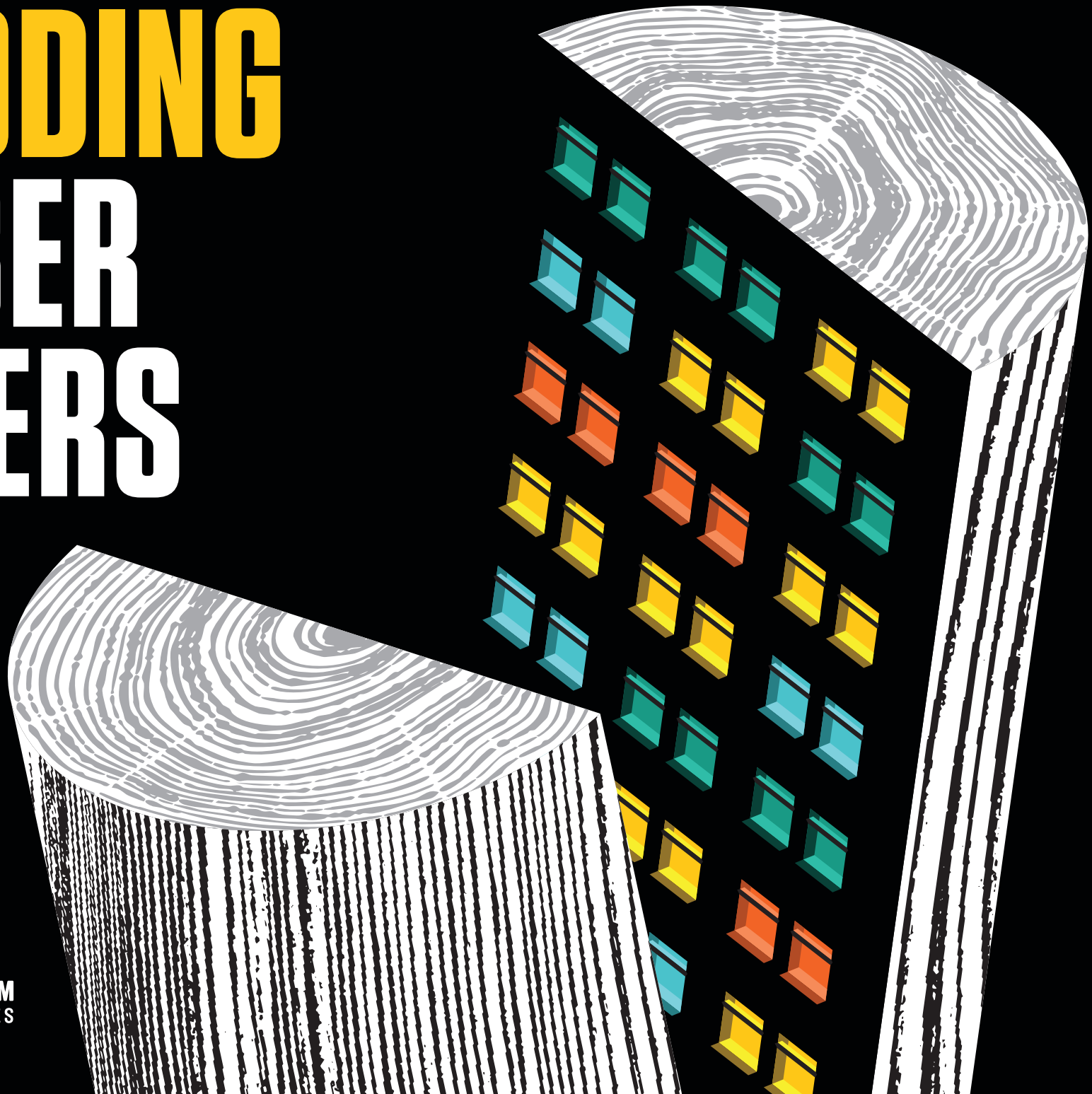
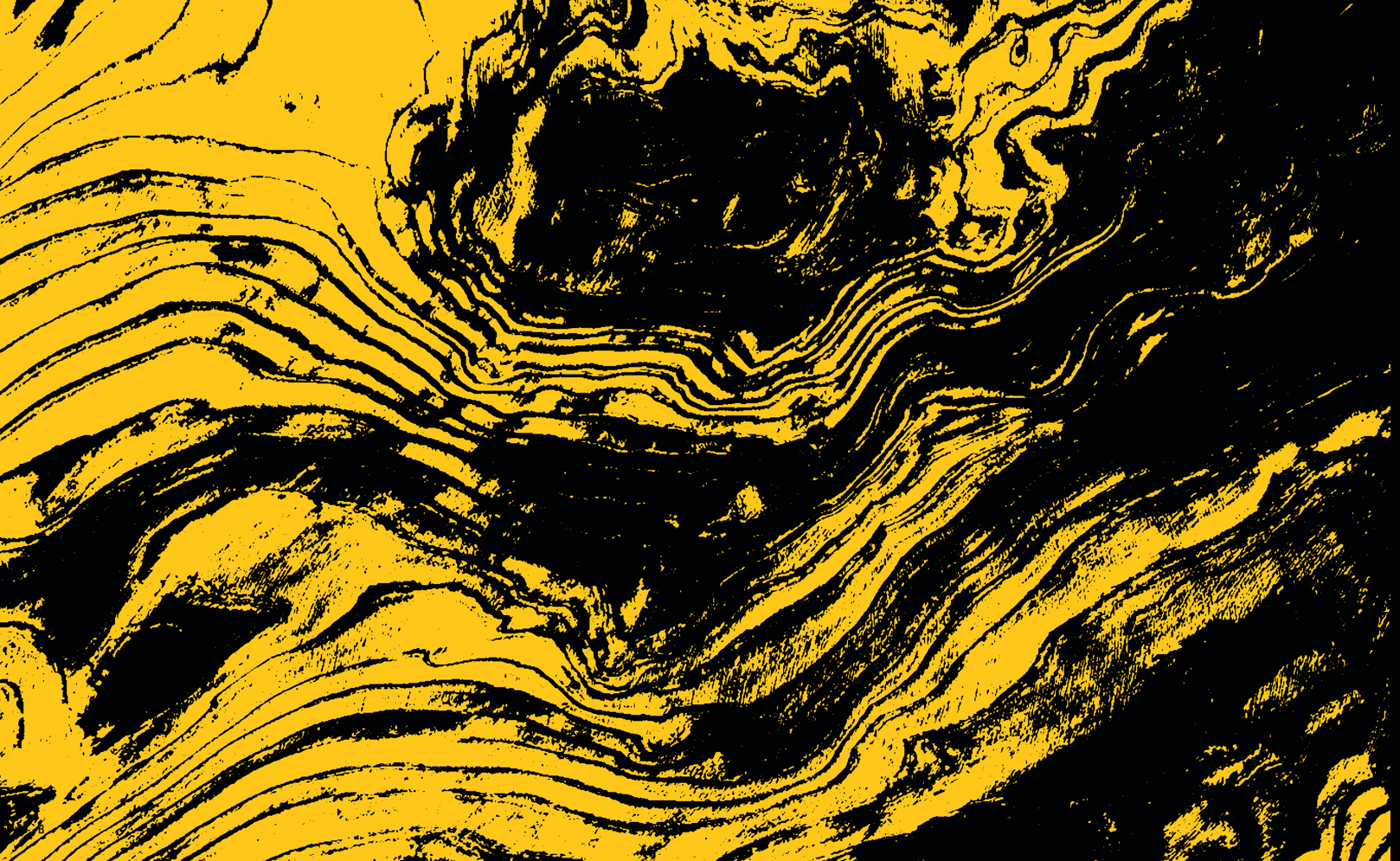
DECODING TIMBER TOWERS

CREATIVE SOLUTIONS FOR LOW-CARBON HIGH RISES



URBANARIUM
FOR SMART CITIES



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VANCOUVER URBANARIUM SOCIETY

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Visit our websites:
urbanarium.org
decodingtimbertowers.com

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Visual Design by KOMBOH

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ABOUT

URBANARIUM

Urbanarium is a registered charity led by a working Board of Directors and supported by staff, an advisory board and volunteers.

Our work aims to motivate residents, government and industry to take informed action to improve their cities.

For 40 years Urbanarium has hosted Competitions, Debates, Talks, and Studios that have inspired solutions to the urgent challenges of affordable housing and climate change.

Our charity registration number is 83332 5830 RR0001.

The DTT Challenge is intentionally aligned with BC Bill 47's mandate to increase housing densities in Transit-Oriented Areas (TOAs).

This map illustrates the distribution of TOAs across the region, highlighting their role in adding new housing close to transit in every major municipality.

* The number of stories permitted in each tier varies between bus exchange and Skytrain areas.

LAND ACKNOWLEDGMENT

The competition sites are located on generic land parcels, which was necessary to stay clear of the regulations of the BC Professional Governance Act, in the area known unceremoniously as the Lower Mainland. The sites were imagined places intended to capture realistic conditions in the region, but are not themselves real.

But this region is a real place, with a long history inhabited, tended, and cared for by the **xʷməθkʷəy̓əm (Musqueam), Sḵwx̱wú7mesh (Squamish), sḵwx̱wú7mesh sníchim (Tsleil-Waututh), kʷikʷəƛ̓əm (Kwikwetlem), Semiahmoo, Katzie, Kwantlen, Qayqayt, Stó:lō, Stz'uminus,** and **sc̓awaθenaʔɬ təməxʷ (Tsawwassen) Nations.**

As an organization working on this unceded, ancestral, and traditional territory, and focused on land use, planning and policy, we acknowledge this history and work to be in relationship with the land and its peoples.

Thank you to our site partners –

BC INDIGENOUS HOUSING SOCIETY
FROG HOLLOW NEIGHBOURHOOD HOUSE
SACRED WATERS DEVELOPMENTS
TSAWWASSEN FIRST NATIONS

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FOREWORD
ELDER NORM LEECH

DECODING TIMBER TOWERS JURY MEMBER
EXECUTIVE DIRECTOR, FROG HOLLOW NEIGHBOURHOOD HOUSE

We're all here together, friends and relatives, and I will begin by acknowledging the land itself first because **the land was here first.**

Our relationship with the land is different from a colonized relationship. To us, the land is not property. The land is a relative. She's an ancestor. She's our first and our great, great, greatest grandmother. And our understanding of that relationship is that she has gifted us everything.

Everything that we or our ancestors have ever eaten or drank or used as medicine or shelter has been a gift from her to us forever. And so we know that every cell and molecule of our bodies is also gifted to us temporarily for our time here as humans on this planet.

When you consider that relationship of someone who gifts you everything that you ever needed forever without question, without limit, without condition, without interruption, well, that is actually the definition of love.

So we know that the land must love us more than we can imagine, more than we can ever even deserve. We know we owe her more than everything. And so we have that gratitude for all that we've received from the land. That's a relationship that we've always had with these lands.

Having acknowledged the land itself, we also acknowledge the people, the people who've lived here the longest, the **xʷməθkʷəy̓əm**, the **Sḵwx̱wú7mesh Úxwumixw**, and the **səlilwətaɬ** people who have received the gifts of these lands the longest and have repaid that love in kind by taking care of these lands as best they could and in such a perfect way that I used to say that they were as good as new when the explorers arrived. But I was corrected by the elders to say that they weren't as good as new.

They were in fact better than new. The people improved the forest health. They improved the salmon spawning areas. They improved the deer habitat, the buffalo habitat. Everything here was beyond the imagination of the explorers when they arrived because of the good work of the people. So we give thanks to all their good work for taking care of these lands in such a good way for 10,000 years and more because now we also get to benefit from the gifts of these lands.

But it also comes with a hope and an expectation and hopefully even a commitment to leave these lands as good as or better than they were provided to us. So with that I say we acknowledge, we give thanks to the good work of the people and to the original gifts of these lands and with that I'll say **All My Relations**. ◄

INTRODUCTION
TRAVIS HANKS
KARI DOW

CO-CHAIRS
URBANARIUM
COMPETITION COMMITTEE

In the current building industry, mass timber and affordability are terms that are **typically mutually exclusive.**

Timber towers are perceived to be, and largely remain a bespoke product that have delivered outstanding carbon reductions, but at a premium cost, while "affordable" construction has leaned toward proven building methods requiring the least amount of specialized knowledge.

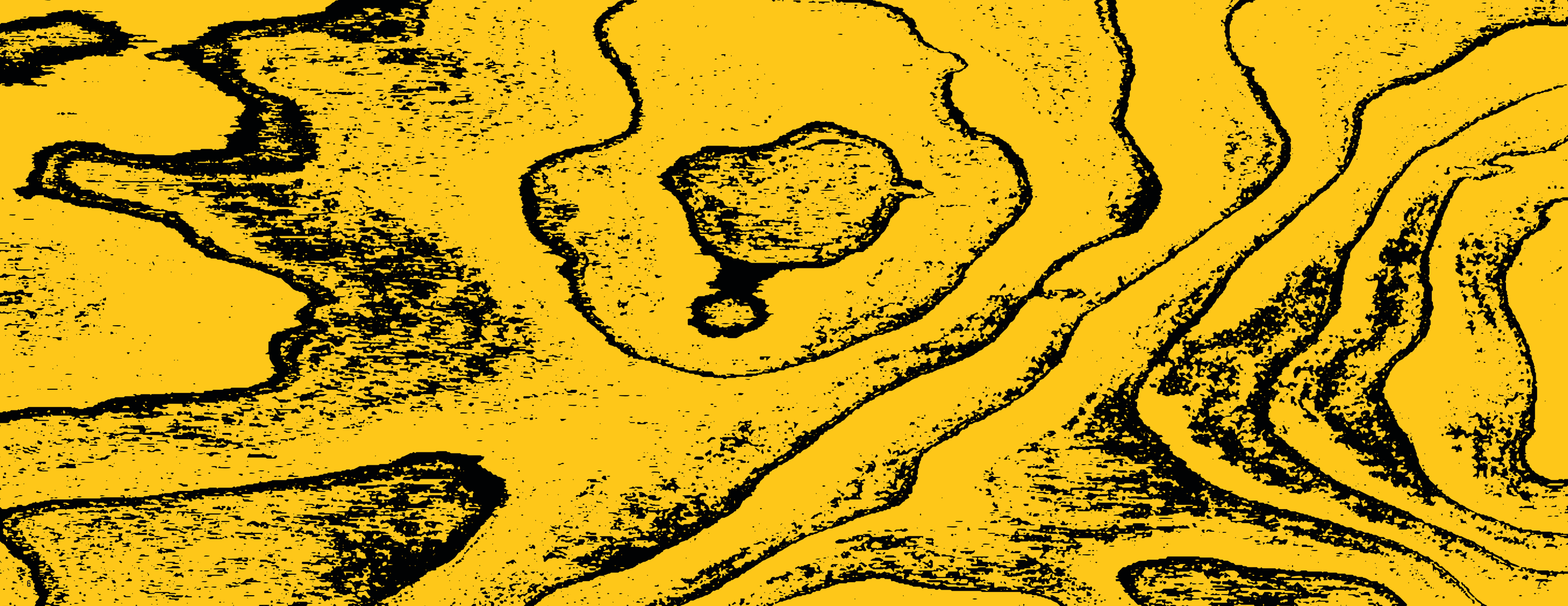
Many high profile demonstration projects have proven the benefits of low-carbon mass timber over concrete or steel, and prefabricated approaches more generally have demonstrated improved construction times, efficient labour usage, and higher quality control. But these projects remain one-offs, not widely scalable solutions.

The Decoding Timber Towers ideas competition (DTT) takes aim at that assertion by asking how surgical changes in the industry can specifically target design and supply chain complexities that stubbornly inhibit the potential of mass timber and pre-fabricated projects, and unlock an industry with the potential to make a large-scale dent in the housing crisis. The input garnered from the design and building industries through DTT seeks to meet the historic land use potential of the TOA mandate with a commensurate potential for large-scale low-carbon housing.

The dream is here: Canada can kickstart demand for engineered timber building components, lowering costs to fuel a housing boom and address climate change, while simultaneously retooling a sustainable forestry sector to reroute tons of soft timber from the US market into locally made value-added mass timber products for distribution across Canada and beyond! It's an elegant solution to multiple intractable problems facing Canada today, but the pathway to implementation is stacked with roadblocks.

Nevertheless, while the vision is ambitious, the focus remains on practical, scalable solutions; roadblocks can be cleared, policy revised, and design innovation can lead the way.

The deeply considered designs and recommendations contained in this volume represent many of the hard discussions and thoughtful compromises that will have to be made to successfully meet this moment. Let's get started. ◄



SITES

A ▶ TOA TIER 1
Frog Hollow Neighbourhood House

- Immediately adjacent to rapid transit and within a 5 minute walk of shops, services, and green space.
- Small block-end assembly of three 50' x 122' lots totalling 18,300 sf. South-facing property fronting onto a mixed use arterial street with lane access at the rear.
- On the shared territories of the Musqueam, Squamish, and Tsleil-Waututh Nations.

B ▶ TOA TIER 2
BC Indigenous Housing Society

- Within a 5 minute walk of rapid transit, shops, services, and green space.
- Large block-end assembly of six 50' x 122' lots totalling 36,000 sf. North-facing property fronting onto a local residential street with lane access at the rear.
- On the shared territories of the Musqueam, Squamish, and Tsleil-Waututh Nations.

C ▶ TOA TIER 2
Sacred Waters Development

- Within a 5 minute walk of rapid transit, shops, services, and green space.
- Small irregular shaped lot, approximately 20,000 sf. South-west-facing property fronting onto an arterial street without lane access.
- On the shared territories of the Katzie, Kwantlen, and Semiahmoo Nations.

D ▶ TOA TIER 3
Tsawwassen First Nations

- Immediately adjacent to a natural area and within a 15 minute walk of rapid transit, shops, services, and green space.
- Large irregular shaped site, approximately 1.5 acres, without lane access. South facing property fronting onto a local residential street.
- On Tsawwassen First Nation lands.

THE BRIEF

Decoding Timber Towers is the fourth ideas competition presented by Urbanarium.

It invited designers, engineers, and builders to rethink how mass timber could move from demonstration projects to mainstream housing delivery. The competition focused on the practical barriers that prevent timber towers from becoming both affordable and scalable, examining how modular, prefabricated, and standardized systems could reduce costs and embodied carbon at the same time.

Entrants were tasked with developing prototypes for 8–20 storey residential or mixed-use buildings. Each team selected one of four fictional Transit-Oriented Area sites, developed with input from First Nations housing partners, to test their design and delivery concepts under realistic conditions.

A standardized concrete tower was developed as the competition's cost and embodied carbon base case, allowing entrants to quantify their proposed reductions through comparative pro forma and carbon analyses.

By coupling affordability and climate action within a single framework, Decoding Timber Towers aims to demonstrate how Canada's forestry, design, and construction sectors can align to deliver sustainable, repeatable solutions for the next generation of housing.

The brief challenged participants to demonstrate how streamlined mass timber systems could accelerate approvals, simplify construction, and improve long-term affordability without compromising livability or design quality. Submissions were also required to identify regulatory, industry, and supply-chain constraints standing in the way of mass timber adoption.

*Entries were judged for their **clarity**, **creativity**, and **technical rigor** — evaluating both design innovation and measurable reductions in cost and embodied carbon.*

The competition's ultimate goal was to generate actionable strategies that align housing affordability, climate responsibility, and construction innovation, charting a path toward widespread delivery of low-carbon, high-quality homes across British Columbia and beyond. ◂

DECODING SUMMARY

The word **Decoding** in the competition title signals Urbanarium's intention to identify potential changes to Building Code, other regulations and policy to realize the opportunities of mass timber construction.

As with the three previous competitions, Urbanarium shares ideas for innovation and change with our sponsors, local and senior governments, and the public that have been flagged by the entries.

Decoding Timber Towers has generated a list of over 35 decoding topics that competitors suggested would enable or improve their design ideas. Below are the top five examples that could immediately reduce costs and increase uptake of scalable low carbon timber buildings:

1. Maximum permitted heights
2. Encapsulation requirements
3. Exterior circulation corridors
4. Code support for atriums and solar chimneys
5. Restrictions on single egress stairs

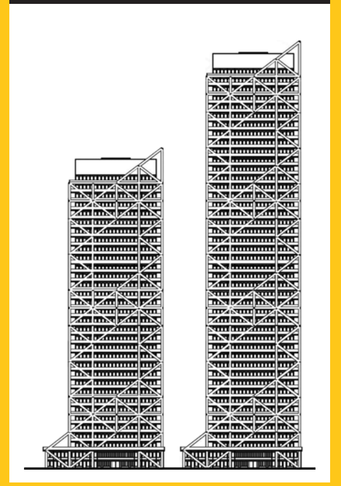
PG PAGE NUMBER
SUBMISSION IS VIEWABLE IN THIS BOOK

REFERENCE NUMBER
SUBMISSION IS VIEWABLE ONLINE AT
DECODINGTIMBERTOWERS.COM

1 INCREASE MAXIMUM HEIGHT

Increase maximum permitted heights of unencapsulated mass timber structures to align with TOA guidelines, and allow mass timber at higher than 18 storeys.

System Eco A-05



2 RETHINK ENCAPSULATION

Rethink encapsulation requirements that limit the ability to fully expose and feature wood in interiors for buildings over 12 storeys in coordination with other fire safety regulations.

Timber Tower Wearing a Greenhouse Coat A-09

3 CIRCULATION CORRIDORS

Exclude exterior circulation corridors from Floor Space Ratio (FSR) calculations to encourage their use and promote their value as amenity and social spaces.

TwoUp PG 48

4 ATRIUMS AND SOLAR CHIMNEYS

Provide code support for atriums and solar chimneys in sprinklered buildings to reduce mechanical equipment for ventilation and cooling and to permit architectural innovation.

Timber Commons PG 16

5 RECONSIDER SINGLE EGRESS STAIRS

Reconsider restrictions on single egress stairs and, in the interim, allow scissor stairs in 6 storey wood buildings to unlock the potential for mass timber on smaller sites.

Bosque Housing A-12

Below are some further examples of **roadblocks** that can be removed and initiatives that can be explored to further unlock the potential for more **affordable low carbon housing**:

BUILDING CODE

BUILDING COMPONENTS

Mass Timber for the Masses — A-10

Consider pre-approved building components or catalogs and associated building official training that can manage risk and accelerate design approvals, permitting, and on-site inspections.

ON-SITE ASSEMBLY

Culture House — PG 32

Consider the potential of on-site assembly of factory components to remove barriers related to building inspections.

STREAMLINED REVIEW

Urban Grain — B-01

Formalize streamlined peer-review/third-party inspection protocols to reduce delays and redundant soft costs.

STICK FRAME MEZZANINES

The Branch Collective — C-02

Explore possibilities of stick frame mezzanines within larger mass timber structures to allow further optimization of timber structures and encourage architectural innovation.

ADAPTABILITY REQUIREMENTS

Solid Void — C-03

Review adaptability requirements for a percentage of bathrooms, kitchens, etc. that limit using modular construction.

MUNICIPAL POLICY & ZONING

BALCONY RESTRICTIONS

The Wooden Tower — C-04

Revisit requirements and restrictions around balconies to promote shared outdoor spaces, better performing balcony construction, and enclosed balconies / ventilated outdoor rooms that are excluded from FSR to protect wood structures.

AMENITY MANDATES

AWR — PG 72

Relax amenity mandates in non-profit housing projects: e.g. a mandate for including a daycare may not be a core activity for a non-profit and therefore a challenge to include.

HOUSEHOLD SIZE

Timberline — A-04

Relax restrictions on household size: allow intergenerational living with units of up to 7 bedrooms to assist with affordability for large families, students, and young professionals.

WINDOW DISTANCE

FAM-1 — PG 64

Relax requirements for distances between windows for privacy to allow light wells (as in many European countries) for access to light and ventilation in deep buildings.

OFF-STREET LOADING

KAPLA — PG 24

Review off-street loading requirements to ensure that they reflect the size of service vehicles in use.

GOVERNMENT INITIATIVES

INVEST IN WOOD

Arbour House — C-08

Invest in wood to diversify supply and stabilize costs: provide provincial and federal grants for labour training and R+D, marketing to external markets, and incentives to housing non-profits and co-ops.

PROVINCIAL HOUSING CORP.

Mass Timber for the Masses — A-10

Establish a provincial housing corporation to help establish a prefab market and unlock potential for timber towers, and enable Tax Increment Financing (TIFs) across BC with a government appointed board.

RISK PRICING

Urban Grain — B-01

Address conservative risk pricing for mass timber that increases builder's risk premiums and financing: expand actuarial data from Canadian and international mass timber projects to demonstrate performance parity in fire and water risk, partner with CMHC and provincial insurers to pilot reduced premiums for projects meeting enhanced moisture and fire protection protocols, and demonstrate lower lifecycle risk to help lenders price more competitively.

VALUES-ALIGNED FINANCING

The Ancestral Peaks — C-01

Adopt Values-Aligned Financing: financing models that explicitly value the long-term social and environmental returns alongside financial ones including "impact investing" or leveraging green bonds/social finance mechanisms that recognize the comprehensive benefits (carbon reduction, community well-being, Indigenous reconciliation, long-term affordability) generated by innovative mass timber and modular housing solutions.

REGIONAL WORKSHOPS

Bosque Housing — A-12

Host regional workshops with industry leaders to ensure engineers, fabricators, and AHJs understand the expectations and limitations of novel approaches such as fire-rated timber shafts and timber lateral systems.

Carbon Wise reviewed the eight Decoding Timber Towers finalist submissions to evaluate and compare embodied carbon performance within a consistent analytical framework.

Reported data from each team were normalized to gross floor area (m^2), separated into above- and below-grade components where possible, and converted to carbon intensity units (kg CO_2 e/m^2).

Each submission was assessed against its reported baseline, representing typical reinforced-concrete construction with zero, one, or two underground parking levels. The teams' own baselines were used as the basis for comparison, as they were functionally equivalent to the corresponding proposed designs.

