2021

CANADIAN GREEN BUILDING AWARDS

THE NATIONAL PROGRAM OF SUSTAINABLE ARCHITECTURE & BUILDING MAGAZINE SABMag

PART 1
PROJECT DESCRIPTION

Use for all categories. For binder submissions, place this form in the first plastic sleeve of your binder, followed by the Project Summary and the Main Project Description. Projects are judged based on criteria of sustainable design, architectural merit and innovation.

Project categories

Identify which Award category you are entering

☐ **1. Residential [small]**
Open to new or renovated buildings less than 600m² in area, of which a minimum of 75% is dedicated to single-family or multi-family residential uses.

☒ **2. Residential [large]**
Open to new or renovated buildings [typically multi-unit buildings or groups of related buildings] greater than 600m² in area, of which at least 75% is dedicated to residential uses.

☐ **3. Commercial/Industrial [small]**
Open to new or renovated buildings up to 2,000m² in area, of which more than 75% is dedicated to commercial or industrial uses.

☐ **4. Commercial/industrial [large]**
Open to new or renovated buildings [or groups of related buildings] greater than 2,000m² in area, of which at least 75% of the floor area is dedicated to commercial or industrial uses.

☐ **5. Institutional [small]**
Open to new or renovated buildings up to 2,000m² in area, of which more than 75% is dedicated to institutional uses.

☒ **6. Institutional [large]**
Open to new or renovated buildings [or groups of buildings] greater than 2,000m² in area, of which at least 75% of the floor area is dedicated to institutional uses.

☐ **7. Mixed Use**
Open to new or renovated buildings [or groups of related buildings] of any size, in which no individual use exceeds 75% of the overall floor area.

☐ **8. Existing Building Upgrade**
Open to buildings of any size or type in which the primary focus of the work has been to enhance the performance or extend the life of an existing structure. Entries in this category are required to respond only to the submission criteria appropriate to the project.

☐ **9. Interior Design**
Open to interior design projects of any size or type. Entries in this category are required to respond only to the submission criteria appropriate to the project.

An award will be given in each category at the discretion of the jury.

PROJECT DETAILS

Project name: SKEENA RESIDENCE UBC OKANAGAN, KELOWNA, BC

Address: 1320 INTERNATIONAL MEWS, KELOWNA, BC V1V 1V8

Year completed: 2020

PROGRAM AND CONTEXT

Project type: [Identify all uses occupying 10% or more of gross floor area]
RESIDENCES

Project site: [Check all that apply]

[X] Previously undeveloped land [ ] Urban [X] Rural

[ ] Previously developed land [ ] Suburban

Other Building description: [Check only one]

[X] New [ ] Renovation [ ] Both [If both, list __% new and __% renovation]

STATISTICS* Provide the following metrics as applicable to your project.

- Site Area: 4,388 m^2
- Building gross floor area: 6,750 m^2
- Energy Intensity: 70 KWhr/m^2/year [Include both base building and process energy]

[optional: report energy intensity separately as follows:

  - Energy Intensity, base building: _____ KWhr/m^2/year
  - Energy Intensity, process energy: _____ KWhr/m^2/year

- Reduction in energy intensity: _____ %.
- State the reference standard on which the % reduction is based: MNECB, NECB or ASHRAE 90.1

[include version]: N/A

- Recycled materials content: _____ % by value
- Water consumption from municipal source: 12,297 litres/occupant/year

[Include both base building and process consumption]

- Reduction in water consumption: 53.16 %
- State the reference on which the % reduction is based: LEED [X] or other [ ]
- Construction materials diverted from landfill: ____ %
- Regional materials by value: _____ %

***NOTE FOR PART 9 RESIDENTIAL PROJECTS: PROVIDE THE STATISTICS ABOVE IF AVAILABLE.** Include in the Executive Summary [see next page] the EnerGuide or the Home Energy Rating System [HERS] ratings if available, and the WalkScore rating [see www.walkscore.com]. Also, a qualitative assessment of project performance should be included in the appropriate sections of the narrative.

Skeena Residence

UBC Okanagan, Kelowna, BC

The six-storey Passive House Skeena residence provides 220 bedrooms and amenity space to UBC Okanagan students. Completing an ensemble of buildings encircling the Commons Field, the project synchs up with the larger campus while supporting student life. The building is so energy efficient that at the coldest point in the year, more than ¼ of the heat required for the building is supplied by students' body heat.

