



## Precipitation – Infiltration – Design Rain Amounts

In previous publications the maximum life time average infiltration rate was conservatively calculated at 1.1 in./hour. Newer research and publications suggest a conservative design rate of 3 3/8 in./hour (270 l/sec x ha).

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Instructions for water permeable pavements under traffic

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For an area infiltration rate without outside storage capability, the worksheet A 138 assumes a 10-minute-rain of  $n = 0.2$  (rain event of 10 minutes every 5 years). Based on a time coefficient method, that results in a rain amount of 270 l/sec x ha (3 3/8 in. /hr). Consequently, with area infiltration of rainwater through permeable pavements, the average permeability of the base must correspond with a  $k_f$  value of at least  $2.7 \times 10^{-5}$  m/sec.

During the infiltration process, air pockets remain in the base, sub base and sub grade, which lower the void volume that is required for the movement of water. A decrease of permeability of about 50% is expected. In these layers a permeability coefficient of  $\geq 5.4 \times 10^{-5}$  m/sec is required (= 540 l/sec x ha or 7.6 in/hr ).

The design rain amount of 270 l/sec x ha (3 3/8 in./hr) must percolate through the permeable pavement and the sub grade over the life of the permeable pavement. The permeability of the paving bed and base however reduces over time. According to available research at this time, a long lasting sufficient permeability cannot be guaranteed. Therefore, a drainage system (bioswales, drain pits, catch basins) for the remaining surface run off is required.