Summer 2021 Sustainability Scholars Program Internship Opportunity

The UBC Sustainability Initiative (USI) is pleased to offer current UBC graduate students the opportunity to work on funded sustainability internship projects. Successful candidates work under the mentorship of a partner organization, and are immersed in real world learning where they can apply their research skills and contribute to advancing sustainability across the region.

- Visit the Sustainability Scholars Program website to learn how the program works and to apply.
- Be sure to review the application guide to confirm your eligibility before applying.

Applications close at midnight on Sunday January 31, 2021.

Research project title
Analysis of industry capacity around the holistic implementation of high-performance envelopes for residential buildings

Background: The Township of Langley (TOL) has adopted the BC Energy Step Code for residential buildings and will require all applicable buildings to be built to Step 3, starting January 1st 2021 and the Upper Steps, 4 and 5, in the future. The average air changes per hour. (ACH) at Step 1, where there are no air tightness requirements is roughly 3.5* and as TOL adopts Step 5 in the foreseeable future, there will be an expected air tightness improvement of 62% to get to 1 ACH.

In order to effectively build air tight envelopes, which contribute to energy/GHG/operating cost reductions, many different segments of industry will need to know how their work will impact the overall effectiveness of the air barrier.

The success of a high-performance envelope relies on a number of stakeholders in the design and multi-step construction process. Each relevant industry will have different degrees of understanding and experience in the implementation of a high-performance envelope. Where there are capacity gaps in in any given industry group, the overall chance of achieving success with the implementation of a high-performance envelope can be dramatically reduced. Failure in achieving airtightness at the final blower test can result in cost burdens to development teams to address envelopes with higher than anticipated air leakage rates after-the-fact through added labour, materials, design and even mechanical retrofits. In other words, we need to identify the weakest links and the stage(s) where there is most risk. This aspect of the envelope capacity is the largest concern for builders. See Figure 1 below.

Project Overview:
The Green Buildings team proposes to conduct an industry wide survey focusing on three major components of the envelope: air tightness, envelope, and thermal bridging. The survey will be built in such a way that once the survey has completed, for each industry group (general contractors, design and construction industry, residential construction industry etc.), we will have a detailed report on where there are gaps in understanding of how to build a high-

performance envelope and at what stage. This will allow us, and other larger support bodies, to prioritize our industry education efforts.

The scholar will be asked to conduct an in-depth review of publications that showcase a large variety of strategies for designing/constructing high performance envelopes, addressing thermal bridging, and improving air tightness. These strategies will then be converted into an industry survey with a large series of Yes and No questions starting at the most basic questions and leading up to very advanced questions. For each industry that participates, we will then know exactly where there are limitations in understanding and how they impact the overall performance of the air barrier. BC Housing issues a number of resources which has already listed out many/all relevant building/design strategies that can make up the survey matrix.

The survey participants are anyone in the design and construction industry for TOL buildings; however, all building industry sectors will be invited.

Upon completion of the survey a report will be created by the scholar describing the capacity profile of each member of the construction process and identify who and where is the weakest link. The report will be actionable by TOL immediately; the results will inform our industry education program and we will share the results with BC Hydro, BC Housing, BCIT and other major partners in Step Code adoption to help create systems to bridge the overall gaps.

Further, the development community can use these findings to improve their own construction methods. This report can act as a very insightful tool adding value to their process and thus adding value to TOL by not passing on inflated construction costs to the consumer.

Additionally, this will support our progress with adopting non-residential Step Code requirements, which is supported by a UBC Scholars project conducted in 2020; the results from the 2021 study will form a part of our consultation process. When we discuss what the community's barriers are in terms of capacity, we will be able to more specifically support their needs on exactly who needs support, at what stages, and how we (and they) can address those gaps.

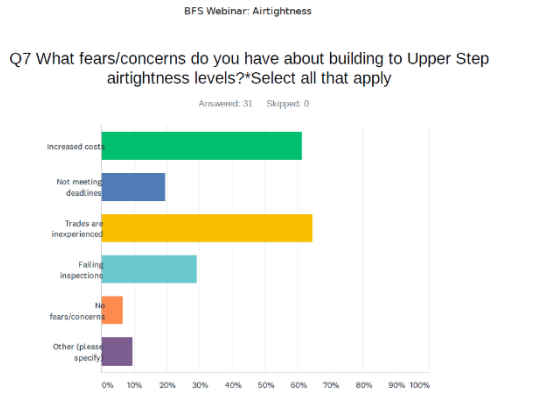

Figure 1: This data, November 19, 2020, highlights the #1 concern the building industry has around Upper Step air tightness – trade capacity. N.B. this concern is higher than even costs.

Deliverables

- A cascading list of survey questions, built off of a variety of BC Housing envelope related guides, increasing in complexity in YES or NO form.
    - Cascading list to have multiple sub sections that will allow certain trades to go down certain question paths.
    - Matrix of questions to be built into online survey form
- A list of all industry resources that can support reaching out to each member of the building industry. TOL can offer certain resources but the Scholar must look for any associations that can provide contact info for those industry groups.
- A matrix made up of each construction industry actor and their capacity profile against a large selection of envelope components and strategies
- A final report highlighting the results of the survey
- Report to identify which parties are higher risk in compromising the success of the envelope
- Report to discuss which industry groups must potentially be brought in earlier in the design and construction process
- Final report for the online Scholars Project Library

Time Commitment

- This project will take 250 hours to complete.
- This project must be completed between May 3 and August 13.
- The scholar is to complete hours between 8:30am to 4:30am, Monday to Friday , approximately 20 hours per week.
- The scholar is anticipated to work remotely and will have access to our network. To enrich the experience of the Scholar and provide network opportunities, we anticipate three optional in-person working days at the Township Civic Centre.
    - It may be possible to have more on-site working days if the Scholar wishes.

Required/preferred Skills and Background

☒ Excellent research and writing skills
☒ Demonstrated interest in sustainability
☒ Experience conducting stakeholder engagement events, including facilitation skills, is an asset
☒ Familiarity with research methodologies and survey techniques
☒ Statistical analysis
☒ Community engagement experience
☒ Familiarity conducting focus group research
☒ Strong analytical skills
☒ Ability to work independently
☒ Deadline oriented
☒ Project management and organizational skills

☒ Experience in or around construction, an asset
☒ Design and layout skills
☒ Intermediate/general understanding of buildings including envelopes, energy efficiency, and the construction process.

Applications close **midnight Sunday January 31, 2021**
Apply here: Click here to apply
Contact Karen Taylor at sustainability.scholars@ubc.ca if you have questions

Useful Resources

We are holding a special **resume preparation workshop for prospective Scholars** on January 19. Click here for details and to register.

Below are some links to useful resources to help you with your resume and cover letter (there are many more online). Some of these resources also provide information on preparing for your interview.

https://students.ubc.ca/career/career-resources/resumes-cover-letters-curricula-vitae

https://www.grad.ubc.ca/current-students/graduate-pathways-success

https://www.grad.ubc.ca/cover-letter-cv-resume-templates-ubc-career-services