This approach enabled meaningful comparison between submissions, even where embodied carbon data were based on differing life-cycle scopes (e.g., A1–A3, A1–A5, or whole-life).

TIMBER COMMONS

MT3 TORONTO / CANADA

Ben Feldman, Carol Cochrane, Carol Phillips, Jaewon Kim, Jay Zhao, Jillian Weinberger, Kayley Mullings, Luis Quezada, Phil Silverstein, Will Klassen

Site **A**

FSR **4.9**

Stories **16**

CO_2 **34.68%**

Potential Carbon Reduction

BASED ON EQUIVALENT BASELINE

KEY STRATEGIES

- Eliminate parking
- Flexible kit of prefabricated mass timber components allowing standardization and systemization
- Stackable volumetric modules and pre-assembled "wallumns" and slab cassettes
- Shifting critical work to controlled factory environments
- Potential to create a variety of different housing typologies with the modular parts
- Replicable framework that allows for bespoke responses to site context

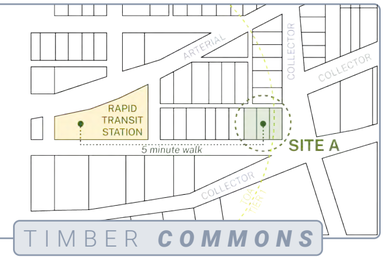
POTENTIAL COST EFFICIENCIES

- Prefab slab cassettes, exterior wall panels, and modular wet spaces can increase cost efficiency at scale compared to conventional concrete construction
- Transferring key construction activities to a controlled factory environment enhances quality control, minimizes site rework, and shortens overall project schedules

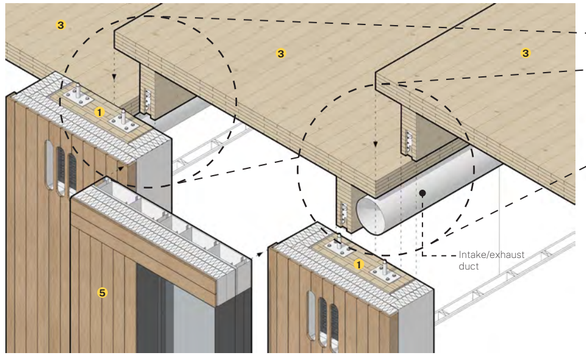
VIEW FROM SOUTH-EAST CORNER

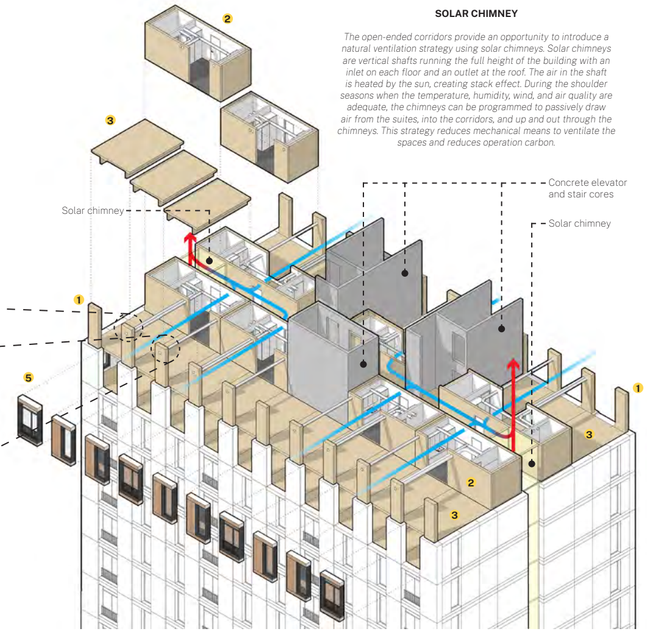
HIERARCHY OF COMMUNAL SPACES

The **Timber Commons** leverages an innovative, low-carbon construction system to deliver affordable housing with efficiency and adaptability. On Site A, the design responds to its context by maximizing density and eliminating parking, creating a visible timber landmark that capitalizes on transit access and the walkable fabric to reduce car reliance. Within, community is fostered through a hierarchy of shared spaces and services. Practical functions like laundry are paired with areas for gathering, play, and performance, cultivating a true vertical village. Built from a flexible kit of prefabricated mass timber components, every decision was guided by three objectives — **affordability**, **sustainability**, and **community**. The result is both a site-specific solution and a replicable framework that confronts the affordable housing and climate crises with a unified approach.



The **Timber Commons** employs a rigorous **kit-of-parts** strategy that reduces cost and accelerates schedule through a high degree of standardization and systemization. **Prefabricated elements** comprise nearly the entire structure and façade, enabling a rapid and orderly construction sequence. Every space type has been assessed for maximum efficiency, leading to a hybrid system: kitchens and washrooms are produced as fully finished, stackable **volumetric modules**, while pre-assembled slab-and-beam cassettes, "wallumns," and envelope panels connect quickly on site to form the rest of the structure and enclosure. The slab cassettes create a deliberate double-beam condition, framing a ceiling channel for services while leaving the remaining underside uncluttered as a continuous wood finish. **All elements are carefully sized to avoid encapsulation**—ensuring that wood is celebrated not only as structure, but as a warm, visible expression throughout the building.





SOLAR CHIMNEY

The open-ended corridors provide an opportunity to introduce a natural ventilation strategy using solar chimneys. Solar chimneys are vertical shafts running the full height of the building with an inlet on each floor and an outlet at the roof. The air in the shaft is heated by the sun, creating stack effect. During the shoulder seasons when the temperature, humidity, wind, and air quality are adequate, the chimneys can be programmed to passively draw air from the suites, into the corridors, and up and out through the chimneys. This strategy reduces mechanical means to ventilate the spaces and reduces operation carbon.

1 EXTERIOR "WALLUMNS"
GLT exposed on one side, CNC'ed wood-to-wood connections and mechanical penetrations

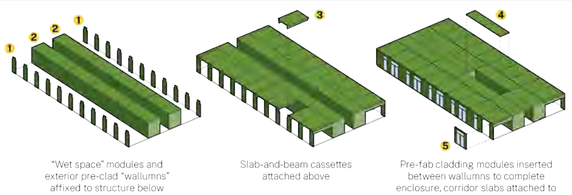
**can be pre-clad*

2 MODULAR "WET SPACE" VOLUMES
Volumetric CLT modules, beamless ceiling spaces allowing for mechanical distribution

3 PRE-ASSEMBLED SLAB CASSETTES
5-ply CLT supported by pre-installed GLT beams, allowing for mechanical distribution between

4 CORRIDOR SLABS
5-ply point-supported CLT, beamless corridor construction allowing for mechanical distribution

5 PRE-FAB CLADDING
Modular system, limited variety of panel types for efficiency

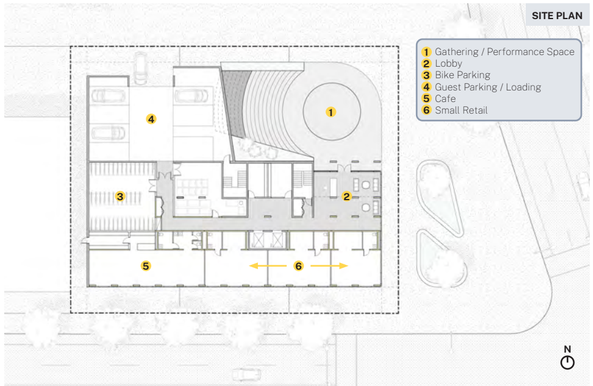


"Wet space" modules and exterior pre-clad "wallumns" affixed to structure below

Slab-and-beam cassettes attached above

Pre-fab cladding modules inserted between wallumns to complete enclosure, corridor slabs attached to complete level

KIT ***ASSEMBLY***



COST & SCHEDULE REDUCTIONS — Our approach combines mass timber elements such as prefabrication slab cassettes, factory-built modular wet spaces, and prefabricated exterior wall panels to reduce costs, shorten schedules, and increase construction certainty in comparison to concrete construction. By shifting critical work into controlled factory environments, we minimize risks tied to site conditions, improve quality, and allow parallel workflows. Mass timber's lighter weight reduces the need for concrete and rebar in foundations and footings, yielding roughly 5% savings below grade and another 5% from the first floor upward. Overall, we predict our strategy could achieve up to a **5% global cost reduction** and a **10% schedule saving**, due to the quality control and efficiencies in prefabrication.

EMBODIED CARBON REDUCTIONS — On average, mass timber provides a 30% reduction on embodied carbon in comparison to concrete. We project that the introduction of prefabricated and modular units could reduce the Embodied Carbon by an additional 5% (**35% total** over concrete) due to reduced waste on site and shipping logistics efficiencies.

STATS	
FSR	4.90
Lot size (sq ft)	18,300
Building sq ft Above Grade	89582
Building efficiency (%)	85
non saleable/rentable (sq ft)	13437.3
saleable/rentable (sq ft)	76144.7
Total Stories above grade (#)	16
Total Stories (#)	16
Base floor (#)	1
Above 1st storey (#)	15
Stories below grade (#)	0
Units (#)	85
Bedrooms (#)	138
Amenity space (sq ft)	7,340
Non-residential (sq ft)	9,348

CONSTRUCTION COSTS						
	Concrete			Submission		
	Sq ft	$/sq ft	Cost	$/sq ft	Cost
Below grade	0	$315	$0	$315	$0
Base floor	10,187	$360	$3,667,320	$362	$3,687,694
Above 1st storey	79,395	$405	$32,154,975	$384	$30,487,680
	Quantity	$/unit		$/unit	
Balconies	0	$25,000	$0	$25,000	$0
	Cost per	# Months	Cost	# Months	Cost
Schedule Costs	$50,000	16	$800,000	12	$600,000
TOTAL			**$36,622,295**		**$34,775,374**

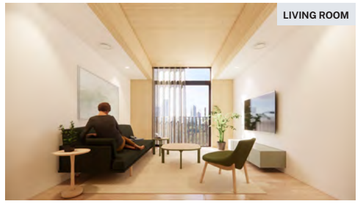
EMBODIED CARBON					
		Concrete		Submission	
	Sq ft	E. Carbon kg/sq ft	Total Carbon	E. Carbon kg/sq ft	Total Carbon
Total Building Sq ft	89582	6.69	**599215.79**	4.37	**391473.34**

While we have opted for a point tower as a response to this project's site constraints, the modular system allows for assembly in varied typologies. Using the same cost- and time-effective kit of parts and sequencing, we can create radically different results that respond to context and need.

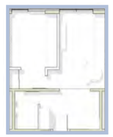
HOUSING ***TYPOLOGIES***

TYPICAL FLOOR PLAN 1

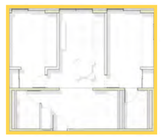
TYPICAL FLOOR PLAN 2



Using the **standard grid module** of 3.05m by 7.6m, we designed 1-, 2-, and 3-bedroom units that assemble into complete floor plates in varied configurations. **Mass timber elements remain exposed**, providing the biophilic warmth of natural wood. Kitchen/washroom modules align with service cores, opening the perimeter to light and air in all living and bedroom spaces. Each home incorporates a Juliet balcony, while private balconies are deliberately omitted. Instead, **exterior space is consolidated into shared terraces**, fostering social connection and ensuring equitable access to outdoor amenity for all residents.

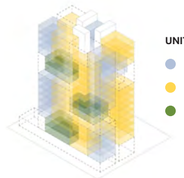


TYPICAL 1-BEDROOM UNIT
530 sq. ft.



TYPICAL 2-BEDROOM UNIT
785 sq. ft.

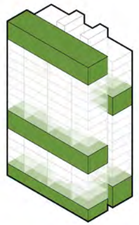
TYPICAL 3-BEDROOM UNIT
990 sq. ft.



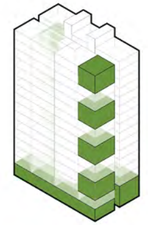
UNIT MIX

- 1-BEDROOM UNITS
- 2-BEDROOM UNITS
- 3-BEDROOM UNITS

PRIVATE ***LIVING***

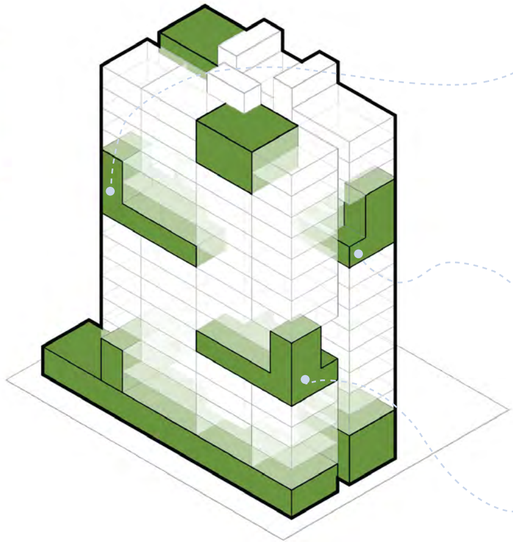


COMMUNAL SPACES DISTRIBUTION
Alternative 1

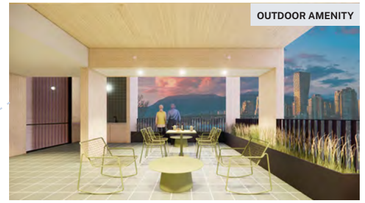


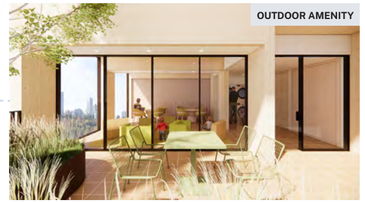
COMMUNAL SPACES DISTRIBUTION
Alternative 2

Generous communal spaces are the heart of the **Timber Commons**. Using the same modular grid, the system supports both interior and exterior gathering areas that can be arranged in many configurations. In this design, **amenities are distributed** vertically in six zones, each pairing interior and exterior functions. These zones combine pragmatic uses, such as laundry, with spaces dedicated to socializing, recreation, and play. Together, they create a true **vertical village**, offering variety from floor to floor and encouraging frequent, casual encounters between neighbors. The richness of these shared environments allows unit floorplans to be efficiently compressed and private balconies to be eliminated, helping reduce per-unit costs. From the outside, these common spaces are expressed as luminous openings within the otherwise ordered grid of the façade, celebrating the **social life at the core of the project**.



COMMUNAL SPACES DISTRIBUTION





COMMUNAL SPACE OPTIONS

BARBECUE & KITCHEN
A communal indoor and outdoor space with a kitchenette, grills, and tables. Neighbors can cook, share meals, and build connections through food in this shared cooking and dining space.

DOG WASH & HOTDESK
A pet-friendly hub combining a dog wash station and flexible hotdesks, supporting pet and pet-owner needs while offering residents a place to work or rest.

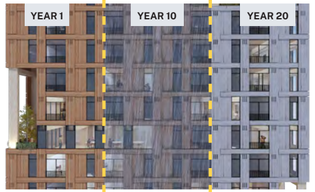
PARTY & GAME ROOM
A playful gathering space with tables, various games, and a bathroom. A lively shared space for celebrations, casual fun, and bonding with friends and neighbours alike.

LAUNDRY & WORK STATIONS
A functional laundry space paired with working stations, allowing residents to read, study, or work productively while waiting for their laundry cycle to complete.

LAUNDRY & TABLE TENNIS
A social space where laundry meets leisure, encouraging neighbourly interaction and fun as residents complete their everyday household chores.

COMMUNAL ***LIVING***

While the modular system establishes a **replicable framework** adaptable to many sites, it is equally important that it allow **bespoke responses to each context**. At **Site A**, this meant shaping a tall urban form tight to the prominent corner, creating **a density-appropriate landmark** visible from multiple view corridors while clearing a sheltered area for ground-level connection. Along the north and west edges, **stepped performance terraces** and an **elevated gathering space** animate the public realm while concealing servicing and bike parking. The roof restores green space otherwise lost to the footprint, providing allotment gardens and terraces for residents. **Cladding** becomes another site-specific gesture: a **prefabricated wood system** that celebrates BC's timber industry, reduces embodied carbon, and weathers gracefully into a silvered patina. Though fire-treated to European precedent standards, this system would currently challenge BC's building code, positioning the project as both **a model and a provocation for regulatory evolution**.



WOOD CLADDING WEATHERING

SITE-SPECIFIC ***FEATURES***

"Timber Commons goes **beyond modular efficiency** by incorporating integrated sustainable systems and community spaces."

JURY COMMENTS

Timber Commons stood out to the jury with its multifaceted approach to the competition requirements and its creative, forward-looking proposals.

The design introduces a true kit-of-parts that thoughtfully integrates volumetric units, floor cassettes, and prefabricated structural façade elements. This adaptable system allows for diverse interpretations across different sites, offering both flexibility and repeatability.

Timber Commons goes beyond modular efficiency by incorporating integrated sustainable systems, including a solar chimney for natural ventilation. Importantly, the project reframes affordability not only in financial terms, but in the dignity of belonging: weaving together community spaces and creating places where people can thrive.

DIGITAL PRIZE RATIONALE

The **Timber Commons** team's understanding of modular and flat pack structural capabilities led to the development of a scheme that demonstrates a high level of systemization shifting critical work into controlled factory environments.

The jury noted that this team had drilled down to understand present challenges and streamline tall timber construction. The proposal offers flexibility for use in design of different building typologies and allows differing site interpretations.

With development, the kit-of-parts is almost implementable tomorrow.

KAPLA

TEAM SOFTWOOD CANADA-WIDE

Conrad Speckert, Glenn Lu,
Jennifer Davis, Joshua Giovinazzo

Site **A**

FSR **5.0**

Stories **20**

CO_2 **42.37%**

Potential Carbon Reduction
BASED ON EQUIVALENT BASELINE

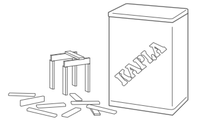
KEY STRATEGIES

- Two-storey concrete podium with an 18-storey mass timber tower above meets current BC Building Code requirements and addresses risks such as flooding and electric vehicle fires
- Non-structural stud partitions allow for reconfiguring of layouts
- 5-ply slab thickness
- Occupant evacuation elevator

POTENTIAL COST EFFICIENCIES

- Simplicity and repetition of KAPLA blocks can streamline design, fabrication, and construction enabling economies of scale in both manufacturing and procurement for future projects
- Standardization of simple components can speed production and establish a consistent inventory of repeatable elements to improve supply chain logistics

KAPLA



The original "Kapla" blocks are a toy construction set of identical wood planks measuring 11.7cm x 2.34cm x 0.78cm. It is a fun and simple modular system for children and adults.

Mass timber towers are not quite so simple, but our design is grounded in this modularity.

The building is a rectangle, optimized to the typical dimension of a 10' (3.05m) CLT panel width. The unit layouts align carefully with the glulam column grid and the facade is panelized accordingly. This is not sculptural architecture, there are no structural gymnastics. The beauty is in the material itself and the sustainable industry it supports.

That's why Kapla's proudest moment is during construction.

20 storeys (63.2m)	Building Height	80	Dwellings
525m²	Building Area	200	Bedrooms
10,140m²	Gross Floor Area	2	Elevators
8,500m²	Residential GFA	4	Car Parking
5.0	Density (FSI)	160	Bike Parking

A SIMPLE, SKINNY EXTRUSION UNLOCKS THE SITE

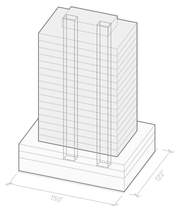
Kapla has a much smaller floorplate than typical high-rise projects, made possible by the compact vertical circulation core commonly known as a "Point Access Block" with a single exit stair and two elevators.

Rather than a dozen or more units along a long hallway, this compact tower has 4 to 6 dwellings per storey, so that most of the homes get a large corner balcony and living space as well as daylight and fresh air from multiple sides.

The skinny building also means smaller shadows on adjacent properties and is in keeping with the rhythm of narrower mixed-use buildings on 50' lot widths along the street. The simple structural grid also avoids costly and carbon-intensive load transfers over the long-span space of the theatre.

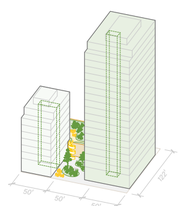
The result is a highly efficient tower that unlocks more outdoor space for the public at street level.

TYPICAL TOWER + PODIUM
"DOUBLE-LOADED CORRIDOR"



750m² residential floorplate
95% lot coverage

KAPLA TOWER
"POINT ACCESS BLOCK"



510m² residential floorplate
67% lot coverage

A HYBRID STRUCTURE ACHIEVES HEIGHT & SAFETY

The BC Building Code prescribes a maximum building height for encapsulated mass timber (EMTC) buildings up to 18 storeys, exposed mass timber up to 8 storeys and light wood-frame construction up to 6 storeys. However, the current limit of 18 storeys is a risk threshold established by the height of UBC Brock Commons and can be exceeded through performance-based design.

We propose to achieve the same risk tolerance by providing a 2-storey concrete podium and 18 storeys of mass timber above, aligned with the permitted building height of 20 storey in the TOA Tier 1 Policy Area. This noncombustible podium also inherently addresses other risks such as floods, explosions and electric vehicle fires.

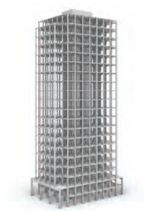
Although an entirely mass timber building is conceptually simpler and maximizes carbon sequestration, Kapla also has a hybrid structural design with a noncombustible vertical circulation core (exit stair, elevator shafts) to address fire and seismic risks in the lower BC mainland.

[1] Table 1: Social Cost of Greenhouse Gas Estimates – Interim Updated Guidance for the Government of Canada

MORE CARBON SEQUESTRATION THAN CONCRETE EMISSIONS

Emissions have been calculated using the Fast+Epp Embodied Carbon Calculator. The scope is limited to the structural system of the 20-storey residential tower only and does not include below-grade basement or foundation systems. Kapla uses 72% less concrete than a typical tower and achieves a net negative carbon balance if carbon sequestration in wood products is included in the calculation.

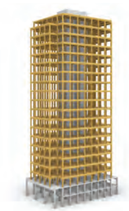
The current estimated social cost of carbon emissions is $271 per tonne [1] !!



78.6
$kgCO_2eq/m^2$

494,540 $kgCO_2eq$	Concrete Slabs *(200mm, 35 MPa + 80kg rebar/m³)*	1,515.6m³ 326.3 $kgCO_2eq/m3$
64,920 $kgCO_2eq$	Concrete Posts *(275x275, 35 MPa + 100kg rebar/m³)*	219.4m³ 295.9 $kgCO_2eq/m3$
158,099 $kgCO_2eq$	Concrete Core *(200mm, 35 MPa + 100kg rebar/m³)*	534.3m³ 295.9 $kgCO_2eq/m3$
85,463 $kgCO_2eq$	Concrete Podium *(35 MPa +125kg rebar/m³)*	230.8m³ 370.3 $kgCO_2eq/m3$
803,022 $kgCO_2eq$	total upfront concrete emissions	2,500m³ total concrete volume
$217,610	estimated social cost of GHG emissions [1]	

emissions factor, concrete structure of typical towers
same building height and 10x10 column grid



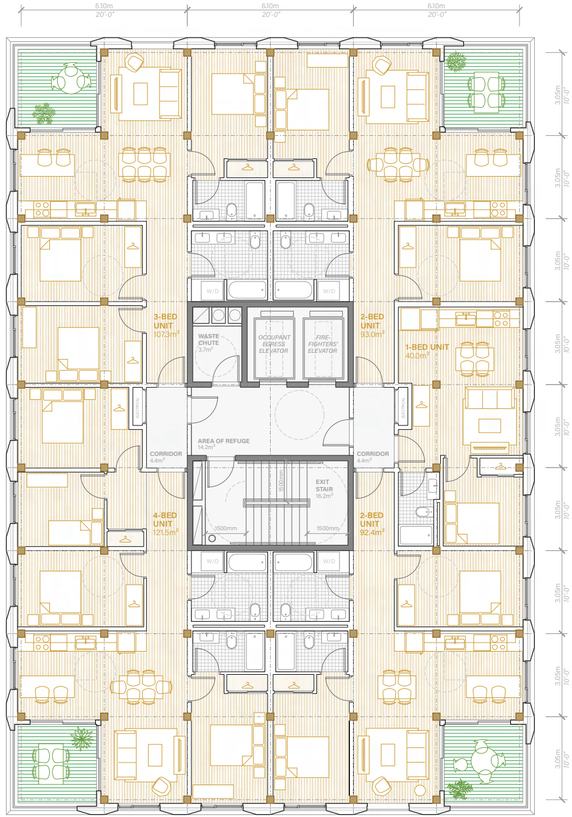
-0.98
$kgCO_2eq/m^2$

175,894 $kgCO_2eq$	CLT Slabs *(175mm, 5-Ply, 10ft wide)*	1,283.9m³ *1370 $kgCO_2eq/m3$ (slab topping excluded)*
24,873 $kgCO_2eq$	Glulam Beams *(260 x 336mm Douglas Fir)*	181.3m³ *1372 $kgCO_2eq/m3$*
35,752 $kgCO_2eq$	Glulam Posts *(305x315mm Douglas Fir)*	260.6m³ *1372 $kgCO_2eq/m3$*
158,099 $kgCO_2eq$	Concrete Core *(35 MPa + 100kg rebar/m³)*	534.3m³ *295.9 $kgCO_2eq/m3$*
68,371 $kgCO_2eq$	Concrete Podium *(35 MPa +125kg rebar/m³)*	184.6m³ 370.3 $kgCO_2eq/m3$
236,519	total mass timber embodied carbon	
226,470	total upfront concrete emissions	
(10,049) $kgCO_2eq$	net balance with carbon sequestration	

emissions factor, hybrid structure of KAPLA tower
incl. sequestration (45.3 $kgCO_2eq/m^2$ excl. sequestration)

ADAPTABLE & ACCESSIBLE LAYOUTS

The typical floor plan is a diverse mix of one to four-bedroom units. Each of the corner units has a barrier-free adaptable bathroom, bedroom and living space. The symmetry of the design also makes it easy to merge two of the units to create a co-housing arrangement of up to 7 bedrooms. The non-structural stud partitions allow for new openings to interconnect or reconfigure the layouts for a variety of family structures and help families stay in their community as they grow or contract during different stages of life.



