PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE
ESCUELA DE INGENIERÍA
DEPARTAMENTO DE INGENIERÍA HIDRÁULICA Y AMBIENTAL

Invitación Seminario N°17/2016

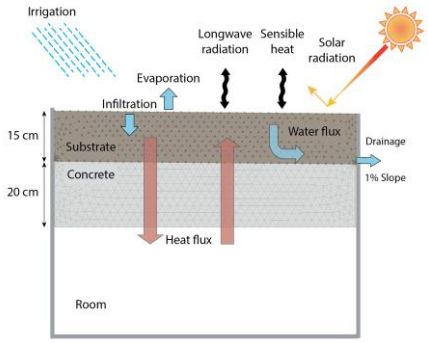
Characterization and compaction of green roof substrates and their impact on the roof's hydraulic and thermal performance.

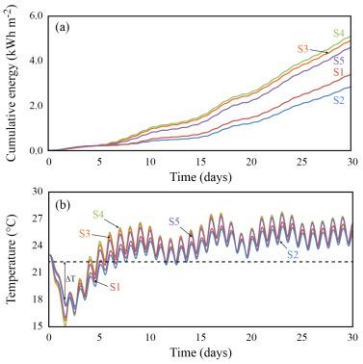
Victoria Sandoval

Alumna de Magíster en Ciencias de la Ingeniería
Departamento de Ingeniería Hidráulica y Ambiental
Pontificia Universidad Católica de Chile

Miércoles 14 de Septiembre de 2016, 13:00 horas

Sala E11, Campus San Joaquín, Vicuña Mackenna 4860





Green roofs integrate vegetation into infrastructures to reach benefits that minimize negative impacts of the urbanization such as reduction of energetic requirements, surface runoff or noise levels. To achieve the previous benefits, an understanding of the processes that occur in a green roof under site-specific climatic conditions is required. The substrate and the vegetation layers are the most important components of a green roof as they strongly influence the water and heat fluxes on the roof. The substrate is an artificial media that has an improved performance compared to natural soils and that provides critical resources for vegetation survival. In this work, we characterized five green roof substrates in terms of their physical, hydrodynamic and thermal properties, and performed numerical simulations of heat and fluid flow to investigate the effect of these properties on the roof performance. The five substrates studied showed a large capacity to transmit water and large water storage volumes, and similar thermal conductivity values than other green roof substrates reported in the literature. Simulation results revealed that under unsaturated conditions, in addition to the substrate storage volume, the water retention characteristics are fundamental as they control the green roof hydraulic response to the atmospheric conditions. In terms of the thermal behavior, it was found that the thermal response of each substrate strongly depends on moisture levels, which also affects the energy consumption of the room that is located below the green roof. Also, as the moisture level increases the substrate heat storage capacity increases, reducing the energy consumption. Compaction reduces the volume storage and increase the thermal conductivity of the substrates studied.

Profesor Encargado: María Molinos, mmolinos@uc.cl , teléfono (+56-2) 23544227