



HENRIQUEZ PARTNERS ARCHITECTS

Public Hearing

PROTOTYPE

M5 - AFFORDABLE & MARKET RENTAL HOUSING

A Mass Timber Net Zero Carbon Future for Vancouver

January 23, 2024

Main Alley Campus

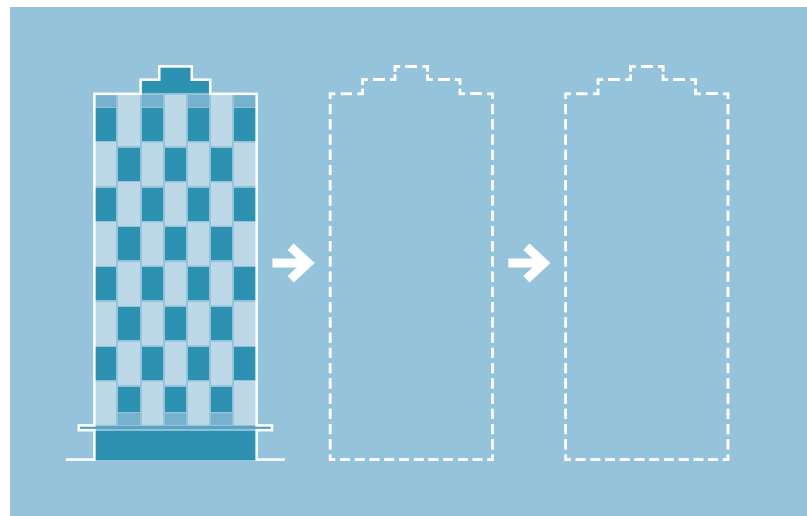


- M1** Existing WeWork Building
- M2** Industrial, Digital Industry, & Offices
- M3** Industrial & Offices
- M4** Industrial, Digital Industry, & Offices
- M5** Residential Tower

"Climate Change is the defining issue of our time and we are at a defining moment. [The] choices made in the next few years will play a critical role in deciding the future of our planet and the generations to come." - United Nations, "Global Issues - Climate Change"



Why is this Project Important?



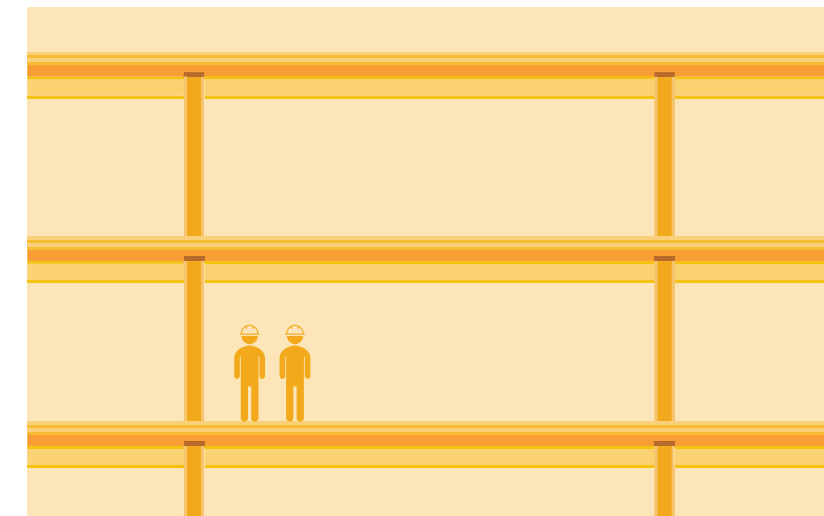
Prototype

This project is a **replicable prototype - an open source, hybrid construction**, case study to help Vancouver and British Columbia achieve a **reduction in lifecycle carbon emissions**.



Net Zero Carbon

Climate change is the challenge of our generation. We must be strategic in maximizing environmental benefits for new buildings.



Hybrid Mass Timber

Mass timber delivers a significant reduction of embodied carbon compared to conventional building materials. A mass timber and steel hybrid structure will allow for building efficiency.

Why is this Project Important?