REVEALING THE BEAUTY OF MASS TIMBER

Exposed Ceilings: Whereas the BCBC allows a maximum of 25% of the ceiling in each suite to be exposed, we have exposed 50 to 100% of the ceiling, beams and posts in the living areas. The slabs are increased from 3-ply to 5-ply thickness to achieve the required 2-hour char time. This province should adopt proposed changes to the national model building code[2] based on fire testing that demonstrates the existing code is *"now conservative in nature and can be safely expanded to provide additional options..."*

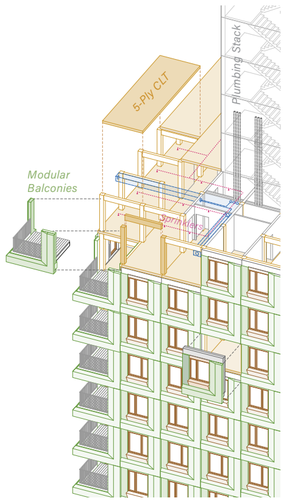
[2] CBHCC. Proposed Change 1870. https://cbhcc-cchcc.ca/

SAFETY FOR PEOPLE WITH REDUCED MOBILITY

In spite of 1 in 10 Canadians having a mobility disability, the code assumes people are able to use stairs to leave buildings in an emergency. KAPLA's design makes sure no one is left behind.

Egressibility: We have provided an occupant evacuation elevator (OEE) in addition to the firefighter's elevator so that persons with disabilities are able to independently and safely evacuate the building without assistance. This means updating building codes and technical standards to accommodate OEE options.

Single Exit Stair (SES): British Columbia limits SES to 6 storeys in height, whereas the 20-storey KAPLA building has a single exit stair based on examples in Sweden, Switzerland, Austria and Germany. The stair width is significantly increased, the elevator lobby is a separate area of refuge from the corridors, and a mechanical smoke control system is provided to achieve a better level of safety than the prescriptive code.



BUILDING A COMPLETE COMMUNITY

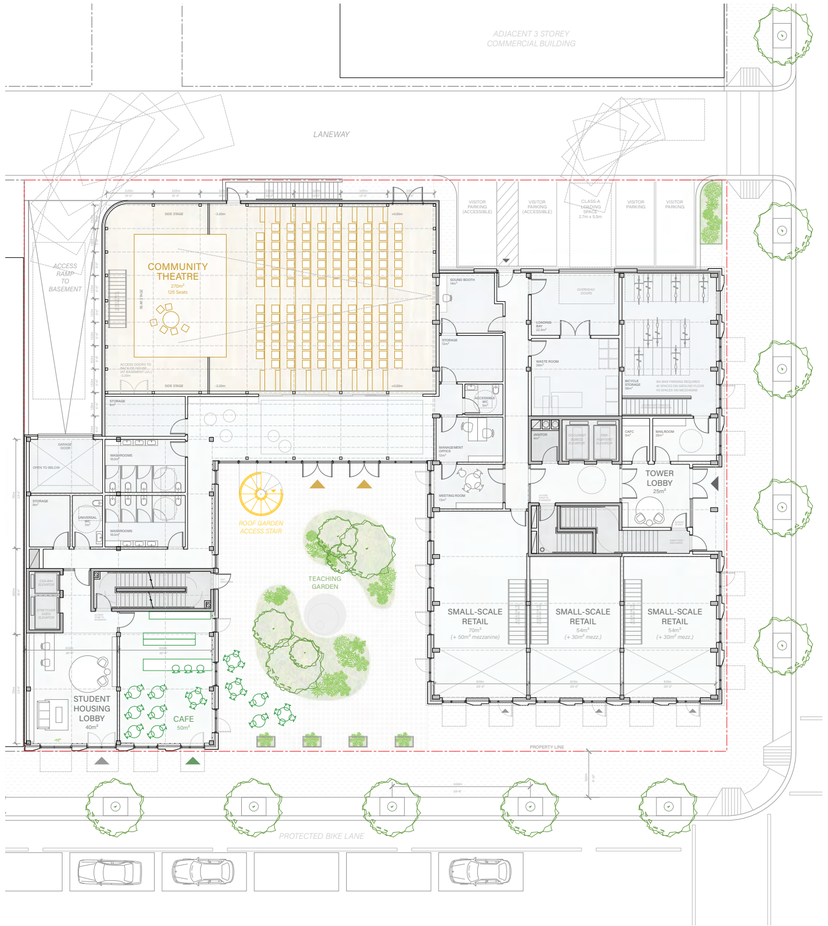
Community Theatre
The 'Kapla Playhouse' is a small theatre for local events. The warmth of the glulam structure and nail-laminated timber ceiling creates a welcoming glow visible from the street. All the back-of-house areas are at the basement level. The fire alarm system is customized for the bypass of smoke detector activation during indigenous smudging ceremonies.

Teaching Gardens
The buildings frame an outdoor space landscaped with plantings that are significant to the Musqueam, Squamish, and Tsleil-Waututh Nations. Native species such as Sitka Spruce, Pacific Crabapple and Vine Maple trees are arranged around a circular reflecting pool. The landscape extends up onto the roof of the community theatre as a garden of sage, cedar, sweetgrass and other native herbs. The deep glulam beams of the theatre are sized to handle the weight of the green roof and the edge of the basement is pulled back from the root balls of street trees.

Cars and Bicycles
Given the location of the site near transit and the cost/carbon intensity of parking garages, the building does not have resident parking. There are four visitor parking spots and 160 bicycle parking spaces (two per dwelling). 45 short-term spaces are on the ground floor and the remaining 115 long-term spaces can be accessed by stair and elevator on the mezzanine level. Additional storage space is in the basement.

Off-Street Loading Space Regulations
Different cities in the lower BC mainland and across Canada have different size requirements for garbage pick-up and loading bay areas. Smaller garbage trucks have a smaller turning radius, making a lot more space available for other uses on the ground floor.

Student Housing
The smaller mid-rise building provides 40 rooms of student housing for a nearby trades college. This includes a kitchen and dining hall beside the rooftop amenity terrace and ground floor lounge with adjacent cafe. At 8 storeys in height, the building code (BCBC 3.2.2.93) allows the mass timber posts and ceiling to be fully exposed.



UNITIZED FACADE PANELS & CAREFUL USE OF COMBUSTIBLE CLADDING

The facade is mostly required to be noncombustible, however combustible cladding is permitted for 100% of the first storey within 15m of a street and on small portions of the upper storeys if it is not contiguous over multipe storeys and is separated horizontally by a distance of at least 2.4m from any adjacent portions. The arrangement of the wood cladding panels is defined by these conditions.

INVENTORY OF REPETITION
(residential tower only)

792 5-PLY (175mm) CLT Slabs
440 linear ft per storey (10' spans, 20' to 40' panels)

504 Glulam Beams (260x336mm Douglas Fir)
28 beams per storey (2.75m span)

972 Glulam Posts (305x315mm Douglas Fir)
54 posts per storey (2.95m height)

396 Facade Panels (ACM Panel on Steel Stud)
(3 variations of window and inset cladding details)

72 Corner Balconies (Prefabricated Steel Frame)
4 per storey

144 Sliding Glass Door Wall Panels at Balconies
8 per storey

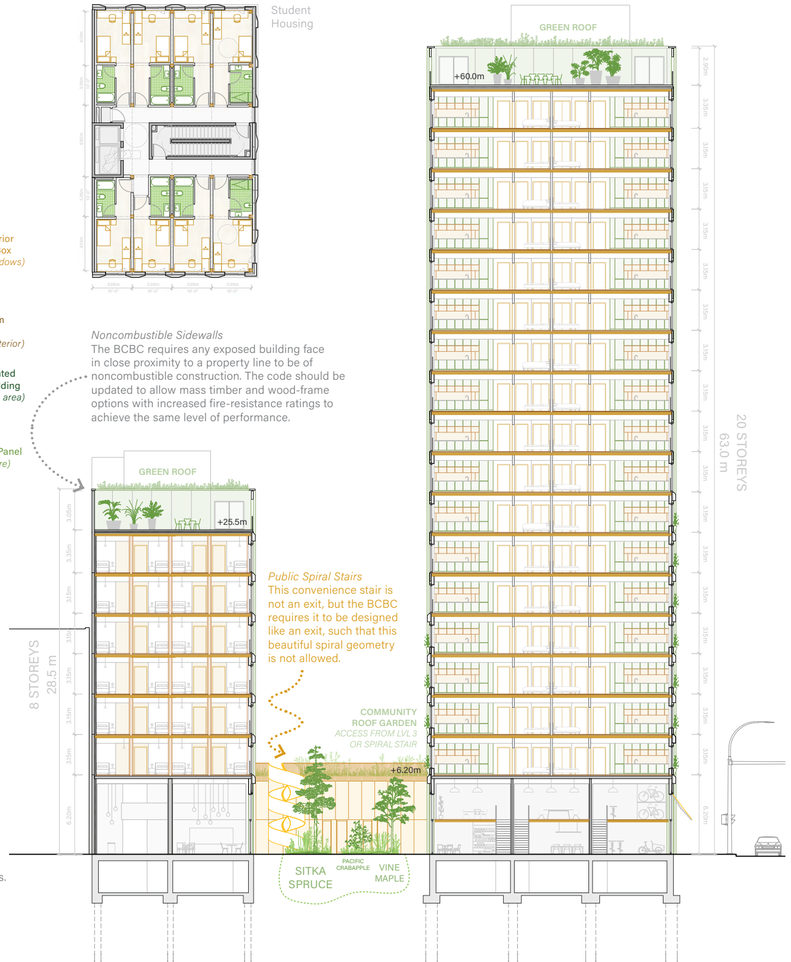
80 Linear Kitchens
5 per storey (semi-modular, shorter run in 1-bed units)

160 Modular Bathroom Pods
(two variations, barrier-free/adaptable and regular)

64 Window Sill Planter Boxes
on lower storey windows only

1,200 Sprinklerhead Count (NFPA 750 Water Mist Type)
average of 60 per storey (pipefitter to install)

Water Mist Systems
The use of water mist systems (NFPA 750) is subject to alternative solutions compliance because Canadian building codes only reference NFPA 13. Water mist systems reduce post-fire water damage and mold risks.



Noncombustible Sidewalls
The BCBC requires any exposed building face in close proximity to a property line to be of noncombustible construction. The code should be updated to allow mass timber and wood-frame options with increased fire-resistance ratings to achieve the same level of performance.

LOWER CONSTRUCTION COST PER BEDROOM

Kapla is situated on a smaller site than the Urbanarium's mass timber base case, reducing land costs. Our design has less dwellings but more bedrooms and bigger balconies. The small basement, compact core and exposed ceilings compensate for the complexity of hybrid construction.

PRO FORMA ANALYSIS	BASE CASE		KAPLA		NOTES
Building Type	18 Storey EMTC Tower		20 Storey Hybrid Tower		*hotel and theatre excluded*
FSR	5.0		5.0		*incl. permitted GFA exclusions*
Lot Size	25,540	sq.ft.	18,300	sq.ft.	
Building Area	7,094	sq.ft.	5500	sq.ft.	*Kapla residential tower only*
Lot Coverage	28%		30%		*Kapla residential tower only*
Building Height	18 storeys	above grade	20 storeys	above grade	
	2 storeys	below grade	1 storey	below grade	
GFA (above grade)	127,700	sq.ft	110,000	sq.ft.	*Kapla residential tower only*
Efficiency	85%		89%		*SES compact circulation*
Residential Area	108,545	sq.ft.	88,110	sq.ft.	
Non-Residential Area	19,155	sq.ft.	20,390	sq.ft.	*incl. circulation, amenity, etc.*
Amenity Area	850	sq.ft.	1,500	sq.ft.	
Basement Area	14,189	sq.ft.	5,500	sq.ft.	
Dwellings (#)	86		80		
Average Unit Size	1,262	sq.ft.	1,101	sq.ft.	
Bedrooms (#)	178	(2.07 beds/unit)	200	(2.5 beds/unit)	

CONSTRUCTION COST	*$/sq.ft.*	*Total Cost*	*$/sq.ft.*	*Total Cost*	
Basement	$299	$4,242,478	$299	$1,644,500	*smaller basement area in Kapla*
Ground and Mezzanine	$403	$2,859,061	$360	$3,690,000	*concrete podium in Kapla*
Upper Storeys	$431	$51,980,994	$450	$44,550,000	*exposed ceilings, concrete core in Kapla*
	$/balcony		*$/balcony*		
Balconies (1x per dwelling)	$25,000 (small)	$2,150,000	$45,000 (big)	$3,600,000	*larger prefabricated balconies in Kapla (80 sq. ft. each)*
	# of months		*# of months*		
Overhead ($50,000 monthly)	16	$800,000	14	$700,000	*smaller basement, repetitive structure and plan in Kapla*
CONSTRUCTION ONLY		**$62,032,533**		**$54,454,500**	*smaller overall GFA in Kapla*
SOFT COSTS (design, approvals, legal)					
25% of construction cost		$15,508,133		$13,613,625	
LAND COSTS	*property area*		*property area*		
assume $250/sq.ft.	25540 sq.ft.	$6,385,000	18300 sq.ft.	$4,575,000	*smaller site for Kapla*
DEVELOPMENT CHARGES	*$/unit*		*$/unit*		
avg. DCC in lower BC mainland	$31,645	$2,721,470	$31,645	$2,531,600	*applicable for apartments 5+ storeys (Vancouver)*
TOTAL PROJECT COST		**$86,647,137**		**$75,174,725**	Δ $11,472,412
cost per sq.ft.	127,700 sq.ft.	$788	110,000 sq.ft.	$683	Δ $104
cost per dwelling	86 dwellings	$1,083,089	80 dwellings	$939,684	Δ $143,405
cost per bed	178 beds	$486,782	200 beds	$375,874	Δ $110,908

LIMITED EQUITY HOUSING CO-OPERATIVE

Kapla will be developed by a non-profit developer supported by low-cost loans and mortgage insurance from the CMHC and BC Housing. The homes will be sold at-cost without typical developer profit (12-20%) and marketing expenses (3-5%). Some of the units will be sold to a "scattered" community land trust, others will be sold to the market under a restrictive covenant known as an LEHC (limited equity housing co-operative).

The purchaser benefits from buying the home at-cost, but the LEHC means that the future market value of the home is indexed to inflation and cannot be resold above this assessed value.

The units that are purchased by the community land trust are rented out at-cost. As the mortgages held by the land trust are paid down, the rents remain constant and subsidize future acquisitions of the land trust, while also becoming lower rents relative to the market over time.

This particular model recognizes that new construction is very expensive and it is very difficult to build new affordable housing without major government subsidies. The benefits of an LEHC, land trust and non-profit development model are combined to remove the project from speculation and focus on making Kapla increasingly affordable over time.

"Kapla Blocks is a great example of how **performance-based alternatives** can create more low-carbon and more beautiful housing."

JURY COMMENTS

Juror Richard Henriquez's comment expressed an all-jury sentiment, "This project actually looks like a timber tower!"

With a concrete podium and 18 storey tower, the scheme was incrementally sensitive to its urban context. Floor plans showed modular efficiency with steel pre-fab clip-on balconies and exposed ceilings.

The single exit staircase for all 18 floors followed a European precedent demonstrated safe through over a hundred years of use in Europe.

KAPLA combines a limited equity housing co-operative, land trust and non-profit development model to remove the project from speculation and focus on making this housing increasingly affordable over time. It is a great example of how performance-based alternatives can create more low-carbon and more beautiful housing.

CULTURE HOUSE

637427 VANCOUVER, CANADA

Aster Cai,
Elvis Lin

Site **A**

FSR **8.0**

Stories **20**

CO_2 **40.06%**

Potential Carbon Reduction
BASED ON EQUIVALENT BASELINE

KEY STRATEGIES

- Establishing temporary site-adjacent factories
- Combination of panelized and volumetric prefabrication to balance efficiency, cost-effectiveness and quality
- Shared neighbourhood planning: shared parking infrastructure and amenity programing across developments to avoid redundancies and diversify shared resources

POTENTIAL COST EFFICIENCIES

- Panelized systems reduce transportation and handling costs while preserving design flexibility, whereas volumetric modules accelerate on-site installation, reducing labour requirements and schedule duration
- The temporary assembly facility further enhances cost performance by localizing production, reducing transportation costs, and enabling concurrent fabrication and site preparation.

A mix of cultural spaces that activate the pedestrian-friendly laneway

CULTURE-HOUSE

Located within a developing Transit-Oriented Area, the project is tasked with delivering a high-density, mixed-use development while embracing the rich local and Indigenous culture. Our proposal seeks collective efforts to address this design challenge. From housing providers, Indigenous artist groups, and local residents to design professionals, prefabrication specialists, and government agencies, the collaboration extends from neighbourhood planning to site-specific operations.

The project includes residential and cultural spaces that work together to create a hybrid, vibrant, and inclusive community. It is a place that celebrates local and Indigenous culture, prefabricated building technologies, and sustainability. The project challenges current building codes and policies to unlock the full potential of mass timber construction, proposes alternative prefabrication methods to reduce construction time and costs, and provides a healthy living environment as well as community cultural spaces.

COLLABORATIVE DEVELOPMENT FRAMEWORK

ESTABLISH COMMON VALUE

Co-development partnership is formed between **non-profit housing provider** and **Indigenous artist group** with common objectives to provide affordable housing for local community and promote Indigenous art culture, as well as celebrating various cultures within the community.

FUND AND LAND SECUREMENT

Joint effort made between the housing provider and artist group in **applying for project funding and land**, through government art and housing agencies such as BC Arts Council and CMHC, strengthening project viability and public support.

PROGRAM PLANNING

Artist group helps lead public consultation to build **creative cultural spaces** and programs tailored to local needs, while housing provider engages with prospective tenants to determine **various housing needs**. The coordinated program decisions help housing and cultural spaces complement each other, creating shared value for the wider community.

DESIGN AND CONSTRUCTION

Collaborative engagement with **design professionals and project builders** throughout the design and construction process to make cultural and housing visions integrated into the built spaces.

ENEGAGE COLLABORATORS

Art & Culture Institution
Provide art education, curate exhibitions, and host performance events rooted in local and Indigenous culture.

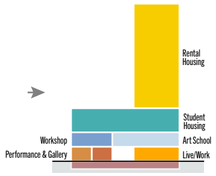
Art Entrepreneurs
Bring creative energy, diverse artisit practice, and cultural programming that enrich the community and foster economic vitality.

Indigenous Communities
Offer art, storytelling, and intergenerational knowledge sharing that strengthen the community identity and deepen its connection to the land.

Program Development

Artist Space ↔ Shared Amenity ↔ Living Space

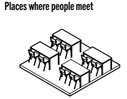
- Art School
- Artist Live/Work (Working)
- Creative Workshop
- Gallery
- Performance Space
- Communal Walkway
- Rental Housing
- Student Housing
- Artist Live/Work (Living)



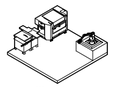
Program Overview

Rental Housing	103,550 sq.ft.
Student Housing	15,320 sq.ft.
Artist Live/Work	12,020 sq.ft.
Art School	9,020 sq.ft.
Workshop	2,490 sq.ft.
Performance Space	2,250 sq.ft.
Gallery	1,790 sq.ft.

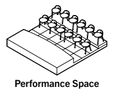
Places where people meet



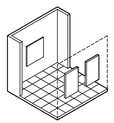
Art School
Places where ideas, knowledge, and experiences are shared and passed on.



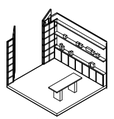
Workshop
Offer hands-on opportunities to create, learn, and collaborate.



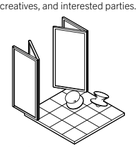
Performance Space
Open venue for hosing community and art events.



Gallery
Flexible spaces to showcase works by Indigenous artists, local creatives, and interested parties.

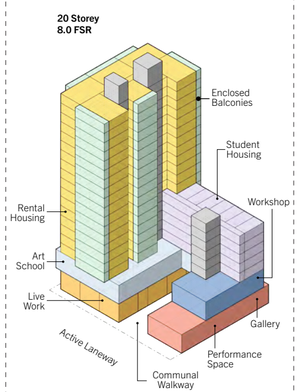


Live Work
Ground-oriented artist creative space with affordable living unit above.



Communal Walkway
Outdoor gathering spaces for performances, pop-up markets, and festival.

Creating high-density, mixed-used development



PROMOTE COMMUNITY INTERACTIONS

CO-FACILITATE OPERATION

Partnership between housing provider and artist group continues to ensure the building supports diverse community needs in the long run. **Revenue-sharing** agreements established between housing and art components to **balance operating costs** and maintain long-term affordable lease for both residential and artistic tenants.

Further collaboration with surrounding and future developments...

HYBRID CONSTRUCTION AND SHARED NEIGHBOURHOOD PLANNING

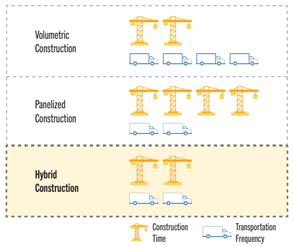
We propose a hybrid construction approach that combines panelized and volumetric prefabrication to balance efficiency, cost-effectiveness, and quality. Panelized construction offers lower transportation costs and greater design flexibility, while volumetric construction enables faster on-site installation with higher precision. By integrating both methods, developments can reduce overall construction time, lower costs, and minimize the carbon footprint.

This hybrid approach is realized by **identifying and establishing temporary site-adjacent factories** on select parcels to support production for neighbouring projects with earlier development timelines. These facilities would assemble panelized prefabricated components and other building elements into completed volumetric modules before lifting them into place on nearby sites. This strategy reduces transportation logistics while maintaining high construction quality in a controlled factory environment. Incentives could be introduced for hosting parcels, such as reduced Community Amenity Contribution charges when the hosting site transitions to its development phase.

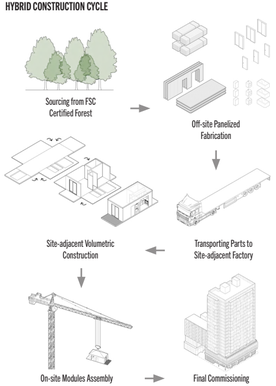
As sites across the Transit-Oriented Area come to development, further collaboration among projects can reduce construction costs and unlock mixed-use potential. For example, developments could **implement shared parking infrastructure**, consolidating vehicular access to fewer entry points. This would free the ground plane for safe and pedestrian-friendly laneways, creating vibrant public spaces connecting to transit stations. An interconnected parking network and reduced access ramps would improve land efficiency, lower construction costs, and reduce overall parking requirements.

Similarly, **amenity programming** can be coordinated to diversify shared resources, avoid redundancy, and enrich the neighbourhood fabric. Instead of replicating standard amenity spaces in every building, each development could host distinct facilities - such as fitness centres, co-working spaces, childcare, or cultural venues - made accessible to all residents through shared-use agreements.

PREFABRICATION CONSTRUCTION COMPARISON



HYBRID CONSTRUCTION CYCLE



HYBRID STRUCTURAL STRATEGY

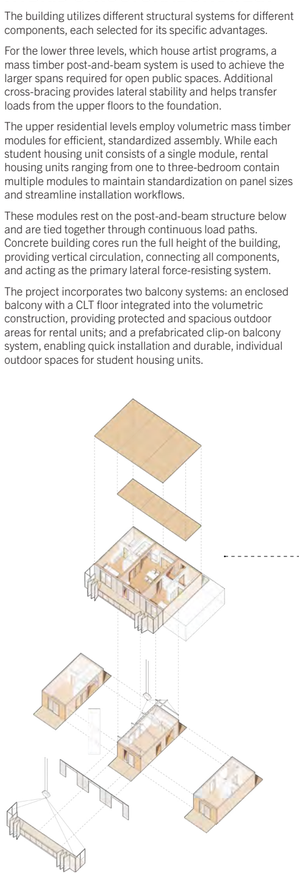
The building utilizes different structural systems for different components, each selected for its specific advantages.

For the lower three levels, which house artist programs, a mass timber post-and-beam system is used to achieve the larger spans required for open public spaces. Additional cross-bracing provides lateral stability and helps transfer loads from the upper floors to the foundation.

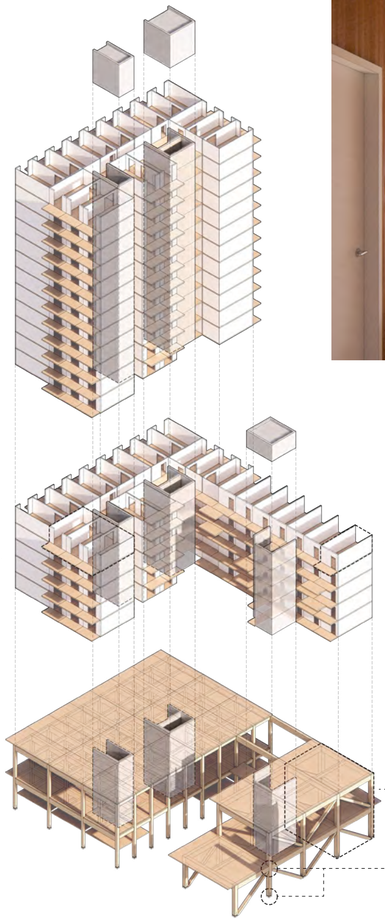
The upper residential levels employ volumetric mass timber modules for efficient, standardized assembly. While each student housing unit consists of a single module, rental housing units ranging from one to three-bedroom contain multiple modules to maintain standardization on panel sizes and streamline installation workflows.

These modules rest on the post-and-beam structure below and are tied together through continuous load paths. Concrete building cores run the full height of the building, providing vertical circulation, connecting all components, and acting as the primary lateral force-resisting system.