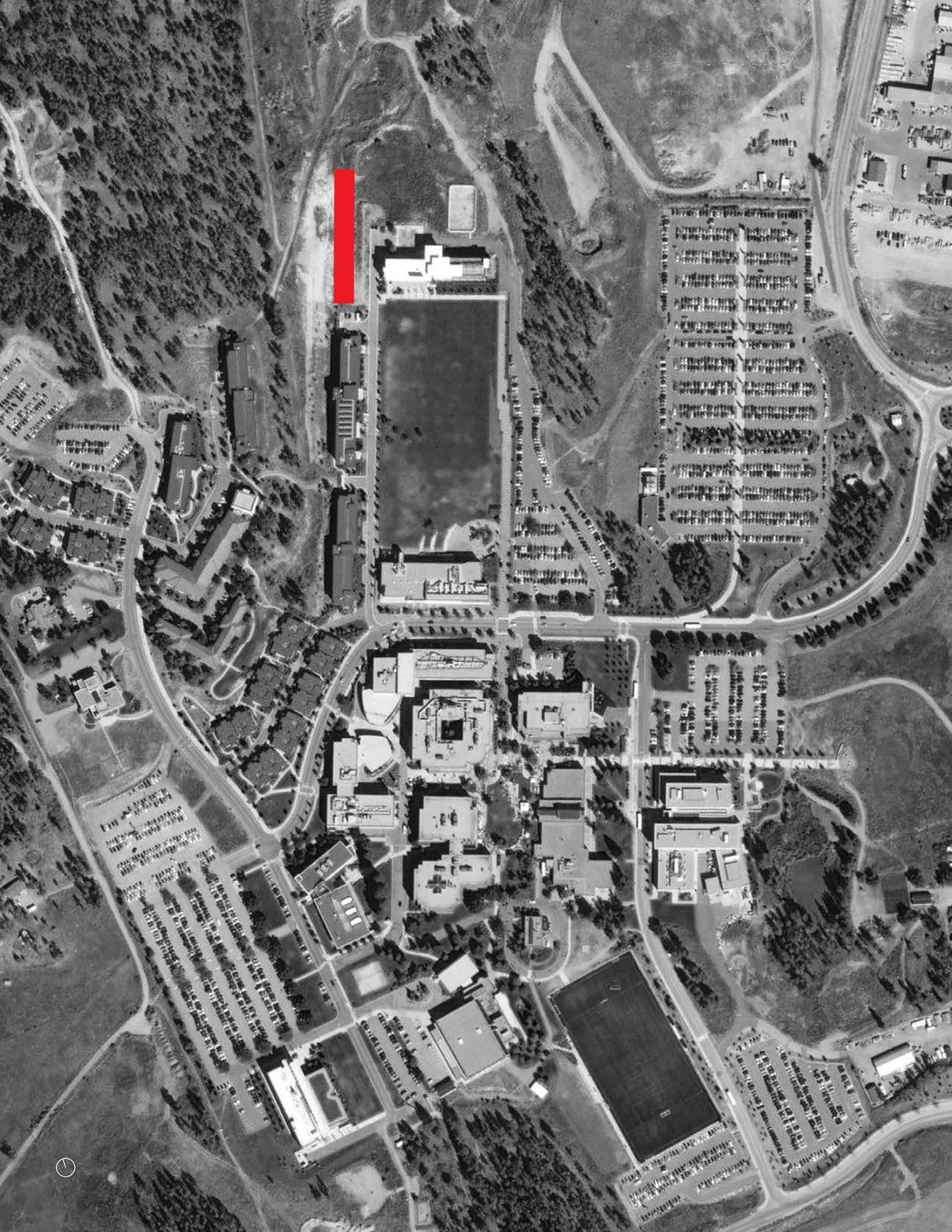
On the first level, Skeena Residence has a large laundry room separated adjacent lounge and social spaces. This relationship between the two spaces encourages chance run-ins, happenstance gathering, and makes doing laundry more fun. Each of the upper five floors contains a house lounge, with views of the surrounding mountains, a kitchenette, dining table, and couches to create hominess. In short, the design of the building supports community life.

STRATEGIC DECISIONS

Aligning with the campus masterplan, Skeena Residence completes an ensemble of buildings encircling the Commons Field. Together with Nicola Residence to the south and Purcell Residence to the east, Skeena creates the social space required in post-secondary landscapes.

To meet its green house gas reduction targets and contribute to its Living Lab initiative, the University of British Columbia (UBC) asked the project team to design Skeena House to meet Passive House (PH) certification. PH is a relatively new certification for midrise buildings in Canada. Currently there are few certified multiunit residential buildings and no certified student residences.

