

# Green Roof Runoff Method

## Green Roof Runoff Method

### Depression storage

The depth of water falling on the Green Roof that is permanently held within it. Research in the UK has shown the average depression storage value to be 5% of the soil substrate depth.

### Evapotranspiration

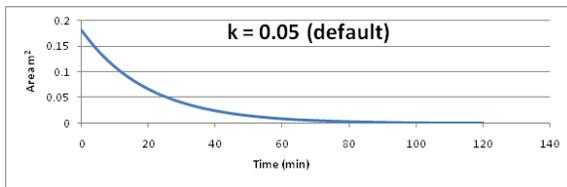
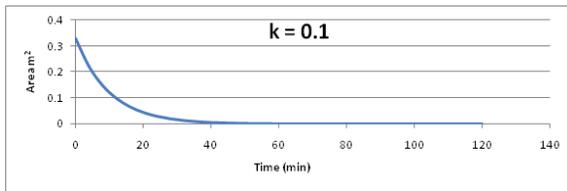
This is the amount of water that is lost to the environment due to evaporation and transpiration. The software uses the value during continuous analysis as the rate that the available depression storage is re-charged.

The evapotranspiration rate alters with location and climate conditions. Typical values for the UK, if no better data is available, are as follows:-

Season	Evapotranspiration Rate (mm/day)
Summer	3
Winter	1

### Decay Coefficiency - k

The k value affects the decay of the areas calculated should be edited with caution. The two graphs below plot the areas calculated and show the difference made by editing the k value. The higher the value the quicker the roof will drain down.



### Time Delay

This is the time over which the decay occurs, typically 120 minutes, and therefore the areas are spread out. Adjusting this value will not affect the decay of the curve, as explained in the equations below, however it will truncate or extend the curve accordingly. At no stage is area lost, it simply affects the amount of time that it is allowed to decay for.

### Green Roof Background calculation



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### Workflow - What's next...?



Connect **Inflows** to your **Stormwater Control**, specify **Inlets** or **Outlets** or connect to another **Stormwater Control** or **Junction**.

The formulas used are:

$$A_t = e^{-kt} \quad a_t = \left( \frac{A_t}{\sum A_t} \right) a$$

Where:

a - the total area of the green roof

A - a factor required to scale the curve to provide the correct total catchment area (area under the graph).

e - exponential

k - the decay coefficient

t - the time in minutes. Equation is based upon a 120 minute period (time taken before the roof becomes saturated)

Contact your Green Roof manufacturer for further information on soil substrate depth etc.

This methodology has been developed in collaboration with Dr Virginia Stovin of Sheffield University. It has been based on research at Sheffield University into green roofs and a review of current practice. The decision to use the method and the selection of input variables are the responsibility of the user. Liability is not accepted for losses arising from the use of the method howsoever caused.

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