The project incorporates two balcony systems: an enclosed balcony with a CLT floor integrated into the volumetric construction, providing protected and spacious outdoor areas for rental units; and a prefabricated clip-on balcony system, enabling quick installation and durable, individual outdoor spaces for student housing units.



Rental Housing - Consist of multiple prefabricated volumetric construction modules assembled together, with enclosed balconies installed on site.

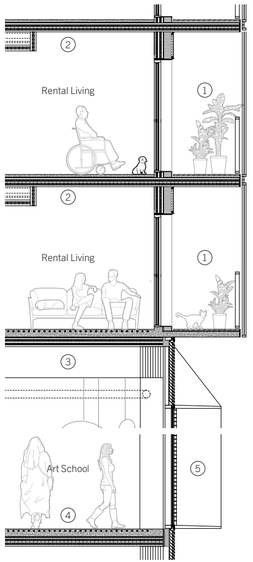


Student Housing - Volumetric construction modules with prefabricated bolt-on balconies.

Artist Spaces - Post-and-beam system allowing larger spans and flexible open uses.

Mass timber post and beams with cross-bracing for lateral stability.

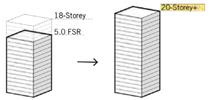
Interior view of rental living space with natural wood finishes from CLT floor and walls



1. Enclosed balcony is used to protect CLT floor and provide usable outdoor space all year around.
2. Exposed CLT floor provides natural wood finish to indoor and outdoor living spaces, while additional CLT bulkhead contains horizontal services and enhances fire separation.
3. Post-and-beam structure is used above the art school and workshop for open space and to transfer load from the floors above.
4. A reinforced concrete topping is applied over the CLT floor to increase the fire-resistance rating and to act compositely with the timber in carrying compressive forces as part of an integrated floor system.
5. A combination of louver screens and canopies is used to diffuse daylight and control solar heat gain.

DECODING BUILDING POLICIES

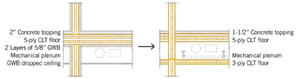
1. Align Building Height with Provincial TOA Policy
Reference: TOA Policy, BC Building Code 3.2.2.93
The BC Building Code currently permits mass timber buildings up to 18 storeys, yet the Provincial Transit-Oriented Areas (TOA) Policy sets a *minimum* allowable building height of 20 storeys within Tier 1. This misalignment represents a missed opportunity for mass timber to reach its full development potential in TOA-designated areas. Mass timber buildings exceeding 20 storeys have already been proven achievable around the world. With established structural and fire safety precedents, **updating the BC Building Code to align with TOA policy** is both feasible and advantageous.



2. City-wide Zoning and Development Framework Update
Reference: TOA Policy, Municipal Zoning Bylaw
A city-wide zoning change for TOA areas that align with provincial policy can **eliminate the need for site-specific rezoning**, significantly reducing permitting time and development costs.
Currently, some municipal frameworks impose both height and density limits, with developments triggering rezoning if either threshold is exceeded. Recent TOA project examples have shown that while a 20-storey building complies with the height requirement, it often exceeds the 5.0 FSR density set out under zoning policy – resulting in unintended rezoning. We propose **unifying the development framework** by either:

a. Increasing the allowable density to support 20-storey or more developments, or
b. Adopting a single regulatory metric – either height or density – to simplify the approval process.

3. Alternative Approaches to Encapsulation Requirements
Reference: BC Building Code 3.1.6.4 & 3.2.2.93
We suggest **alleviating encapsulation requirements** to both reduce construction costs and highlight the exposed mass timber aesthetic. Reducing the use of gypsum boards also contributes to lower carbon emissions. **To maintain fire safety, we propose several alternative approaches that are appropriate for mass timber construction.**
For volumetric construction modules consisting of CLT floor and ceiling panels, the ceiling of the lower module can act as the fire-protective layer for the floor of module above, eliminating the need for additional encapsulation. Horizontal plenums between modules units can replace dropped ceilings for mechanical systems, further minimizing gypsum use. Additionally, sprinklers within concealed spaces can provide further fire protection.

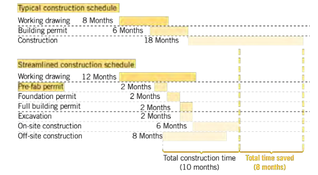


On lower levels constructed with post-and beam systems, we propose combining enhanced fire separation floor assembly with active suppression systems in place of rated encapsulation. The thicker CLT slabs – used for larger spans – also naturally provide an higher rating for fire separation.

4. Standardize and Implement CSA A277
Reference: CSA A277
Although CSA A277 provides standards for off-site construction, its implementation remains inconsistent. Many stakeholders are unaware of the standard or unsure of their roles during off-site fabrication. This ambiguity often leads to confusion and rejection of prefabricated components at the construction site. To address this, we recommend **clear assignment of responsibilities** within the CSA A277 framework and broader education across the construction industry to support effective and consistent application.

5. Enable Use of Enclosed Balconies
Reference: Municipal Zoning Bylaw
Not all municipalities permit enclosed balconies, and some impose limits on their maximum allowable area. Enclosed balconies enhance year-round usability, particularly for mass timber buildings, where standard **CLT balconies benefit from added weather protection**. We believe accessible, weather-protected outdoor space is essential for all residents. A modest revision to zoning bylaws to permit enclosed balconies could deliver meaningful improvements in both quality of life and building performance.

6. Introduce Prefabrication Building Permit
Reference: Municipal Building Permit Requirements
Prefabricated construction requires intricate coordination and often a longer design cycle. Currently, there is a significant lag between full building permit submission and the start of off-site fabrication. To address this, we propose introducing a **Prefabrication Building Permit**. Similar to how excavation permits allow for early site work, **this permit would specifically cover prefabricated structural components and authorize off-site construction** to begin before the full building permit is finalized. The additional building permit phase can align overall permitting process well with design and prefabrication workflows, reduce overall project timelines, and enhance construction efficiency.



Open gathering space at art school encourages spontaneous interactions and exchange of ideas.

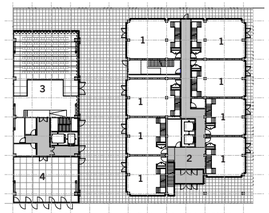
SUSTAINABLE BUILDING PRO FORMA

The building is designed on a 12' by 12' grid system to unify various program spaces into a clear modular and structural layout. The housing components include a mix of student housing and one to three bedroom units, allowing for different housing mixes and ready for adaptable configurations.

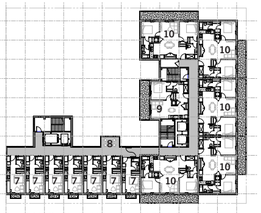
The project aims to reduce its carbon footprint by using mass timber construction combined with a site-adjacent factory, which lowers carbon emissions typically associated with transporting volumetric modules. A shared parking network and fewer parking entrances across the neighborhood increase parking and mechanical service space efficiency, while minimizing excavation needs at all Transit-Oriented Area sites — further reducing both carbon footprint and construction costs.

Additional carbon reductions are achieved through the use of low-carbon concrete for underground structures and lateral reinforcement, and by minimizing gypsum board use with alternative approaches to encapsulation requirement.

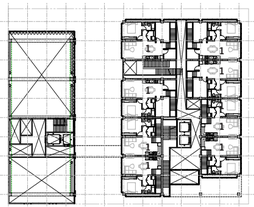
The project also benefits from a streamlined construction schedule, supported by a new prefabrication building permit that aligns with the prefabrication design and construction cycle. This approach shortens the total construction time and effectively lowers overall costs.



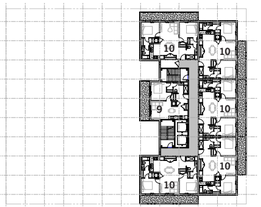
Level 1 - Performance Space, Gallery, Artist Live/Work



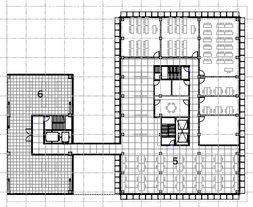
Level 4 to 8 - Student Housing and Rental



Level 2 - Living for Artist Live/Work



Level 9 to 20 - Typical Rental with 1-2 Bedroom Mix



Level 3 - Workshop, Art School

Level 9 to 20 - Typical Rental with Studio-3 Bedroom Mix

1 Artist Live Work
2 Residential Lobby
3 Performance Space
4 Gallery / Event Space
5 Art School
6 Workshop
7 Student housing
8 Common Space
9 Rental 1 Bed
10 Rental 2 Bed
11 Rental 3 Bed
12 Rental Studio

Exterior view looking at different facade treatments for rental, student housing, art school, and live work units.

PROJECT DATA	
FSR	8.00
LOT SIZE	18,300 sq.ft.
BUILDING SQ FT ABOVE GRADE	146,450 sq.ft.
BUILDING EFFICIENCY (%)	80%
NON RENTABLE	29,935 sq.ft.
RENTABLE	116,515 sq.ft.
TOTAL STORIES ABOVE GRADE	20
TOTAL STORIES	21
BASE FLOOR	1
ABOVE 1ST STOREY	19
STORIES BELOW GRADE	1
UNITS	145
BEDROOMS	230
AMENITY SPACE	6,540 sq.ft.
NON-RESIDENTIAL	9,020 sq.ft.

CONSTRUCTION COST		CONCRETE (BASE CASE)		SUBMISSION		
	SF	COST/SF	COST	COST/SF	COST	
BELOW GRADE	18,300 sq.ft.	$315	$5,764,500	$378	$6,917,400	LOW-CARBON CONCRETE FOR BELOW GRADE CONSTRUCTION
BASE FLOOR	12,353 sq.ft.	$360	$4,447,080	$398	$4,916,494	REDUCE GYPSUM BOARD COST THROUGH ALTERNATIVE APPROACHES (SEE PAGE 5)
ABOVE 1ST STOREY	134,097 sq.ft.	$385	$51,627,345	$426	$57,125,322	REDUCE GYPSUM BOARD COST THROUGH ALTERNATIVE APPROACHES (SEE PAGE 5)
BALCONIES	18,360 sq.ft.	$500	$9,180,000	$450	$8,262,000	CLT AND MODULAR BALCONIES ARE USED. COST CALCULATED BY AREA FOR COMPARISON
	COST/MONTH	# MONTH	COST	# MONTH	COST	
SCHEDULE COSTS	$50,000	18	$900,000	10	$500,000	SUBMISSION FOLLOWS STREAMLINED CONSTRUCTION SCHEDULE (SEE PAGE 5)
TOTAL			**$71,918,925**		**$77,721,216**	

EMBODIED CARBON		CONCRETE (BASE CASE)		SUBMISSION		
	SF	EMBODIED CARBON	TOTAL CARBON	EMBODIED CARBON	TOTAL CARBON	
BELOW GRADE	18,300 sq.ft.	6.69 kg/sq.ft.	122,409 kg	4.01 kg/sq.ft.	73,445 kg	LOW-CARBON CONCRETE YIELDS 40% REDUCTION IN CARBON FOOTPRINT
ABOVE GRADE	164,810 sq.ft.	6.69 kg/sq.ft.	1,102,417 kg	2.39 kg/sq.ft.	394,586 kg	REDUCE CARBON FOOTPRINT THROUGH MINIMIZED GYPSUM BOARD USE
TOTAL		**6.69 kg/sq.ft.**	**1,224,826 kg**	**2.56 kg/sq.ft.**	**468,032 kg**	

"Culture House saved costs **creatively by locating a factory** on the project site and offered rigorous detail in decoding recommendations."

JURY COMMENTS

The jury applauded this affordable cultural project's use of hybrid panelized modular prefabrication, with its creative approach of locating a factory on the project site.

The costing technical advisors acknowledged the major cost advantage of the on-site factory, which would be cost-effective in saved transportation costs, achieving quicker site-adjacent quality control and offering time efficiencies for building inspections.

Juror Natalie Telewiak particularly liked this team's approach that showed a strong understanding of regulations and offering rigorous detail in decoding recommendations.

DIGITAL PRIZE RATIONALE

Juror Sailen Black noticed a theme of duality in the project: achieving things in two different ways and using the strength of each one.

"The project is an appealing blend of the strengths of mass timber panelized and volumetric pre-fabrication. It proposes bringing flat-pack panels to the site to make trucking easier and support existing mass timber fabricators, with assembly into volumetric modules on-site where they can be craned into place.

It also demonstrates a good use of mass timber structurally, with repetitive floors stacked while still achieving a varied and interesting massing overall. It achieved a significant amount of density and height on the site. Culture House tackles the perennial challenge of balconies in two different ways: using weather protected enclosure for larger rental units where CLT is the structure, and using prefabricated bolt-on balconies for the smaller student housing units."

FLUVIAL FORMWORK

ADJACENT BRICK ROWS BURNABY, CANADA

Benjamin Beckwith, Cameron Lockhart,
Elisabeth Baudinaud, Jessica Little,
Mike Knauer

Site **C**

FSR **4.8**

Stories **14**

CO_2 **27.78%**

Potential Carbon Reduction
BASED ON EQUIVALENT BASELINE

KEY STRATEGIES

- Reduce the interior module to allow a greater variety of producers to participate in the production of interior modules
- Circular building process where carbon is continuously cycled through our consumption patterns
- Regenerative design

POTENTIAL COST EFFICIENCIES

- Continuing the assembly line from factory to site minimizes on-site labour, reduces trade overlap, and enhances quality control, leading to lower rework and faster builds
- Interior modules smaller than the structural grid enables transportation by standard cube trucks, expanding access to a broader network of local fabricators and competitive pricing
- Extending prefab beyond the structural envelope to include interior and building service modules creates further opportunities for cost reduction
- The hybrid volumetric system introduces flexibility within standardized modules, reducing design constraints while maintaining production efficiency

FLUVIAL FORMWORK

CONTEXTUALIZING STANDARDIZED METHODS AND MATERIALS

BY TEAM ADJACENT BRICK ROWS

"River dolphins all over the world (in the Ganges and Amazon Rivers, for example) are not close genetic relatives. But they are remarkably physically similar. They have grown common forms due to their common circumstances.

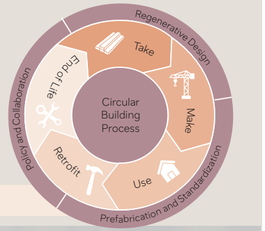
Have you grown that way, riverine? In a context that moves so quickly that looking at it tells you almost nothing. Are you evolving a deeper way of listening where you are? Could we become students of shape precise enough to move with the grace and flexibility our circumstance requires ***even though your river is not my river?****"*

Alexis Pauline Gumbs
Undrowned: Black Feminist Lessons from Marine Mammals, P.19

Shaping Our Common Future

This design competition asks us to consider how mass timber in residential construction can help mitigate climate change and improve housing affordability. Our response is that while mass-timber, prefabrication, and modular design are important tools in the toolkit for addressing these challenges, a broader systems-level shift is essential. We must move from a conventional linear building process to a circular one (where carbon is continuously cycled through our consumption patterns) rather than released into the atmosphere or sent to landfill. To support this goal, we propose Three Implementation Strategies intended to guide the project's design, ensuring that intergenerational equity is considered at every stage of the building and its components' lifecycle. All new construction should enhance intergenerational equity, not diminish it.

Conventional Linear Building Process



Intergenerational equity

Carbon
Affordability
Opportunity

Time is running out to meaningfully address climate change and housing affordability, if it hasn't already. With a 1.5°C temperature rise likely inevitable due to past emissions, urgent and meaningful action is needed. As climate leaders, policy makers, and designers of the built environment, we have a responsibility to confront these intersecting crises. This demands bold, systemic change in how we use resources and a rethinking of our relationship with ecosystems and our role within them. Considering the passage above in the context of consumption and the built environment, it is essential that we reshape the "riverbanks" of our built environments to ensure that the direction of our progress is not just sustainable, but regenerative and equitable.

Cedit: Bill Reed - "Shifting from Sustainability to Regeneration"

CONTEXTUAL (YES)

Implementation strategies

Regenerative Design

Regenerative Design is a holistic design philosophy and practice that goes beyond sustainability to create systems, buildings, and communities that actively repair and regenerate ecological, social, and economic systems.

Prefabrication + Modular

Through efficiencies in manufacturing, prefabrication and modular construction have a singular potential to mitigate the economic and carbon cost of providing housing in the future while simultaneously providing a higher quality of construction and project outcomes.

Policy and Collaboration

Regulation and policy are paramount in implementing this framework of consumption which posits the reframing of established processes of delivering housing. Collaboration and buy-in among all parties is critical for success.

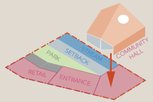
Policy reformwork

- **A** Daylighting streams should be encouraged and incentivized through density and height bonuses
- **B** Regulate embodied carbon alongside operational carbon with a lifecycle metric approach
- **C** Reward upcycle and deconstruction efforts through carbon targets. Provision of natural areas can contribute to meeting carbon targets.
- **D** Permit voids within mass timber slabs with acceptable fill materials and stringent safety testing
- **E** Require RFPs for publicly awarded projects to be evaluated on best-value outcomes from integrated teams at the proposal stage
- **F** Facilitate development of material standards for upcycleable or reusable materials

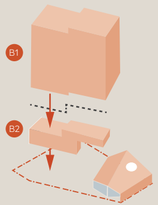
Parti Diagrams

The culverted stream is brought to the surface starting one third of the length of the North property line, establishing a 10.0m setback on the subject site. The buildable area and ecological areas are established.

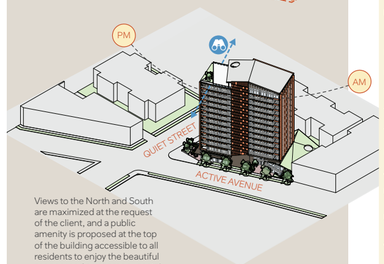
The site is programmed giving prominence to the KKS Nations Community Hall, from which the new stream emerges from underground. In exchange for daylighting the stream and providing a public park, **the project receives a density bonus** from the planning authority with jurisdiction.



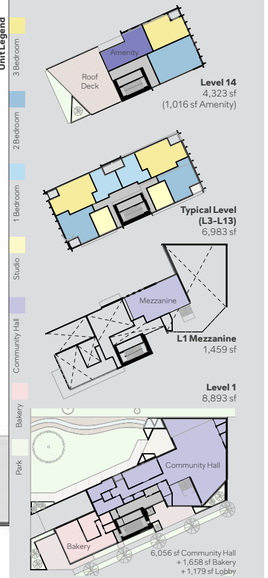
To accomodate the extra density on the site, the building is proposed at 14 storeys instead of the 12 as recommended by the TOA Tier 2 guidelines. Additional density is at the discretion of the AHJ. To permit the building to have exposed mass timber elements (max. 12 storeys), the building is split in two using an **Alternative Solution** which allows a fire rated floor to compartmentalize the two buildings from each other.



Solar shading devices are designed for the East, South, and West elevations to ensure a reduction in solar heat gain while ensuring the maximum amount of glazing in the liveable areas. The ration of glazed area to opaque is 70 / 30, which is above average at the request of the client.



Views to the North and South are maximized at the request of the client, and a public amenity is proposed at the top of the building accessible to all residents to enjoy the beautiful scenery and awesome sunsets!



Level 14
4,323 sf
(1,016 sf Amenity)

Typical Level (L3–L13)
6,983 sf

L1 Mezzanine
1,459 sf

Level 1
8,893 sf

6,056 sf Community Hall
+ 1,658 sf Bakery
+ 1,179 sf Lobby

Area Summary

	Permitted	Provided
Floor Space Ratio (FSR)	4.0 (+1.0)	4.8
Lot size (sf)	20,125 sf	-
Building area above grade (sf)	-	95,544 sf
Building efficiency (%)	-	84.3%
Non-leaseable area (sf)	-	15,956 sf
Leasable area (sf)	-	80,544 sf
Total stories above grade(#)	12	14
Total stories (#)	-	16
Base floor (#)	-	1
Above 1st storey (#)	-	13
Units (#)	-	96
Unit Mix (%)	25% 3-Bed, 25% 2-Bed, 25% 1-Bed, 25%-Studio	
Amenity space (sf)	-	1,016
Non-residential area (sf)		7,762 sf

Building Code Summary

Construction article: 3.2.2.93

	Permitted / Required	Provided
Building height (storeys)	18	14
Building height (m)	76 m	50.2 m
Building area (m2)	6000 m2	826.2 m2
Encapsulation (floors) (3.1.6.4.(9))	50 min	50 min
Encapsulation (all other)	70 min	70 min
FRR (Floors)	2 hr	2 hr
FRR (Columns)	2 hr	2 hr
STC (All construction)	47 (STC) 47 (ASTC)	47 ASTC

Alternative Solutions

AS1 - P1 to L2 / L3 (partial) are to be considered two separate buildings. Additional fire safety measures and compartmentalization required.

Zoning Relaxations

Tier 2 Minimum Allowable Density Framework

	Distance	Min. FAR	Min. Height
Prescribed	200-400m	4.0	12 storeys
Proposed	200-400m	5.0	14 storeys

As per the Ministry of Transportation and Infrastructure's guiding document "Provincial Policy Manual: Transit Oriented Areas" issued on May 29 2024, "local governments retain the zoning authority to establish densities and heights **greater than** those prescribed by Provincial regulations."

In this hypothetical project proposal, we imagine that in exchange for daylighting the culverted stream that exists along the North PL, the authority having jurisdiction will provide a density and height bonus as incentive to restore the ecological functions historically provided by these natural features.

Design for Nature

High land costs of urban areas paired with stringent legislation outcompetes incentives to open (daylight) piped streams and to reactivate their direct and indirect public benefits. To capture the economic, social, and ecosystem values that urban streams provide, this sheet indicates barriers and solutions that are recommended for local and senior government consideration.

Incentivize Carbon Sinks and Ecosystem Services

To address this issue, we are proposing the following relaxations to the Municipal and Provincial regulatory frameworks governing stream setbacks:

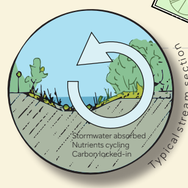
1. Relax municipal stream setbacks where they exceed Provincial minimums.

2. Formally recognize these projects under a WSA Notification and / or DFO request for review to alleviate permitting uncertainty and schedule delays.

3. Offset setback encumberances on neighbouring properties by offering density bonuses where the Provincial setback is achieved or recognize neighbouring lands as legacied land use to exempt from Provinical setbacks.

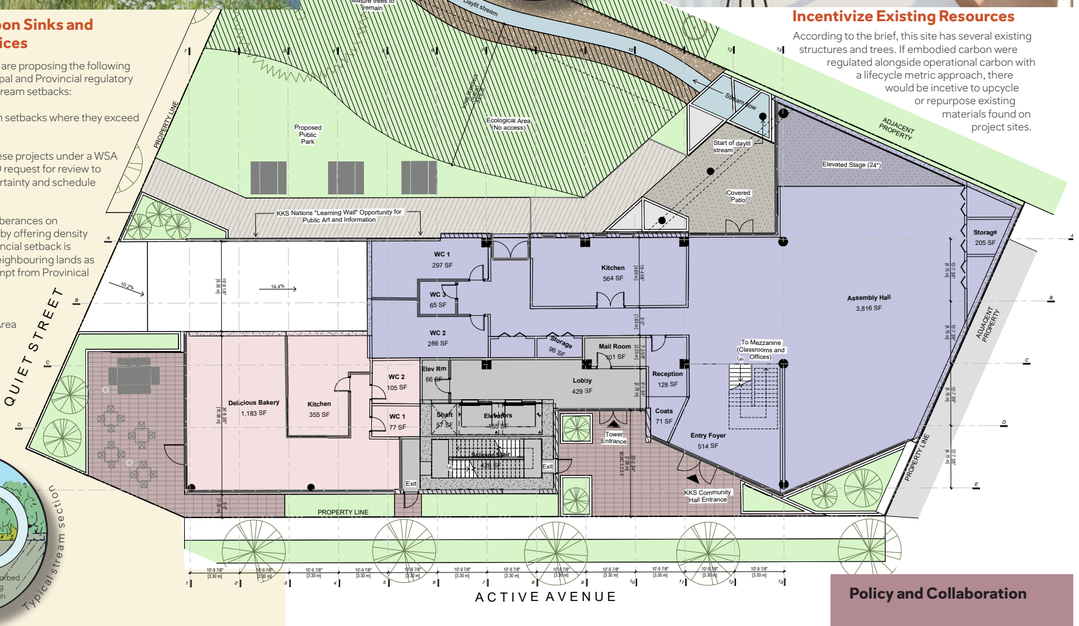
4. Include the "Sensitive Ecological Area" in Site Area and density calculations.

5. Develop and promote density bonus programs for daylighting streams currently in catchments on private property.



Incentivize Existing Resources

According to the brief, this site has several existing structures and trees. If embodied carbon were regulated alongside operational carbon with a lifecycle metric approach, there would be incetive to upcycle or repurpose existing materials found on project sites.



Policy and Collaboration

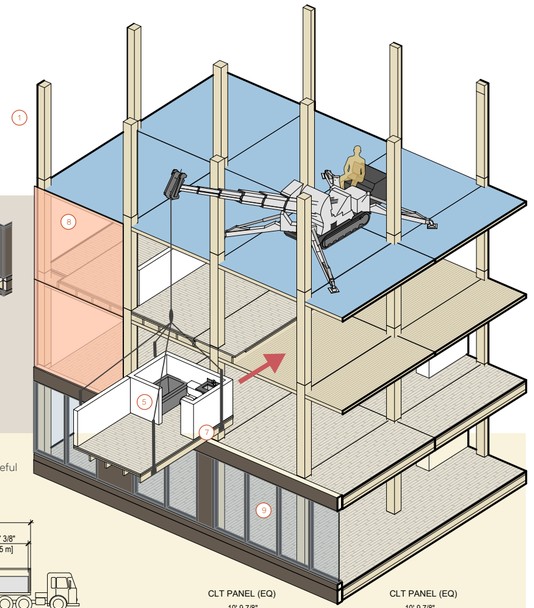
Prefabrication + Modular

From assembly line to assembly line

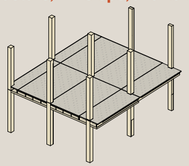
Prefabrication and modularity is an integral component of circularity in the building environment. Mass timber is an inherently prefabricated and modular building system, and yet many projects in the Lower Mainland still resort to traditional methods of connecting the mechanical, electrical, and plumbing services and finishing the interiors once the envelope is delivered and installed. We propose to continue the assembly line from the factory to the building site, and apply the same principles of efficiency to the interiors and building services.

