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.

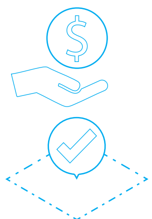
COLLABORATIVE DEVELOPMENT FRAMEWORK

ESTABLISH COMMON VALUE

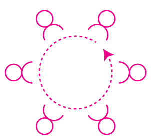
Co-development partnership is formed between **non-profit housing provider** and **Indigenous artist group** with common objectives to provide affordable housing for local community and promote Indigenous art culture, as well as celebrating various cultures within the community.

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.



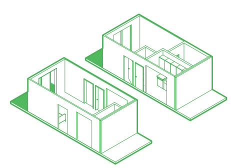
PROGRAM PLANNING



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.

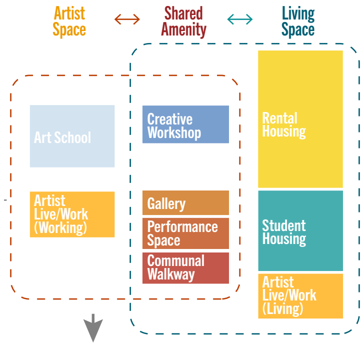
Art Entrepreneurs

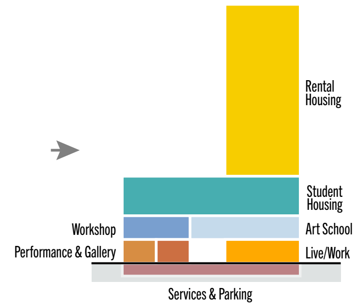
Bring creative energy, diverse artist practice, and cultural programming that enrich the community and foster economic vitality.

Indigenous Communities

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

Program Development

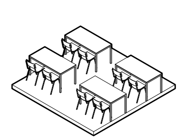




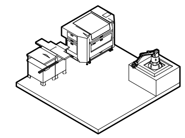
Program Overview

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.

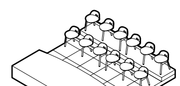
Places where people meet



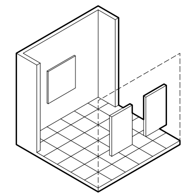
Art School
Places where ideas, knowledge, and experiences are shared and passed on.



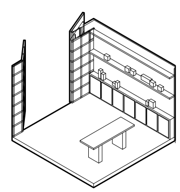
Workshop
Offer hands-on opportunities to create, learn, and collaborate.



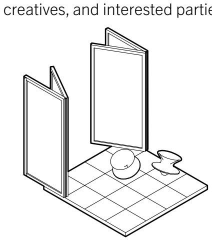
Performance Space
Open venue for hosing community and art events.



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

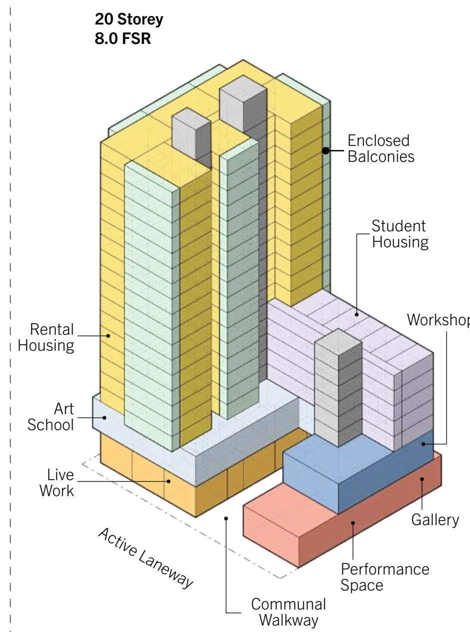


Live Work
Ground-oriented artist creative space with affordable living unit above.



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...

DTT-A-01

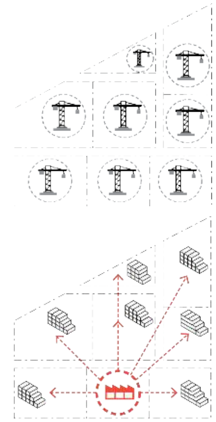
HYBRID CONSTRUCTION AND SHARED NEIGHBOURHOOD PLANNING

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.

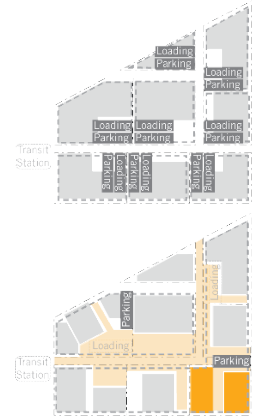
This hybrid approach is realized by **identifying and establishing temporary site-adjacent factories** on select parcels to support production for neighbouring projects with earlier development timelines. These facilities would assemble panelized prefabricated components and other building elements into 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.

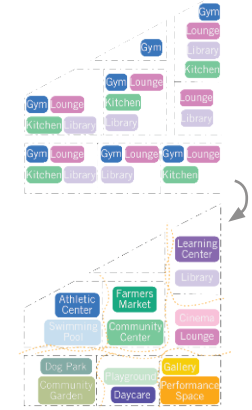
Similarly, **amenity programming** can be coordinated to diversify shared resources, avoid redundancy, and enrich the neighbourhood fabric. Instead of replicating standard amenity spaces in every building, each development could host distinct facilities - such as fitness centres, co-working spaces, childcare,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



Create site-adjacent factory

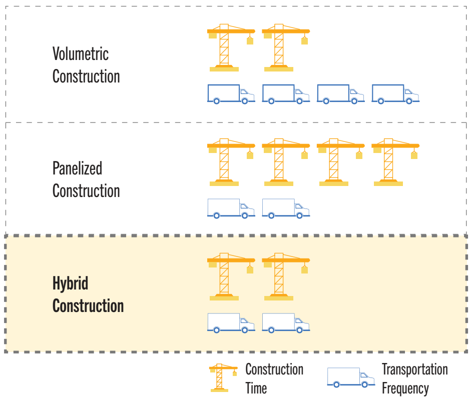


Share parking infrastructure

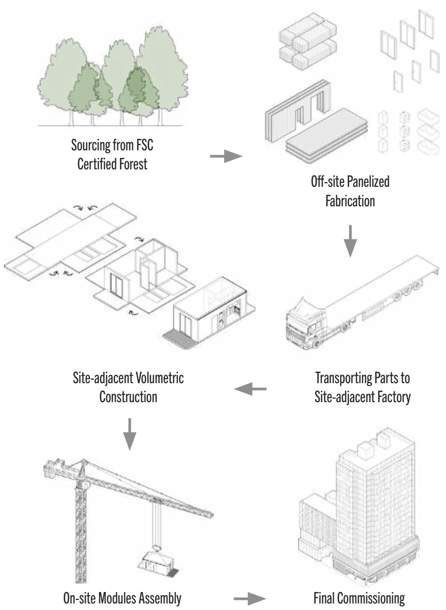


Diversify shared amenities

PREFABRICATION CONSTRUCTION COMPARISON



HYBRID CONSTRUCTION CYCLE



HYBRID STRUCTURAL STRATEGY

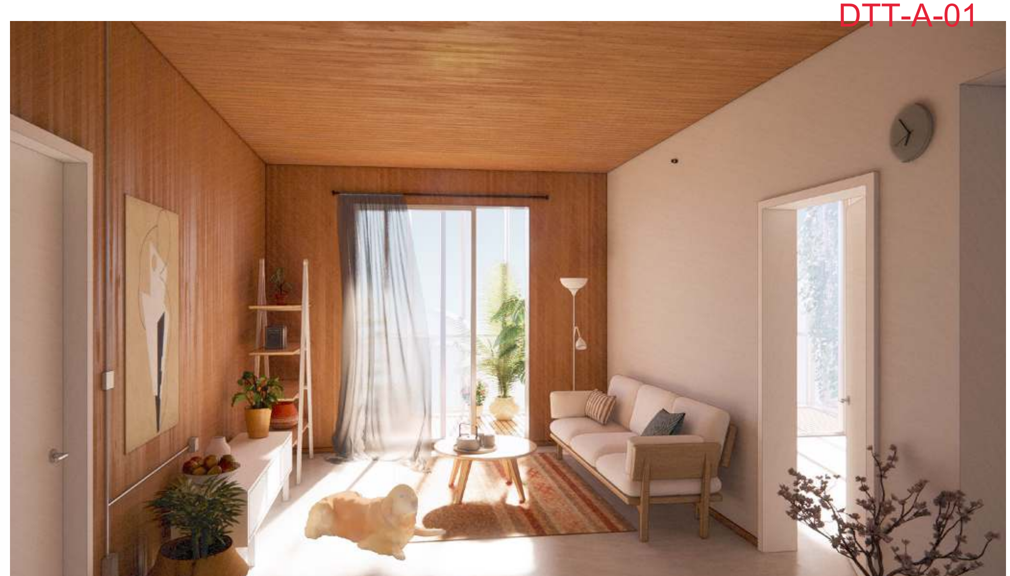
The building utilizes different structural systems for different components, each selected for its specific advantages.

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.

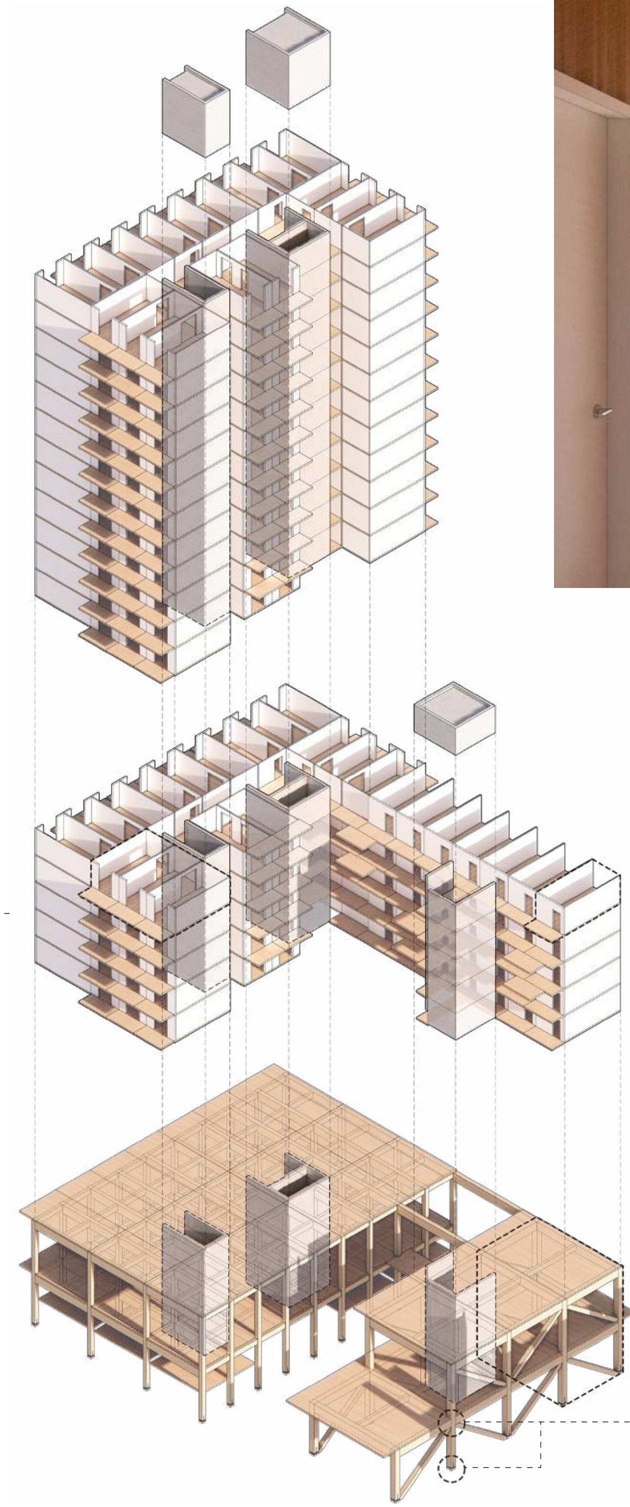
The upper residential levels employ volumetric mass timber modules for efficient, standardized assembly. While each student housing unit consists of a single module, rental housing units ranging from one to three-bedroom contain multiple modules to maintain standardization on panel sizes and streamline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

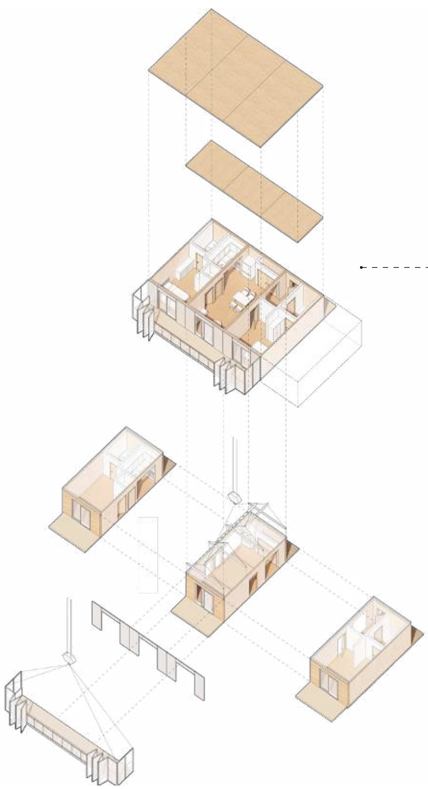
These modules rest on the post-and-beam structure below and are tied together through continuous load paths. Concrete building cores run the full height of the building, providing vertical circulation, connecting all components, and acting as the primary lateral force-resisting system.

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.



