START

for each rainfall time-intensity a simulation is done

$$\begin{cases} \dfrac{\partial d}{\partial t} = i - f - e - \alpha\, d_x^{5/3} \\ q = \alpha\, d_x^{5/3} \end{cases}$$

where $d_x = d - d_s$

RUNOFF

Steady flow

Kinematic wave

Dynamic wave

ROUTING

SWMM

Q_i-t_i

interpolation of all Q_i-t_i curves to evaluate Qmax and related t

Qmax

change D_j to commercial dimension

evaluation of the diameter D

$$D = \left[\frac{2^{13/3} Q_{max}}{k_s\, S^{1/2}\, (1 - \frac{\sin\theta}{\theta})^{2/3} (\theta - \sin\theta)} \right]^{3/8}$$

$$\theta = 2\cos^{-1}(1 - 2G)$$

check hypothesis on max depth, slope and grade of filling

Yes

No

D_j

repeated for each node-subcatchment

END