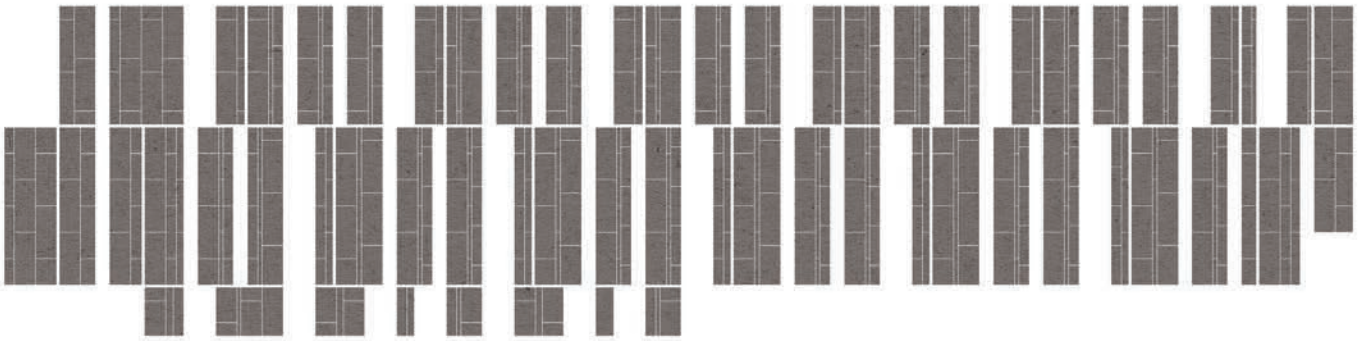
The university owns and operates approximately 15,000 beds of student accommodation and is an international leader in post-secondary education. UBC recently leveraged its notoriety by building the Brock Commons heavy timber tower which has contributed to the acceleration of tall timber high rises internationally. A PH student residence is another opportunity for the university to accelerate the adoption of the standard. Every year 220 students will live in Skeena House and understand the numerous benefits of a PH environment.



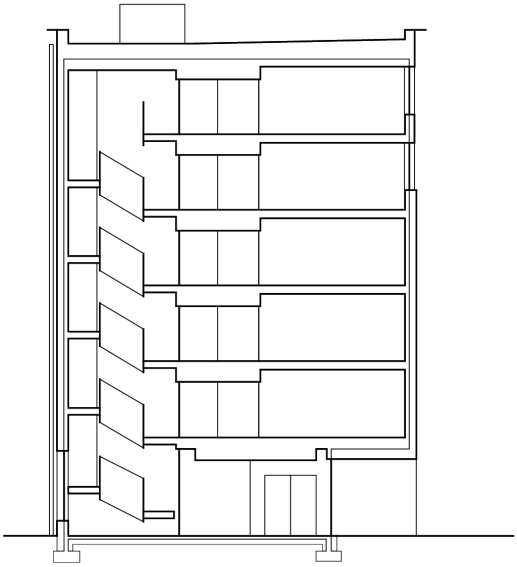
In addition to social and environmental performance, affordable housing is also a key objective for the university. Capital and anticipated operating costs for the project were carefully modeled and tracked throughout the process to ensure these criteria could be met.

While the building's north/south orientation aligns with the campus masterplan, it was recognized at the outset that the form is not inherently suited to passive strategies, particularly when sited in the northern desert climatic region of the Okanagan. Early in the process, as a risk mitigation strategy, the decision was made to allow PH elements (enhanced envelope and mechanical systems) to be changed to conventional systems if the final tenders were not within the budget.

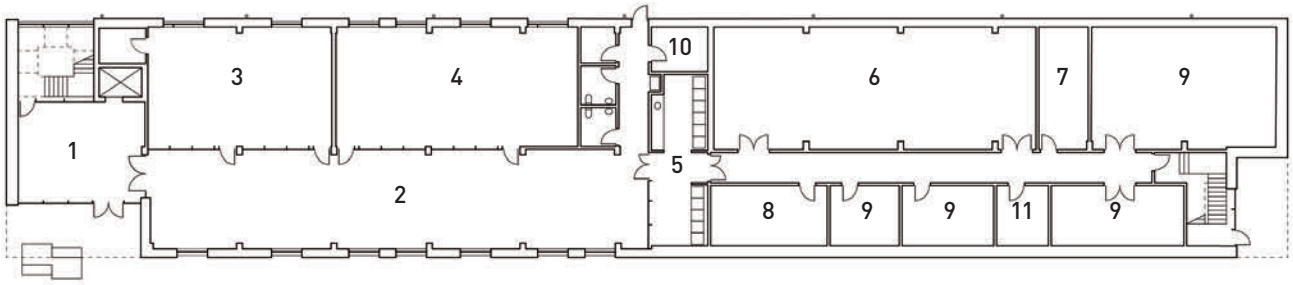
With the PH go/no/go decision moved to the post CD stage, the integrated design team focused on all elements that could be selected to meet PH. For example, the building height and floor area were coordinated with the building code to avoid the power draw associated with high rise ventilation and emergency generator requirements. The building massing was simplified to improve its form factor and reduce associated envelope costs.