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

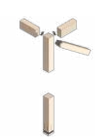




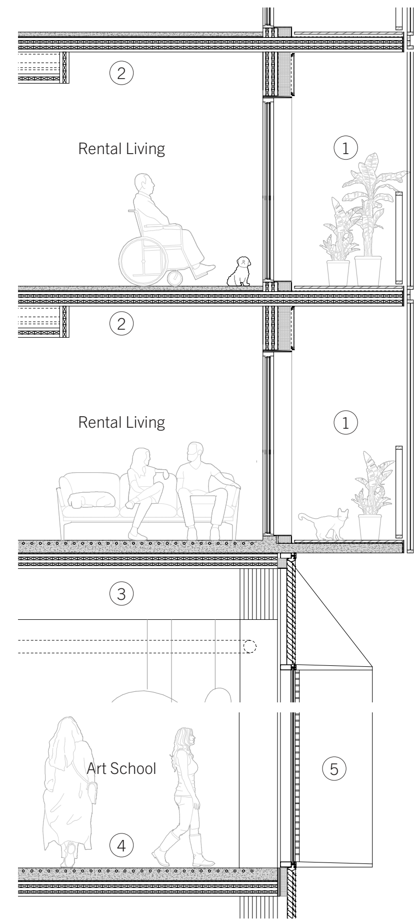
Rental Housing - Consist of multiple prefabricated volumetric construction modules assembled together, with enclosed balconies installed on site.

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.



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:

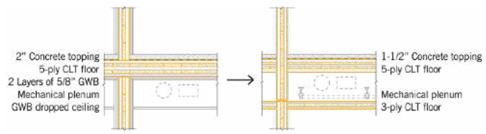
a. Increasing the allowable density to support 20-storey or more developments, or

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

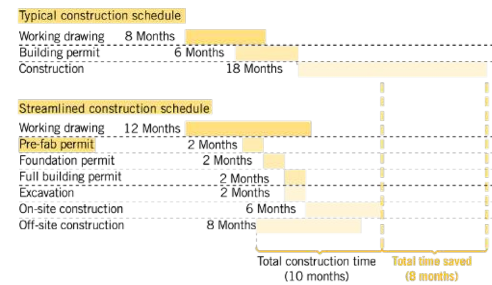
Although CSA A277 provides standards for off-site construction, its implementation remains inconsistent. Many stakeholders are unaware of the standard or unsure of their roles during off-site fabrication. This ambiguity often leads to confusion and rejection of prefabricated components at the construction 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.

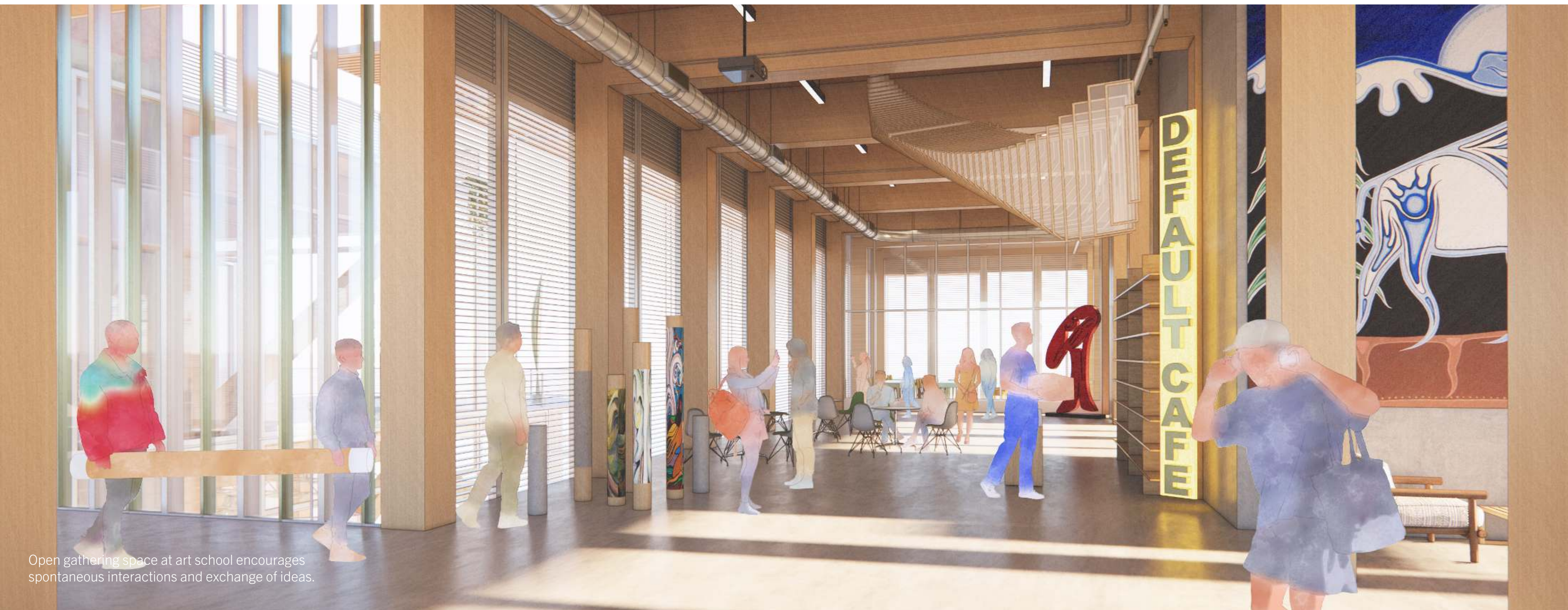
5. Enable Use of Enclosed Balconies
Reference: Municipal Zoning Bylaw

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.

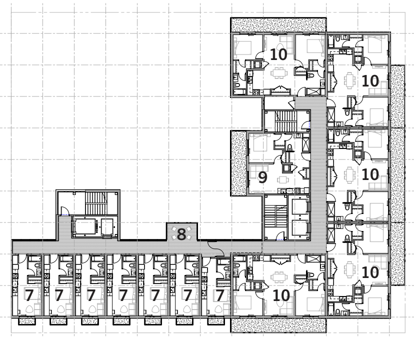
The project aims to reduce its carbon footprint by using mass timber construction combined with a site-adjacent factory, which lowers carbon emissions typically associated with transporting volumetric modules. A shared parking network and fewer parking entrances across the neighborhood increase parking 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.

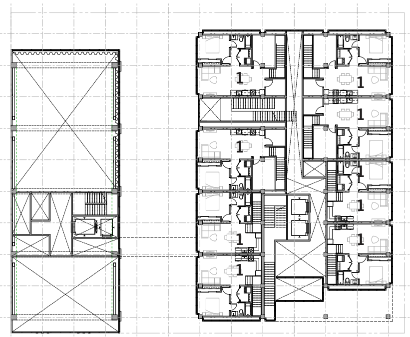
The project also benefits from a streamlined construction schedule, supported by a new prefabrication building permit that aligns with the prefabrication design and construction cycle. This approach shortens the total construction time and effectively lowers overall costs.

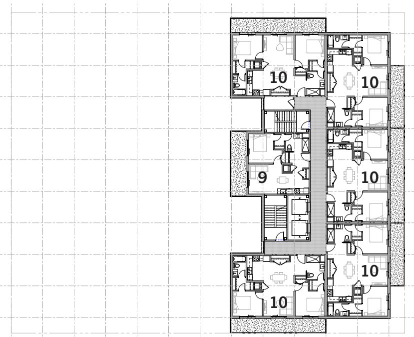
1 Artist Live Work
2 Residential Lobby
3 Performance Space
4 Gallery / Event Space
5 Art School
6 Workshop
7 Student housing
8 Common Space
9 Rental 1 Bed
10 Rental 2 Bed
11 Rental 3 Bed
12 Rental Studio

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

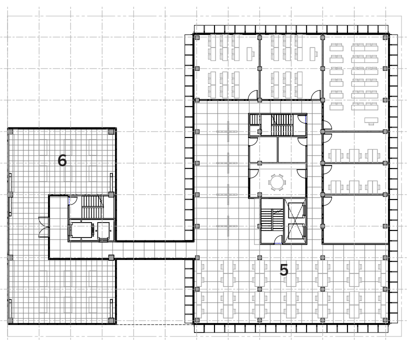


Level 4 to 8 - Student Housing and Rental

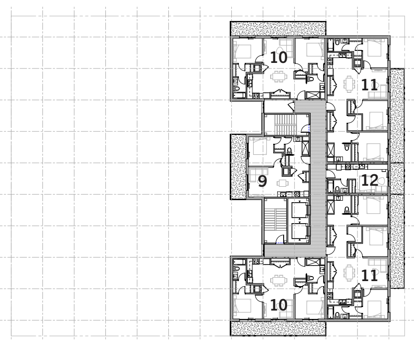

Level 2 - Living for Artist Live/Work



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

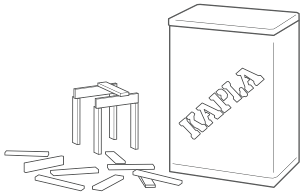
Exterior view looking at different facade treatments for rental, student housing, art school, and live/work units.

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**	

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

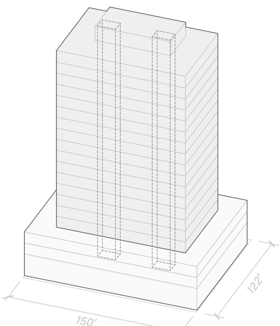
Kapla has a much smaller floorplate than typical high-rise projects, made possible by the compact vertical circulation core commonly known as a “Point Access Block” with a single exit stair and two elevators.

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.

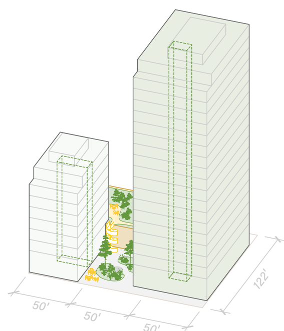
The result is a highly efficient tower that unlocks more outdoor space for the public at street level.

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.

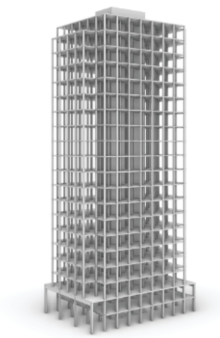
Although an entirely mass timber building is conceptually simpler and maximizes carbon sequestration, Kapla also has a hybrid structural design with a noncombustible vertical circulation core (exit stair, elevator shafts) to address fire and seismic risks in the lower BC mainland.

[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.

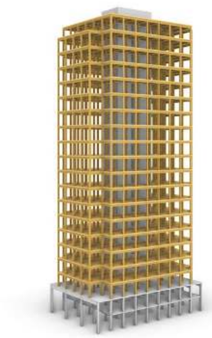
The current estimated social cost of carbon emissions is $271 per tonne [1] !!



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]

78.6
kgCO_2eq/m²

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



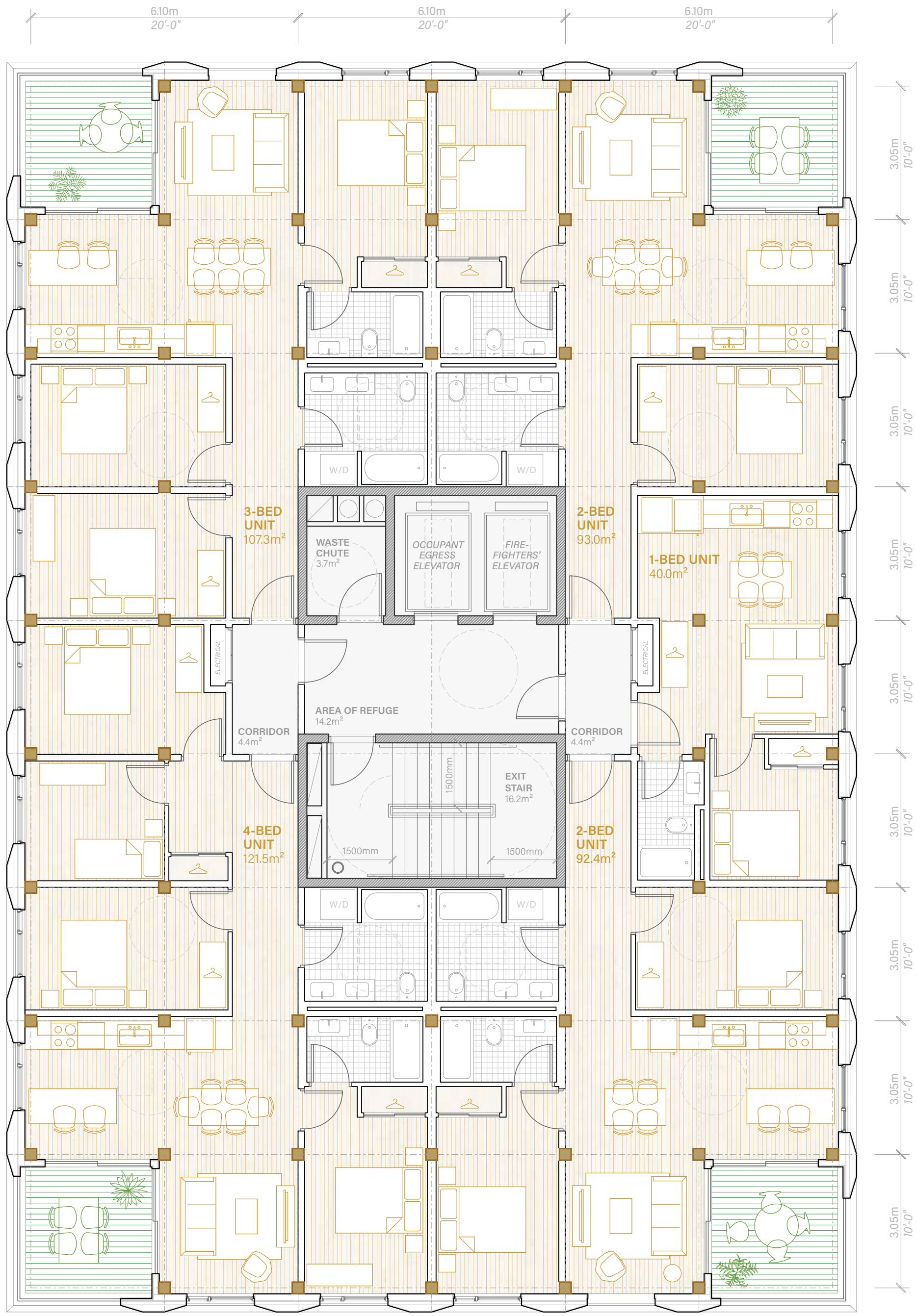
175,894 kgCO_2eq	CLT Slabs *(175mm, 5-Ply, 10ft wide)* 1,283.9m³ *137.0 kgCO_2eq/m3 (slab topping excluded)*
24,873 kgCO_2eq	Glulam Beams *(260 x 336mm Douglas Fir)* 181.3m³ *137.2 kgCO_2eq/m3*
35,752 kgCO_2eq	Glulam Posts *(305x315mm Douglas Fir)* 260.6m³ *137.2 kgCO_2eq/m3*
158,099 kgCO_2eq	Concrete 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

