Geophysical Research Abstracts
Vol. 17, EGU2015-13480, 2015
EGU General Assembly 2015
© Author(s) 2015. CC Attribution 3.0 License.

Study of water infiltration in a lightweight green roof substrate

Klara Tomankova (1), Martina Holeckova (1), Vladimira Jelinkova (2), Michal Snehota (1,2)

(1) Faculty of Civil Engineering, Czech Technical University in Prague, Thakurova 7, 166 29 Prague 6, Czech Republic, (2) University Centre for Energy Efficient Buildings, Czech Technical University in Prague, Trinecká 1024, 273 43, Bustehrad, Czech Republic

Green roofs have a positive impact on the environment (e.g. improving microclimate and air quality in cities, reducing solar absorbance and storm water).
A laboratory infiltration experiment was conducted on the narrow flume serving as 2D vertical model of a green roof. The lightweight Optigreen substrate Type M was used (depth of 20 cm). The front wall of the flume was transparent and inspected by digital camera. The experiment was designed to measure pressure head, volumetric water content and calculate water retention in the substrate. Experiment comprised three artificial rainfall intensities with different values of initial water content of the substrate.
The experimental results confirmed that green roofs have the ability to retain rainwater and thus have a beneficial effect on reducing runoff. In the experiment with the artificial 10 minutes rainfall event (total precipitation of 29 mm), the air dry substrate retained 95.9 % of precipitation. On the other hand for moist initial condition 4.2 % of precipitations amount was captured in the substrate. Additionally, the analysis of images taken during the experiment confirmed preferential flow and uneven advancement of the wetting front.

The research was realized as a part of the University Centre for Energy Efficient Buildings supported by the EU and with financial support from the Czech Science Foundation under project number 14-10455P.