Break the module

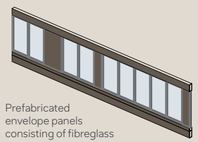
One important consideration we made was to make our interior module smaller than the typical structural grid. With a width small enough to fit inside a cube truck, the smaller modules allow for a greater variety of producers to participate in the production of interior modules.
The hybrid volumetric module we designed breaks the rigidity traditionally associated with modular design and allows for flexibility within the floorplans and assemblies.



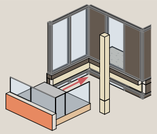
Structure, Envelope, and Balconies



Structure is comprised of GLT columns and CLT slabs which will form a ribbed cassette once the interior module is placed.

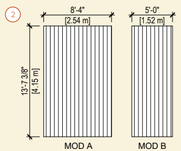


Prefabricated envelope panels consisting of fibreglass window wall and steel stud framing. The steel stud curb ensures that installation does not require custom attachments and is installed like a typical window installation.

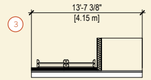


Balconies are LVL slabs interspliced with waterproof membrane layers which prevents water from advancing through multiple veneers.

Interiors + MEP Modules



Factory modules are split to permit crane movement between columns. Some modules will require column notches to allow space for the columns in their final position.

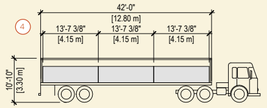


Max lifting weight = 1000 kg

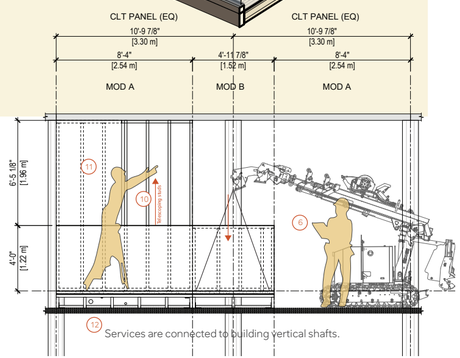
1 sheet 5/8 Type X GWB = 32 kg
2" LVL Panel (4.15m x 2.54m) = 33 kg / m2
8" LVL Beams (4.15m) = 21 kg

10.54m2 LVL Panel = 346 kg
6 LVL Beams = 126 kg
Module base weight = 472 kg + finishes and fixtures

The reduced module size avoids wasteful "shipping of air" and does not require specialized trucks or permits to ship.



Maximum dimensions of modules in BC without requiring permit or pilot car for transport are 8'6" x 53'-0".



Services are connected to building vertical shafts.

On-Site Assembly Process

Following the successful Deconstruction of existing structures and completion of Site Preparation:

1. Glulam columns and 5-ply CLT slabs installed on site
2. Interior modules are fabricated off-site including all interior finishes, flooring, fixtures, and all mechanical, electrical, plumbing connections, and telescoping stud walls up to 4'-0" in
3. Module packages are packed to include additional components such as doors and drywall sheets, up to a max. weight of 1000kg.
4. Modules are loaded onto a local delivery vehicle. The delivery vehicle is equipped with weather protection on all sides, and ideally is accessible form the top or sides for unloading. Maximum module width of 8'4" ensures simplicity of delivery.
5. Interior modules arrive on site and are immediately craned into place by secondary lifting systems.
6. Rolling mini-picker on floor level manouvers the module into final position.
7. Lifting points on modules double as attachment points to CLT floors below. Modules are fastened to CLT subfloor.
8. Temporary weather protection is preinstalled on floors, and installed on facades where interior units are present
9. Envelope and balcony modules are craned into place by the primary crane.
10. Telescoping steel studs are raised to underside of CLT slab.
11. Interior GWB panels are installed to finish the interior modules.

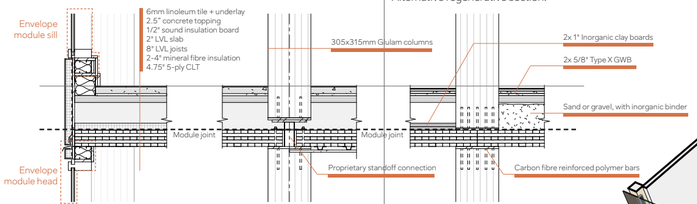
Prefabrication + Modular

Air and Moisture

Envelope modules in this proposal consist of fibreglass window wall embedded within steel stud frames to create modules suitable for prefabrication. Envelope modules were designed to connect to premanufactured curbs and cladding on the interior modules to avoid costly custom attachments.

Fire

Fire and life safety are one the primary concerns when designing any building. This proposal complies with the 35% exposed surface allowance by the building code, and prefabrication allows for encapsulation to be achieved easily in a high quality factory setting.



Acoustics

This proposal suggests a conventional assembly using 2.5" concrete topping to achieve both the encapsulation requirements and the acoustic requirements simultaneously. However, the concrete topping in this floor assembly has by far the highest global warming potential impact of any other assembly component within the project. Replacing the concrete with 2 layers Type X is possible from an encapsulation perspective, but the loss of mass compromises the acoustic performance.

Regenerative Design

What if everything we put into the building was beneficial?

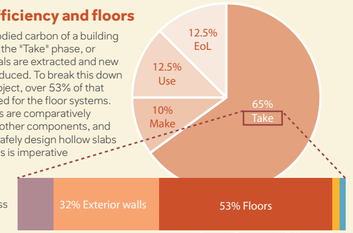
Regenerative materials are substances that, when used and managed responsibly, actively contribute to the restoration and enhancement of natural resources and ecosystems. As William McDonough argues in his book "The Upcycle", consumption of materials is not inherently negative when that consumption has positive externalities.

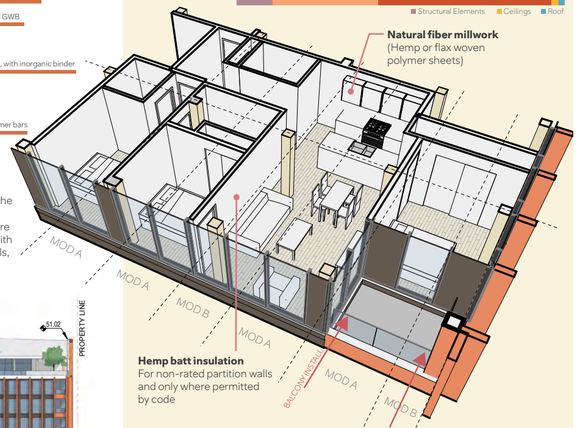
Alternative regenerative section:

There are potential alternatives to fill voids in slabs that can mitigate the issue of achieving the acoustic requirements through mass, such as sand, gravel, or clay. These natural materials are non-combustible and in relative abundance with a low global warming potential. Some materials, like olivine sand from Hope, BC, could even capture atmospheric carbon as it weathers.

Focus on efficiency and floors

65% of the embodied carbon of a building is emitted during the "Take" phase, or when raw materials are extracted and new materials are produced. To break this down further, in this project, over 53% of that energy was utilized for the floor systems. Mass timber slabs are comparatively inefficient to the other components, and finding a way to safely design hollow slabs or slabs with voids is imperative to reducing the carbon footprint associated with creating new mass timber slabs.





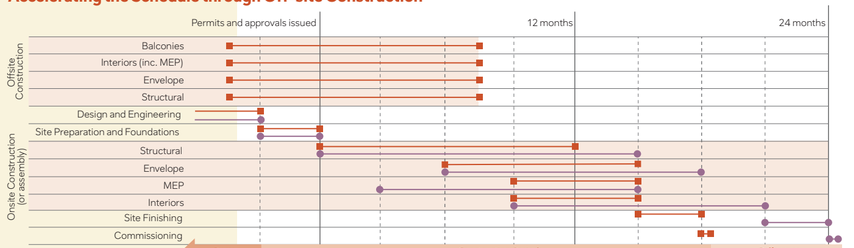
Materials are a reflection of our values

The materials that we choose to surround our daily lives with are a direct reflection of the ideals and concessions we make and value as a society. The majority of embodied carbon emissions are created during the "Take" phase, meaning that the greatest opportunity to address atmospheric carbon lies not in addressing the transportation of goods to site or the operation of the buildings, but by carefully and dilligently selecting the materials that we choose to build with.

Design for dissassmbly

Prefabrication enables rapid on-site assembly, but also allows for quick disassembly when components need to be changed or removed. This adaptability is essential to regenerative design, as it meets current needs without always requiring new materials. Disassembled components can often be reused in future projects, lowering both costs and carbon impacts.

Accelerating the Schedule through Off-site Construction



24% schedule reduction

Construction Costs

			Concrete (Base case) ○		Proposal ☐	
	Area (sf)	Area (m²)	$ / sf	Cost	$ / sf	Cost
Below grade	23,381	2,172	$315	$7,365,015	$315	$7,365,015
Base floor	8,893	826	$420	$3,735,060	$390	$3,557,200
Above 1st storey	86,651	8,050	$400	$34,660,400	$360	$29,894,595
	Quantity		$ / Unit	Cost	$ / Unit	Cost
Balconies			N/A	Included	$20,000	$1,440,000
	Cost / month		# months	Cost	# months	Cost
Monthly overhead	$75,000		25	$1,875,000	19	$1,425,000
TOTAL			401	$47,635,475	367	$43,681,810

8.3% cost reduction

Embodied Carbon

			Concrete (Base case)		Proposal	
	Area (sf)	Area (m²)	Emission intensity (kg CO_2e / m²)	Net emissions (kg CO_2e)	Emission intensity (kg CO_2e / m²)	Net emissions (kg CO_2e)
Total building (inc. parkade)	118,925	11,048	198	2,187,600	143	1,579,933

28% carbon reduction

Embodied carbon was calculated using the **Building Emissions Accounting for Materials (BEAM) Estimator** produced by Builders for Climate Action. Neither the Construction Cost nor Embodied Carbon included the impact of upcycled or repurposed materials, nor the carbon sink benefit of the ecological stream setback. Future study or proposals would evaluate these considerations to better understand how the embodied carbon of a project or capital costs can be further offset by implementation of circular building strategies.

Works Referenced

1. Undrowned: Black Feminist Lessons from Marine Mammals, Alexis Pauline Gumbs
2. WoodWorks Mass Timber CAD + Revit details
3. RDH Mass Timber Design Guide v2.1 Oct 2022
4. Making Mass Timber Work for High Rise Residential in BC, BTY WSP Axiom + ZGF 2021
5. Technical Guide for the Design and Construction of Tall Wood Buildings in Canada, FP Innovations 2022
6. A Practical Path Forward for Offsite Manufacturing, WoodWorks + Canadian Wood Council

Discussion

We made several adjustments to the schedule, construction cost, and carbon calculators that reflect the advantages put forward by our proposal. Most substantially, we believe that the future cost on carbon will make a concrete base case more expensive above the 1st storey due to increased regulation so we increased the base unit cost to reflect this. We also assumed that timber would still be desireable in a Community Hall design for either scenario, which would be more expensive to implement and mobilize in a full concrete structure. The cost and schedule reductions are largely a result of the efficiencies we anticipate through off-site fabrication. While there is a modest cost reduction, affordability could be greater addressed by utilizing a higher percentage of upcycled or repurposed materials.

Leasehold Business Case

The business case for this project envisions a leasehold project that leases units to potential residents at a price that is below the average market value for freehold properties.

	$ / Unit (Avg.)	Profit at sale	Average Unit Price ($)
Freehold	$455,019	18%	$536,922
Leasehold	$455,019	12.5%	$511,896

$ / Unit: $43,681,810 / 96 Units = $455,019 per unit

The benefits of a leasehold project as opposed to typical freehold are substantial. Since ownership of the land after the lifetime of the building is retained by the developer (Sacred Waters) and the KKS Nations, future generations will have a similar opportunity to develop or redevelop a project that meets their needs in the future. Leasehold also assists in reducing speculation and encourages long-term thinking for the future of the site. Lastly, leasehold arrangements can also provide steady lease income for the ownership group, depending upon the arrangement. Leasehold allows the current generation to develop the site while simultaneously setting up future generations for their own successes.

Assumptions

This project was designed to the specifications outlined in Appendix C of the project brief. As is the nature of competitions, we were unable to consult or work with Sacred Waters Development or the KKS Nations to develop this propopsal, and would welcome the opportunity to revisit the design and proposal as design partners in the future.

"Fluvial Formwork gave **livability** and **affordability** major consideration, through a good program, with solid neighbourhood facilities."

JURY COMMENTS

The jury found this scheme's strengths to be highly replicability and, as juror Andrew Lawrence stated, "This project is strong on technical elements, from structure to acoustics."

The ground was sensitively handled, with Juror Sailen Black recognizing the re-integration of an existing ground water stream as a site-sensitive move toward land restoration, "while working within the reality of limitation," given the project's one site to work on.

Fluvial Formwork gave livability and affordability major consideration, through a good program, with solid neighbourhood facilities in a community hall and good amenity in a bakery, the leasing of which could bring revenue. This project provided one of the lower costs per bed of the competition submissions.

TWOUP

DIALOG VANCOUVER, CANADA

Brady Dunlop, James Jiang, Katie Theall, Paul Giles, Ryan McClanaghan, Sideqa Haqani, Yury Kulikov

Site **B**

FSR **4.0**

Stories **18**

CO_2 **41%**

Potential Carbon Reduction

BASED ON EQUIVALENT BASELINE

KEY STRATEGIES

- Combines light wood framing with mass timber
- Excluding exterior circulation from FSR calculations unlocks greater creativity and efficiency in building design
- Double-aspect, double-height subspaces allow for versatility, ventilation, and daylighting

POTENTIAL COST EFFICIENCIES

- Pairing mass timber superstructure with panelized light-wood components achieves meaningful cost efficiencies through standardization, adaptability, and long-term flexibility
- Simple, repeatable forms reduce design complexity and fabrication costs, while the panelized system streamlines on-site assembly and minimizes waste compared to conventional concrete construction

TwoUp

Decoding Timber Towers

The Urbanarium has inspired designers to pioneer affordable, low-carbon mass timber buildings that harness modular, prefabricated methods - transforming challenges into opportunities to fight climate change and redefine housing.

The Problem

High-rise buildings today rely on carbon-intensive concrete and steel, which are costly to construct and maintain. Inflexible designs limit adaptability, locking in embodied emissions for decades. Current ownership models often prioritize short-term sales over long-term stewardship, discouraging the use of sustainable materials, shared amenities, and adaptable layouts that are essential for reducing cost, carbon, and environmental impact.

An emphasis on efficiency over quality of life has produced isolating, single aspect units, deep corridors, and minimal outdoor space. Fixed layouts restrict resident agency and future adaptability, while a lack of shared spaces weakens community, disconnecting buildings from nature and the public realm.

The Solution

TwoUp envisions a living future rooted in nature: a mass timber superstructure with panelized light-wood, adapable, double-aspect, double-height subspaces designed for versatility, ventilation, and daylighting. A structural grid accommodates both residential and future commercial uses, allowing the building to evolve as community needs change. Proposed co-housing and rent-to-own units can adapt over time — shifting from open, airy live/work spaces to two-storey homes, or even commercial suites — cultivating a biogenic community with long-term resilience.

Through simple, repeatable forms, vibrantly composed to shape inviting spaces in-between, we can weave vertical villages - places where movement and gathering foster connection. In doing so, we nurture healthy communities while tackling the challenges of affordability and climate change.

Project Data

Site Area	Project Area	Floor Space Ratio
36,600 SF	146,766 SF	4.0

Occupancy Residential 95% (100% Capability) Commercial 5% (100% Capability)	# of 2-Storey Flex Units 80	Saleable 86,697 SF
	Number of Storeys 18	Levels Below-Grade 00
Site Coverage 39%	Cost 431/ft2	Efficiency 81%

Step 01
Panelized Modules For Living

1x
2x
3x
4x

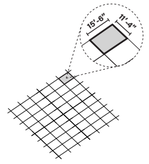
Single I Double

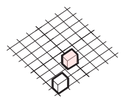
A Living grid
Standardized 15'-6" x 11'-4" grid to accommodate flexible living spaces and future commercial uses.

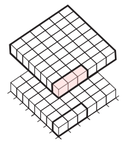
B Panelized modules
A double-height volumetric framework that allows 175 sq.ft panelized modules to stack.

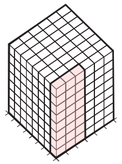
C Baseline floor plate
Panelized modules stacked and assembled in baseline 6,500 sq.ft tower floor plate sizes.

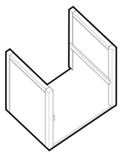
D Baseline density & efficiency
Floor plates replicated on all floors for max. efficiency.



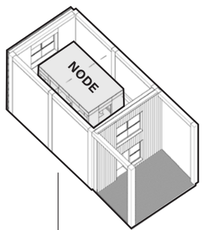




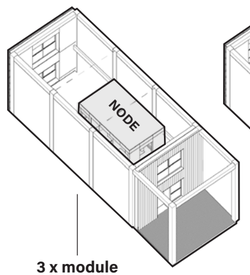




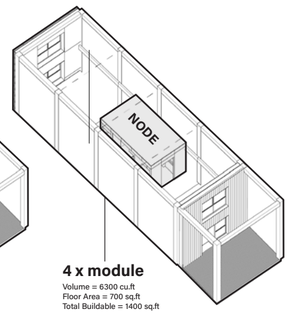
1 x module
Volume = 1575 cu.ft
Floor Area = 175 sq.ft
Total Buildable = 350 sq.ft



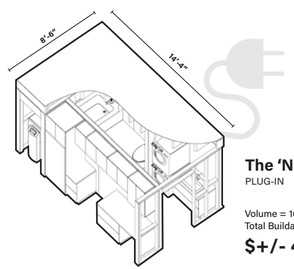
2 x module
Volume = 3150 cu.ft
Floor Area = 350 sq.ft
Total Buildable = 700 sq. ft



3 x module
Volume = 4725 cu.ft
Floor Area = 525 sq.ft
Total Buildable = 1050 sq.ft



4 x module
Volume = 6300 cu.ft
Floor Area = 700 sq.ft
Total Buildable = 1400 sq.ft

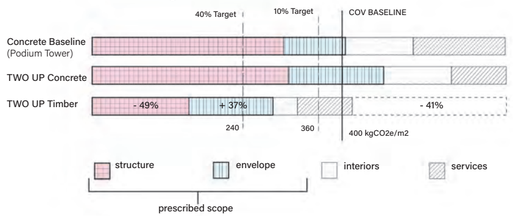


The 'NODE'
PLUG-IN

Volume = 1080 cu.ft
Total Buildable = 120 sq.ft

$+/- 410 per sq.ft

Municipal Carbon Targets



Resilient Frameworks

The simple grid can unlock the potential for high-density development without rigidity. Its clarity enables efficient stacking and repetition, while a two-storey framework can introduce vertical flexibility to shift between residential and commercial programs. This approach balances density with adaptability, ensuring buildings can evolve as urban needs change — from maximizing housing supply to accommodating future workspace or shared uses. Rather than prescribing fixed outcomes, the system offers a scalable, resilient strategy for intensification that remains open to long-term transformation.

Deconstructing 'The Baseline'

Converting a typical base-case concrete high-rise to mass timber using a simple grid could reduce embodied carbon by 20%, but this approach does not fully address climate resilience or social sustainability. What if the building were broken into smaller, stacked volumes with generous outdoor circulation that encourages social interaction and provides better access to outdoor spaces? Such circulation could support dual-aspect units, offering natural ventilation and daylighting, improving resilience to climate events like power outages while reducing reliance on mechanical systems.

Meeting the City of Vancouver's 10% embodied carbon reduction target—and aiming for 40% by 2030—required a rigorous, holistic approach. While our massing strategy offered key social benefits, it increased the envelope area, partially offsetting the carbon savings from switching to mass timber. To counter this, we prioritized low-carbon assemblies and targeted reductions across the structure, envelope, interiors, and building services.

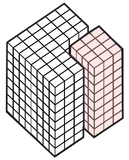
Recognizing that structure and envelope alone don't capture the full picture, we adopted a broader life cycle lens, including service life and interior systems, which can have equally significant carbon impacts.

Our double-height circulation strategy cut circulation material use by 50% per floor. We reinvested this into generous, social corridors, and by placing them on the exterior, we reduced conditioned space by 20%, improving passive performance.

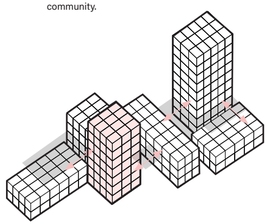
TWO UP Timber
41% less whole life carbon

Step 02
Human-Scale Communities

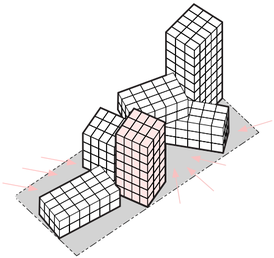
E Dissect
B. The massing is broken down into smaller volumes, offering dual-aspect floor plates that maximize daylight, ventilation, and views. Simplicity of form ensures construction efficiency, while the composition can create a more human-scaled rhythm.



F Re-Arrange
C. By redistributing and pulling apart the building volumes, pockets of 'negative' space emerge — outdoor rooms and circulation zones that invite neighbors to pause, connect, and build relationships, fostering a friendlier, more connected community.



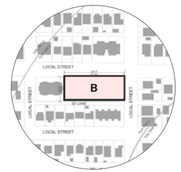
G Place
D. Volumes are angled to invite the community in, enhance streetscape vibrancy, and optimize unit performance by improving aspect, privacy, and airflow.



01 Wetlands
02 Events Hub
03 Community Garden
04 Bathhouse Sky Garden

Overall Building Axo & Circulation

Site B



- Located in TOA Tier 2
- Within 5 minute walk of rapid transit, shops, services and greenspace.
- Large block-end assembly of sixe 50' x 122' lots.
- North-facing peoperty fronting onto local residential street with lane access at the rear.

Amenities

Neighbourhood
1 x Street Plaza
1 x Cafe
1 x Event Space
1 x Bathhouse
1 x Childcare

Roof Top Amenity
10,774.67 SF

Essentials
1 x Bike Amenity
1 x Flex Space
1 x Work Space
1 x Community Kitchen

City Farming
# of Grow Boxes 12

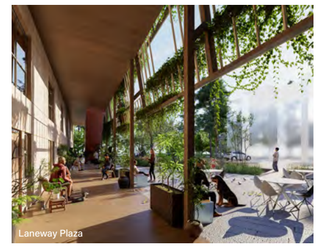
Bike Stalls **350**

Gathering Space
28,362.9 SF

Vertical Village Size
144-200 Ppl


Events Hub


Mid-Block Courtyard and Plaza


Laneway Plaza

Development Scenario

Rent-to-own: Rent-to-own and co-housing – Rent-to-own helps tenants build toward ownership, while co-housing fosters shared, socially connected living with collaborative spaces and resources.

Commercial and community spaces: Shops, services, childcare, and shared amenities like a community kitchen, rooftop garden, and flexible workspaces support both rent-to-own and co-housing models, strengthening social connections and community ties.

Loose Fit, Long Life

Carbon & Cost Reduction Rational

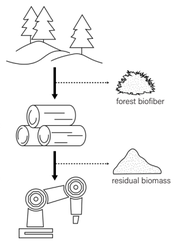
The most sustainable building is the one that already exists, the next most sustainable building is the one that will stay in use for a long time ensuring its materials remain in use. The best way to do that is to make it the space adaptable to change.

Building Elements with different service lives can be easily disassembled from one another Building as inventory - giving materials identity and value for re-use. Building and un-building - building sheathing, structure (longest lasting layer - 150 years) remains and can be adapted for commercial or residential uses.

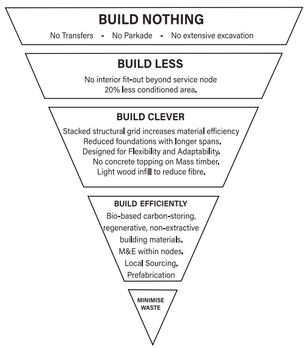
Tree-to-Trade

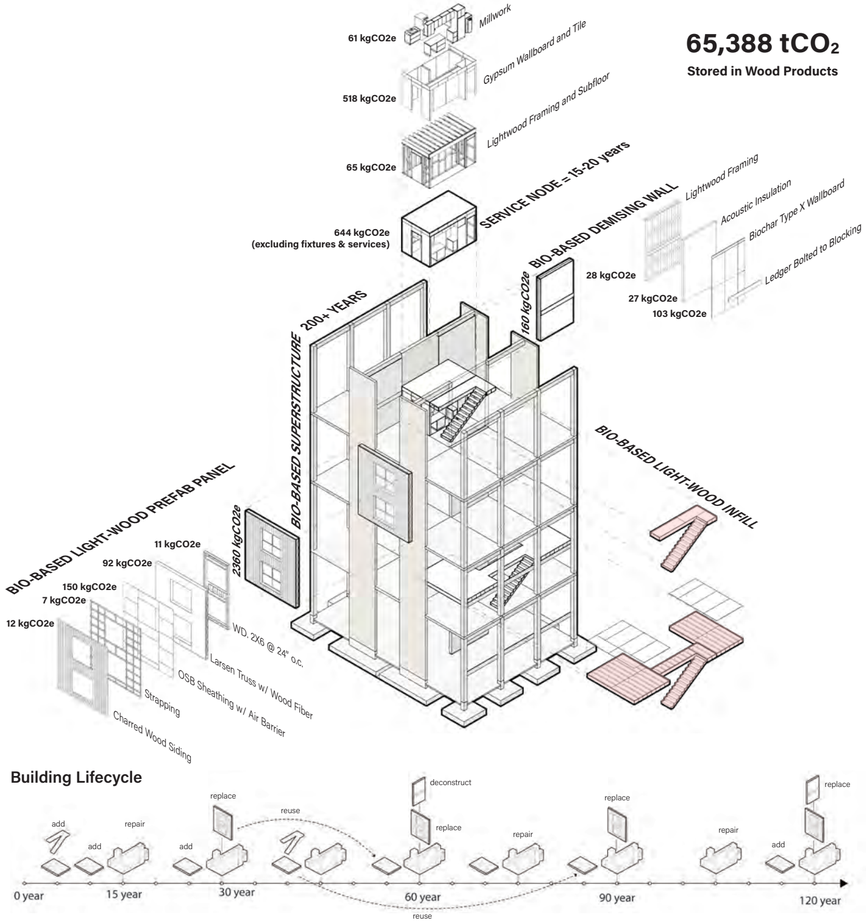
This approach shapes the design and construction by embedding regenerative materials and ensuring that every part of the tree is valued. From structure to finish, and even through the reuse of by-products, we are demonstrating how sustainable forestry can generate high-performance architecture while minimizing waste.

