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Green roof soil system affected by soil structural changes: A project initiation

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Anthropogenic soil systems and structures such as green roofs, permeable or grassed pavements comprise appreciable part of the urban watersheds and are considered to be beneficial regarding to numerous aspects (e.g. carbon dioxide cycle, microclimate, reducing solar absorbance and storm water).
Expected performance of these systems is significantly affected by water and heat regimes that are primarily defined by technology and materials used for system construction, local climate condition, amount of precipitation, the orientation and type of the vegetation cover. The benefits and potencies of anthropogenic soil systems could be considerably threatened in case when exposed to structural changes of thin top soil layer in time.
Extensive green roof together with experimental green roof segment was established and advanced automated monitoring system of micrometeorological variables was set-up at the experimental site of University Centre for Energy Efficient Buildings as an interdisciplinary research facility of the Czech Technical University in Prague. The key objectives of the project are (i) to characterize hydraulic and thermal properties of soil substrate studied, (ii) to establish seasonal dynamics of water and heat in selected soil systems from continuous monitoring of relevant variables, (iii) to detect structural changes with the use of X-ray Computed Tomography, (iv) to identify with the help of numerical modeling and acquired datasets how water and heat dynamics in anthropogenic soil systems are affected by soil structural changes. Achievements of the objectives will advance understanding of the anthropogenic soil systems behavior in conurbations with the temperate climate.