East elevation

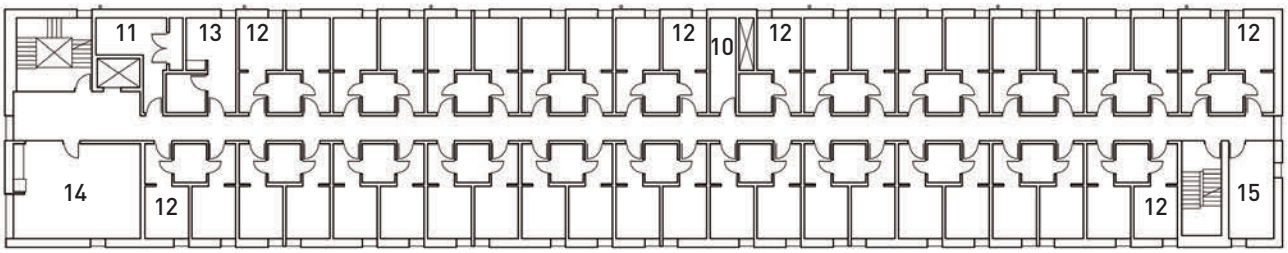


Cross section



Level 1

1.	Entry lobby	6.	Mechanical room	11.	Waste
2.	Informal seating area	7.	Electrical room	12.	Student rooms
3.	Activity room	8.	Communications room	13.	Accessible student rooms
4.	House lounge	9.	Storage	14.	Floor lounge
5.	Laundry	10.	Housekeeping	15.	Study lounge



Typical floor

1.	Entry lobby	6.	Mechanical room	11.	Waste
2.	Informal seating area	7.	Electrical room	12.	Student rooms
3.	Activity room	8.	Communications room	13.	Accessible student rooms
4.	House lounge	9.	Storage	14.	Floor lounge
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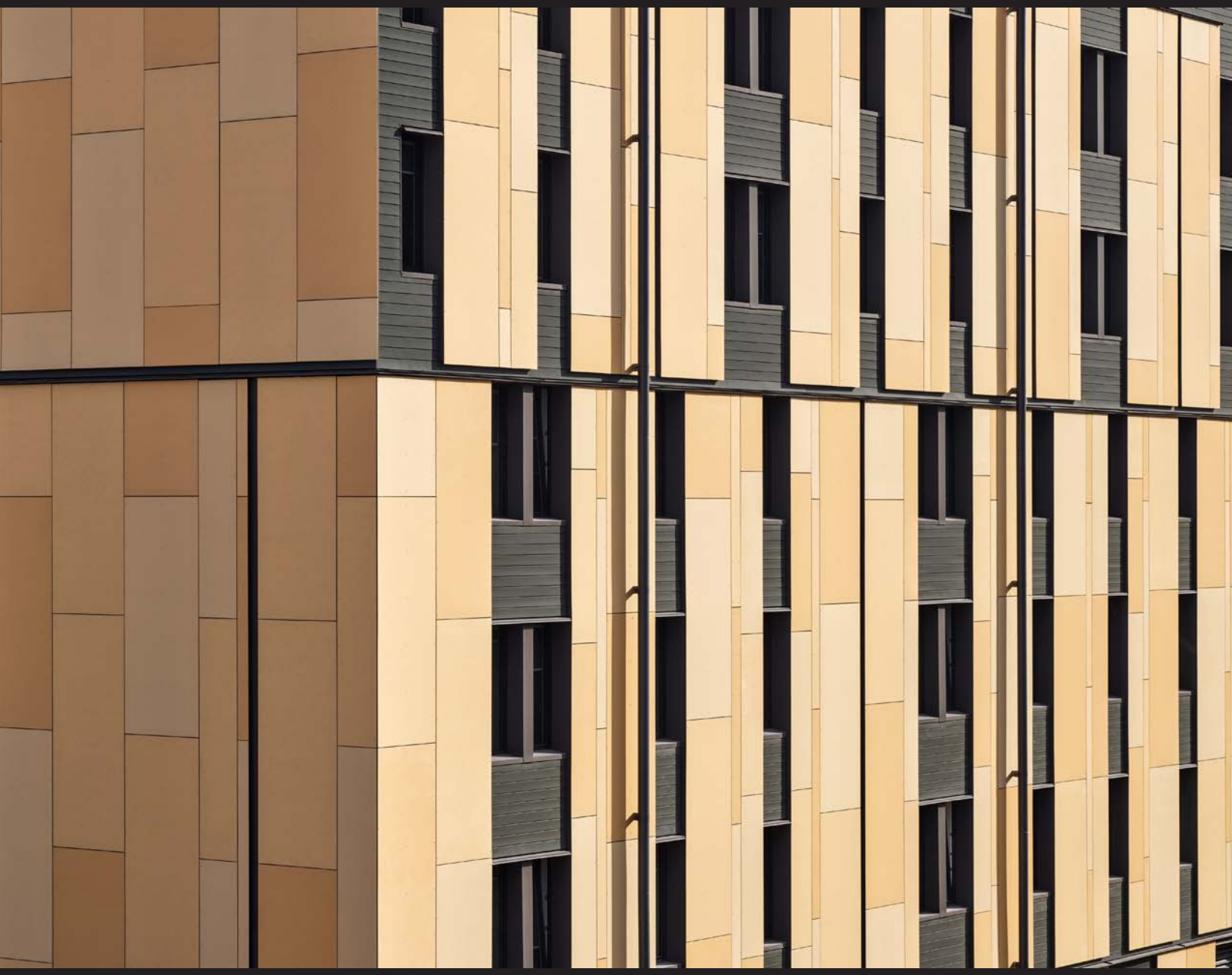



