

Master Thesis Brief Description

Thesis Title	Numerical assessment of Green Roofs with the use of Building Energy Performance Simulation (BEPS) integrated into Building Information Modelling (BIM) tools
Programme of Studies	MSc in Sustainable Energy Systems
Course	MES 580 Master Thesis
Area of Study	Computational Building Physics – Building Information Modelling
Student's Name	Ramiz Qumsieh
Students Reg. Number	9726
Supervisor	Dr.-Ing. Paris A. Fokaides, Ass. Professor, Mechanical Engineering Department
Supervisory Committee	Dr Byron Ioannou, Ass. Professor, Architectural Department Dr. George Karagiorgis, Assoc. Professor, Mechanical Engineering Department
Semester	Fall Semester 2020
Short Description	<p>The purpose of this assessment was to analyze and evaluate the impact of green roofs on the energy performance of buildings in a subtropical climate zone. A medium-sized building of 200 m² was designed using BIM (Building Information Modeling), and an energy performance simulation was conducted. Subsequently, a green roof was integrated into the building's design, and its energy performance was reassessed. The study also provided a comprehensive overview of different types of green roofs, along with their respective advantages, disadvantages, and underlying physics, including the various layers involved. Results from both scenarios, with and without a green roof, were thoroughly interpreted. The investigation extended to explore alternative scenarios, leading to comprehensive discussions and concluding whether green roofs could significantly impact the building's energy performance if implemented. Beyond aesthetic appeal, green roofs were found to contribute to the sustainable development of urban areas by mitigating heat flux through roof shading, acting as thermal and sound insulators, and assisting in the reduction of stormwater runoff. The findings of this study emphasize the potential of green roofs as an energy-efficient and environmentally friendly solution in subtropical climates.</p>