



Water and thermal regime of extensive green roof test beds planted with Sedum cuttings and Sedum carpets

Jitka Hanzlíková (1,2), Michal Sněhota (1,2), Jan Šácha (1), Vladimíra Jelínková (2), Petra Hečková (1,2)

(1) Faculty of Civil Engineering, Czech Technical University in Prague, (2) University Centre for Energy Efficient Buildings, Czech Technical University in Prague

Development of anthropogenic soil-plant system, such a green roofs, has a significant task in adaptation to climate change especially in urban areas. A detailed study of hydrological balance of green roofs is a present-day research topic with impacts into many field of human activity, including water management. Green roofs have become more and more popular because of their ability to reduce the total annual runoff as well as peak storm water runoff in comparison to regular roofs.

To evaluate the water retention capacity and evapotranspiration of an extensive green roofs, four test beds has been established on the roof of University Centre for Energy Efficient Buildings of the Czech Technical University. The study compares four test beds of which two were established with different green roof substrates and were planted with plants at two different stages of growth (Sedum cutting and Sedum carpet). Test beds dimensions are 1 x 1 m and depth of substrates reaches 0.05 m. The experiment has been started in September 2017. To determine water regime of extensive green roof test beds characteristic values are monitored. The volumetric water content is measured by eight Time Domain Reflectometry probes (two in each test bed). Outflow from each test bed is measured by tipping bucket flow meter. The weight changes are additionally measured on one test bed. The soil substrate temperature is measured on each test bed. Wind speed, wind direction, solar radiation, relative air humidity and air temperatures are measured on a weather station located on the roof. Three undisturbed samples from each segment were taken for laboratory measurements to determine hydraulic properties. The results of measurements are interpreted by numerical simulation.