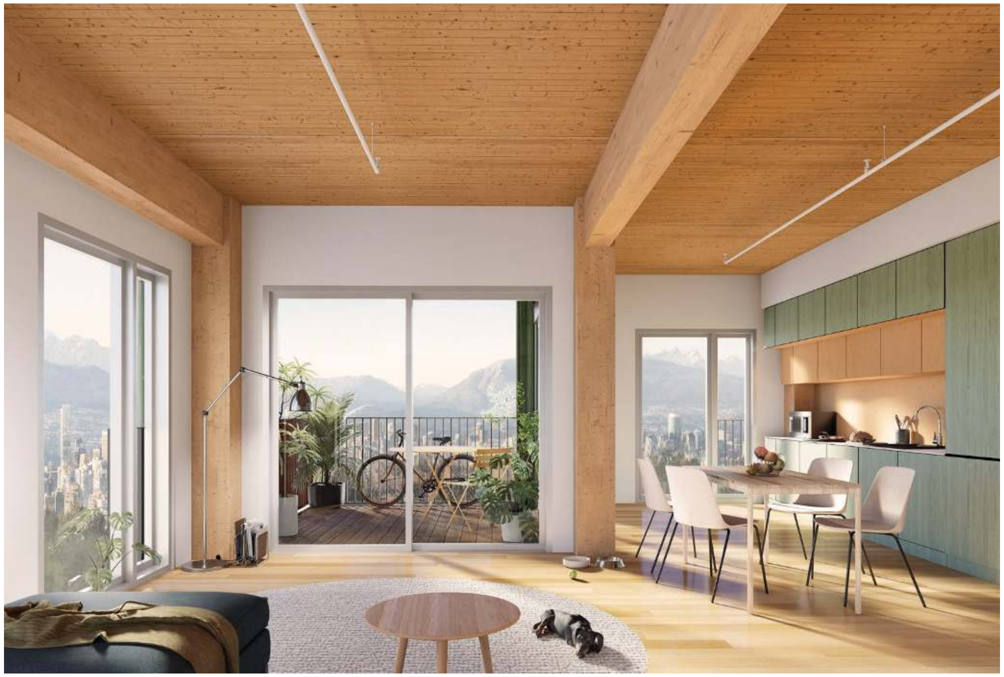
-0.98
kgCO_2eq/m²

emissions factor, hybrid structure of KAPLA tower
incl. sequestration (45.3 kgCO_2eq/m² 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.

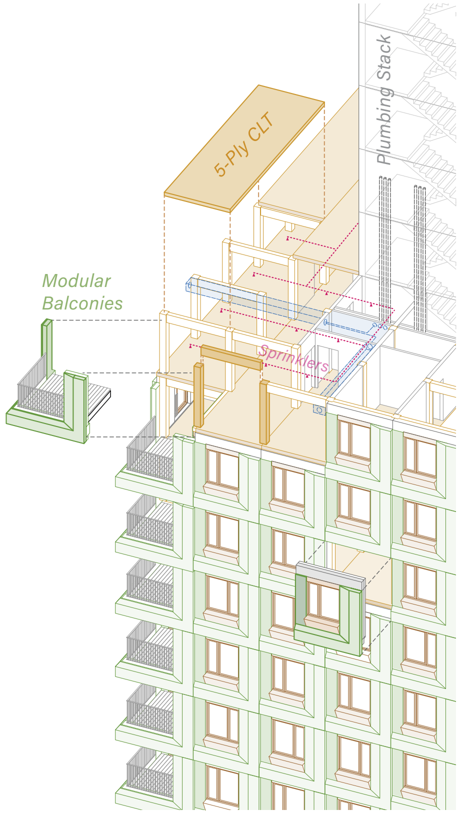




REVEALING THE BEAUTY OF MASS TIMBER

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

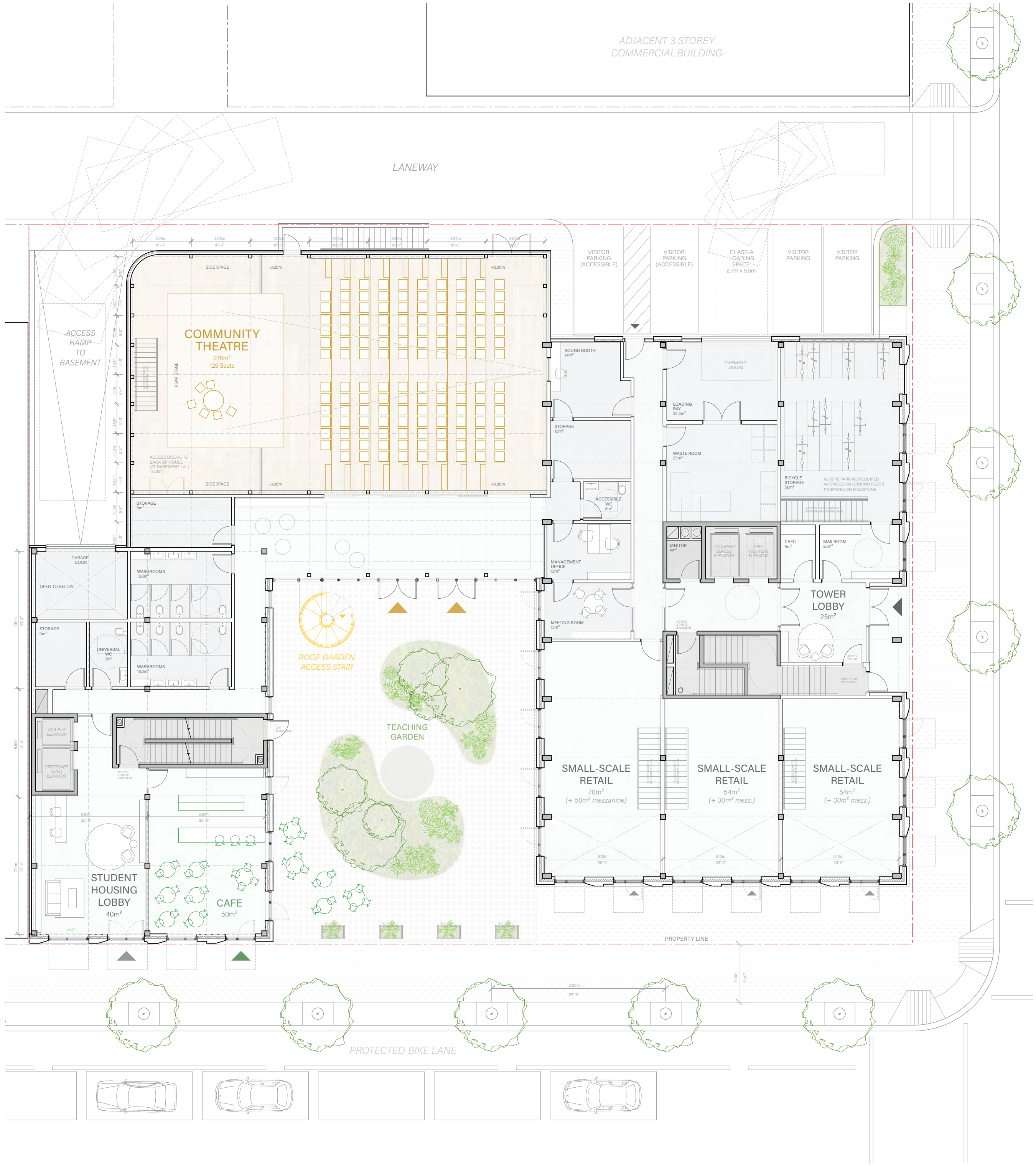
Community Theatre
The 'Kapla Playhouse' is a small theatre for local events. The warmth of the glulam structure and nail-laminated timber ceiling creates a welcoming glow visible from the street. All the back-of-house areas are at the basement level. The fire alarm system is customized for the bypass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

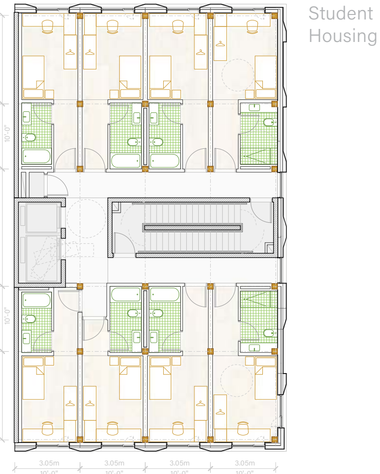
> 2.4m

Painted Metal Exterior Shutter & Planter Box
(finish to match windows)

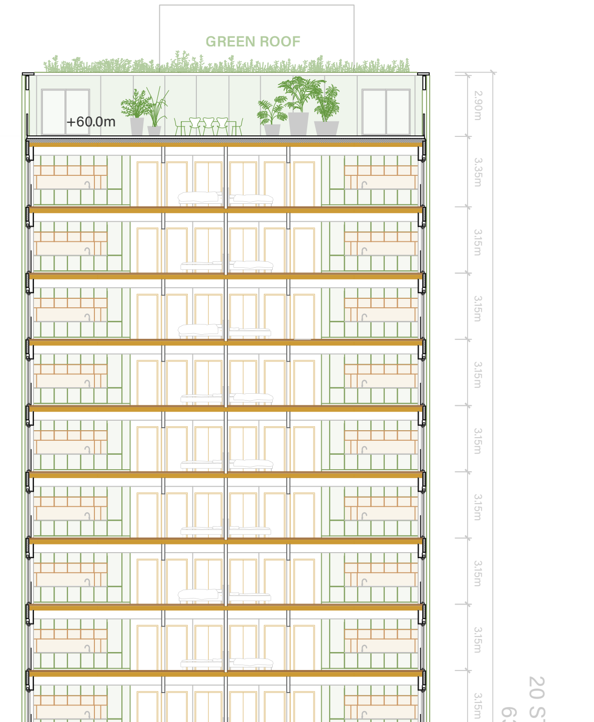
Anodized Aluminum Window Frame
(bronze finish on exterior)

Fire-Retardant Treated Wood (FRTW) Cladding
(max. 10% of facade area)

Matte Green ACM Panel
(noncombustible core)



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.




Public Spiral Stairs
This convenience stair is not an exit, but the BCBC requires it to be designed like an exit, such that this beautiful spiral geometry is not allowed.

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.

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.

FLOATLINE.

Affordability

Delivering high-quality spaces at a lower cost through efficient mass timber construction and modular fabrication.

Sustainability

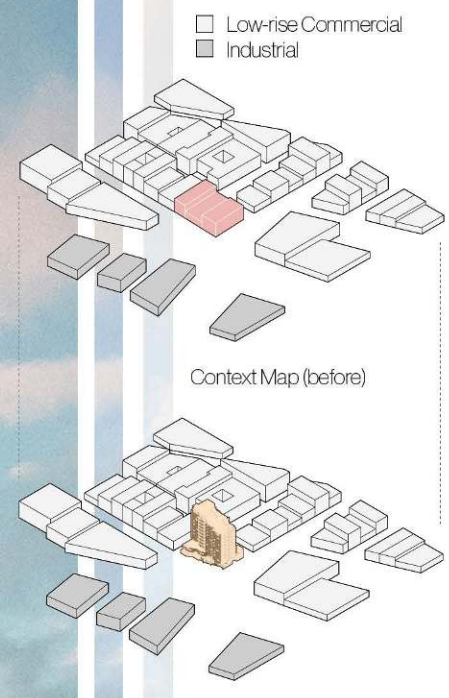
Minimizing the building's carbon footprint by using renewable mass timber and sustainable manufacturing process.

Modular Design

Employing prefabricated timber modules for rapid assembly, adaptability, and minimize on-site disruption.

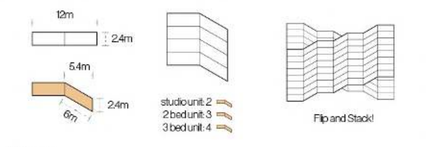
Cultural, Wellness, Community

Designign spaces that celebrate local culture, enhance residents well-being, and encourage social interation.