This process not only reduces carbon and celebrates renewable resources but also strengthens the trade industry—showcasing how regenerative practices can drive innovation, economic growth, and ecological resilience.



Hierachy of Net Zero Design





Unlocking the Potential for Mass Timber

Decoding Timber Towers

To fully realize the benefits of timber high-rises, several existing barriers must be addressed. A framework that advances sustainable design - including a change to FSR rules, greater allowable timber exposure, single-stair strategies, stricter carbon limits, and expanded performance-based fire and bio-based material approvals - can better support the growth of the industry.

- **Flexible density tools for FSR calculations –** Vancouver zoning currently counts exterior circulation as FSR, which limits open-air design. Allowing these areas to be excluded, and calculating FSR based on potential floor area while valuing usable exterior space, could unlock greater creativity and efficiency.
- **Material Usage and Compatibility** - Supporting Mass Timber higher buildings that combine light wood framing with mass timber requires updates to current code requirements. Mass timber could provide primary load-bearing capacity, while light wood framing could support non-structural partitions, façade elements, and interior finishes.
- **Safety through innovation** – Single-stair strategies and performance-based approvals for bio-based materials need to be more aligned with global best practices.
- **Climate accountability** – Stricter embodied carbon limits and encouragement of regional sourcing to strengthen local economies and reduce transport impacts.

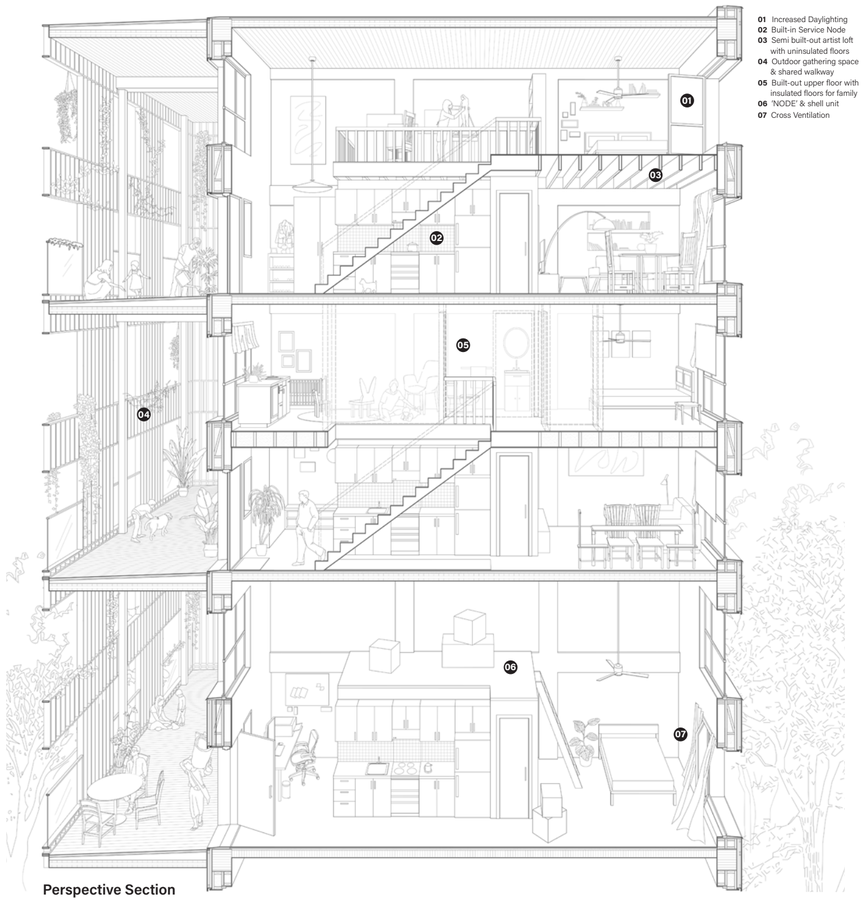
Level 05 Plan

Level 01 Plan

01 East Lobby and Bike Amenity
02 Street Plaza and Courtyard Gardens
03 Wetlands
04 West Lobby
05 Cafe
06 Services/ Loading
07 Exterior Walkways/Gathering
08 Double-Height Lofts
09 Public Rooftop Gardens
10 Circulation Stairs

Skyline View

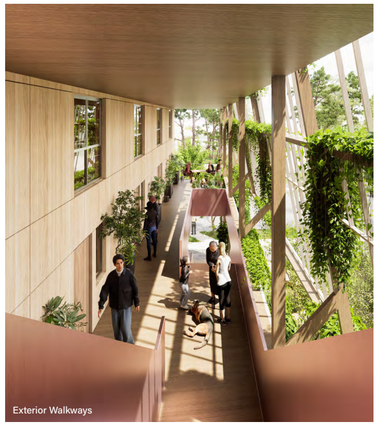
Rooftops and Bathhouse



01 Increased Daylighting
02 Built-in Service Node
03 Semi built-out artist loft with uninsulated floors
04 Outdoor gathering space & shared walkway
05 Built-out upper floor with insulated floors for family
06 'NODE' & shell unit
07 Cross Ventilation

Perspective Section

Rooftop Gardens



Exterior Walkways

Connecting People and Space

Dual-Flow Community

This community fosters sociability through circulation and visual connections that also serve as gathering spaces. Arranged as micro-villages or community plateaus, it cultivates a biogenic sense of place. Dual-aspect units maximize daylight and airflow, promoting comfort, well-being, and a stronger connection between people and their environment.

The Model Ahead

TwoUp reimagines high-density living as adaptable, resilient, and community-focused. Replacing rigid, carbon-intensive structures with flexible mass timber superstructures, it incorporates light-wood frame prefabricated double-aspect homes and thoughtfully designed shared spaces, maximizing the efficiencies of mass timber fabrication and minimizing waste. This vision integrates sustainability, affordability, and well-being, creating vertical villages that evolve with residents' lives while reducing environmental impact.

"With TwoUp's **efficient tower layout**, this is where we should be going."

JURY COMMENTS

This entry's mass timber structure, with light wood frame infill, offered one of the more efficient tower layouts of the competition submissions. However the project's standardization is difficult, with lost efficiencies at connections.

The scheme's major strength is the two storey, double height, light wood frame infill construction for studios, offering a significant unit cost reduction.

Juror Ian Boyle commented, "This is where we should be going," although the code technical advisor noted that no authorities having jurisdiction are likely to approve this, given the fire wall separation concerns related to the light wood frame infill.

Jurors liked the co-housing and rent-to-own strategy and the consideration for building life cycle; Juror Gary Hack also commented that project costs seemed reasonable and the two storey exterior spaces look great.

TIMBER TOWN

STUDIO OH SONG BROOKLYN, UNITED STATES

Ericka Song,
Justin Oh

Site **D**

FSR **3.3**

Stories **10, 12, 14, 18**

CO_2 **46.94%**

Potential Carbon Reduction
BASED ON EQUIVALENT BASELINE

KEY STRATEGIES

- Post-and-Plate construction system for speed, efficiency, and tighter column grids
- Reform to on-site parking requirements allows a significant reduction to the building footprint and reliance on the use of concrete
- Diversifying allowable uses on the site creates a vibrant focal point for the larger neighbourhood
- Pre-fabricated, modularized steel frame balconies reduces construction complexities

POTENTIAL COST EFFICIENCIES

- A hybrid mass timber Post-and-Plate and steel system offers cost efficiencies compared to conventional concrete tower-and-podium construction
- The simplified structural system accelerates fabrication and assembly, while tighter column grids align naturally with residential layouts, minimizing wasted space and structural redundancies
- Thinner floor assemblies reduce material overall building weight, which in turn can lower foundation and seismic design requirements

Timber Town.

This project is an exploration into how a hybrid mass timber Post-and-Plate and steel construction system, combined with efficient residential layouts and thoughtful landscape integration, can create high-quality, community-oriented urban living environments that challenge conventional construction systems like the concrete tower-and-podium.

Timber Town envisions a vibrant, high-density neighbourhood that seamlessly integrates the natural beauty of Vancouver with the warmth and sustainability of mass timber construction. At its core, this project aims to create high-quality living environments that foster deep connections - both to nature and to the community - through thoughtfully considered site planning, building design, and biophilic principles.

Drawing from lessons learned in established mass timber projects, we employ a Post-and-Plate construction system, chosen for its speed, efficiency, and tighter column grids compatible with residential unit layouts. This method encourages vertical development over horizontal sprawl and the efficient footprint of each tower preserves more of the ground plane for shared outdoor spaces. These open areas, inspired by the Tsawwassen First Nation's core values of gathering and maintaining connection with the lands, are conceived as extensions of the residents' living spaces and a way to connect the surrounding neighbourhood to Timber Town as well as to the adjacent forest and waterfront. The landscape is not an afterthought but a vital part of the neighbourhood, functioning as both a natural corridor and a public amenity, creating a development that feels cohesive, sustainable, and deeply rooted in its place.

Compact, Simple, & Repetitive. This proposal challenges the conventional concrete tower-and-podium model that is increasingly common in Vancouver's cityscape. In the typical tower-and-podium model, the podium serves as a structural and mechanical transfer zone as well as access to on-site parking, often a costly and complex intermediary that supports the tower above. The ubiquitous use of concrete to facilitate this massing exacerbates the resource intensiveness of new developments.

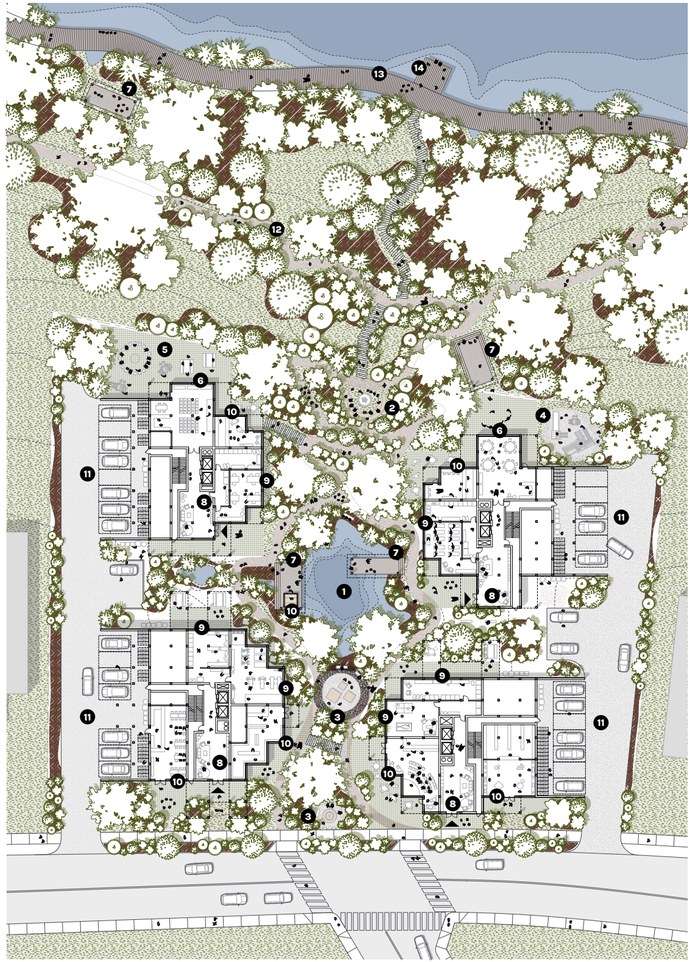
In Timber Town, tall, compact mass timber towers meet the ground directly, giving back much of the ground floor to it's residents and the community.

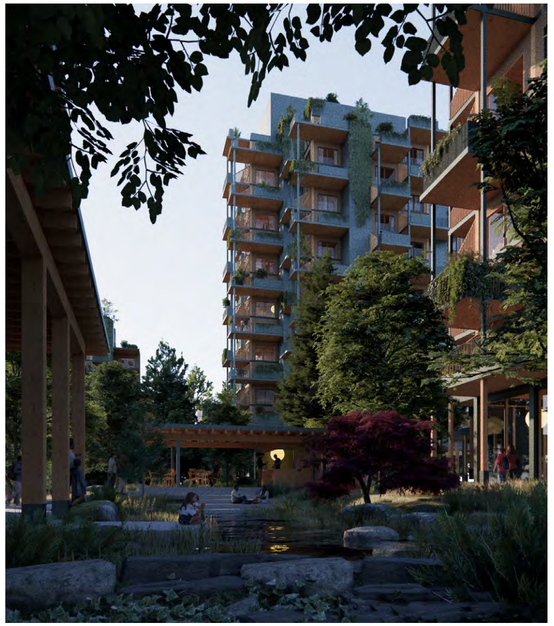
Key reform to on-site parking requirements would allow a significant reduction to the building footprint and reliance on the use of concrete. By eliminating the podium, we reduce the building's footprint, and the tower instead rises from a compact base, supported by a straightforward, repetitive structural grid. Each tower utilizes the Post-and-Plate system to simplify construction and removes the need for costly structural and mechanical transfers.

Concrete Tower-Podium Construction
- carbon intensive concrete construction
- complex structural and mechanical transfers
- excavation and concrete required for on-site parking
- large building footprint
- minimal outdoor public space
- secondary beams require additional coordination

Hybrid Mass Timber & Steel Post-and-Plate Tower
- sustainably sourced mass timber
- simplified and repetitive structure, faster assembly
- limit on-site parking, employ contemporary solutions
- compact building footprint
- maximized outdoor public space and landscape
- flat plate allows for simplified MEP installation

Left: In the evening, the towers emit a warm glow. Amenities throughout the landscape offer people places to connect. Above: Balconies give each tower its distinctive exterior character, offering each home a generous extension of their indoor spaces.

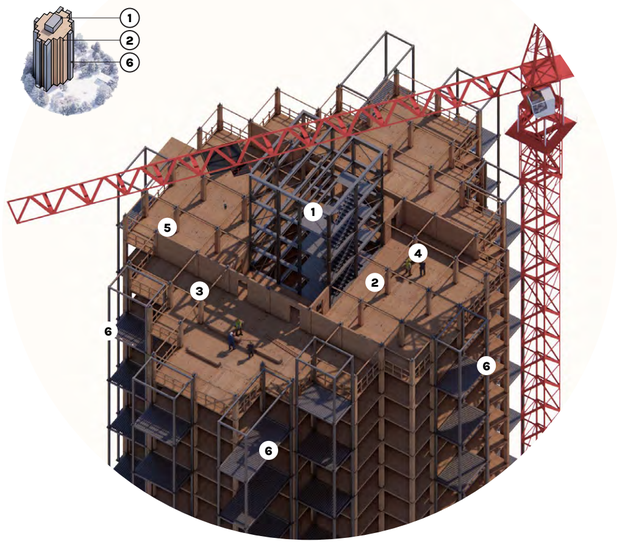




Connection to Land. The efficient building footprints provides an opportunity to transform the site into community-oriented land with an abundance of natural amenities that create surprising, memorable, and joyful moments for rest, play, and discovery.
Inspired by the Tsawwassen First Nation's values of connection to land and water, a water collection pond anchors the heart of the site, storing rainwater for landscape irrigation and community amenity use.
The site is bookended on the south residential zone by public art displays, and on the north by a communal fire pit overlooking the adjacent natural area and public waterfront.
Small scale commercial spaces that are compatible with a tighter structural grid are mixed in throughout. We strongly believe diversifying allowable uses on the site creates a vibrant focal point for the larger neighbourhood.
Residential amenities are all oriented to face the heart of the site and an abundance of community spaces are dispersed throughout: indoor and outdoor community rooms, walkways with seating, and covered outdoor pavilions.

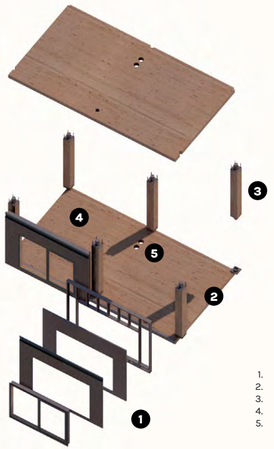
Left: 1. Water collection pond / Water garden 2. Firepit 3. Public art 4. Playground 5. Outdoor community room 6. Indoor community room 7. Covered Outdoor Pavilion 8. Residential lobby 9. Residential amenities 10. Small-scale commercial spaces 11. Car share parking / service access 12. Waterfront trail 13. Boardwalk 14. Dock / Bank fishing area (11 to 14 are envisioned outside of site boundaries)

Post-and-Plate. Mass timber case studies reveal a preference for simplified structural systems. Inspired by the success of Brock Commons Tallwood House, this proposal leverages the Post-and-Plate system's compatibility with residential layouts - using a tighter column grid that aligns naturally with apartment room configurations.
Each proposed tower avoids cantilevers, ensuring columns track uniformly from bottom to top. This approach establishes a simple, consistent structural grid throughout the core. Variation is then introduced at the building perimeter, where exterior-facing corners and independent steel balcony systems are utilized to create layouts that feel generous and flexible while maintaining structural efficiency.
The Post-and-Plate system enables thinner, more efficient floor assemblies that can provide uninterrupted wood ceilings that give interiors a warm, loft-like character.

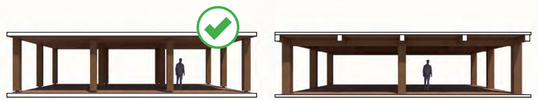


The balconies are conceived as pre-fabricated, modularized steel frame units that are self-supporting and tied back to the building at discrete points. The intent of de-coupling the balcony structure from the mass timber building is to reduce construction complexities typical of cantilevered structures and have more control at potential thermal bridging points. The independent structure also allows pre-fabrication to occur in tandem and for flexibility in phasing the balcony installation.

1. Steel frame building core
2. Point supported CLT panels
3. 12" x 12.5" 16c-E DF glulam column
4. 12' x 10' structural grid
5. CLT shear wall
6. Balcony steel frame independant from mass timber structure



1. Pre-fabricated building envelope
2. Point supported CLT panels
3. 12" x 12.5" 16c-E DF glulam column
4. 12' x 10' structural grid
5. Pre-drilled slab openings



Post-and-Plate*
7" thick 5ply E1 CLT deck
12" x 12.5" 16c-E DF glulam column

Total structural depth: 6.9"

Post-and-Beam*
3.5" thick 3 ply E1 CLT deck
8.5" x 10" 24f-E DF glulam purlin
8.5" x 14.5" 24f-E DF glulam girder
14.5" x 15" 16c-E DF glulam column

Total structural depth: 18.3"

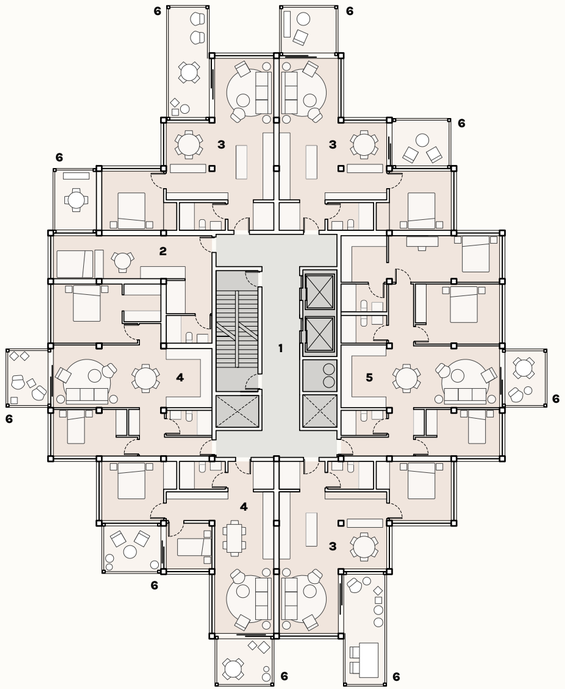
Compared to Post-and-Beam systems, Post-and-Plate construction uses fewer structural members, allowing for faster build times and reduced material complexity. This efficiency makes it possible to fit more floors within the same building envelope without sacrificing desirable ceiling heights which is key for sites with stringent zoning constraints. Additionally, the flat plate slab simplifies MEP installation by eliminating the need to route services beneath secondary beams.

*Structural member sizing and take-off data generated by Fast + Epp Concept Lab's Bay Design Tool 2.0

High Density Living. Surrounded by nature, each mass timber tower is designed to maximize exposure to natural light and provide expansive views of the City, water, and open landscape below. The tower's 'serrated' facade increases the number of corner windows, giving every living unit a panoramic view of its surroundings. This design enhances airflow and brings ample daylight into each room - a significant advantage over conventional 'shoebox' apartments. This greater access to daylight and fresh air can reduce occupants' reliance on electrical and mechanical systems, lowering energy consumption over the building's lifespan. Steel-framed balconies, independent of the mass timber structure and thermally broken from the enclosure, are located at the tower's perimeter. Conceived as 'backyards in the sky,' these generously sized terraces function as outdoor living rooms and spacious extensions of the interior. By staggering the terraces both horizontally and vertically, each outdoor space achieves a double-height ceiling. The simple and repetitive Post-and-Plate structural grid offers the flexibility to create varied yet straightforward unit layouts to accommodate diverse contemporary living arrangements.

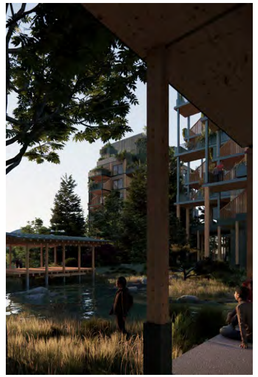
On lush, double-height balconies, residents can enjoy the outdoors surrounded by greenery and mountain views. The steel-supported balcony, system tied back to the mass timber superstructure, creates spacious outdoor living rooms that blur the line between interior and exterior.

Connection to daylight and nature is a priority. The apartments emphasize outdoor living, with interiors that open onto generous balconies. Building corners are designed to maximize views and bring daylight into each room.



1. Steel frame building core
2. Studio unit
3. 1 Bedroom unit
4. 2 Bedroom unit
5. 3 Bedroom unit
6. Steel frame balcony system

The simple and repetitive Post-and-Plate structural grid offers the flexibility to create varied yet straightforward unit layouts to accommodate diverse contemporary living arrangements.



Building (on) a Legacy. As more existing neighbourhoods undergo densification, mass timber construction sites offer the benefits of being cleaner and quieter, with reduced construction timelines. Timber Town aims to be a great neighbour - bringing value by reinforcing a sense of place and prioritizing a sustainable approach in both the buildings and the land. We also believe in balancing risk without sacrificing priorities of quality, dignified housing: Structural systems should be straightforward and floor plates compact while designing to maximize light, air, and access to nature.
Initially, costs for mass timber high rise construction may be higher than it's concrete equivalent, especially in the early stages of the industry's growth. To alleviate financial roadblocks, we believe that mass timber projects that provide significant public amenities as Community Amenity Contributions, such as in Timber Town's aims, should receive subsidy and investment at both the local and federal levels.

Construction Costs

		Concrete		Timber Town	
	Square footage	$/sq ft	Cost	$/sq ft	Cost
Below grade		$315	$0	$299	$0
Base floor	23,250	$360	$8,370,000	$403	$9,369,750
Above 1st storey	255,555	$385	$98,388,675	$431	$110,144,205
	Quantity	$/unit		$/unit	
Balconies	176	$25,000	$4,400,000	$15,000	$2,640,000
	Cost / Month	# Months	Cost	# Months	Cost
Schedule Costs (Monthly Overhead)	$50,000	36	$1,800,000	27	$1,350,000
		TOTAL	**$112,958,675**		**$123,503,955**

Embodied Carbon *(based on the Fast + Epp Bay Design Tool)*

		Concrete		Timber Town	
	Sq ft	Embodied Carbon kg/sq ft	Total Carbon	Embodied Carbon kg/sq ft	Total Carbon
Total Building Sq Footage	278,805	6.69	**1,864,932**	3.55	**989,758**

While timber construction may at present be costlier than it's concrete equivalent, the inherent benefits of timber such as reduction in the amount of embodied carbon and improvements in construction timeline (25% reduction assumed based on industry studies) are key considerations particularly when material and labour costs for timber construction are projected to reduce alongside industry growth. For Timber Town, there was also an assumed reduction in costs for the de-coupled balconies due to efficiencies in pre-fabricating off-site and simplifying installation.

Timber Town aims to be a great neighbour - bringing value by reinforcing a sense of place and prioritizing a sustainable approach in both the buildings and the land.

"Timber Town has the strongest **relationship and connection to the land.**"

JURY COMMENTS

It was agreed that this project had the strongest relationship and connection to the land. With beautiful graphics, the project provided great – but expensive – living spaces.

Juror Sailen Black commented on how **Timber Town** intricately developed the landscape ground plane.

"These dark, compelling components in the renderings have you trying to understand what is happening. They transform the site into community with an abundance of natural amenities.

They've also flipped the hierarchy where steel is hidden, load bearing. By putting steel outside it protects the wood. Beautiful balconies, nice living spaces, people would be happy to live here. Structural elements are straightforward."

