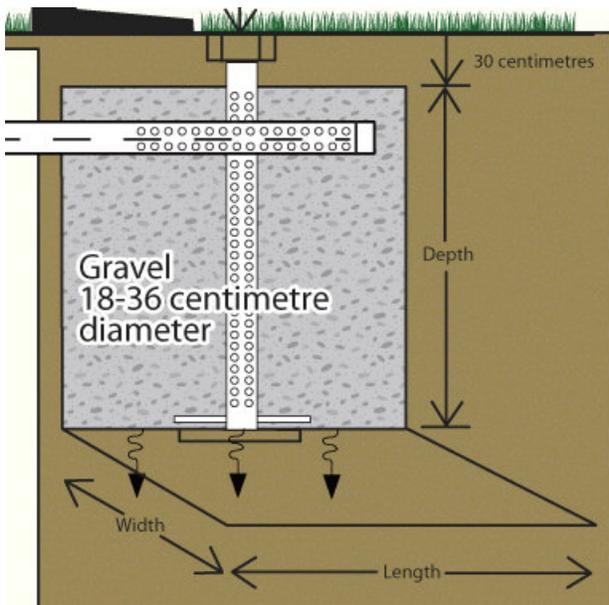
If you do not know the dimensions of your infiltration gallery, because it was installed at the time the house was constructed, select "installed by homebuilder" on the application. If you do not know the dimensions of your infiltration gallery for any other reason please call 519-741-3400 ext. 3355 to discuss your application with city staff.

Rain Gardens

Rain gardens are specifically designed gardens constructed to receive, filter, and absorb water runoff into the ground. Rain gardens differ from conventional gardens as they primarily serve a drainage purpose. These gardens are located so they are in line with where the water drains from the downspout of the home, and where rain water drains from the property. The have a specially designed base similar to an infiltration gallery that allows water to be slowly absorbed into the ground. (see figure 3).

When filling out the application you will need to know the length and width dimensions of the rain garden and also the depth of the bioretention media and of the underlying gravel layer.
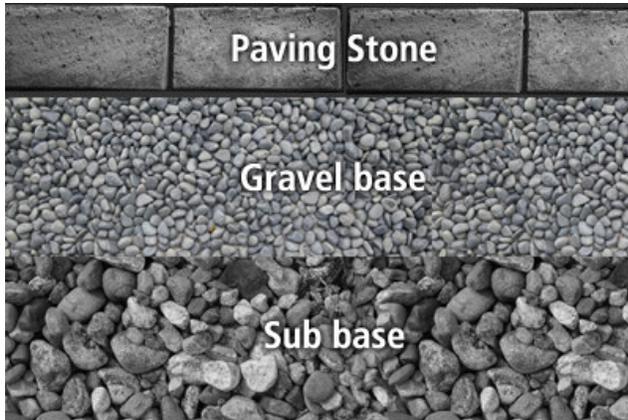
If your rain garden is complex in shape e.g. shaped as an oval, circular area etc. simply approximate the area as a square or as a rectangle and provide the distance from one edge of garden to the other edge along the length and width dimensions as illustrated in figure 4.

After entering the length and width of the rain garden into the form you must also enter the depth of the bioretention media beneath the rain garden and to enter the depth of the gravel layer located beneath the bioretention media. Typically, the bioretention media ranges in depth from 0.35m to 1m and the gravel layer, if present, is typically about 0.3m deep. If you do not know the depth dimensions enter 0.35 meters depth for bioretention media and 0.0 meters depth for the gravel layer.

Permeable Pavers

Permeable pavers are an alternative to traditional pavement or paving stones that allows water to drain between the stones. They are often interlocking pieces that are spaced for water to get through and be absorbed by an under-layer of gravel and sand. The difference between traditional paving stones and permeable pavers is there is slightly larger spacing between stones and rather than a fine sand mix between the stones, a looser, gravel mix is used that allows water to be absorbed rather than running off the hard surface. (see figure 5).

When filling out the application you will need to know the length and width dimensions of the driveway or patio area and also the depth of the gravel base and the depth of the gravel sub base layer if present.

If your driveway or patio area is complex in shape simply approximate the area as a square or as a rectangle and provide the distance from one edge to the other along the length and width dimensions as illustrated in figure 6.

After entering the length and width of the permeable pavers into the form you must also enter the depth of the gavel base layer beneath the pavers and to enter the depth of the gravel sub base layer located beneath the gravel base (if present). Typically, the gravel layer ranges in depth from 0.3m to 0.6m and the gravel sub base layer, if present, is typically about 0.3m deep. If you do not know the depth dimensions enter 0.3 meters depth for gravel base layer and enter 0.0 meters depth for the gravel sub base layer.