

Thesis title:

Innovative approach to develop modular composite roof panels using papercrete to improve thermal comfort in buildings

Abstract:

The materials and energy are mostly consumed by construction industry. The sustainable development is a serious issue when facing challenges to provide shelter for rapidly increasing population. To cater this challenges, the innovation of alternative and sustainable materials to be identified. The papercrete is a new experimental material which is not yet produced from many commercial manufacturing companies even though it was invented in year 1928. This study is to propose papercrete for sustainable and thermal comfort constructions. This study will be focused on developing low cost modular composite roof panels using papercrete and lightweight concrete. The main objective of this study is to identify an innovative approach to develop modular composite roof panels using papercrete technology. A detailed literature survey to be done related to the proposed modular composite roof panels, papercrete technology and their applications. The laboratory experiments and trial mixed to be conducted to find the mix design of papercrete to be used in modular composite roof panels. The detailed design and development of modular composite roof panels using papercrete and lightweight concrete to be done. The structural performance analysis and optimization for developed modular composite roof panels to be done. Development of product specifications and connectivity for sustainable and thermal comfort constructions to be done. Development of a numerical model to determine the thermo-mechanical performance of developed composite modular roof panels to be done. According to the detailed design, structural analysis, experimental results, cost benefit analysis and discussions of the results, the conclusions of this study to be drawn.