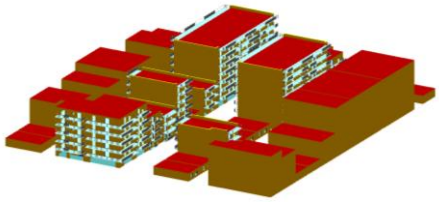
EVALUATION OF GREEN ROOFS IN BUILDINGS

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Abstract

Green Roofs are a solution for restoring the green element to urban cities. In Greece this technique is not widespread, so there are several elements such as the selection of substrate and plant material, still being studied. Furthermore, the assessment of their contribution to energy saving for heating and cooling of buildings is proven but has not been studied in depth for Northern Greece. This study has two objectives. The first is to find the appropriate substrate for the Sedum sp., specifically of the genus coral carpet, for the 3rd climatic zone. The second is to prove the energy savings in buildings. On the roof of a block of flats in Xanthi, three specimens were created with a different substrate each. The first sample contains 30% peat, 30% soil and 40% perlite as well as zeolite 0.5%. The second sample contains 20% peat, 30% soil and 50% perlite. The third sample contains 40% peat, 30% soil and 30% sand with a small amount of tile. The substrate impact assessment was based on measurements of humidity and temperature. The substrate that had better insulating behavior was parallel with the better development of plant material. Measurements in the samples took place from November to April. From the tree, the one with better insulate behavior is the second, which shows good results both in cold and warm weather. Then, from May to July, they were made on a planted roof in Komotini. Next, the building was simulated in a computer program (EDSL TAS) and a comparison between the results and measurements. The results of all measurements show the insulating role the green roof has in buildings of the 3rd climatic zone of Greece, during winter and summer. From the simulation, it is perceived that saved energy in buildings is about 11%.

Image



3D display of a block of flats with and without a green roof on them.

Recent Publications

1. Stanitsa, Tsagkalidou, Yannas, 2016. Environmental Retrofit of the Unexploited Roofscape. Case studies in Athens and Thessaloniki. PLEA 2016 Los Angeles- 36th International Conference on Passive and Low Energy Architecture. Cities, Buildings, People: Towards Regenerative Environments.

2. Vijayaraghavan. 2015. Green roofs: A critical review on the role of components, benefits, limitations and trends. Department of Chemical Engineering, Indian Institute of Technology Madras, Chennai 600036, India.

3. Castleton, Stovin, Beck, Davinson, 2010. Green roofs; building energy savings and potential for retrofit. Sheffield Uk.

4. VanWoert, Rowe, Andresen, Rugh, Fernandez and Xiao. 2005. Green roof storm water retention: effects of roof surface, slope and media depth. Journal of environmental Quality 34:1036-1044.

5. Eumorfopoulou and Aravantinos. 1998. The contribution of a planted roof to the thermal protection of buildings in Greece. Energy and buildings 27:29-36.

Biography

Anastasia Makri has her expertise in Green Roofs and passion to make her town “go green”.
With her master thesis she proves that green roofs can only have good effects in the environment. Next step is to make people look in these positives possibilities and adopt her thoughts to make the town greener and sustainable for the next generation.

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