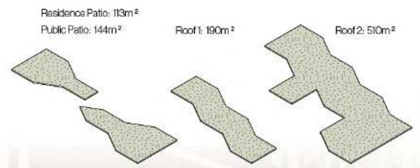


Context Map (before)

Context Map (after)



1// Form

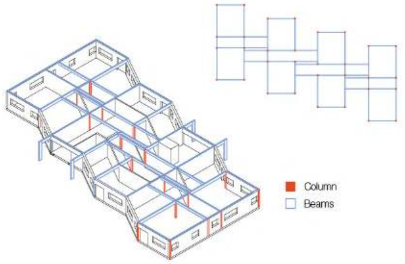


2// Green Space

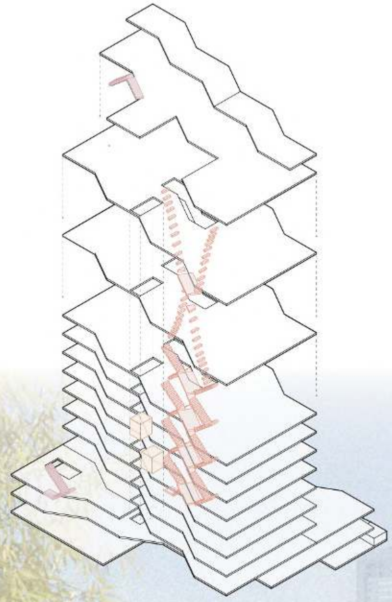
Project Highlight

This project reimagines sustainable living through mass timber modular construction, uniting affordability, adaptability, and environmental stewardship.

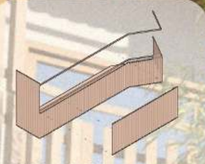
Prefabricated timber modules allow rapid assembly, minimal waste, and a reduced carbon footprint. The design flows with its surroundings, fostering cultural connection, wellness, and community, creating spaces that feel light, fluid, and rooted in place.



6// Beam & Column System

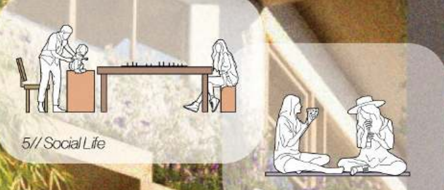


8// Staircase

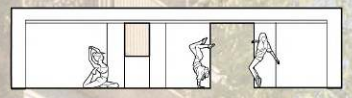


3// Modular Balcony

4// Mix of Unit Types



5// Social Life



7// Performance Space

The building is angled within the lot, creating a stacked composition that evokes the movement of flowing water through the space.

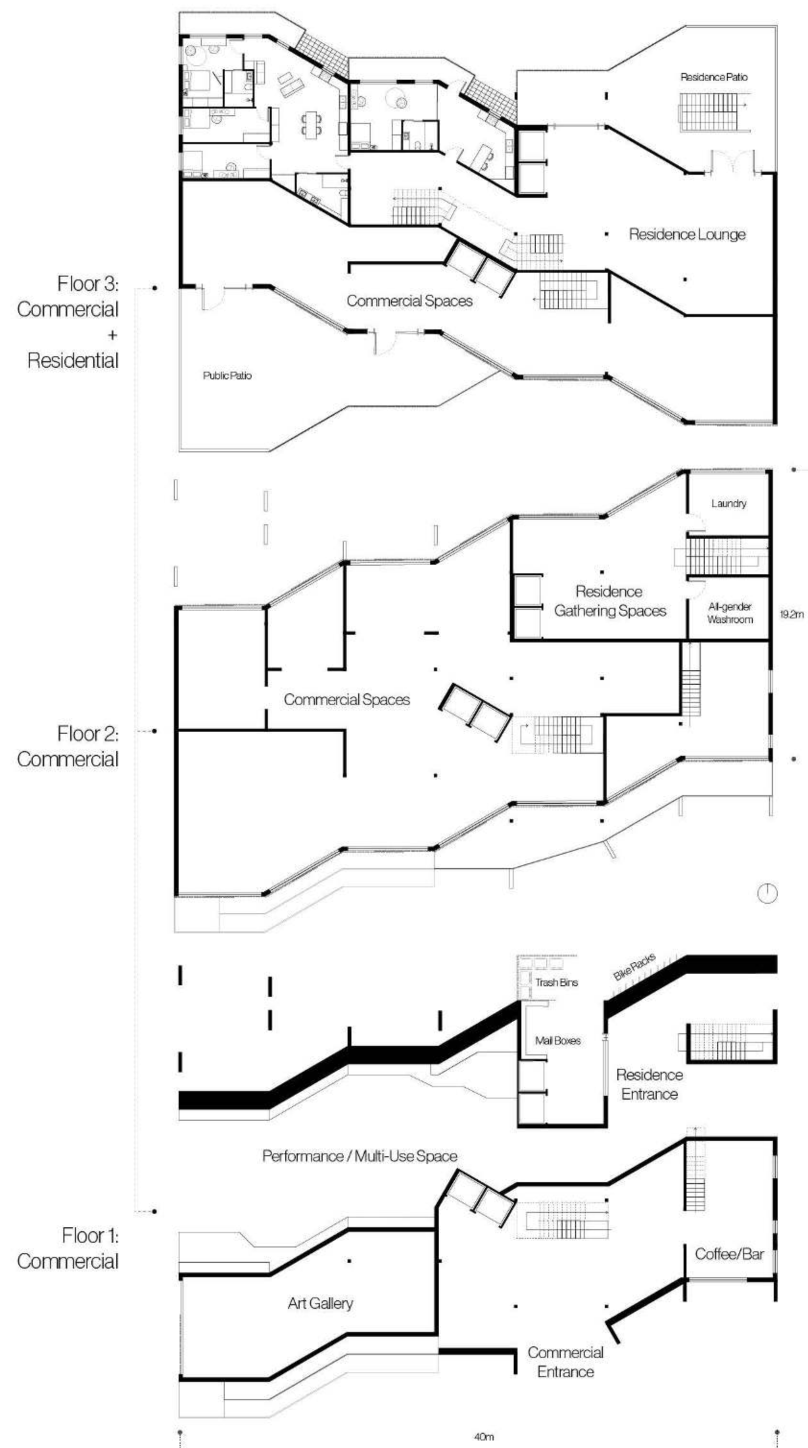
Mass timber serves as the primary material, showcased thoughtfully in both the cladding and the exposed structural elements. This approach not only brings a natural warmth to the design but also highlights the significance and versatility of mass timber in contemporary building practices.

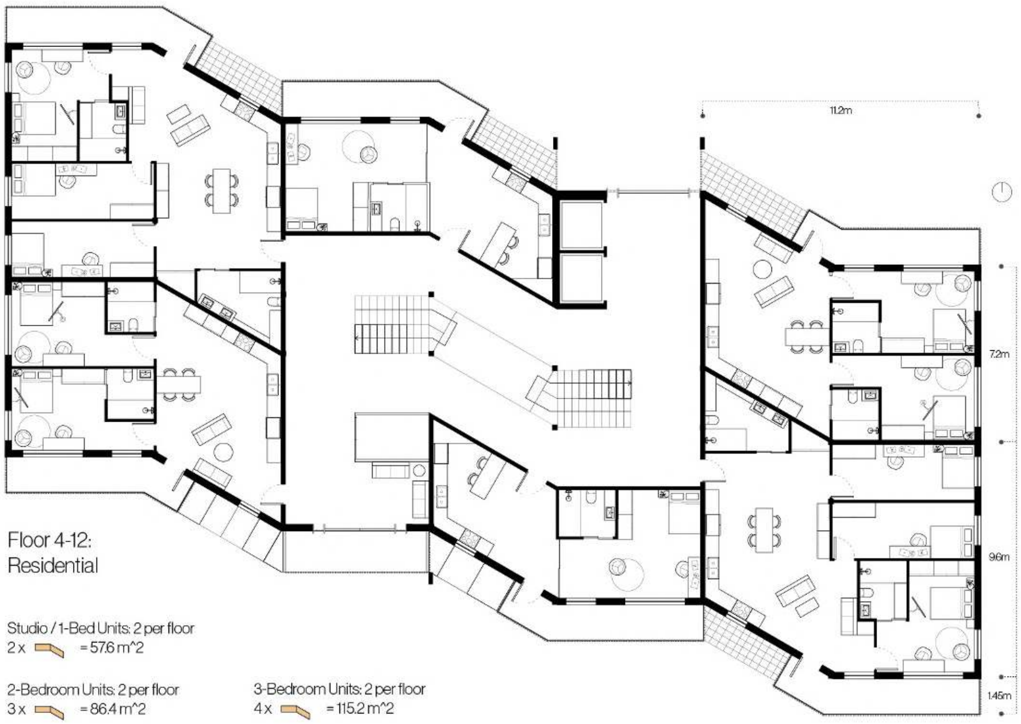
Floor Plan, and the Land

The building's parallelogram-shaped plan, angled relative to the block, shifts views and orientations so that each unit engages uniquely with the surrounding environment. This angular form, when repeated, produces a rhythmic wave-like pattern that evokes flowing water, anchoring the mass timber structure to the land and sea in both form and spirit.

Water in the Pacific Northwest Indigenous traditions is revered as sacred, symbolizing life, purification, adaptability, and the interconnection of all beings. This flowing geometry, interpreted as parallels to water's movement, resonates with Indigenous architectural principles that emphasize harmony with the land, orientation in response to natural features, and the use of geometry to express spiritual values and community connection.

On the commercial side, spaces like gallery, café, grocery, and food bank, act as active public edges, drawing community into this architectural "flow."





Floor 4-12:
Residential

Studio / 1-Bed Units: 2 per floor
2 x = 57.6 m^2

2-Bedroom Units: 2 per floor
3 x = 86.4 m^2

3-Bedroom Units: 2 per floor
4 x = 115.2 m^2

Residence Design, and Community

The residential levels are conceived as a non-profit, **affordable housing development** that responds to the urgent need for inclusive and equitable living spaces. The angled parallelogram layout is a formal gesture and a strategy to optimize natural light, privacy, and views, offering residents a stronger sense of connection to their surroundings.

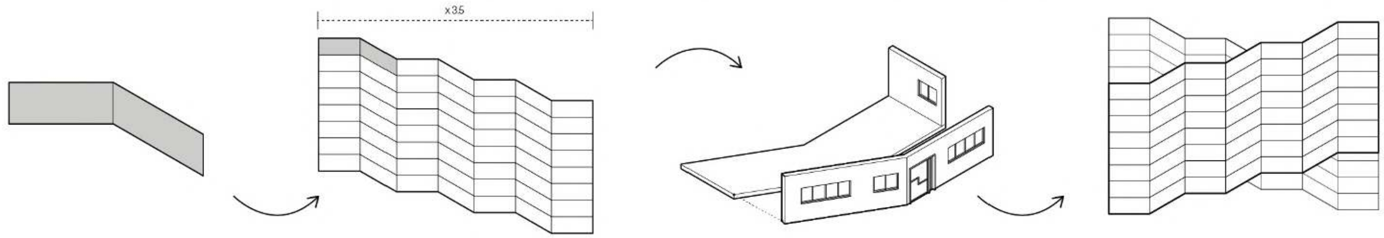
Units are thoughtfully arranged to accommodate various household types, from singles and seniors to young families, supporting a diverse and resilient community. Shared amenities, such as laundry facilities and multipurpose lounge rooms, are positioned to encourage daily interaction, reduce isolation, and create opportunities for collective activities like shared meals, workshops, and childcare.

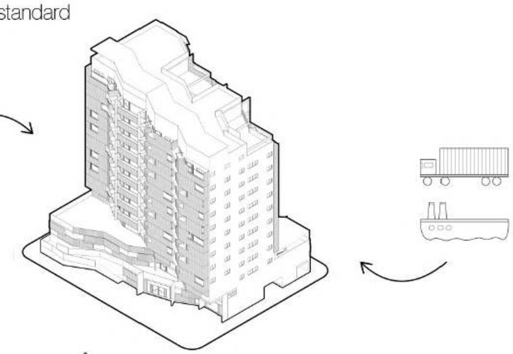
Outdoor terraces and courtyards serve as social anchors, offering safe and welcoming spaces for relaxation, gardening, and play. Circulation areas are treated as extensions of the home, with wide corridors and stairwells that encourage informal gatherings and casual interaction among residents. At the rear of the building, near the residential entrance, a flexible multi-use space is tucked away to provide added functionality. This space can serve as a children's playground, a secure transition zone to the outdoors, or a small performance and gathering area, adapting to the evolving needs of the community.

By combining affordability with high-quality design, the project challenges the stigma around subsidized housing and demonstrates that non-profit developments can be both socially impactful and architecturally ambitious. The ultimate goal is to create housing that fosters pride, strengthens neighbourly ties, and builds a supportive community where residents can thrive long term.

Decoding System

The purpose of this system design is to simplify construction, reduce the overall timeline, and lower embodied carbon. The building's modular system is based on the dimensions of a standard shipping container, with each unit designed to be easily repeatable and assembled. These modules combine to create the building's distinctive wave-like façade.