B10
Skvera

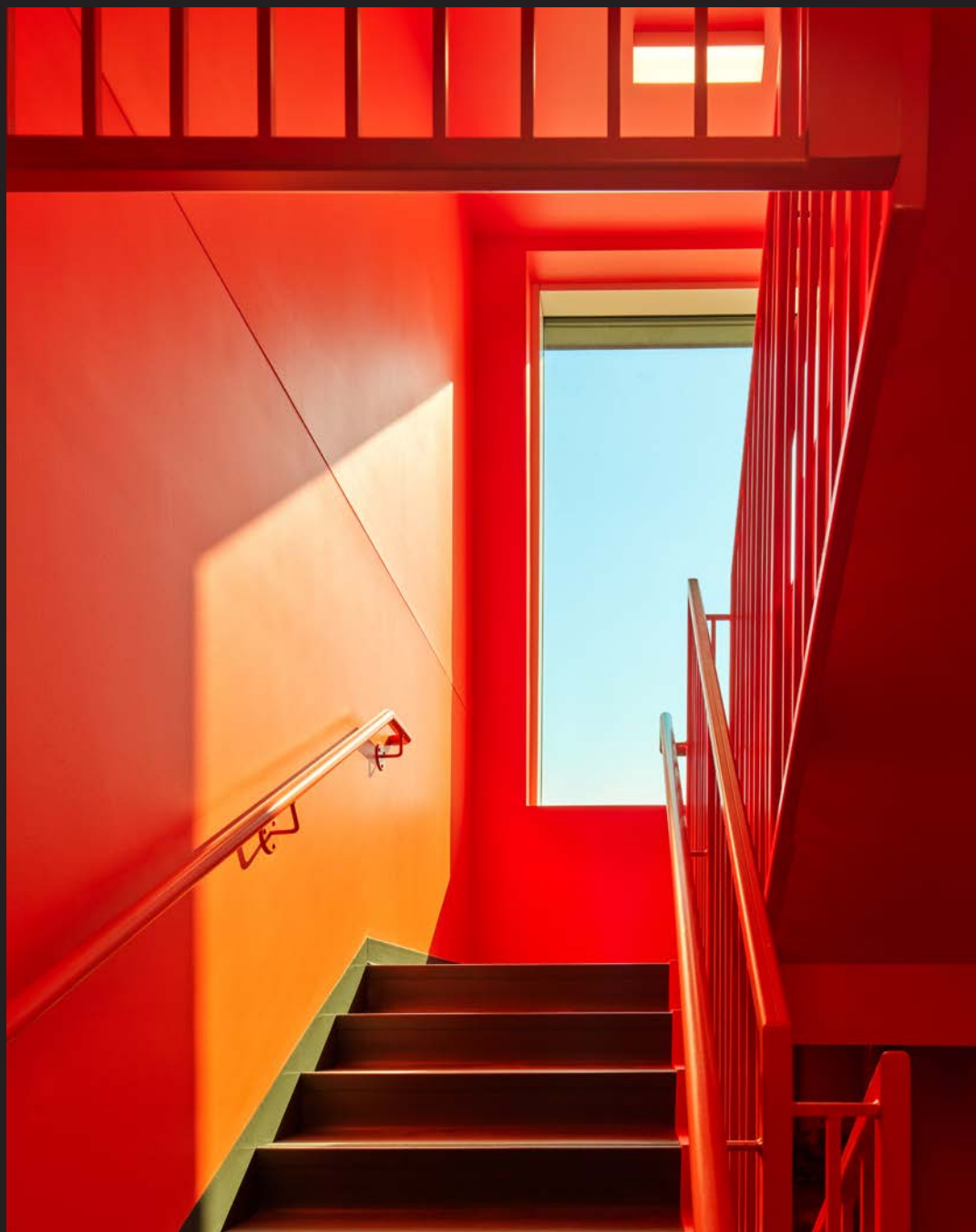
COMMUNITY

Skeena is a street wall building that works closely with its neighbours to create an intimate and walkable campus. All social spaces in the building, such as lounges, study halls, and laundry areas, look directly over the street to create a safe environment. Only service vehicles are welcome in this park of the university and parking requirements are met on existing campus parking areas.