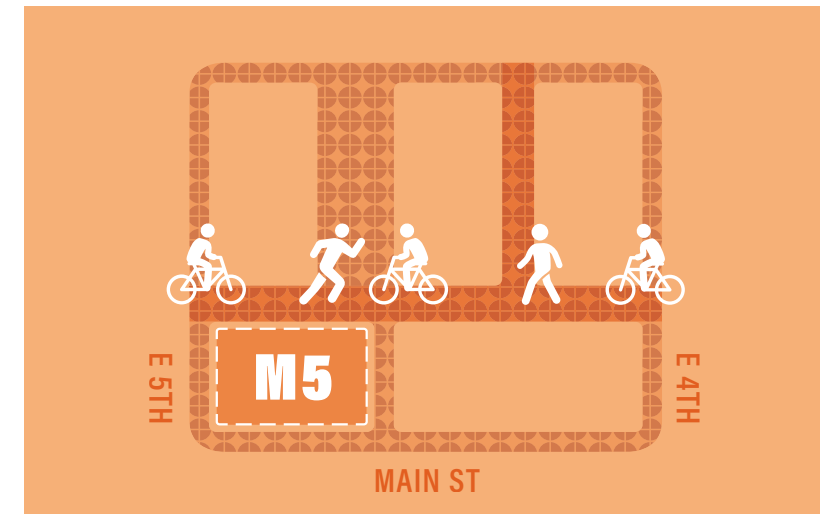
Affordable Rental Housing

The provision of **100% secured rental housing, including 20% below-market rental housing**, will address housing challenges in the Mount Pleasant area under the Broadway Plan.



Enhanced Public Realm

This project will **replace a surface parking lot** and enhance the Main Alley Campus plan, which aims to **create a vibrant neighborhood that is safe and active at all hours of the day**.



Car Free Active Lifestyle

The M5 rental housing development, as part of the overall Main Alley campus and our net zero lifecycle carbon targets, could **reduce car dependence and encourage sustainable modes of travel**.

Zero Carbon Strategy

We believe climate change is the challenge of our generation. Our M5 project will minimize both operational and embodied carbon, and will offset any residual emissions.

NET ZERO LIFECYCLE CARBON

$$\text{Reduced Operational Carbon} + \text{Reduced Embodied Carbon} - \text{Carbon Offsets} = \text{Zero Carbon}$$