FAM-1

FAMILYANDFRIENDS VANCOUVER, CANADA

McKean Shave,
Richard Ranta,
Robert Ferguson

Site **C**

FSR **3.7**

Stories **10.5**

CO_2 **59.64%**

Potential Carbon Reduction
BASED ON EQUIVALENT BASELINE

KEY STRATEGIES

- Extra large units including 5, 6, and 7-bedrooms to support intergenerational living
- Tandem mass timber facilities that produces both prefabricated CLT panels and prefabricated light wood framing panels
- Ability to scale across similar sites

POTENTIAL COST EFFICIENCIES

- Tandem mass timber facility—capable of producing both prefabricated CLT and light wood framing panels—lowers material and labour expenses
- Leveraging mass timber and stick-framing efficiencies reduces reliance on carbon-intensive materials while maximizing material utilization
- On-site assembly is simplified, requiring minimal labour and only a single crane, which accelerates construction schedules and reduces site overhead costs

familyandfriends

FAM-1

FAM-1 is a prototype twice over.

familyandfriends envisions not just one building, but a comprehensive mass timber design, fabrication and construction system: **FAM**.

The system leverages our region's great timber resources, burgeoning mass timber fabrication industry, and massive housing demand to innovate both the material and social character of high density living.

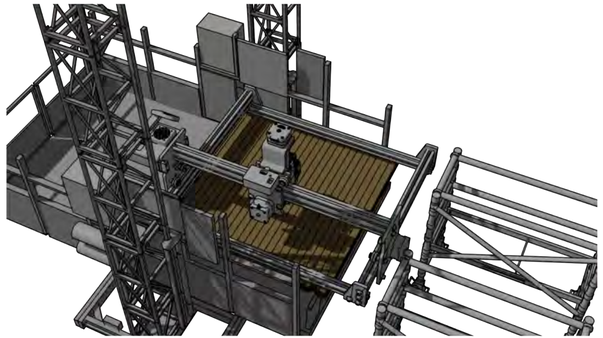
In a time of increasing loneliness, we need alternatives to the studio, one- and two-bedroom units dominating the market. Two demographics historically underserved by the housing sector — **intergenerational families** and **young people** — both stand to benefit from larger units. For families, remaining together offers affordability, mutual support, and cultural continuity. For youth, roommates mean a more affordable, more social way of life. Accordingly, **FAM-1 has 5, 6, and 7 bedroom units**. Their design builds on the success of student sharehouses in Vancouver, adopting many of the spatial characteristics of the single-family home.

From a construction standpoint, FAM minimizes the number of unique components, adopting just a few **modular panels, plates, and columns**. Prefabricated partitions, fixtures and fittings **expedite on-site construction**. The system is also modular at the building scale -- independent CLT circulation cores allow for the design of both small and large building footprints.

A pilot project, FAM-1 intends to prove both the efficacy of the manufacturing and construction system, as well as the market feasibility of large, multi-bedroom 'sharehouse' units. It will be developed and funded by the CMHC, in partnership with Kwantlen First Nation's "Səy̓əm̓" development corporation. If successful, the FAM system will be available to private developers and non-profits alike for rapid deployment across the West Coast.

MANUFACTURING AND ASSEMBLY

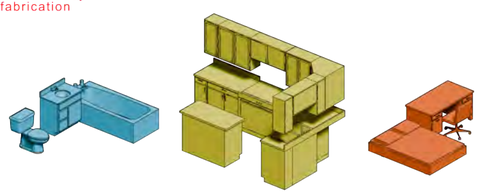
the project proposes a tandem mass timber facility that can produce both prefabricated CLT panels as well as prefabricated light wood framing panels. This would avoid more carbon heavy materials such as steel framing as well as utilising the efficiency of materials provided by the stick framing.



each panel is designed to fit within the constraints of a long haul truck bed for distribution throughout Vancouver as well as the rest of the Pacific climate zone. Once on site, the pieces can be easily assembled with minimal crews and an on-site crane.

PODS

standardized kitchen, bathrooms and bedrooms allow for easy prefabrication



EXTERIOR PANEL FRAMING

prefabricated in factory

EXTERIOR PANELS

cladding and assembly completed in factory

CLT SHAFT PANELS

prefabricated in factory

GLULAM POST + STEEL CONNECTION

prefabricated in factory

CLT PLATES

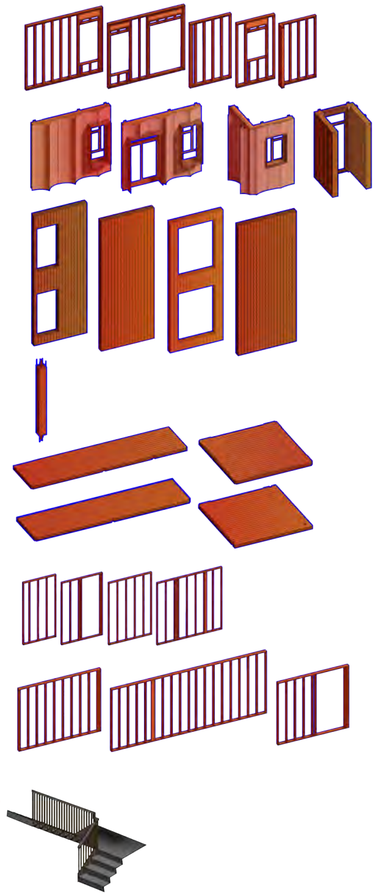
prefabricated in factory

INTERIOR PARTITIONS

prefabricated in factory

STAIRS

prefabricated in factory



MANUFACTURING AND ASSEMBLY

the composite post and plate structure is compromised of approximately 1178 m³ of lumber including sheathing, CLT, light wood framing and glulam posts. Storing in total 1057 metric tons of CO_2, which is equivalent to 343 cars off the road in one year or the energy to operate 171 homes.

each room is equipped with an electric baseboard heater

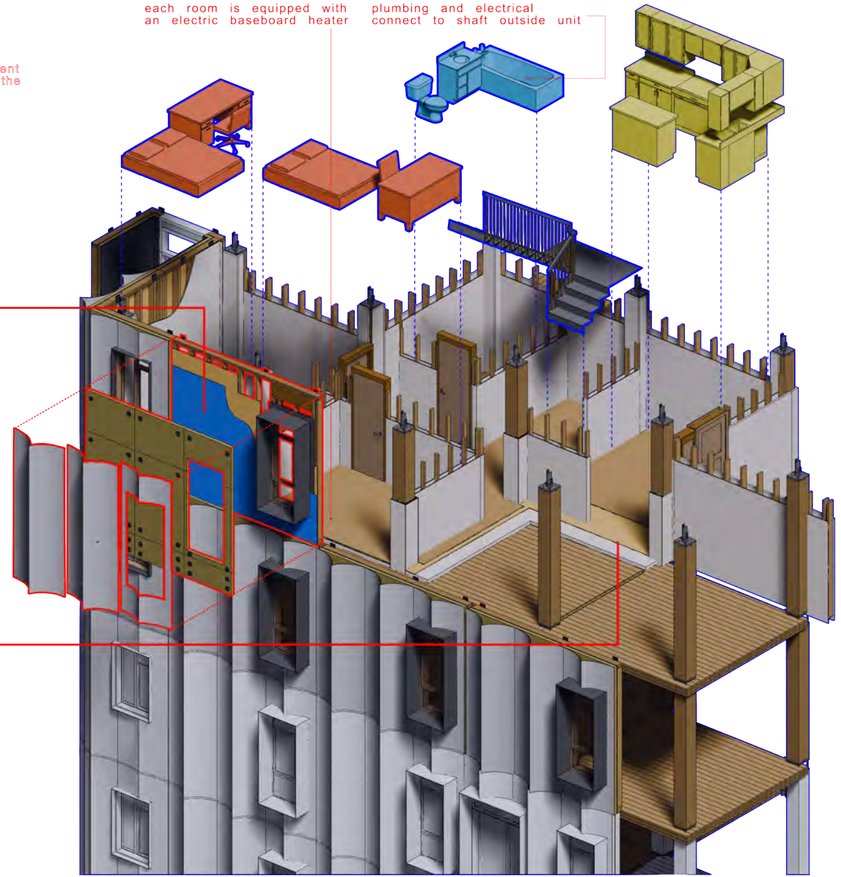
plumbing and electrical connect to shaft outside unit

EXTERIOR ASSEMBLY

metal cladding
25mm steel girts
76mm rigid insulation with thermally broken clips
liquid applied membrane
12.7mm plywood sheathing
140mm light wood frame with fibreglass batt insulation
16mm gypsum finish

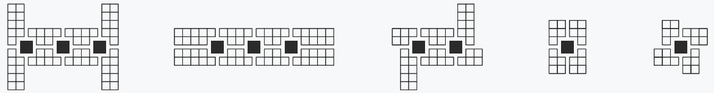
FLOOR ASSEMBLY

floor finish
12.7mm plywood subfloor
50mm rigid insulation with acoustic rails and dampeners
3 ply 16mm gypsum panel
5 ply CLT deck

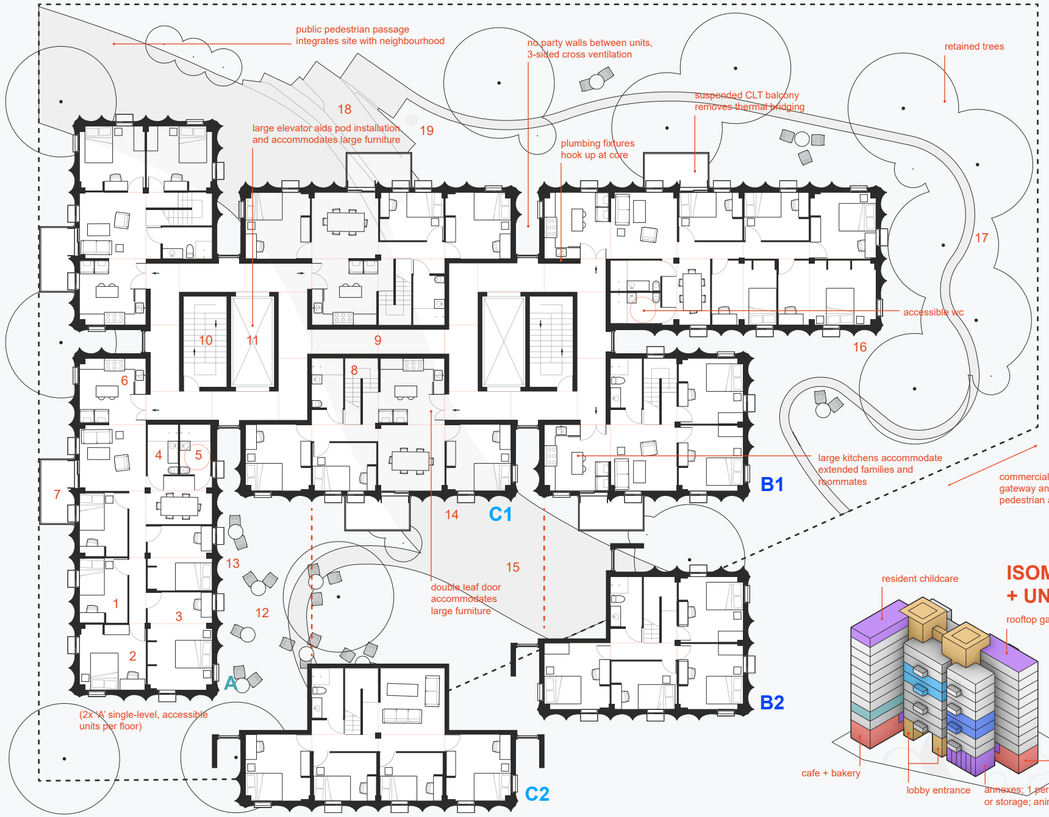


TYPICAL UPPER FLOOR + SITE PLAN

1:250
0 1 2 5 10 m



modular core + unit system allows configuration for large and small sites



IN-UNIT PODS

1 bedroom S
2 bedroom M
3 bedroom L
4 wc X
5 wc Y (accessible)
6 shared kitchen
7 balcony
8 stair

CORE

9 shared circulation
10 exit stair
11 oversized elevator

URBAN + LANDSCAPE

12 cafe patio
13 cafe + bakery entry
14 timber gateway + carving workshop
15 lost stream urban passage
16 family health clinic entry
17 stormwater runnel
18 rain garden + reflecting pool
19 sculpture

ISOMETRIC: AMENITY + UNIT LAYOUT

The system is designed to serve the largest possible market with a single product, thereby maximizing fabrication efficiency and leveraging economies of scale. Weatherproof, insulated panels suit West Coast climate zones—Csb to the south and Cfb to the north. With millions of residents across Vancouver, Victoria, Seattle, Portland, and San Francisco, BC's timber and fabrication industries are well placed to supply this "climate market." We need to think big.

In addition to climate, the design must respond to its cultural region. The large units can accommodate atypical family sizes, a need expressed by the Semiahmoo, Kwantlen, and Katzie First Nations, on whose territory the project is located. At the site scale, a culverted stream and dense tree cover have become opportunities for stewardship through daylighting and preservation, while spaces such as a covered outdoor patio and rain garden can support cultural programming, such as carving or workshops.

PROFORMA

FSR	3.708468229
Lot size (sq ft)	20,125
Building sq ft Above Grade	74633
Building efficiency (%)	85
non saleable/rentable (sq ft)	11194.89739
saleable/rentable (sq ft)	63437.75188
Total Stories above grade (#)	10.5
Total Stories (#)	10.5
Base floor (#)	1
Above 1st storey (#)	9.5
Stories below grade (#)	0
Units (#)	34
Bedrooms (#)	194
Amenity space (sq ft)	1395.00279
Non-residential (sq ft)	7463.264927

CONSTRUCTION COSTS

		Concrete		Submission	
	Square footage	**$/sq ft**	**Cost**	**$/sq ft**	**Cost**
Below grade	0.0	$315	$0	$150	$0
Base floor	7463.3	$360	$2,686,775	$270	$2,015,082
Above 1st storey	67169.4	$385	$25,860,21	$280	$18,807,428
	Quantity	**$/unit**		**$/unit**	
Balconies	34	$25,000	$850,000	$25,000	$850,000
	Cost per month	**# Months**	**Cost**	**# Months**	**Cost**
Schedule Costs (Monthly	$50,000	18	$900,000	16	$800,000
TOTAL			**$30,296,98**		**$22,472,509**

EMBODIED CARBON

		Concrete		Submission	
	Sq ft	**Embodied**	**Total**	**Embodied**	**Total**
Total Building Sq Footage	74632.6	6.69	**499219.28**	2.7	**201508.153**

The proforma points to general project benefits, such as reduced carbon emissions and cost compared to concrete construction. However, some advantages of the FAM system are not fully captured in the table, such as faster construction timelines due to prefabrication and standardization of unit design, and the ability to scale this system across similar sites for further cost efficiencies. Together, the proforma demonstrates that this system is not only feasible but establishes a replicable path toward affordable, low-carbon, family-oriented urban housing.

"FAM-1's large unit sizes for **intergenerational families** and **young people** asks us to rethink our assumptions."

JURY COMMENTS

This entry was provocative in providing for very large units with 5–7 bedrooms for intergenerational families and young people ('sharehouses'), which pushes some of our assumptions about the number of bedrooms that is viable in high density living.

The cost consultants, though, found such unit sizes unmarketable. On prefabrication, the proposal also gave considerable thought to the exterior envelope and parts that are repeatable.

The scheme also proposes to use light wells, again challenging conventions in a way that would enable greater density.

AWR

RWA VANCOUVER, CANADA

Andrea Bolin, Cindy Brenneis,
Lian Gilles, Mohneesh Vidhani,
Tanita Cherian, Simin Lofti

B
Site

4.0
FSR

11 PLUS ROOFTOP AMENITY
Stories

45.45%
Potential Carbon Reduction
BASED ON EQUIVALENT BASELINE

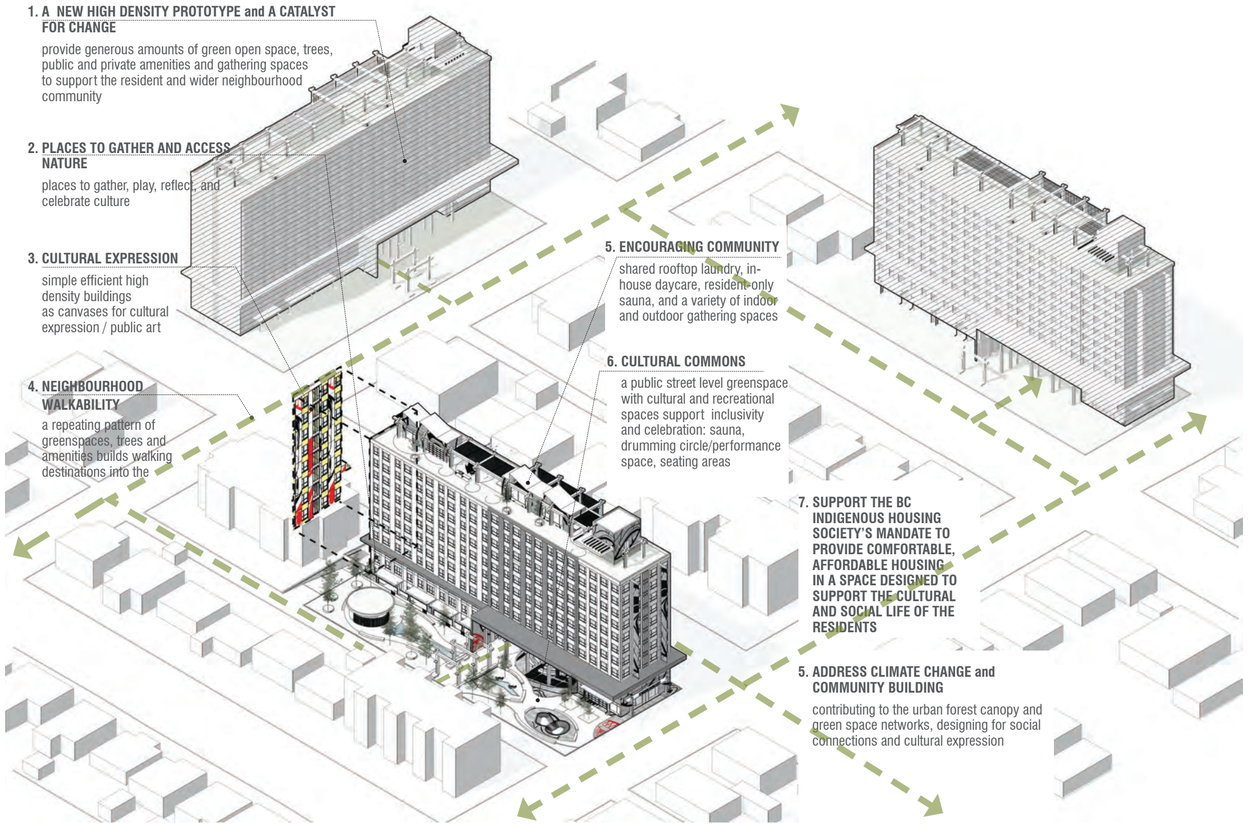
KEY STRATEGIES

- Hybrid system of concrete parking and elevator shaft with an above-grade superstructure of prefabricated mass timber
- Rooftop laundry and daycare supports community
- No balconies, but large shared terraces are provided on each floor

POTENTIAL COST EFFICIENCIES

- Combining a below-grade concrete podium and elevator core with an above-grade prefabricated mass timber superstructure delivers shorter schedules and a more financially efficient alternative to conventional full concrete construction
- Concrete is labour- and time- intensive, particularly for above-grade structures, whereas prefabricated mass timber panels allow faster assembly and reduced on-site labour
- Standardized timber components benefit from economies of scale, which are expected to reduce production costs over time

KEY INTENTIONS

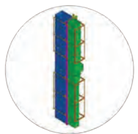


ECONOMIC + CARBON RATIONALE

Our proposal balances cost competitiveness with constructability by adopting a hybrid system: one level of below-grade concrete parking and a concrete elevator shaft for resilience and code compliance, paired with an above-grade superstructure of prefabricated mass timber. This strategy reflects current market practice while unlocking timber's economic advantages where they matter most.

The project is located in Vancouver, BC, where both provincial and federal subsidies and grants are available to accelerate the adoption of mass timber. British Columbia has a strong regional CLT supply chain, lowering transportation costs and providing competitive pricing compared to imported products. Together, these factors make timber not only technically viable but financially attractive today. Looking ahead, as with any technological advancement, the cost of production will decline as economies of scale take effect. Even if subsidies and grants are phased out in future, the industry will be in motion, and the regular manufacturing cost of standardized timber components will naturally come down.

COST OPTIMIZATION TECHNIQUES



pre-fab MEP riser

in-situ prefab MEP riser

pre-fab bathroom pod

40-45% WWR

CATEGORY	CONCRETE	CLT	SAVINGS
STRUCTURE	Cast in place slabs and Rebar ~$110/sf	CLT slabs +beam/columns frames ~$90 / sf	~$20 / sf
BATHROOMS	On site trades, coordination risks	Prefabricated Bathroom Pods	~$2-3 / sf (~$6-8k / unit)
KITCHENS	Varied layouts, bespoke millwork	Standardized kitchens in all units	~$1-2 / sf (~$1-1.5k / unit)
FACADE	Curtain Wall ~ $70 / sf facade	Panelized timber wall + punched windows ~ $50-55 / sf	~$8 - 12 / sf GFA
GLAZING RATIO	~ 65-70% WWR, Larger HVAC	~ 40% WWR, smaller HVAC	~$5 - 7 / sf
INTERIORS	Full drywall, suspended ceilings	Exposed CLT Soffits, reduced finish	~$3 - 5 / sf
MEP	Conventional risers, long runs	Prefab risers + shorter runs	~$2 - 3 / sf
SCHEDULE	~ 18 months	~ 14-15 months (20-25% faster)	~$12 - 15 / sf
GC OH&P	~ 5% of direct costs	~4% (lower risk + faster build)	~$4/ sf

BC Housing, "Comparative Feasibility Study for Encapsulated Mass Timber Construction" (2020) found timber 7–10% more expensive than concrete. Our design applies the recommended optimizations (prefabrication, panelized façade, reduced connectors) to achieve ~7–10% lower costs than concrete

EXPLODED VIEW OF PREFABRICATED STRUCTURE, MEP
(MECHANICAL ELECTRICAL PLUMBING) AND ENVELOPE COMPONENTS

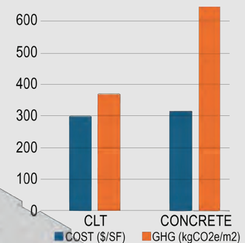
5% CHEAPER THAN CONVENTIONAL CONCRETE

40% - 50% LESS GHG EMISSIONS THAN CONCRETE

20% -25% LESS SCHEDULE CONSTRUCTION TIME

LIFECYCLE SAVINGS
Less maintenance, Simpler MEP, Less Operational Expenditure

BIOGENIC CARBON SINK
CLT locks in CO2 for the life of the building



On carbon performance, the whole building (with 1-level concrete parkade and shaft) achieves a 30–35% reduction in embodied carbon compared to a full concrete baseline. Above grade, where mass timber displaces concrete, the reduction is more pronounced at 45–50%. Mass timber additionally acts as a carbon store, sequestering biogenic carbon for the life of the building. Optimized façades (~40% glazing) further reduce operational carbon by 10–15%, cutting long-term emissions.

DESIGN RATIONALE

Three key ideas:

Higher density development, balanced with areas of nature, is good for city-building and city-living.

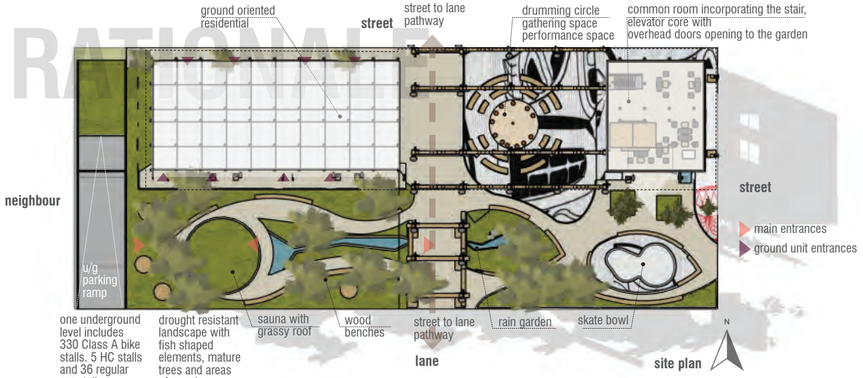
Simple, efficient, economical developments are wonderful canvases for colourful, inspiring, and culturally expressive buildings.

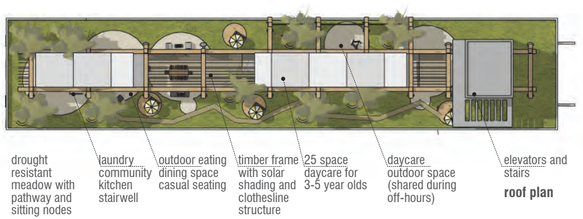
Inviting neighbours to share on-site green, open space and witness or participate in cultural activities follows the BC Indigenous Housing Society's Seven Laws of Life: Health, Happiness, Humbleness, Generations, Generosity, Forgiveness and Understanding.

Our proposal locates the building close to the front street to optimize open space. This open area, without the constraints of a parkade, will support mature trees and a patch of nature as an antidote to urban living and a welcome new green space in the neighbourhood.

We intend to provide a comfortable living space for residents, spaces where residents can spend time together and share cultural practices, if they choose to. The natural area is populated with a variety of seating and gathering spaces which would be shared with the surrounding community. Daycare for 25 3-5 year olds is located on the rooftop.