A building that is safe, must also feel safe. This orientation of the lobby space and other shared programs—facing the entrance and outdoor social space—creates passive surveillance over the building entry and enhances security for all occupants. Reinforcing this aspect, the main building entry opens onto a pedestrian arterial.

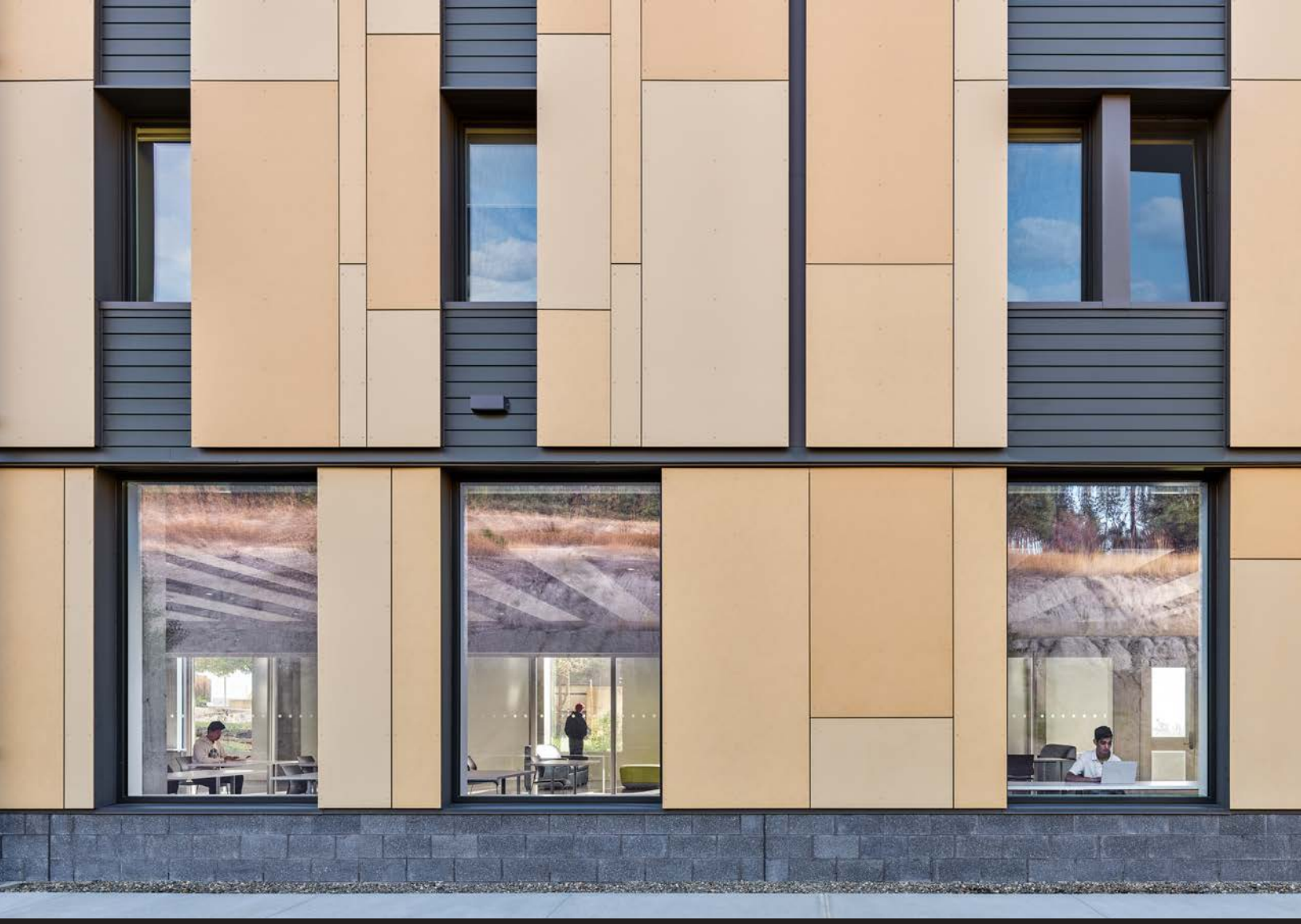
Student residences are for more than just sleeping. In the design for this typology, a balance of academic priorities and recreation is important. On the first level, Skeena Residence has a large laundry room in close conversation with adjacent lounge and social spaces. The relationship between the two spaces encourage chance meetings and happenstance gatherings.

To further maintain safety and privacy, the upper five floors contain the residence apartments, semi-private living, and study areas. Each of these five floors contains a homey house lounge with views of the surrounding mountains with a kitchenette, dining table, and couches and—to keep unlike activities acoustically separated—a study room at the other end of the building. These microclimates help to cultivate meaningful interpersonal relationships and provide forums for focused study and the adjudication of interpersonal conflict.