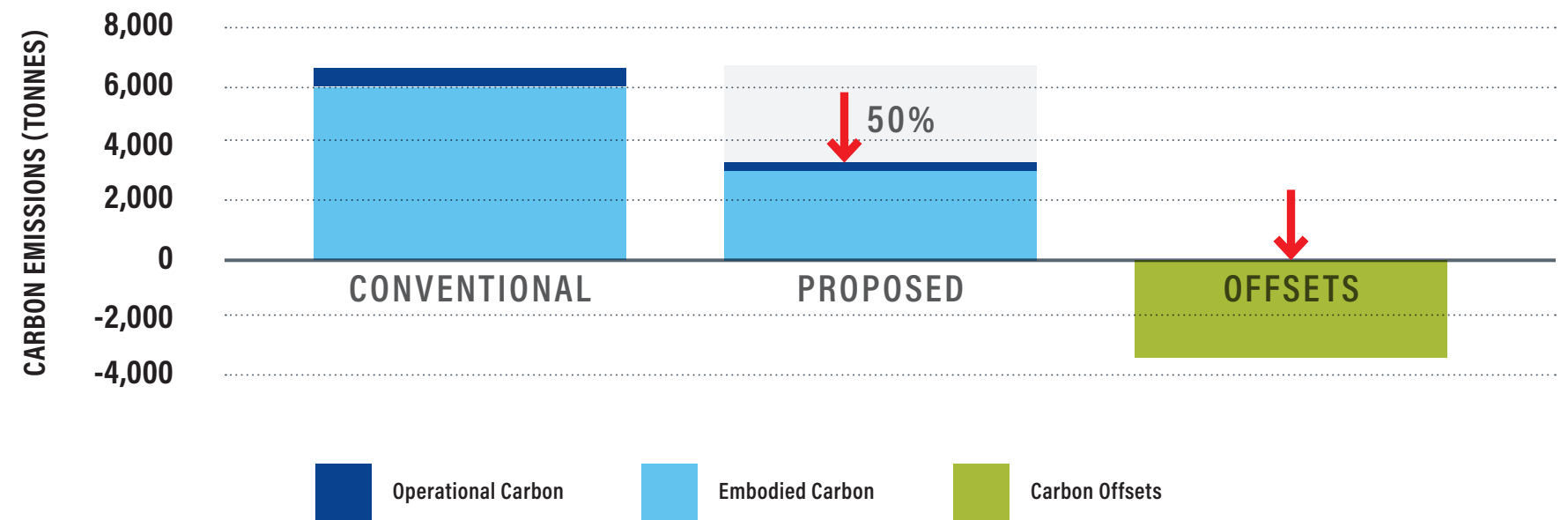
Our Focus on Reducing Carbon



Our goal is to reduce Operational and Embodied Carbon by half and purchase offsets for the remaining carbon emissions over the course of a 25-year lifecycle.

- Operational Carbon = 10% of emissions
- Embodied Carbon = 90% of emissions
- Offsets

