

## **Dual-system concept for stormwater control in commercial centre**

### **ABSTRACT**

This paper describes the stormwater characterization due to a dual stormwater detention system that is tailored for a commercial area. A commercial centre is known to have the area covered with two distinct land uses, namely the shop buildings and tarred road surfaces. Manipulating these land uses for more environmental-friendly urban stormwater management; a novel dual stormwater detention system is introduced within the buildings and roads. Using a case study of a simple one-row shop building, a detention system is proposed under the walkway in front of the shop lots and under the parking spaces in front of the same shops. Storm water management model (SWMM) version 5.0 is used to simulate three scenarios of drainage flow in the study site. Simulations of a single detention system of either under the walkway (Scenario 1) or parking spaces (Scenario 2) are carried out. Scenario 3 is a simulation of a dual system combining the previous two scenarios. Scenario 1 has a catchment of about 10% of the total commercial centre; Scenario 2 has about 20% and Scenario 3 has about 30%. It is found that Scenario 3, namely the dual system with the highest connected water contributing catchment produces the best stormwater control by lowering the post-development peak hydrographs by 1.5 times, thus achieving the nearest to the pre-development condition. The simulations also show that the two separate single detention systems are less effective than the dual system in this case study.