representing the maximum design outflow (i.e. the design flow capacity of the storm water system downstream of the storage structure) is the retention volume required to store enough water to attenuate the hydrograph sufficiently. The calculation should be repeated for a range of storm durations and the maximum volume used as the retention volume.
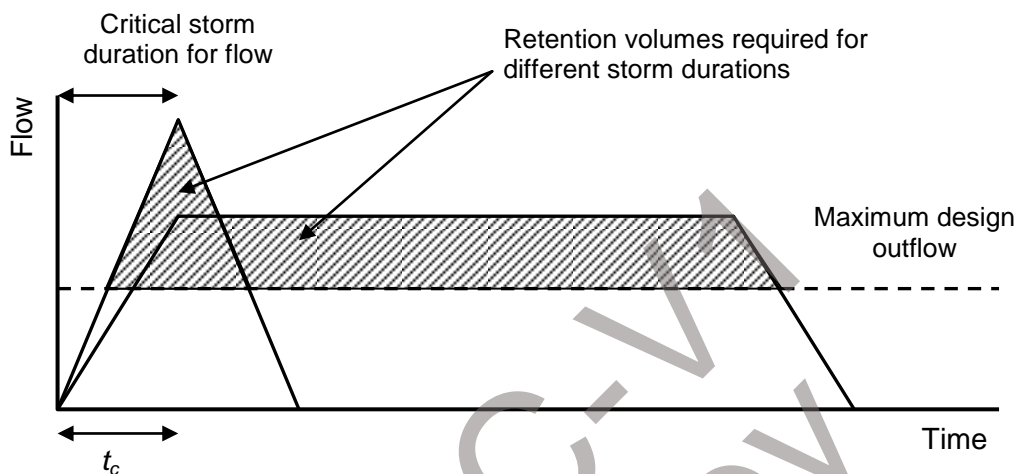

Figure 3-8 - Use of rational method for flood volumes for sizing of retention basins etc

For detailed design, and for catchments where the rational method is not appropriate, the SCS method should be used to estimate storage. The SCS method produces flood hydrographs as part of the calculation, and these should be used in a process similar to that for the rational method for flood volumes:

- For initial sizing, the retention volume represented as the area between the hydrograph and maximum design outflow should be calculated as for the rational method for flood volumes, but using the SCS hydrograph output (see Figure 3-9). This should be repeated for a range of storm durations, and the maximum volume required used as the design retention volume.

- For detailed design, the hydraulics of the retention structure, outflow control weirs etc should be represented in a modelling software package and the peak outflow and retention volume calculated for a range of storm durations for the design return period. Each potential set of design characteristics (retention volume, outflow weir design etc.) should be tested to verify that the storage volume is not exceeded and that the outflow from the storage structure is below the acceptable maximum.
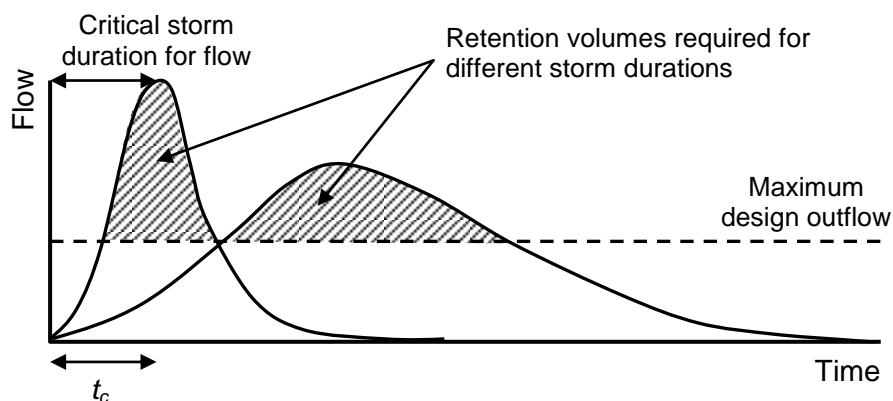

Figure 3-9 - Use of SCS method for sizing of retention basins

When designing a pond or lagoon for areas that are not connected to a stormwater network with a final outfall to sea (no downstream network), the minimum retention volume of the pond or lagoon will be represented by the entire area under the graph.