Carbon Emissions over a 25-year lifecycle

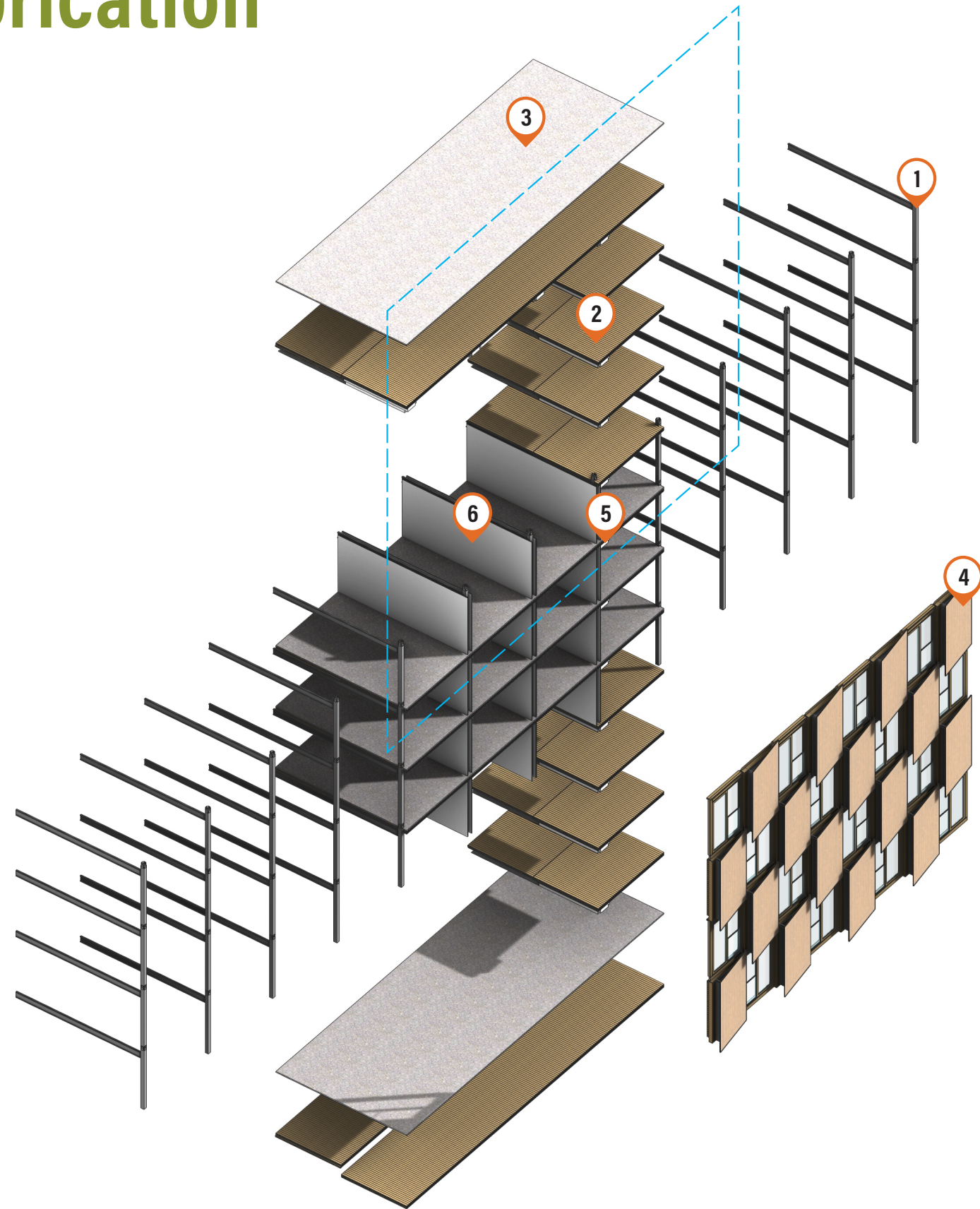


M5 Residential Tower



Mass Timber & Prefabrication

- 1 Steel Structure
- 2 CLT Floor Panels
- 3 Concrete Topping
- 4 CLT Wall Panel & Window Wall Envelope System
- 5 Services routed to facade
- 6 Interior Partitions



Hybrid Mass Timber Structure

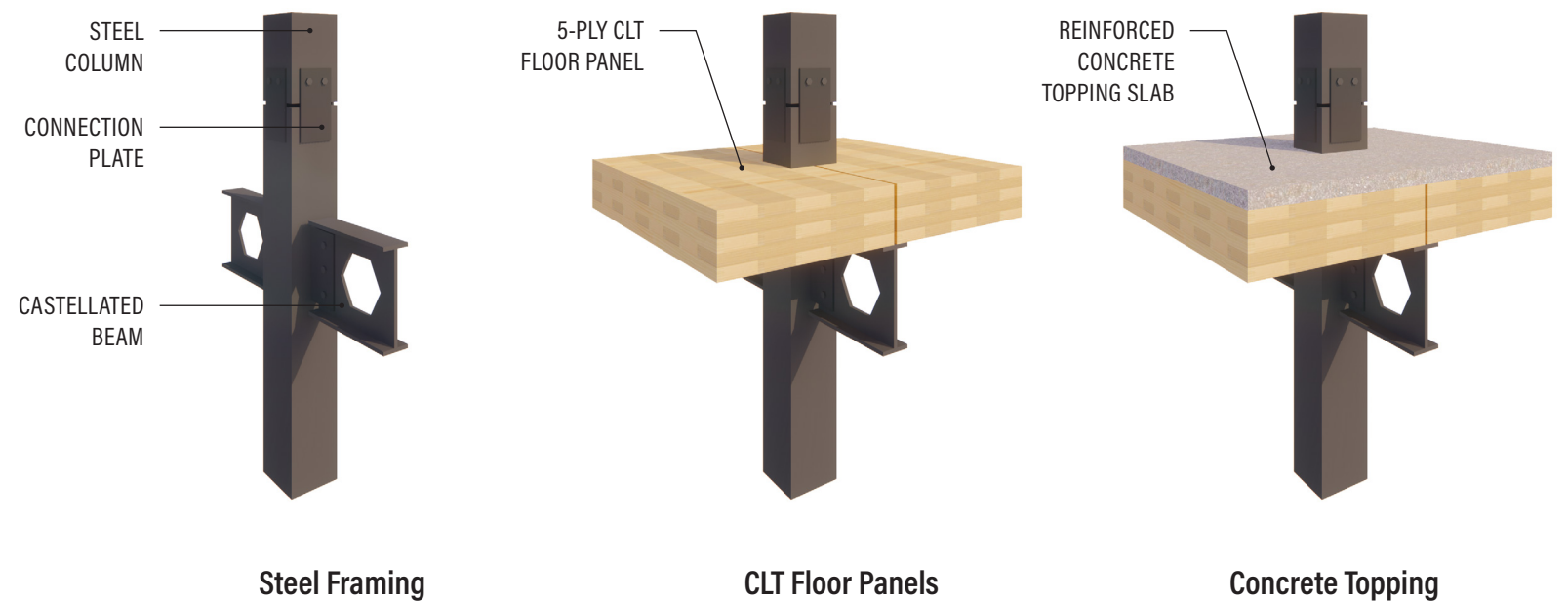


Curtain Place, Hybrid Mass Timber Building, London

We are proposing a hybrid mass timber structure to reduce embodied carbon with a focus on using the right materials for the right use.

