GreenBuild Net-Zero Energy High Performance Home Evaluation Plan

Overview
EEHR Group has created an affordable and zero-energy home, but the group has no way of determining the success of the zero-energy home. The home’s success depends on understanding energy usage in the home, evaluating occupant satisfaction, and ensuring the health and safety of the home. EEHR wants to know if their creative decisions were ultimately successful, and if not, then they want to attain a foundation from which improvements can be made.

Objectives
The objectives for this capstone project is to develop a post-construction evaluation plan for the GreenBuild homes. The ending deliverables for this project include a protocol of instructions on how to conduct the evaluation plan (which consists of data collection and data analysis plans), survey and interview materials to collection information on the occupants, and a carefully chosen set of monitors and devices to held aid in conducting the evaluation plan.

Approach
- Initial research showed that there plenty of evaluation plans and occupancy survey materials for commercial building, but not residential settings.
- Our concept generation narrowed down the evaluation plan into 3 main components: Energy monitoring, Occupancy behavior, Construction design.
- Customer needs were gathered in a brainstorming session with the sponsor contact, and we determined goals, strategies, and design details to be achieved under each component.
- Information on monitors and devices that can help reach these more detailed goals was gathered, and the final decisions were then purchased.
- Research on occupancy behavior was conducted to develop a time-table worksheet, online survey, and interview template that will gather relevant information.
- Protocol of instructions was developed to includes data collection and analysis plans. It also includes testing procedures since devices cannot be tested until construction is complete.

Outcomes
- Conclusions will be made once construction is complete and the evaluation is carried out.
- Detailed protocol with specific data collection and analysis plans, and device testing procedures.
- Recommendations to buy a second set of devices for the other duplex home and to publish conclusions found from the evaluation plan.
- This is one of the first evaluation plans for a residential setting with an energy focus. This can hopefully be used on other homes to innovate new high performance home solutions.