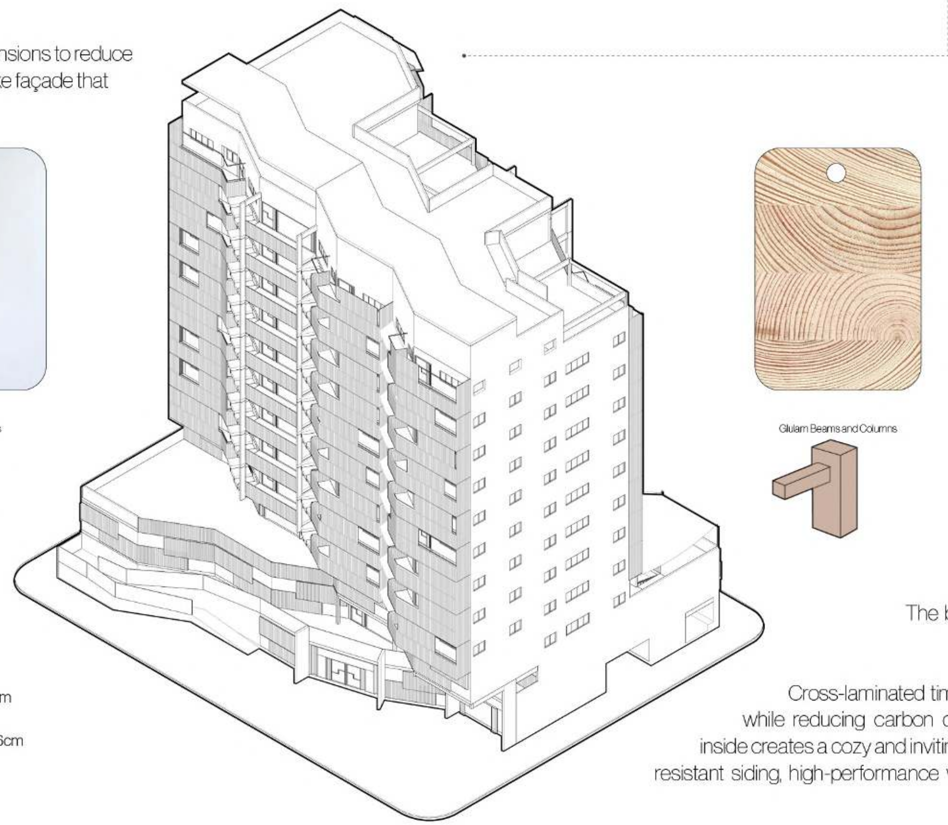
Material Samples

The design uses mass timber modules based on shipping container dimensions to reduce embodied carbon, speed up construction, and create a distinctive wave-like façade that showcases sustainable building practices.

Stucco

Semi-transparent Glass

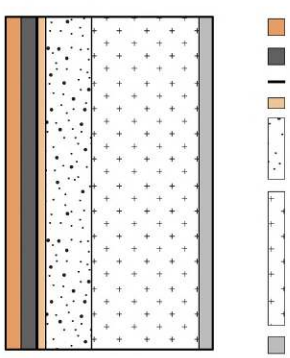
Transparent Glass



Glulam Beams and Columns

Douglas Fir Decking

Western Red Cedar



Wood Cladding // 2cm

Stucco Finish // 2cm

Weather Barrier // thin layer

Exterior Sheathing (Plywood) // 1.2cm

Exterior Insulation (Mineral Wool) // 6cm

Structural Mass Timber (CLT) // 15cm

Interior Finish // 2cm

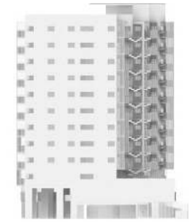
The building mainly uses mass timber, which is strong, sustainable, and has a warm, natural look.

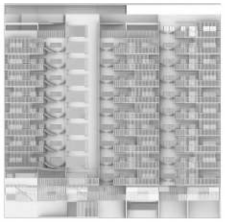
Cross-laminated timber panels and glulam beams form the structure while reducing carbon compared to concrete or steel. Exposed timber inside creates a cozy and inviting atmosphere, and durable materials like weather-resistant siding, high-performance windows, and low-VOC finishes complement the timber.

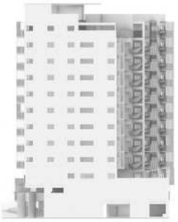
These materials show how renewable resources can be used to make a building both environmentally friendly and comfortable for residents.

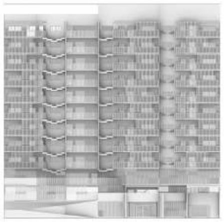
Construction Cost + Embodied Carbon Calculations

The modular mass timber design greatly improves efficiency and cost-effectiveness. By prefabricating units off-site, construction time on-site is significantly reduced, allowing the building to be assembled more quickly than traditional methods. Using mass timber not only lowers the embodied carbon but also reduces the need for heavy equipment and labor-intensive processes, cutting construction costs by nearly half.









Building Information	
FSR	**4.9**
Lot size (sq ft)	18,300
Building sq ft Above Grade	90,100
Building efficiency (%)	85
non saleable / rentalable (sq ft)	13,515
saleable / rentable (sq ft)	76,585
Total Stories above grade (#)	13
Total Stories (#)	13
Base floor (#)	1
Above 1st storey (#)	12
Stories below grade (#)	0
Units (#)	54
Bedrooms (#)	109
Amenity space (sq ft)	13,700
Non-residential (sq ft)	13,900

Construction Costs					
		Concrete		**Mass Timber**	
	Square footage	$/sq ft	**Cost**	$/sq ft	**Cost**
Below grade	0.0	$75	n/a	$150	n/a
Base floor	6800.0	$75	$510,000	$150	$1,020,000
Above 1st storey	83300.0	$75	$6,247,500	$150	$12,485,000
	Quantity	$/unit		$/unit	
Balconies	60	$10,000	$600,000	$12,000	$720,000
	Cost per month	#Months	**Cost**	#Months	**Cost**
Schedule Cost (Monthly)	$50,000	18	$900,000	11	$550,000
TOTAL			**$8,257,500**		**$14,785,000**

Embodied Carbon					
		Concrete		**Mass Timber**	
	Sq ft	**Embodied**	**Total**	**Embodied**	**Total**
Total Building Sq Footage	90100.0	6.69	**602,680.70**	2.69	**242,369**

Economical

The modular mass timber design offers significant economic advantages, making the building both cost-effective and efficient to construct.

Prefabricated modules are produced off-site with precision, reducing on-site labor requirements and minimizing delays, which directly lowers overall construction costs. The modular system also reduces material waste and streamlines logistics, further contributing to savings. With a cost per square foot of approximately $150, the 13-floor building on an 18,300 sq. ft. lot was completed for around $14 million, demonstrating that multi-story mass timber construction can be achieved at a fraction of the expense of traditional concrete or steel methods.

Beyond initial construction costs, the design's energy-efficient systems and sustainable material choices help reduce long-term operating expenses, making the building more affordable for both developers and residents. This approach showcases how innovative design strategies can combine financial prudence with environmental responsibility, providing high-quality, multi-family housing that is both economically viable and socially beneficial.

Sustainability

The building incorporates multiple strategies to reduce its environmental impact while enhancing comfort for residents. With a Floor Space Ratio (FSR) of 4.9, the design efficiently uses the lot and maximizes light and airflow.

Natural ventilation is encouraged through wind circulation and strategically placed openings, reducing reliance on mechanical systems. Modular balconies provide outdoor space and passive shading for interior units.

The primary use of mass timber as a structural material lowers embodied carbon compared to steel or concrete, and careful material selection further supports environmental performance. Together, these strategies create a high-density residential building that balances efficiency, sustainability, and occupant comfort.

Social and Culture

The residential program prioritizes inclusivity, community, and shared experiences. The building contains 54 units with 109 bedrooms, ranging from studios and one-bedroom units to larger two- and three-bedroom apartments, accommodating diverse household types.

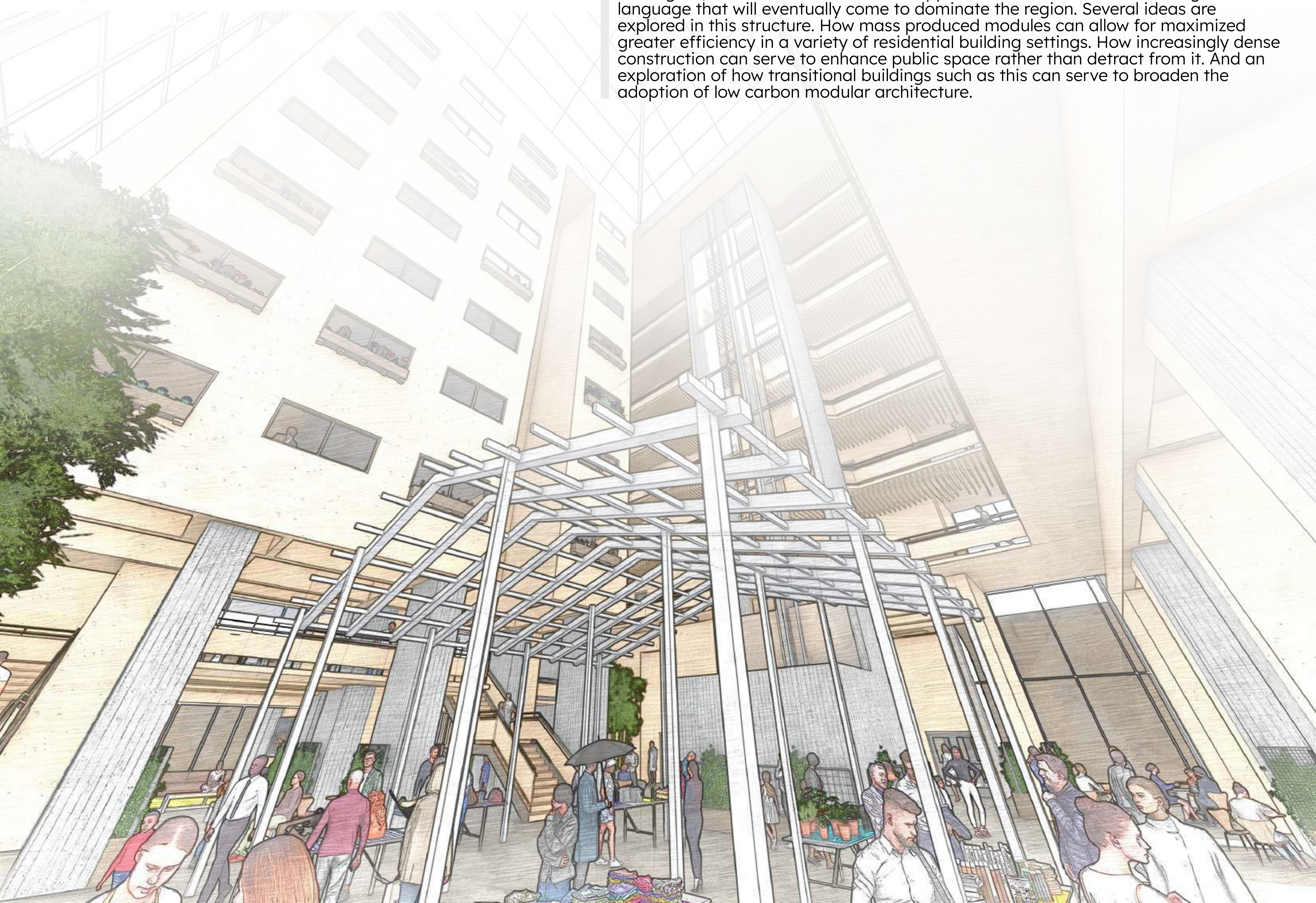
Each floor features shared gathering areas to encourage interaction and neighborly connections, while large communal spaces on the ground floor and rooftop provide opportunities for collective activities, events, and relaxation. Green spaces are integrated throughout the building, including landscaped terraces and courtyards, fostering a connection to nature and promoting well-being.

By combining private living with generous communal amenities, the design cultivates a strong sense of community, creating a supportive and engaging environment for all residents.

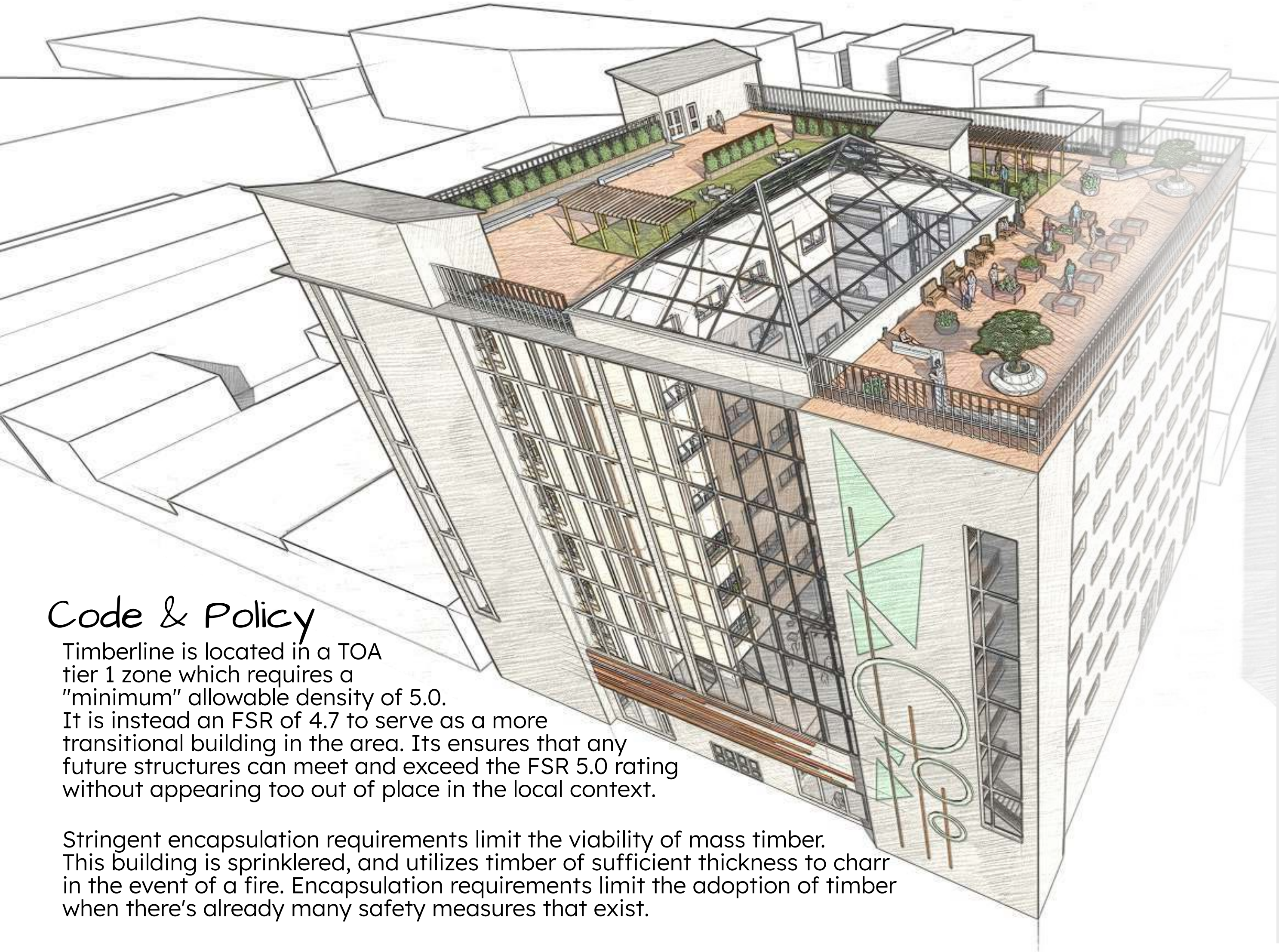
Timberline

How can we streamline the system of delivery of large-scale low carbon buildings to unlock their potential to address climate change and housing unaffordability?