Structural Strategy

- Mass Timber Floors
- Steel Columns and Beams
- Low Carbon Concrete Core



Mass Timber Balconies – Construction Challenges

Barriers to entry for mass timber are very high. Height and density Incentives are not possible due to the view cone. In lieu of additional density, our proposal has been designed without projecting balconies in response to the following challenges.

Challenges

- Significant risk of moisture damage with CLT floors
- Challenging structural and building envelope detailing with wood CLT floors
- Increased thermal bridging / increased carbon emissions
- Combustibility of mass timber overhangs – balconies to be of non-combustible construction or to be sprinklered
- Constructibility challenges – prefabricated balconies difficult to install
- Expensive – will add \$3 to \$4 million to the project
- Projecting steel Balconies will increase overall embodied carbon
- Changes the design – concrete construction if balconies required
- Delays approvals and delivery of affordable rental housing – necessitates complete redesign

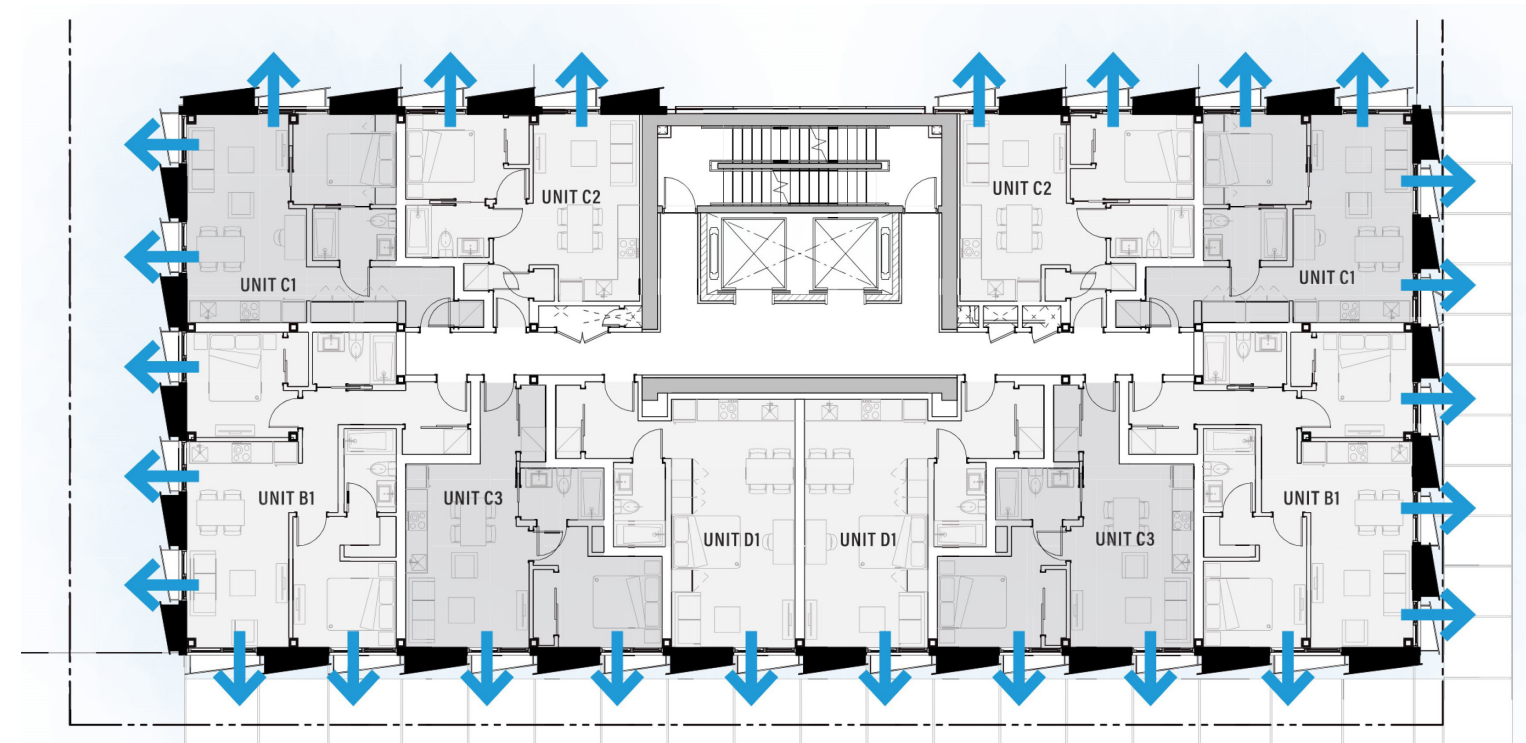
Considering the many challenges of providing balconies, if individual private balconies are to be provided, a full redesign of the project would be required to change the structure to conventional concrete construction.

