MAAE Seminar – April 21st, 2023

WUFI Model Validation of a Panelized Exterior Retrofit for Ottawa Community Housing PEER Project

Majority of existing buildings were constructed prior to the implementation of building energy codes, and it is estimated 70-90% of buildings inhabited in 2050 already exist. As many of these buildings are aging or approaching the requirement for repairs, it is important to improve their resiliency. For majority of these aging buildings a retrofit of the building envelope would provide
the most substantial reduction in energy requirement compared to a mechanical system retrofit.
To prove the scalability and feasibility of building envelope retrofits community housing has been
a large focus as thousands of units dating to the 1950's are in poor condition and would greatly benefit from improvements to the building envelope. As many of the community housing units utilize the same design, a single solution that is tested and proven could easily be scaled across Ontario and Canada in a rapid retrofit project.
Currently, the restricting factors preventing widespread retrofits are based on the moisture risk to the building envelope and developers reluctancy to hold said risk. Hygrothermal analysis is typically performed prior to implementation of a design but it may not depict the performance of the envelope as constructed. To better understand and mitigate the mold risk a validated hygrothermal model was developed using a pilot project in Ottawa. The pilot project utilized a panelized design which allowed for the retrofit solution to be applied over the existing brick building and was monitored for 2 years.
Jordan McNally
PhD Student
Co-supervised by Cynthia Cruickshank and Michael Jemtrud (McGill).
Jordan achieved his undergraduate degree in Aerospace Engineering at Carleton and continued on to complete his M.A.Sc. in Mechanical Engineering with Cynthia Cruickshank, focusing on solar
adsorption cooling. He has worked in the field of solar and energy systems for multiple projects and supporting colleague's research. Jordan is currently a year and a half into his PhD where he is focusing on hygrothermal modelling of building retrofits.