Timberline is emblematic of a transitional time in the architecture of Vancouver. In this regard, it takes a more measured approach to interventions and design language that will eventually come to dominate the region. Several ideas are explored in this structure. How mass produced modules can allow for maximized greater efficiency in a variety of residential building settings. How increasingly dense construction can serve to enhance public space rather than detract from it. And an exploration of how transitional buildings such as this can serve to broaden the adoption of low carbon modular architecture.



Building Blocks



The Product:
The crux of this design is the low carbon module and an exploration of delivery at scale.

The Problem:
Shelter is one of the barest necessities for human survival, and yet the current market has priced many out of homes that would have been perfectly affordable in the past.

The Scope:
The Canadian Mortgage and Housing Corporation states that 460,000 units of housing need to be produced annually for the next decade in order to achieve affordability. Canada requires the production of 1,260 housing units every day. For the next ten years.

The Solution:
The only way for modularity to assist in this effort is for a standard module to work in a variety of residential applications. The modules need to be modular themselves. Our module designs lend themselves to this required variety, not just vertical stacks in dense cities. Core components of a home can be mass produced as modules for use everywhere. A modular kitchen and toilet room can be a part of a non-modular structure to accelerate construction.

In Timberline, spaces are comprised of multiple chunks for ease of transportation and assembly.

Code & Policy

Timberline is located in a TOA tier 1 zone which requires a "minimum" allowable density of 5.0. It is instead an FSR of 4.7 to serve as a more transitional building in the area. Its ensures that any future structures can meet and exceed the FSR 5.0 rating without appearing too out of place in the local context.

Stringent encapsulation requirements limit the viability of mass timber. This building is sprinklered, and utilizes timber of sufficient thickness to charr in the event of a fire. Encapsulation requirements limit the adoption of timber when there's already many safety measures that exist.

Studio
340 SF

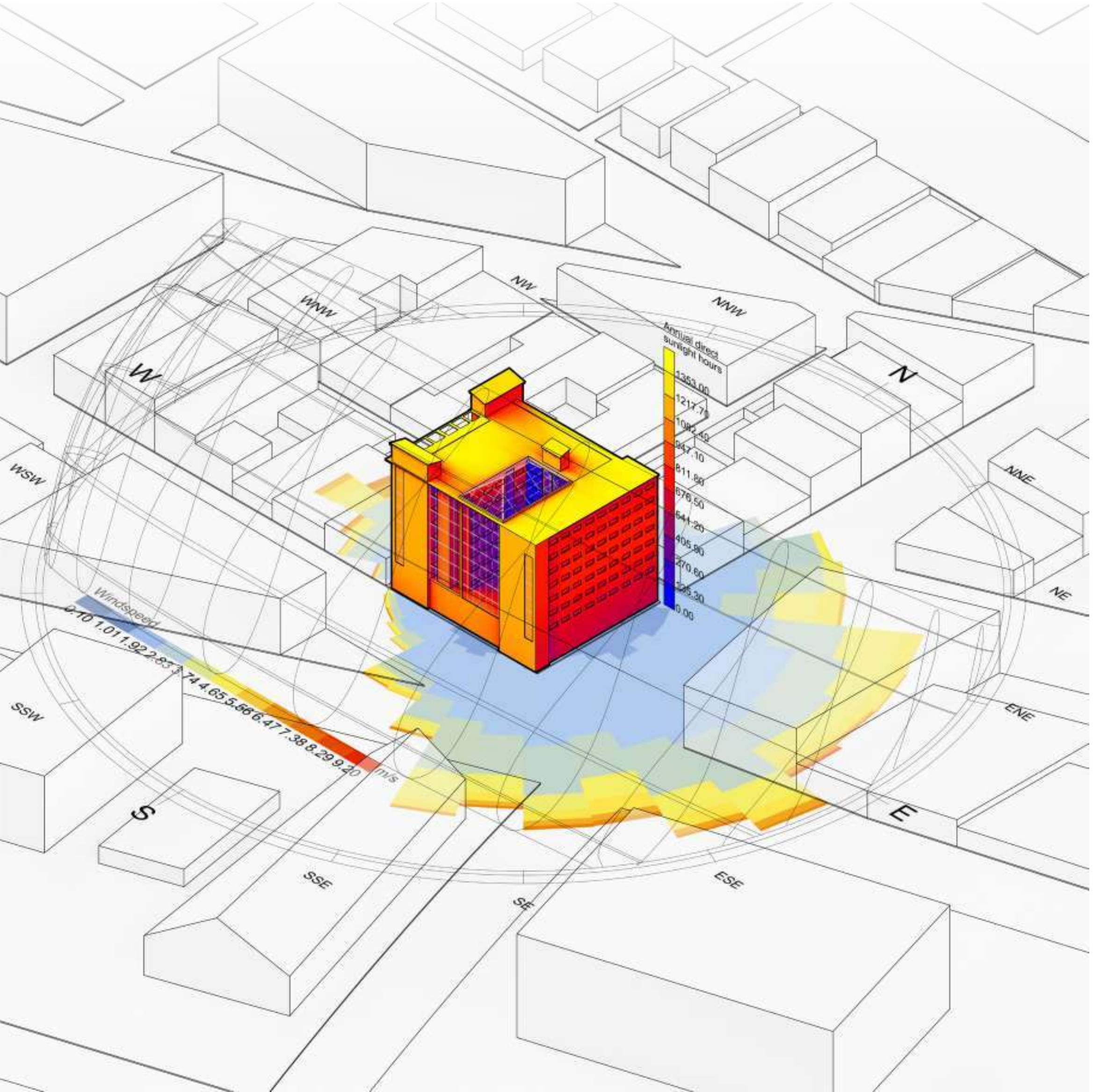
One Bedroom
530 SF

Two Bedroom
800 SF

Three Bedroom
930 SF

Site, Sunlight, and Wind

Vancouver's location in the northern hemisphere limits the direct daylight hours the northern face of the building. Opening the building with an atrium allows interior apartment units get daylight through their south walls. As the tallest building in the neighborhood it has unobstructed views and unlimited direct sunlight. The large central atrium also allows for the strong westerly winds in Vancouver to circulate are throughout the building.



Massing

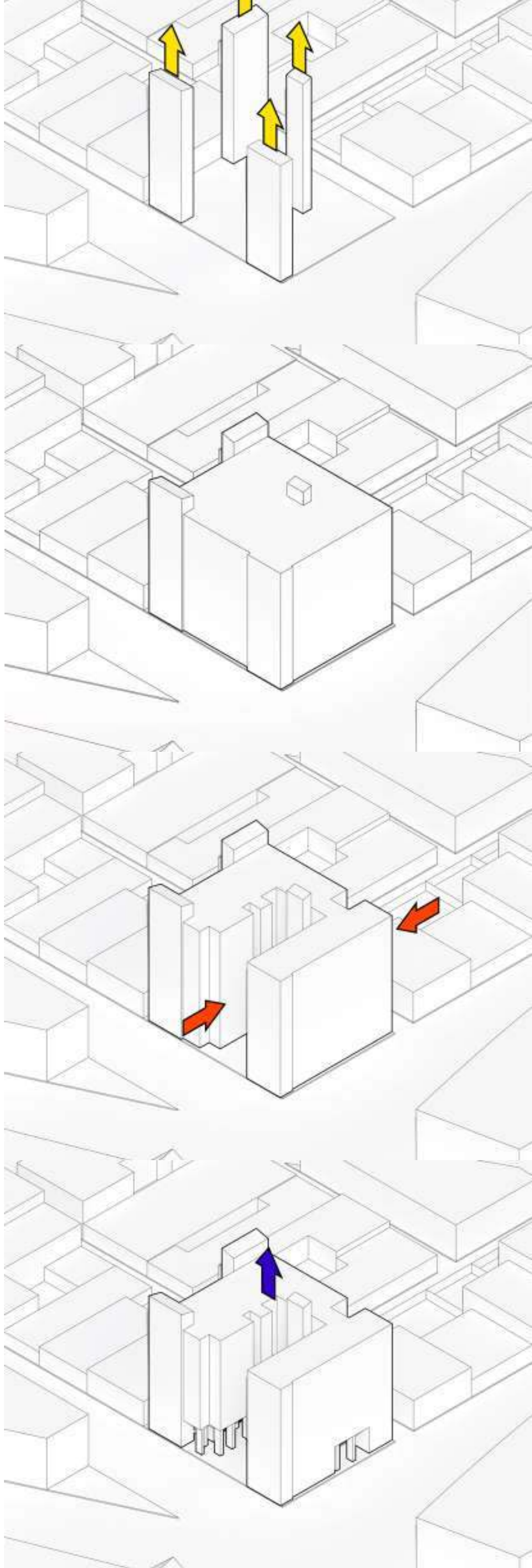
Our team took a few simple steps to achieve the form of the Timberline.

Stairs:
For optimal egress opportunities, and to help support the structure, stair towers were placed at three of the four corners of the site. A central elevator within the atrium provides vertical circulation & views of the expansive open space.

Volume:
Filling in the space between the vertical circulation creates space to maximize the number of residential units as possible on the site.

Light:
Carving out a central atrium permits light penetrate deeper into the structure creating a welcoming environment and a large open public space.

Lift:
Lifting the building mass serves to minimize its impact on the site at a human level while creating more opportunities at the human level for connections to the community.



Efficiency of space: Maintaining an efficient footprint allows for the amount of units to be maximized. This space is returned in the form of communal spaces.

Typical Residential Floor

Adaptability in amenities: Four multipurpose rooms can be used to fit the particular needs of the residents. A place to exercise, daycare, an event space, or even a library are just a few options available.

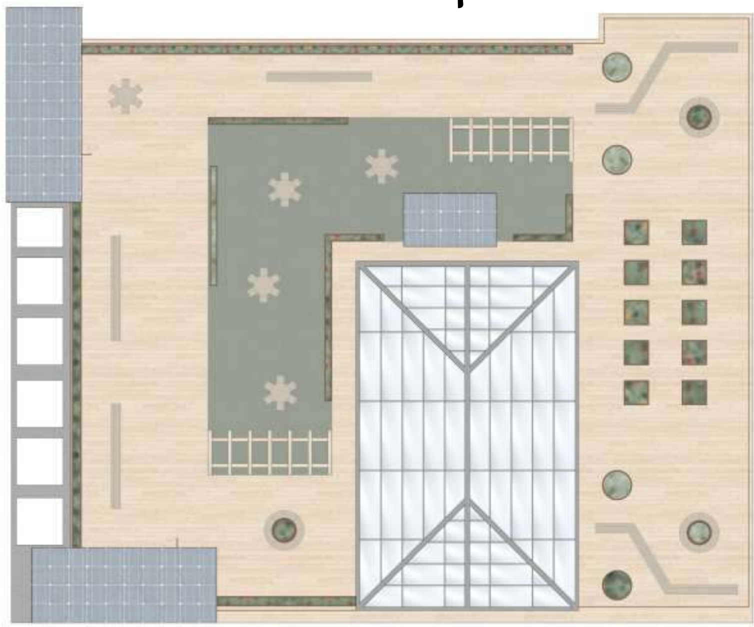
Ground Floor

Creation of community: An open forum has been the thriving heart of communities all over the world for millennia. It will be the heart of Timberline too. With cafes, seating, and versatile open spaces, the ground floor can become whatever is needed, whenever it is needed.