Proposed - Juliet Balconies

Our proposal has been designed with juliet balconies at each window, allowing large openings, access to fresh air and cross ventilation.

Juliet Balcony Strategy

- Each room has a juliet balcony
- 26 juliet balconies per floor
- Total: 598 juliet balconies



Typical Floor Plan Showing Location of Juliette Balconies

Proposed – 8 Common Balconies on North Facade

We are proposing large common balconies for private and communal gatherings with views of water and mountains.

Common Balcony Strategy

- Located at every third floor / 8 in total
- Large programmable space / 3 m deep × 7.8 m wide / 250 ft² each
- Private or communal gatherings



Common Balconies



Proposed - Outdoor Amenities: Rooftop & Ground Floor

We are proposing to use all available outdoor area for amenity.



- 1 BBQ / Lounge
- 2 Urban Agriculture
- 3 Kitchen
- 4 Lounge
- 5 Indoor Gym
- 6 Outdoor Gym
- 7 Mechanical
- 8 WC
- 9 Common Balconies
- 10 Outdoor Kitchen Lounge
- 11 Children's Play Area
- 12 Hydro Kiosk
- 13 Street-level patio
- 14 Loading

Rooftop Outdoor Amenity: BBQ / Lounge



Rooftop Outdoor Amenity: Gym



Ground Floor Outdoor Amenity: Lounge & Children's Play Area



Proposed Amendment

To support our project as proposed and to provide flexibility at the Development Permit stage, we require the following amendment to Urban Design Condition 1.1:

Our proposed revision is supported by the “Administration of Mass Timber Variances” for Design Flexibility to the external design of the building.

Urban Design Condition 1.1.

Design development to provide private outdoor space, such as roof decks or balconies, for all dwelling units pursuant to Broadway Plan policy 11.1.20 and 11.1.21.

Note to Applicant: Alternatives to this condition, sought under 11.1.21 are to support the viability of hybrid-timber construction and will only be considered ~~for studio and one-bedroom units~~ if the applicant demonstrates to the satisfaction of the Director of Planning:

1. That meeting the policy will significantly impact financial viability and construction techniques; and
2. The building will meet the definition of Mass Timber Building in the Zoning and Development By-law.

Alternatives to private outdoor space for all dwelling units ~~should contain a minimum total floor area equal to the aggregate area of private outdoor space required for each of the impacted units (5.0 sq. m (52 sq. ft.) per unit as outlined in the High-Density Housing for Families with Children Guidelines).~~ Alternatives may include: private Juliet balconies, communal balconies, common outdoor ~~rooftop~~ amenity areas, or a combination of these. Also refer to Sustainability Condition 1.18.

Awards & Grants - International Recognition before Approval

Awards

- **Future House Awards**, Residential Towers, 2023
- **Grands Prix du Design Awards**, Gold Certification: Concept & Unbuilt, 2022
- **World Architecture Festival**, WAFX 2022 Winner
- **World Architecture Festival**, Finalist, Future Project: Residential, 2022
- **Architizer A+ Awards**, Jury Winner, Unbuilt - Multi-Unit Housing (L >10 Floors), 2022
- **Architecture MasterPrize** - Green Architecture, 2021

Grants

- **500K Grant**, Mass Timber Program of BC

