

Methodology Proposal for Determination of Simplified Equations for Distributed Detention Sizing

Victor David Santos de Barros, Nadiane Smaha Kruk and Paulo Ivo Braga de Queiroz
Instituto Tecnológico de Aeronáutica, Divisão de Engenharia Civil. São José dos Campos, SP, Brazil.
victordavid.sjc@gmail.com, nadiane@ita.br, pi@ita.br

Given the need for tools to assist the management of flood control, this paper proposes a methodology for the determination of simplified equations for the sizing of distributed detention tanks. Simplified equations provide greater speed in urban planning. The equations incorporate a coefficient of control that shares the responsibility between municipalities and citizens. In encouraging adoption of surfaces that favor water infiltration into the soil, the simplified equations admit the use of the weighted runoff coefficient of the occupied lot. Thus, the more representative are the infiltration surfaces, the smaller the required detention volume. In the case study, we observed that for a waterproofed lot of 1,000m² the required volume is 7.8m³, while retaining 40% of permeable surface the volume is reduced to 1.3m³. In order to ensure the effectiveness of the results shown, it is necessary that the outflow hydraulic structures guarantee the flow control. Therefore, it is also proposed a simplified equation of the critical rain time for determining the input hydrogram.