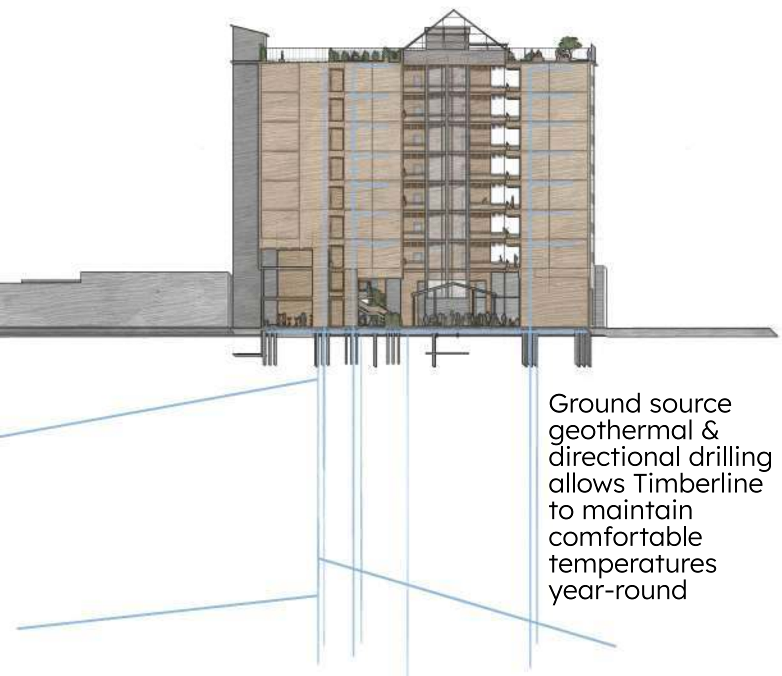
Rooftop Park

A common criticism of dense apartment living is a lack of green space.

The rooftop provides a park, a garden, and a private escape from the city to residents. It serves as a personal yard to those that live here.



The "Roots"



Ground source geothermal & directional drilling allows Timberline to maintain comfortable temperatures year-round

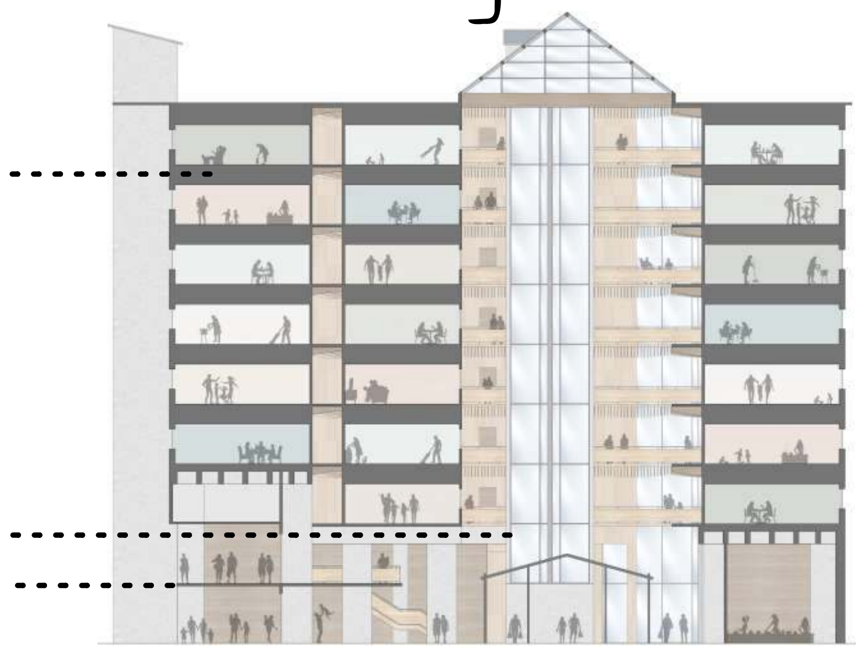
The Plenum:

This space allows for a variety of mechanical systems to be viable within the structure. Keeping this space large and accessible allows Timberline to evolve with time and adopt more efficient systems as they become available.

Third Place:

The bottom 1/5 of Timberline is dominated by communal spaces. A bright atrium, cafes, and mixed use spaces enable a versatile space that can be utilized year-round.

Building Section



Cost Base Case Analysis

Building Size	Base Case	Timberline	
FSR	5	4.69	
Lot Size (sq ft)	25,540	18,300	
Building sq ft Above Grade	127,700	85,835	
Building Efficiency %	85%	74%	
Total Stories #	21	8	
Units #	86	82	
Bedrooms #	178	135	
Amenity Space (sq ft)	850	3,707	Multipurpose Rooms
Non-Residential (sq ft)	3,000	15,555	Atrium+Cafes

Construction Cost $/sqft (timber)	Base Case	Timberline
Below Grade $	$299	$315
Base Floor $	$403	$452
Above 1st Storey	$431	$527
Balconies	$25,000	-
Schedule Costs	$800,000	$700,000
Cost/Bedroom	$450,393	$333,243
Total	$80,170,100	$44,987,885

Estimates made using timberx.ca & the Canadian Wood Council (CWC) Carbon Calculator

At a glance, these apartments are far from affordability, thankfully there are less tangible benefits that serve to offset that cost. It is also possible that the benefits of mass production exceed expectations and lower costs further. This building has a first floor entirely dominated by communal spaces. It serves to create a place for people in both home and leisure. Regardless of costs, the value of this structure is in creating community and showcasing modular mass timber within the region.

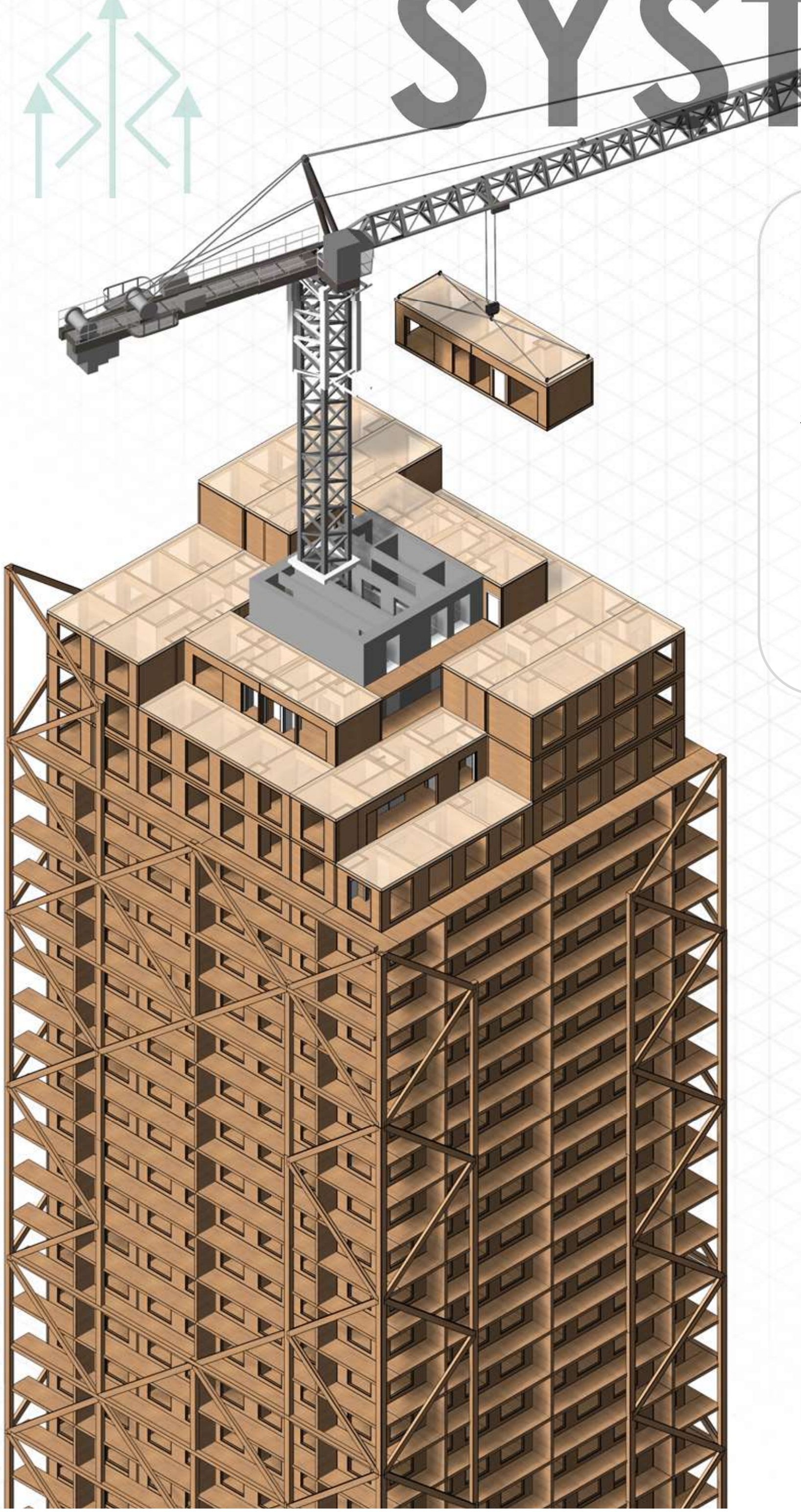
Embodied Carbon

Base Case	Concrete		Mass Timber	
	Embodied	Total	Embodied	Total
	6.69	1,355,864	2.69	546,112

Timberline	Concrete		Mass Timber	
	Embodied	Total	Embodied	Total
	6.69	580,346	3.81	330,559

Put simply, wood is good. It's a wondrous material that acts as a form of carbon sequestration. While a design with an excessive amount of wood products does have a greater amount of embodied carbon, it also represents a large amount of carbon removed from the atmosphere. This building contains 33,085 cubic feet of wood of various types. According to The CWC this equates to 817 metric tons of carbon stored within the wood. If harvested sustainably, wood is an excellent means of storing carbon, and can more than offset the concrete use required in a space like this.

SYSTEM_ECO(N)

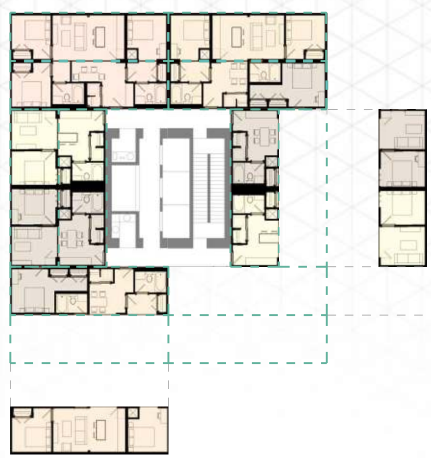


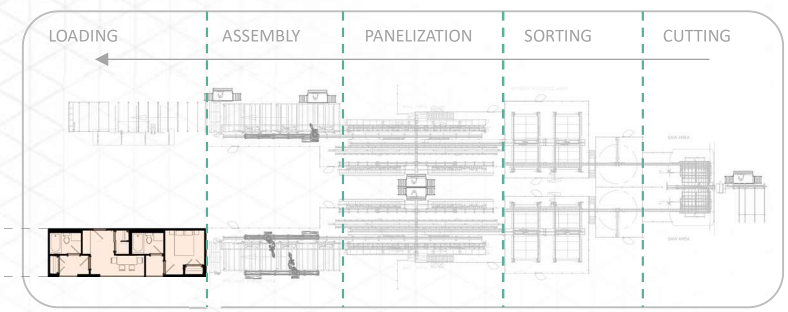
System_Eco(n) is conceived as a tree-to-tower process-based solution to affordable tall timber apartments. Leveraging modularity to accelerate construction timelines and unlock economies of scale with the use of public funds and industry innovation. The tower is fully modular, each mass-timber volumetric unit is sized to fit standard North American semi-truck trailers, allowing rapid factory production and on-site assembly. A highly efficient typical floor plate is designed around those exact dimensions with the human experience remaining the primary design driver. The result is spacious, corner-focused family homes flooded with daylight to compliment the natural warmth of the exposed wood interiors. To address a key issue of high-rise wood construction, lateral stability is achieved through a robust concrete core supplemented by perimeter bracing in the form of the project's signature corner trusses. It is estimated that this combination of lateral bracing will be sufficient to allow for optimizations of the interior mass timber elements, in particular it is proposed that nail-laminated timber (NLT) can be strategically specified in low-risk areas to lower barriers to entry for fabricators and harness regional wood expertise. As a provocation to The City of Vancouver, the design proposes unlocking density bonuses and eliminating parking minimums in exchange for sustainable and affordable family-oriented units.