SITE ECOLOGY

The exterior complements the existing campus colour palette with a combination of fibre cement panels and darker metal panels that reference the Okanagan grassland landscape.



LIGHT AND AIR

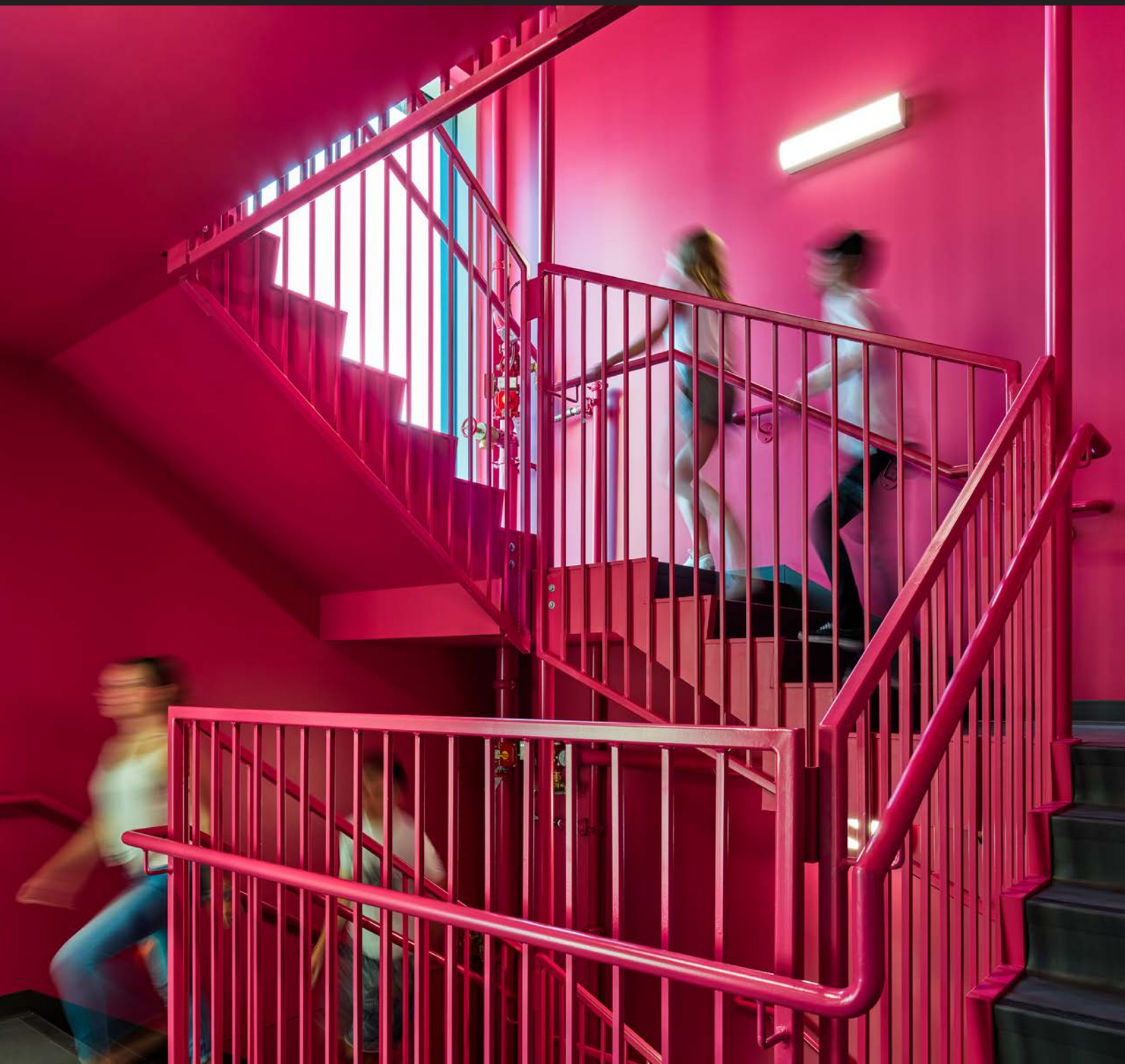
The floor plan is a slender 14m wide form, orientated on a north-south axis, which allows ample daylight penetration. In virtually all areas of the building, occupants are within a 7m distance of an operable window, allowing user-control over ventilation. Room occupant sensors help to reduce the energy use associated with the lighting systems.

The ventilation system offers a continuous supply of fresh air to every occupied room via a set of high-efficiency ERV units located on the ground floor. These units filter dust and pollen from the incoming air and recover ~85% of the heat from the extract air at -10°C outside temperature. The ERV units also recover moisture from the extract air to maintain a healthy indoor humidity range throughout the year. The exceptional airtightness and insulation of the building envelope prevent condensation and any resulting mould growth from compromising occupant health over time.

