World Academy of Science, Engineering and Technology
International Journal of Civil and Architectural Engineering
Vol:16, No:01, 2022

# Modeling Approach for Evaluating Infiltration Rate of a Large-Scale Housing Stock

**Authors :** Azzam Alosaimi

**Abstract :** Different countries attempt to reduce energy demands and Greenhouse Gas (GHG) emissions to mitigate global warming potential. They set different building codes to regulate excessive building's energy losses. Energy losses occur due to pressure difference between the indoor and outdoor environments, and thus, heat transfers from one region to another. One major sources of energy loss is known as building airtightness. Building airtightness is the fundamental feature of the building envelope that directly impacts infiltration. Most of international building codes require minimum performance for new construction to ensure acceptable airtightness. The execution of airtightness required standards has become more challenging in recent years due to a lack of expertise and equipment, making it costly and time-consuming. Hence, researchers have developed predictive models to predict buildings infiltration rates to meet building codes and to reduce energy and cost. This research applies a theoretical modeling approach using Matlab software to predict mean infiltration rate distributions and total heat loss of Saudi Arabia's housing stock.

**Keywords :** infiltration rate, energy demands, heating loss, cooling loss, carbon emissions
**Conference Title :** ICASCE 2022 : International Conference on Architecture, Structure and Civil Engineering
**Conference Location :** London, United Kingdom
**Conference Dates :** January 21-22, 2022