### Meeting Notes Building Research Council (BRC)

Tuesday April 04, 2024, 8:30 a.m. to 12:00 p.m. **The Italian Cultural Centre Society** 3075 Slocan Street Vancouver, BC

#### In Attendance:

Denisa Ionescu, BC Housing, BRC Chair Cindy Moran, BC Housing Alireza Asharioun, BC Housing Faizan Mithani, BC Housing Grace Oh, BC Housing Fitsum Tariku, BCIT Omid Tamanna, BCIT Christopher Black, BCIT, LDR Engineering Farnaz Fahimi, CMHC Alison Conroy, UNBC Rebecca Siggner, BCNPHA Phalguni Mukhopadhyaya, UVic Forest Borch, reLoad Sustainable Design Jessica McIlroy, Pembina Institute Shawn Davis, UBC Cara Lozinsky, Carleton University Einar Halbig, E3 Eco Group Ivan Lee, MH now Stantec Richard Kadulski, Richard Kadulski Architect Patrick Roppel, Evoke Buildings Susannah Coons, Evoke Buildings Niti Lad, Evoke Buildings Gary Brown, SGB Services Jason Teetaert, SMT Michael Lemm, Busque Engineering Kevin So, Travelers

### 1. Approval of Agenda/Additional Items

The meeting was called to order at 9.00 a.m. D. Ionescu welcomed everyone to the meeting on behalf of the BRC followed by a roundtable introduction. The meeting agenda was approved.

# 2. Optimizing Affordable Housing for Embodied Carbon, Energy and Cost, Forest Borch, reLoad Sustainable Design

Forest Borch discussed optimizing affordable housing for embodied carbon, energy, and cost through building design advisory, performance analysis, and climate adaptation. Project targets included energy savings 55% below NECB 2015 and GHGI limits. Envelope optimization resulted in significant cost savings and embodied carbon reduction, achieving capital cost savings and a reduction of 123 tCO2e through insulation optimization. Overheating analysis was conducted to ensure indoor air temperature compliance. A whole building carbon analysis emphasized the importance of considering upfront emissions.

### 3. Performance of a Thick-wall Assembly with an Exterior Air Barrier, Alison Conroy, UNBC

Alison, a PhD student, presented on her research work at UNBC regarding convective air movement and moisture accumulation in thick-wall assemblies with exterior air barriers due to forced convection in cold climates. Discussion focused on acceptable convective air flow levels and the impact of insulation material on moisture accumulation.

# 4. Beyond Energy Efficiency: Deep Retrofits Save More Than Just Money, Betsy Agar and Jessica Mcllroy, Pembina Institute

Jessica's presentation focused on policies that support Canada's clean energy transition, with emphasis on deep retrofit solutions for buildings to enhance energy efficiency, climate mitigation, infection control, and resilience. The deep retrofit solutions involve upgrades integrating seismic, energy, and wildfire protection, highlighting their interdependencies with ventilation, air filtration, and conditioning.

# **5.** Use of Infrared Thermography to Prioritize Energy Retrofit of Exterior Building Envelopes, Phalguni Mukhopadhyaya, UVic

Dr. Phalguni discussed recent research using infrared thermography as an assessment tool to prioritize energy retrofits of building envelopes. Noting that buildings consume up to 40% of total energy demand (rising to 60% in urban areas), he highlighted benefits and challenges in current U-value estimation methods, such as neglecting thermal bridges. The Infrared Index (IRI) provided a rapid ranking of building envelope thermal performance, and dynamic IRT with UAVs demonstrated accuracy influenced by environmental conditions.

# 6. Enhancements in Thermal Bridging Calculations for Glazing Spandrels and Balconies, Susannah Coons, Evoke Buildings

Susannah presented on enhancements in thermal bridging calculations for glazing spandrels, balconies, and opaque assemblies. She noted that ASHRAE Research Project 1365 grouped spandrel details together, making them challenging to apply to most projects. Accurate thermal analysis requires linear transmittances for curtain wall horizontal expansion joints and intermediate transoms. 3D modeling for spandrels with vision glass and full-height spandrels showed differences in thermal transmittance compared to 2D modeling. Ongoing work includes details on door sill to curb transitions, curb to balcony transitions, and various opaque assemblies.

### 7. The Impact of Compartmentalization and Ventilation System Type on Dwelling Unit Cross-Contamination in MURBs, Cara Lozinsky, Univ of Toronto

Cara discussed the impact of compartmentalization and ventilation system types on crosscontamination in MURBs. A field study measured partition-level airtightness in six buildings, revealing significant inter- and intra-partition variability. Simulation studies confirmed the IAQ benefits of compartmentalization. Building design was shown to impact both IAQ and energy use, with vertical inter-unit airflow identified as the primary pathway for cross-contamination. The type of ventilation system also affects CO2 concentrations, emphasizing the importance of interior partition airtightness for IAQ. Cara mentioned that future research would include examining corridor supply flow rates and verifying simulations.

#### 8. Forum Discussion

Participants discussed various topics, including:

- Acoustic measurement in building envelope.
- BIM for future of the construction, challenges of implementing this technology.
- Standardizing prefab and modular construction as a solution to accelerate the future building industry and make affordable housing more accessible.

#### 9. Next BRC Meeting

Next meeting is scheduled for September 4<sup>th</sup>, 2024.