REUSABLE STORMWATER CALCULATOR

1) HARD SURFACES & DOWNSPOUTS

Calculate how much area drains into each downspout. You can also calculate runoff from your driveway or patio.
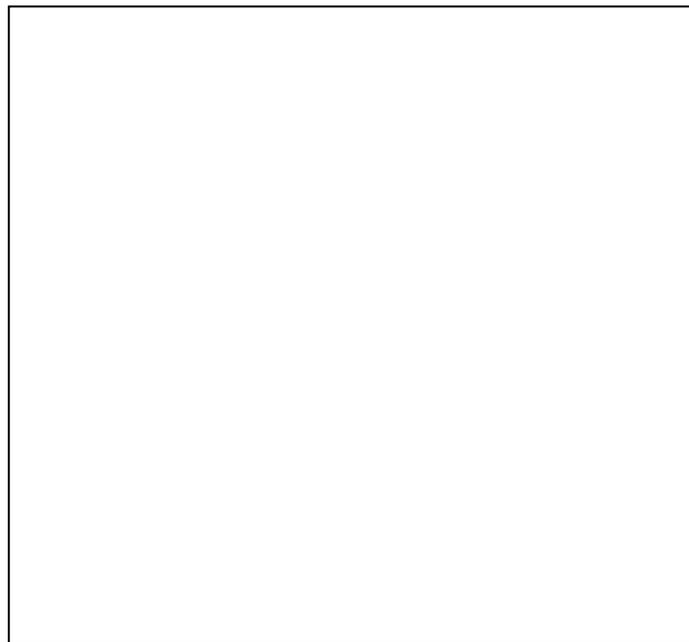
_____ (***a***) _____m x _____m = _____m^2

_____ (***b***) _____m x _____m = _____m^2

_____ (***c***) _____m x _____m = _____m^2

** *a* + *b* + *c* = Total Impermeable Area**
(use this only if your whole yard drains in one direction)

_____m^2 + _____m^2 + _____m^2 = _____m^2

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2) VOLUME OF RAINFALL

Calculate how much water can empty from each downspout. This will determine how much storage you need in the ground or in rain barrels. See table at right for rainfall stats and decide if you want your system to accommodate extreme rain events or regular ones. Sizing your system for extreme rain events will help reduce water pollution year-round.

_____m^2 x _____m = _____m^3 **(RAIN)** *Want that in litres?* **Multiply by 1000 =** _____**(L)**

RAINFALL STATISTICS IN KINGSTON

71mm*(0.071m)* **July 30, 2011**

8.4mm *(0.0084m)* **Average Rain Event**

Rainiest Month: September (90mm avg)

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3) DETERMINE YOUR INFILTRATION RATE

See the table at right or complete an infiltration test to determine your hourly drainage rate then multiply by 24 hours for your daily infiltration rate.

_____m/hr x 24 = _____ m/day **(RATE)**

COMMON SOIL INFILTRATION RATES

Sandy Soil : 0.21 m/hr
Sandy Loam : 0.025 m/hr
Loam : 0.015 m/hr
Clay : 0.001 m/hr

Or see reverse for how to do an infiltration test in your yard

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4) SIZE YOUR GARDEN & RAIN STORAGE

*Now that you know the volume of rainfall draining from each location (**RAIN**) and the infiltration rate of your soil (**RATE**) you can use this to determine a lot of things! Once you know how much space you need, you can use rainscaping and storage techniques to soak up all that water.*

How many rain barrels could I fill? _____**(L)** **÷ 200 Litres =** _____ **Rain Barrels**

What size garden will soak up my rain water? _____ **(RAIN)** ÷ _____ **(RATE)** = _____m^3

INFILTRATION TEST

- Dig a hole as wide and deep as a shovel head.

- Fill the hole with water and note the time at which the hole is filled.

- Record how long it takes for the water to completely disappear (e.g. 5mins, 30 mins, 1 hour, etc).

- If the water is draining slowly, note how much water is draining every 30 minutes (e.g. ½ inch every 30 mins).

- If you suspect the water will drain slowly, stick a ruler in the bottom of the hole for better accuracy.

- Note that impaction from heavy traffic can affect the results of your drainage test. Various locations in your yard may have different soil types.

Assess your results:

- **0-4 minutes**: You have fast draining soil; likely a high-sand mix. Adding organic matter such as mulch or compost will help your soil retain moisture – good for your plants!

- **5-15 minutes:** Soil drainage is ideal. Perfect for most rainscaping techniques. No soil amendment necessary.

- **16-60 minutes:** If soil is draining at least ½ - 1 inch per hour there maybe be some compaction of soil or higher percentage of clay. Loosen soil with pitch fork and amend with organic matter before rainscaping.

- **>1 Hour-Days:** Soil as slow draining as this can be either clay, #1 Topsoil, or heavily compacted. It is best to removes as much as possible to be replaced with lawn mix or organic matter. Rainscaping in these soil conditions will require more holding capacity by using more void space (eg: Big O pipes, deeper trenches, or drywells)
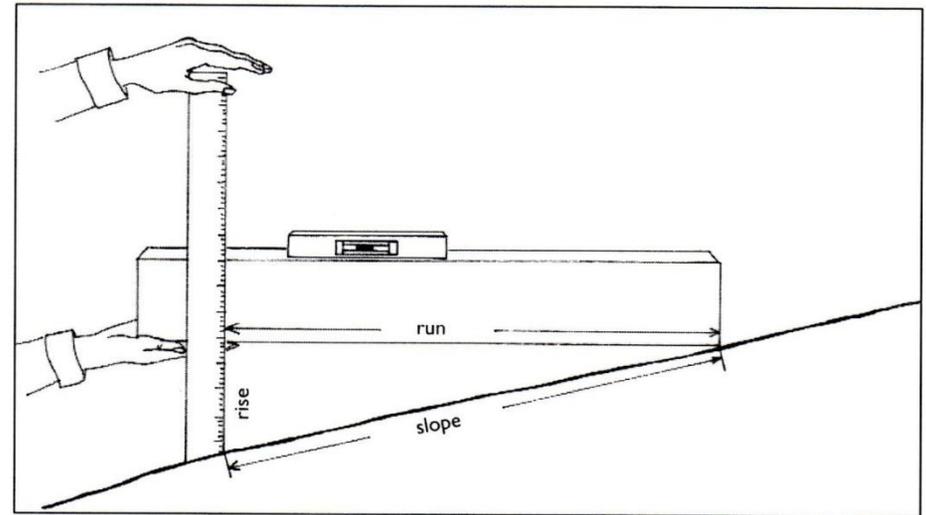
MEASURING SLOPE

Credit: www.cmhc.ca

Figure 3—How to measure a slope

How to measure a slope

Slope is the ratio of the length of the rise (the vertical change) to the length of the run (the horizontal change). A simple way to measure slope is to use a carpenter's level placed on a 2x4 (Figure 3).

- Place the board on the ground along the slope you want to measure and lift the lower end until the board is level.

- To determine the rise, measure the distance from the ground to the bottom edge of the board at the end of the slope.

- The run is the length of the board from the end to where you measured the rise.

- Divide the rise by the run to obtain the per cent of the slope. For example, if the rise is 5 cm (2 in.) and the run is 2.5 m (8 ft., 2 1/2 in.), the slope is $0.05 \div 2.5 = 2\%$.