The system provides a minimum fresh air supply of 0.3 air changes per hour, with the capacity for boost ventilation above this level.

WELLNESS

The Okanagan is known for its abundant summer sunshine. Its winters however are surprisingly overcast and gloomy. To alleviate this, airy, colourful, and naturally-lit corridors with bold floor and wall finishes abound. Vertical splashes of intensely coloured stairwells encourage the movement by feet over elevator. Small bouts of exercise throughout a day are known to boost physical health, immunity, and encourage micro-interactions beneficial to psychological health.



WATER CONSERVATION

Water conservation and management is achieved through:

a. Achieving a Minimum Indoor Water Use Reduction of 35% based on LEEDv4 indoor water use credit calculations).
b. Installing low-flow plumbing fixtures including toilets, showers, urinals and sinks.
c. Favouring native and adapted plants for landscape in order to reduce irrigation needs. Providing deep beds to absorb rainwater. Achieving a minimum Outdoor Water Use Reduction of 50% (based on LEEDv4 outdoor water use credit calculation option 2.
d. Use of efficient irrigation systems with smart irrigation controllers.
e. Rainwater management adheres to the UBCO Integrated Rainwater Management Plan.

OPERATING ENERGY PRESENT AND FUTURE

Skeena's annual energy consumption for the building is 70 kWh/m2 per year. This includes a heating demand of just 7.1 kWh/m2 per year, which allows the building to provide heating, cooling and domestic hot water without a fossil fuel (e.g. natural gas) connection. The building is not connected to the campus district heating system as this uses a significant amount of natural gas in its heat generation. Skeena Residence is a standalone electric-based system and utilises electric heat pump technologies for heating and cooling.

The result is a Greenhouse Gas Intensity (GHGI) of just 0.66 kgCO2eq/m2 per year.

This performance is a function of the 'fabric first' approach of the Passive House standard (airtightness, super-insulation, minimal thermal bridging, triple-glazing etc.) combined with the efficiency of the mechanical design (ventilation heat recovery, heat pumps etc.).

MATERIALS AND RESOURCES

The Passive House standard places equal emphasis on occupant comfort and energy-efficiency. The materials specified for both the building envelope and interior finishes were carefully evaluated during design. The PHPP energy model quantified not just building energy use but also thermal comfort to ensure the building envelope creates a comfortable indoor environment free from drafts and cold surfaces. This led to the specification of triple pane glazing in highly-insulated frames as well as a continuous 8" thick blanket of mineral wool insulation around the building. A super insulated roof (approx. R100) further minimizes heat loss from the building.

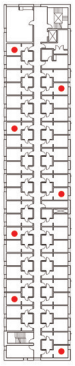
The exceptional airtightness of the building and the continuous wall and roof insulation greatly reduces the risk of air leakage and condensation in the structural assemblies of the building which should increase the durability and service life of the structure. The structure of the building is mainly light wood framing with a resulting saving in embodied energy over alternate materials like structural steel or concrete.

Low-VOC paint and floor finishes are specified throughout the interior of the building.

BUILDING LIFE CYCLE CONSIDERATIONS

The designers worked closely with the housing operations team to ensure durability and deconstructability. Short life span elements in student housing were planning for easy replacement. The sequencing of washroom construction, in particular, was carefully considered so that countertops and shower liners could be removed without damaging adjacent wall and floor finishes.

An advantage of PH building is that mechanical systems are located within the thermal envelope and highly insulated to minimize thermal bridging and damage due to condensation. Medium and long service life elements in the building envelope system were sequenced and installed with exposed fasteners to permit disassembly without extensive deconstruction. Long service life elements such as the structure are completely enveloped in exterior insulation. No movement or degradation from thermal bridging is possible. Finally, areas prone to mechanical and moisture damage such as grade to wall transitions are thermally broken masonry units for maximum durability.



EDUCATION AND INFORMATION SHARING

Located between typologically identical buildings designed to building code minimums and LEED Gold levels, Skeena Residence presents a unique opportunity for understanding PH buildings. The building has been fitted with a comprehensive measurement system that will gather data for an ongoing research project to compare Skeena's energy use and occupant comfort. In addition, every year students provide post-occupancy surveys, a qualitative assessment to complement the quantitative data. Red dots indicate the location of sensors that collect research data.

The project team have presented the Skeena Residence story at the Passive House Canada Conference, EcoCity World Summit, WoodTALKS at the Global Buyer's Mission, and ZBex, at UBC Okanagan won the Net-Zero Energy-Ready (NZER) Challenge, a provincial CleanBC incentive program aimed at the celebration and promotion of innovative and energy-efficient projects.