

عنوان مقاله:

Introducing an Optimal Model and Dimensions of Lightweight Membrane Canopy for Hot and Dry Climate of City of Semnan in Iran

محل انتشار:

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خلاصه مقاله:

In urban open spaces, especially in large cities with warm climates, users are experiencing high thermal loads, which causes thermal discomfort. Thermal comfort in open spaces can be improved; by shading. The problem is shading and protecting open spaces from stresses caused by overheating of the earth's surface and environment. The importance of shade and reducing radiation in achieving thermal comfort in open urban spaces is to increase human presence, create climate change, increase comfort conditions. Recognizing factors that create shadows, such as canopies and their characteristics, can create a favorable space to enjoy the capabilities of outdoor space. New membranes have many characteristics of nomadic tents, and, due to creating shade and natural ventilation, are very suitable for areas with hot climates. Introducing an optimal model and dimensions of a lightweight membrane canopy can create outdoor thermal comfort and increase the efficiency of outdoor spaces. In this paper, library, field, and simulation studies have been used. According to field studies, the presence of membrane canopy can cause temperature differences up to 7.8 °C. The simulation results with Ansys, ENVI-met, and Ladybug showed that the membrane canopy cools the space below and prevents overheating. Between four canopy models, the saddle canopy is suitable with a 40.63% impact on the environment and creates cooler space under the canopy. Therefore, a lightweight saddle membrane canopy with dimensions of 5*5 m² and a useful height of 3 meters is introduced as a suitable model of membrane canopy for the hot climate of Semnan.

کلمات کلیدی:

Membrane structure, Canopy, Outdoor thermal comfort, Semnan City, Energy Softwares

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