The landscape and building design offers something special to the neighbourhood in the spirit of inclusion and reconciliation





DATA +

Project Statistics

Site:
Depth: 122'-0"
Length: 300'-0"
Site Area: 36,600 sf

Setbacks:
North 5-0"
West 6'-0"
East 27'-6"
South 63'-0"

Building: Depth: 54'-0"
Length: 266'-6"
Height: 11 Storeys + Rooftop Amenities
11'-0" floor to floor (133 ft)

FSR: 4

Floor Area:

L1	**9,980 sf**	
	Residential + Circ	7,240 sf
	Lobby / Lounge	2,290 sf
	Sauna	450 sf
L2 & 3	**13,880 sf**	6,940 sf / floor
	Residential + Circ	6,940 sf
L4-11	**113,200 sf**	14,150 sf / floor
	Residential + Circ	13,910 sf
	Shared Lounge	240 sf
	Shared Balcony	240 sf *
	* Not Included in area	
L12	**6,640 sf**	Rooftop Amenity
	Childcare	2200 sf
	Kitchen & Laundry	1750 sf
	Lounge	2290 sf
	Circulation	400 sf
	Gross Area:	**143,700 sf**

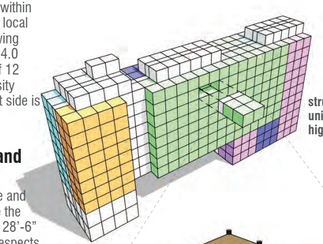
Unit Mix:
1-Bedroom: 95
2-Bedroom: 26
2-Bedroom + flex: 11
3-Bedroom: 28
3-Bedroom + flex: 8

Total Suites: **168 Units**

STRUCTURE + UNITS

Site Description

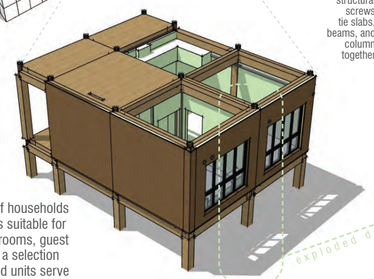
The site is situated on a corner site in Transit Oriented Area Tier 2, within 200 - 400m from the local skytrain station, allowing for maximum FSR of 4.0 & maximum height of 12 Storeys. A low-density neighbour on the east side is assumed.

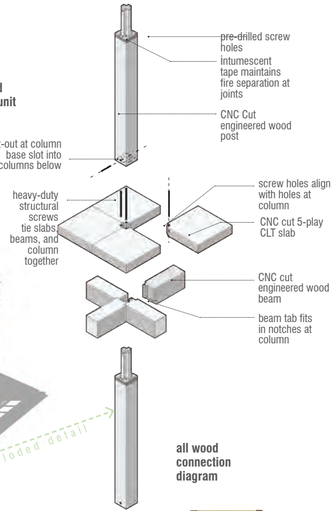


structural grid and unit mix (one bed unit highlighted)

Building Form and Location

The building is simple and compact to maximize the building economy. A 28'-6" setback on the east respects the privacy of the neighbour and accommodates a parking ramp. Underground parking is limited to one level and exceeds marginally beyond the building footprint to provide optimum conditions for tall and mature tree growth.





all wood connection diagram

Dwelling Units

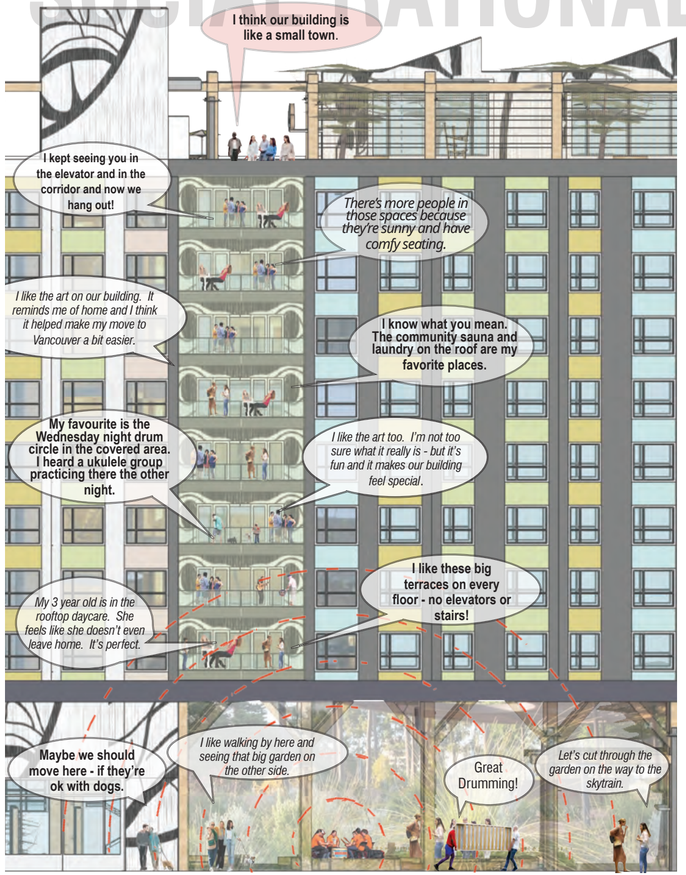
The development supports a range of households including larger families. Flex spaces suitable for home offices, kid's homework, play rooms, guest rooms, media/tv, etc. are included in a selection of 2 and 3 bed units. Ground oriented units serve seniors and families.

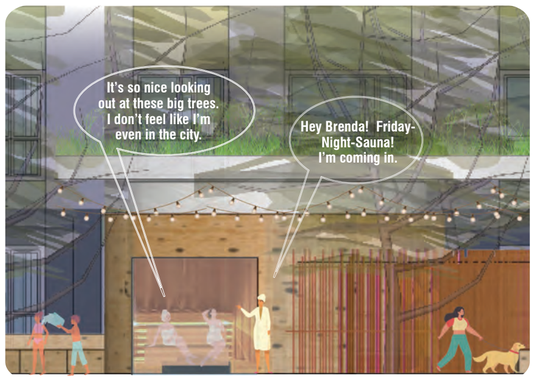
Units do not include private balconies. Large shared terraces are provided as a convenient outdoor space for residents on each floor.

mass timber grid including and a one-bed unit

1 bedroom | 2 bedroom | 2 bedroom + flex | 3 bedroom | 3 bedroom + Flex

SOCIAL RATIONALE





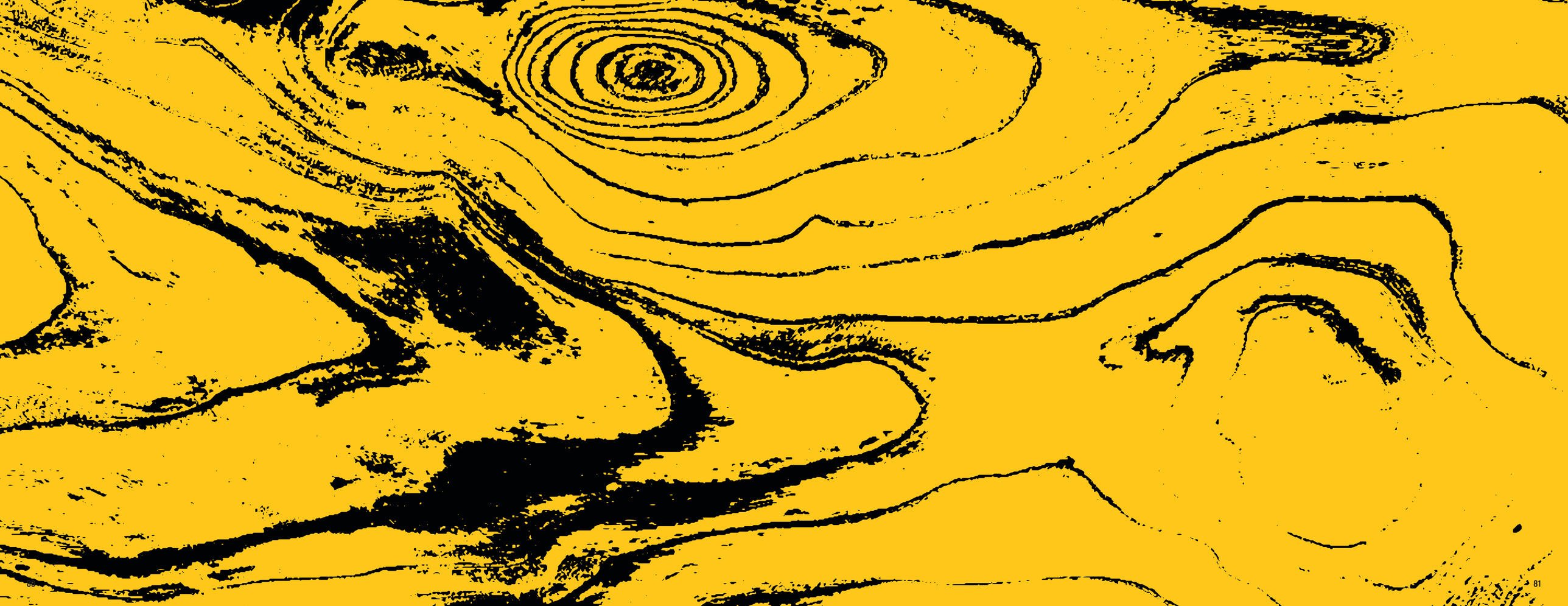
"AWR's strength is in **supporting community life** and encouraging interactions among neighbours."

JURY COMMENTS

Components of this scheme were commended by jurors Brenda Knights and Norm Leech for supporting community life and encouraging interaction and informal meetings among neighbours.

A great example was providing laundry facilities at roof level. Those going up to relax or barbecue will happen on those using the laundry and vice versa. The jury agreed that the scheme's modularity works and the concept of floor plans combining to meet different needs seemed smart. However the jury chair Emilie Adin expressed that the inclusion of floor plans would have been beneficial.

This project demonstrated simplicity and an economical design with a dedication to livability and shared space, as evidenced by the example of its community double height covered area.



DIGITAL PRIZE STATEMENT

ANDREW LAWRENCE

DECODING TIMBER TOWERS JURY MEMBER
FELLOW, DIRECTOR AND LEADING TIMBER EXPERT AT ARUP, LONDON, UK

*It is a **pivotal time** for mass timber construction, as architects and engineers across the world strive to understand both the most **efficient** ways to build in mass timber, and the types of buildings where it can offer a real **reduction in carbon footprint**.*

The two aspects are often related, as efficiency implies less material and so less cost and less carbon. It is the same journey that other materials such as steel and reinforced concrete have travelled in the past—to the point at which most steel or concrete framed buildings across the world look relatively similar (at least from an engineering perspective), compared, for example, with the huge number of proprietary steel reinforcement systems that existed in the first half of the twentieth century.

By comparison, mass timber is still at the research phase—every building is different, exploring new framing and connection techniques, searching for the optimal way to build. Standardization of mass timber will be key to predictable costs (based on the costs of previous similar buildings), and there will be no need to spend time (and money) comparing options and materials to find the lowest carbon solution because, for a particular typology such as a school or apartment building, we will already know the answer.

The new DIGITAL Prize is intended to help us all on this journey. Named partly after DIGITAL, Canada's Global Innovation Cluster for digital technologies and its Housing Growth Innovation program, the Prize is awarded to a submission that demonstrates innovation in both systematization and standardization of timber tower construction.

This year, the prize was awarded jointly to two entries. Importantly, both entries recognise the relative merits of flat-packed and volumetric construction, and both winners seek to combine the advantages of both approaches, albeit in different ways. The winners also recognise the need to let the architecture flow from a deep understanding of the material and efficient ways of using it, instead of postulating a layout in isolation and then forcing the structure to fit. To some extent, we can engineer anything, but if we understand and work with the material, our designs will be cheaper and lower carbon. Unlike concrete which can be cast to any geometry, timber is prefabricated, and so we need to shape our buildings around standard timber sizes and transportable volumes.

Timber Commons cleverly combines volumetric modules for complex highly serviced areas such as kitchens and bathrooms, with flat-pack for the simple bedroom and living spaces. Thereby, all the complex labour-intensive work is shifted to a controlled factory environment where the modules are made, enabling rapid assembly on site.

Culture House takes a different approach, delivering flat-packed elements to site to minimise truck deliveries, but assembling these into modules in a site-based factory down on the ground reducing craneage.

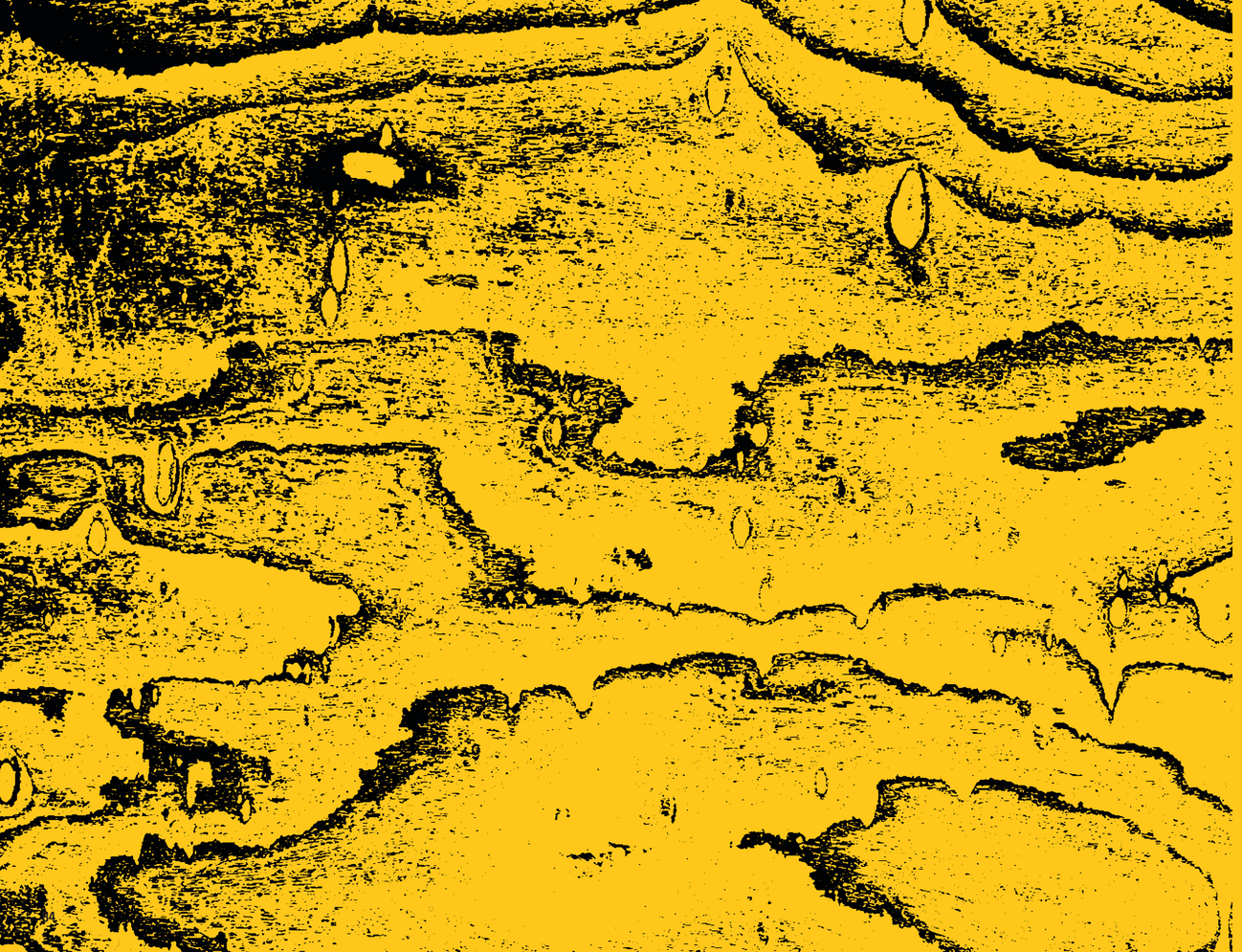
All materials are different in terms of their strength, appearance, fire and acoustic performance, and how we build with them. To use timber efficiently, it is absolutely critical that we understand the material.

The engineer who thinks that simply switching from steel to timber properties in their computer model makes them an expert, or the architect who thinks that switching from grey concrete to brown timber in their renders makes them an expert, have both completely missed the point.

Timber is a different material, and we need to understand that and work with it. Understanding how to build with timber and the relative merits of different forms of prefabrication is one part of that. We also need to understand how to achieve the long-life rot-free structures (long-life being key to sustainability), how to ensure fire safety, how to overcome the brittle nature of the material and how to integrate building services amongst many others.

This is why competitions such as Urbanarium's, where ideas can be explored and lessons learned and shared in a safe environment, are so critical to helping make mass timber a standard construction solution. ◄

The engineer who thinks that simply switching from steel to timber properties in their computer model makes them an expert, or the architect who thinks that switching from grey concrete to brown timber in their renders makes them an expert, **have both completely missed the point.**



ACKNOWLEDGMENTS

SARA STEVENS

CHAIRPERSON
VANCOUVER URBANARIUM SOCIETY

***Housing affordability** is a problem with a seemingly infinite number of variables. Solving the climate crisis doesn't appear to be any easier.*

So the audacity of this competition, to put these things together, and to do so with a highly technical subject such as mass timber, takes a not insignificant amount of chutzpah. It also requires a lot of expertise, from a range of fields, and a lot of work—from competition entrants, staff, and many volunteers. This publication is a celebration of all the creativity that the competition entrants demonstrated in their submissions, with a range and breadth of ideas, and it is also a moment to show gratitude for all the work that went into the competition, from start to finish.

As the Chairperson of the Board of Directors and a member of the competition committee, I want to thank the competition co-chairs, Kari Dow and Travis Hanks, who put in countless hours shepherding the competition from an initial idea, through the details of site packages, to the great discussions of jury day, and now finally to this publication. Kari has served previously on our competition committees, as had Travis, whose involvement we can trace back to our first competition—as an entrant and winner with his firm, Haeccity Studio Architects. Together their complementing expertise as a planner and architect, steered the committee's success. Past competition co-chairs also joined the committee, including Catherine Alkenbrack, and Marta Farevaag, whose wise counsel and energy kept up the momentum. As well, on the committee we had another experienced member with Zoe Acton, whose contributions over the last three competitions have been tremendous. Richard Henriquez, the founding chair of the Urbanarium, has served on every competition committee and jury since our first, and his leadership and stewardship of the organization are unmatched; this year, his grandson Jacob Henriquez also joined the committee to carry on the family legacy of service. From our staff, our Operations Manager, Samantha Francey, kept us all organized and eased our load. Our Executive Director, Amy Nugent, brought experience, positive energy, direction, and enormous support to the competition's work.

The entrants' submissions are reviewed by an immensely talented jury representing a mountain of expertise. The jury included Andrew Lawrence, Arup Fellow, Director, Arup; Brenda Knights, CEO, BC Indigenous Housing Society; Emilie Adin, President, Planning Institute of British Columbia; Gary Hack, Professor Emeritus, UPenn, MIT; Ian Boyle, Principal, Fast + Epp; Mingyuk Chen, Associate Director, LWPAC; Natalie Telewiak, Principal, Michael Green Architecture; Norm Leech, Executive Director, Frog Hollow Neighbourhood House; Richard Henriquez, Founding Principal, Henriquez Partners Architecture; and Sailen Black, Senior Green Building Planner, City of Vancouver. We are very grateful for the expertise, experience, perspective, and care brought to the group by Brenda Knights and Norm Leech, who, alongside partners Sacred Waters and Tsawwassen First Nation, particularly supported our site selection through their organizations. The jury was then supported by technical advisors, who participated through reviewing shortlisted submissions; these included BTY Global Director Annie David and BTY Project Consultant Tiernan Tinnelly, and GHL Consultants Founding Principal Andrew Harmsworth.

A competition of this scale requires significant financial support as well. For this, we are grateful to many—first being the co-presenting sponsors, BC Housing and Kindred Construction, for their generous support. The competition's partners include CMHC, BC Indigenous Housing Society, DIGITAL, Frog Hollow Neighbourhood House, naturally:wood, Sacred Waters, Tsawwassen First Nation, Woodrise2025, the City of Surrey, the City of Vancouver, and the University of British Columbia School of Architecture and Landscape Architecture. An additional 19 sponsors whose logos are in the credits contributed to the work of the competition. All of this support reminds us of the potential for the exchange of ideas at the heart of this competition to shape policy and bring change to our cities. And as well, it demonstrates strong interest in both the ambitions of the competition theme toward the problems of affordability and climate change, and the creative solutions proposed by the entrants and winners. Thoughtfully-designed mass timber, plus intelligent policy change, can make a difference for housing and climate. ◀

CREDITS

Visit **decodingtimbertowers.com** to view the brief, all submissions, videos and more.

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Norm Leech	COMMUNITY LEADER	*Executive Director, Frog Hollow Neighbourhood House*
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SPECIAL THANKS

The Urbanarium Board of Directors and Advisory Board

"Decoding Timber Towers provided a platform to explore forward-thinking construction solutions and challenge conventional practices—an opportunity to investigate ideas that leverage mass timber, hybrid prefabrication, and modular design, demonstrating how innovative approaches can deliver efficiency, sustainability, and potential cost efficiencies. It fosters the exchange of bold ideas and cross-disciplinary collaboration, offering a unique opportunity to advance solutions that drive the industry forward and create resilient, adaptable spaces for the communities they serve."

ANNIE DAVID, DIRECTOR, BTY

"Participating in Urbanarium's Decoding Timber Towers was both a challenge and a rewarding experience. Competitions like this give designers the freedom to test low-carbon ideas before they're constrained by real-world budgets and codes. We loved exploring how much embodied carbon reduction is possible with today's materials and tools, and how aligning our methods through life cycle assessment can turn early design innovation into measurable climate impact."

ELISABETH BAUDINAUD, PRINCIPAL, CARBON WISE

"Higher buildings are coming. More interior exposed timber is coming, but there is a need to get some buildings built in order to develop the experience to get costs down. We've done a lot of work with codes, we've worked and pushed things through the Provincial Building Codes. In 2009, 15 years ago, I was laughed at when I spoke to Building Officials on mass timber. Now it's the norm. That says a lot about the change that has happened. The convening of voices and drawings that Urbanarium Competitions brings is important. Ideas bring the discourse and scrutiny needed to create safe solutions."

ANDREW HARMSWORTH, FOUNDING PRINCIPAL, GHL CONSULTANTS

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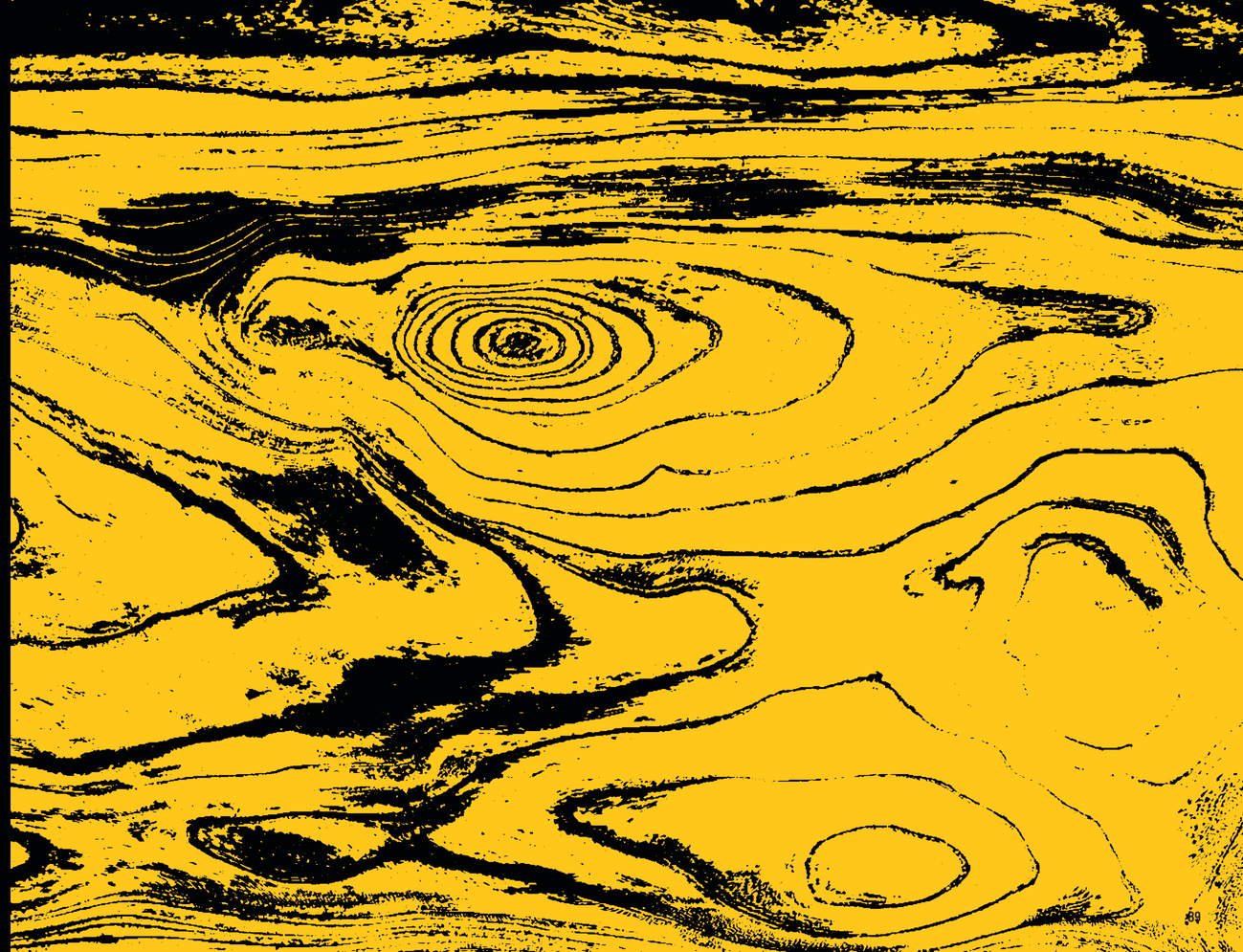

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