This project is gratefully situated on the shared and unceded territories of the Musqueam, Squamish, and Tsleil-Waututh Nations

FOREST TO FACTORY

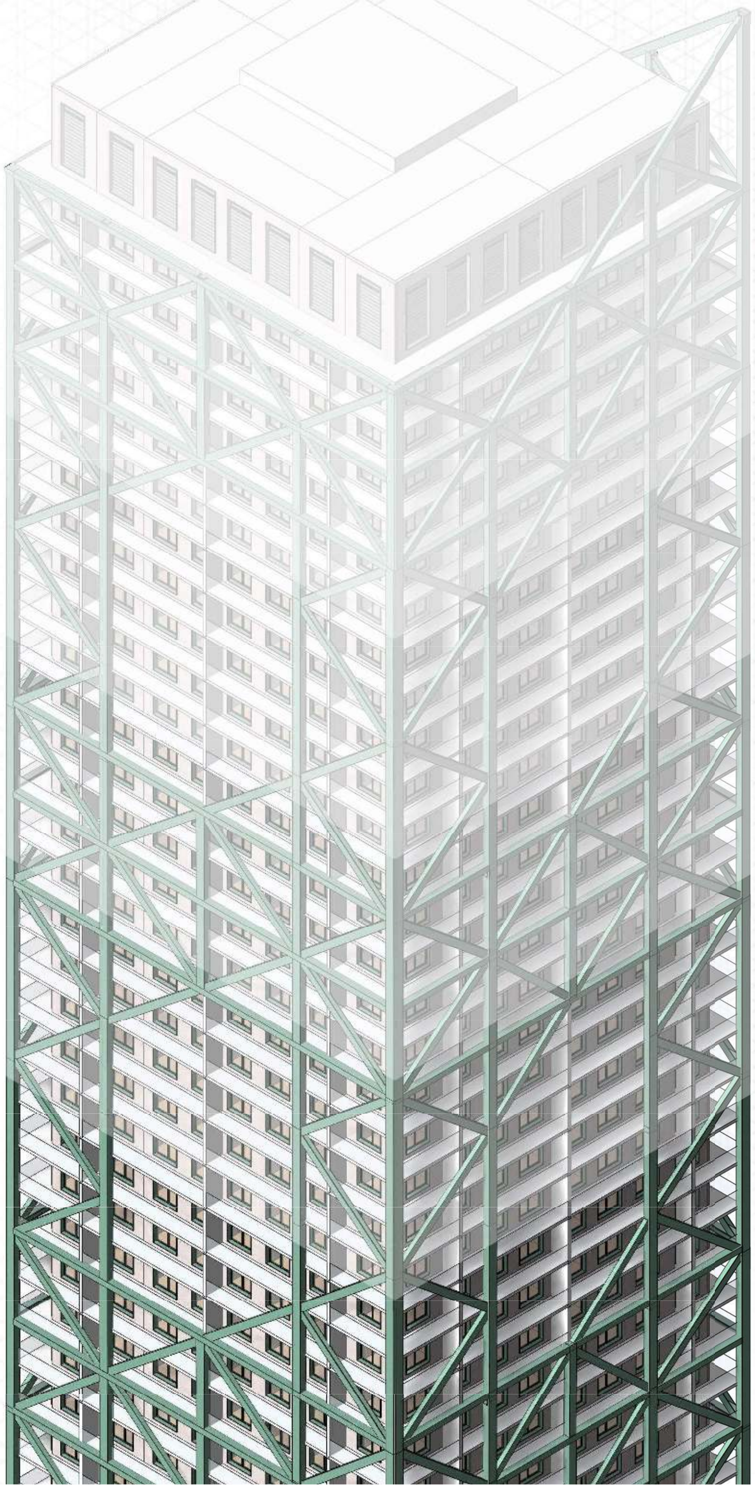
Current political momentum to invest in home manufacturing processes should be leveraged towards establishing capacity building assembly lines, both human and automated, for producing a high volume of mass customizable timber living modules.





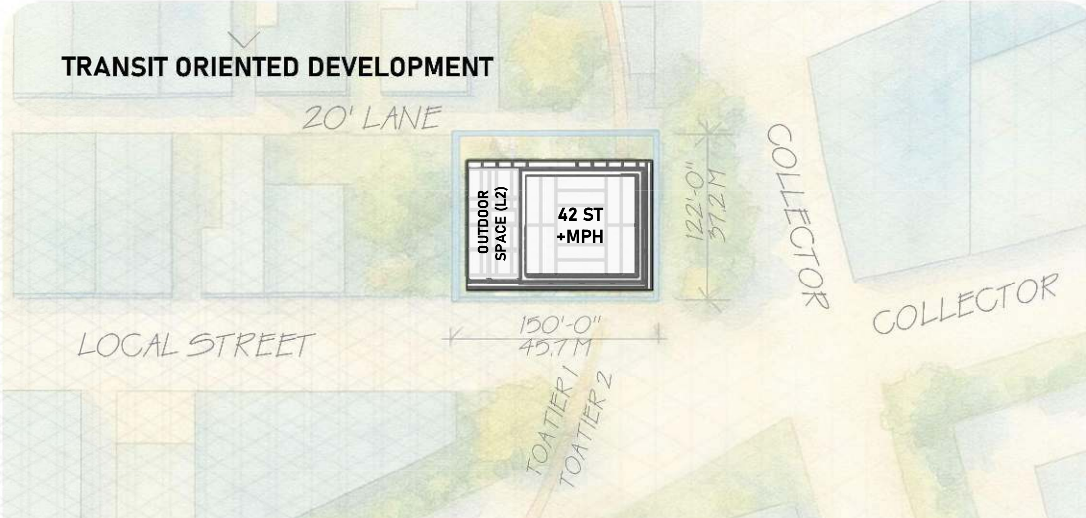
Kickstarting supply for low carbon buildings will generate the technical capabilities, skilled manpower, facilities, and equipment needed to manufacture mass timber panels and assemble them in truck sized modules at scale.

SHIPPED TO SITE



HOW TALL?

TRANSIT ORIENTED DEVELOPMENT



To overcome the evergrowing burden of urban land costs and other economic hurdles that drive home prices higher and higher, this proposal calls on the city to unlock density in transit oriented neighbourhoods in exchange for tangible commitments from developers to provide affordable and sustainable family units. Site A's prominent corner in Vancouver's Tier 1 Transit-Oriented Area is a prime location for the city to commit to climate and housing goals, allowing people more options to live a walkable, car-free lifestyle, increasing transit ridership and ultimately generating a virtuous cycle of smart urban intensification and improvement.

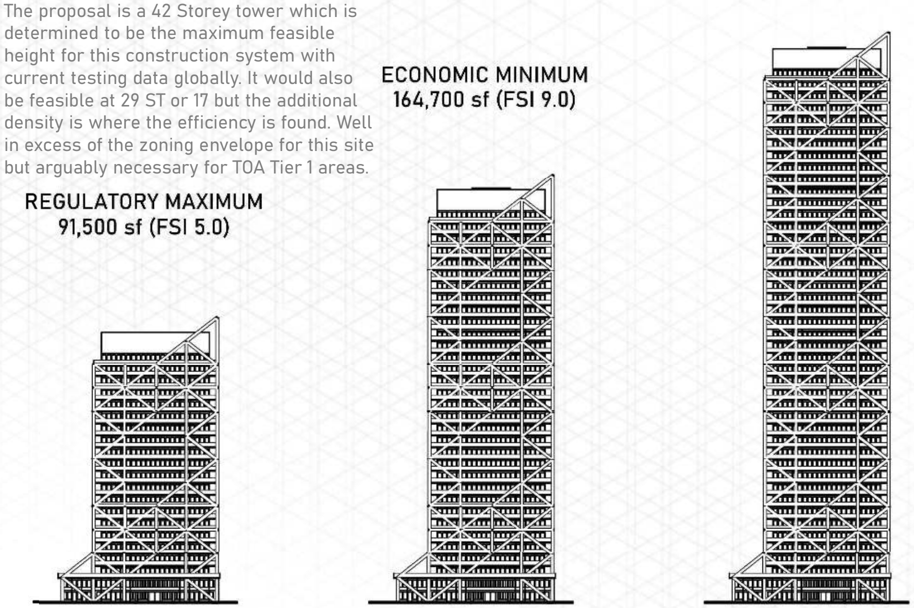
CHALLENGING DENSITY CAPS

The proposal is a 42 Storey tower which is determined to be the maximum feasible height for this construction system with current testing data globally. It would also be feasible at 29 ST or 17 but the additional density is where the efficiency is found. Well in excess of the zoning envelope for this site but arguably necessary for TOA Tier 1 areas.

REGULATORY MAXIMUM
91,500 sf (FSI 5.0)

ECONOMIC MINIMUM
164,700 sf (FSI 9.0)

ECONOMIC OPTIMUM
237,900 sf (FSI 13.0)+



Below the “Economic Minimum” public subsidy is increasingly necessary for timber to compete with concrete

FAMILY ORIENTED UNITS

ACCESS TO DAYLIGHT

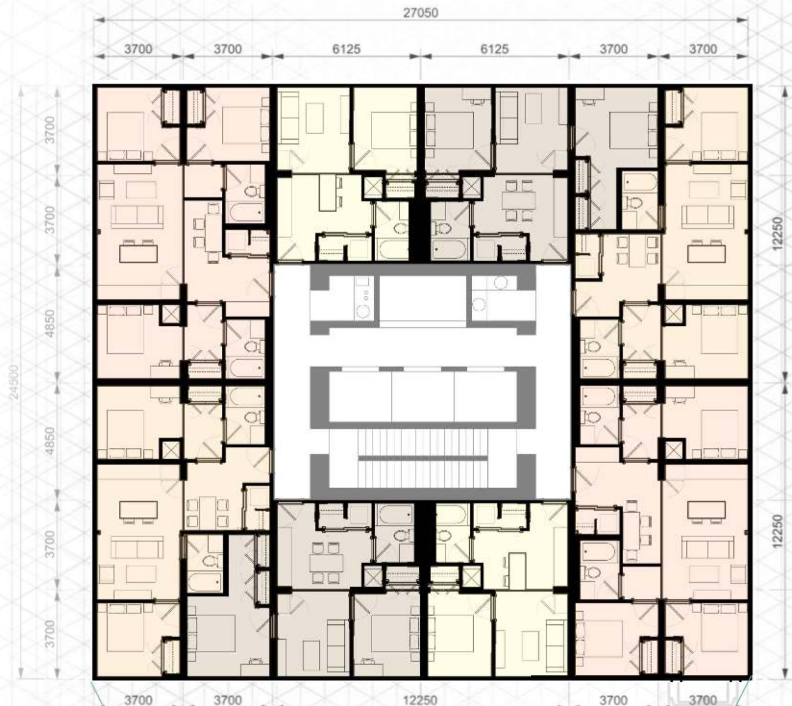
ACCESS TO OUTDOORS

EFFICIENT LAYOUTS

ROOM FOR LIVING

The proposal pushes against Vancouver's maximum tower floor plate slightly while respecting that building widths and separations need to be sensitively balanced with the rights of neighbouring sites to daylight and privacy. The unit count also pushes gently on industry norms for elevator counts at slightly more than 100 units per car, a standard which is being challenged increasingly in markets with the worst affordability crises. Ample closet space is provided in every unit but this proposal suggests that storage rooms are better situated below grade where costs per square foot are more reasonable. In fact, this proposal calls for the entirety of the below grade levels to be devoted to storage of more than just personal motor vehicles, parking minimums must also be challenged

TYPICAL TOWER FLOOR PLATE



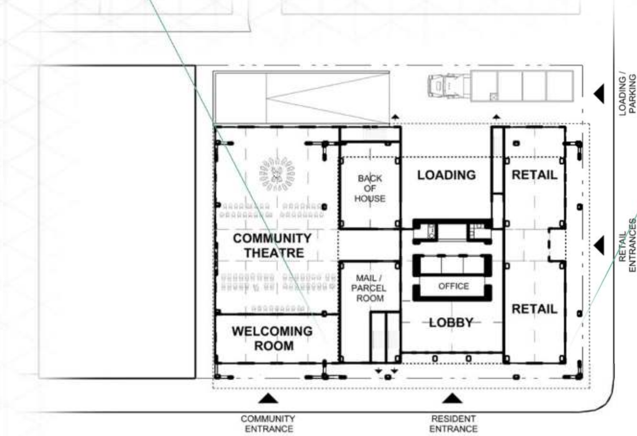
660 m² Floor Plate

82% Saleable Area

8 Units / Floor
- **25% 1 Bed**
- **50% 2 Bed**
- **25% 3 Bed**

68 m² Avg Unit

GROUND FLOOR PLAN



The Ground Floor makes the most of a constricted urban site in a prime location, activating the adjacent streets with retail and community "Welcoming Room" leading to a small but functional Community Performance Theatre.

The ground floor is set back from the tower extents allowing the timber perimeter braces to frame a colonnade for a more interesting and pleasant pedestrian realm. This colonnade also supports a canopy to protect pedestrians from Vancouver's well-known weather.

Levels 2 is devoted to indoor amenity with access to the rooftop above the Community Theatre. This space could also be made accessible for community activities such as a shared garden or children's playground.

The units are based on a modular grid determined by the dimensions of a typical shipping tractor trailer. However, the design of the unit layouts goes beyond this utilitarian starting point with a focus on the occupants that will live in them.

Five key drivers were used to guide the layout exercise in order to keep the human experience centered throughout the process, these were the objectives chosen to balance the needs of the users with the economical and ecological optimization of the project.

FAMILY ORIENTED UNITS

The unit mix is adapted from the developer driven status quo that skews towards small average unit sizes and a predominance of studios and one bedrooms catering to investor demand. Instead, it is proposed that more family sized units be provided to address the actual needs of end users in exchange for density bonuses and rebates from various levels of government.

ACCESS TO DAYLIGHT

Though interior bedrooms with indirect daylight are becoming increasingly common in contemporary apartment design this floor plate shows that even a building constrained by modular dimensions can secure real windows for all living spaces.

ACCESS TO OUTDOORS

The building is designed with generous wraparound balconies for all residential levels ensuring that all inhabitants can step outside for fresh air when needed. An outdoor amenity space is accessible to everyone on the podium roof.

EFFICIENT LAYOUTS

Each modular unit achieves all of these livability goals while being no bigger than necessary, each unit is equipped with standardized washrooms and kitchens to achieve economies of scale through repetition.

ROOM FOR LIVING

Every unit, the family units in particular, are provided with adequate space for living room seating and a full dining table, full size closets in all bedrooms and foyers as well as flexible spaces for desk work or hobbies.

SUPPORTING MODULAR TALL TIMBER

STRUCTURAL CONCEPT:

FOUR MODULAR MIDRISE BUILDINGS

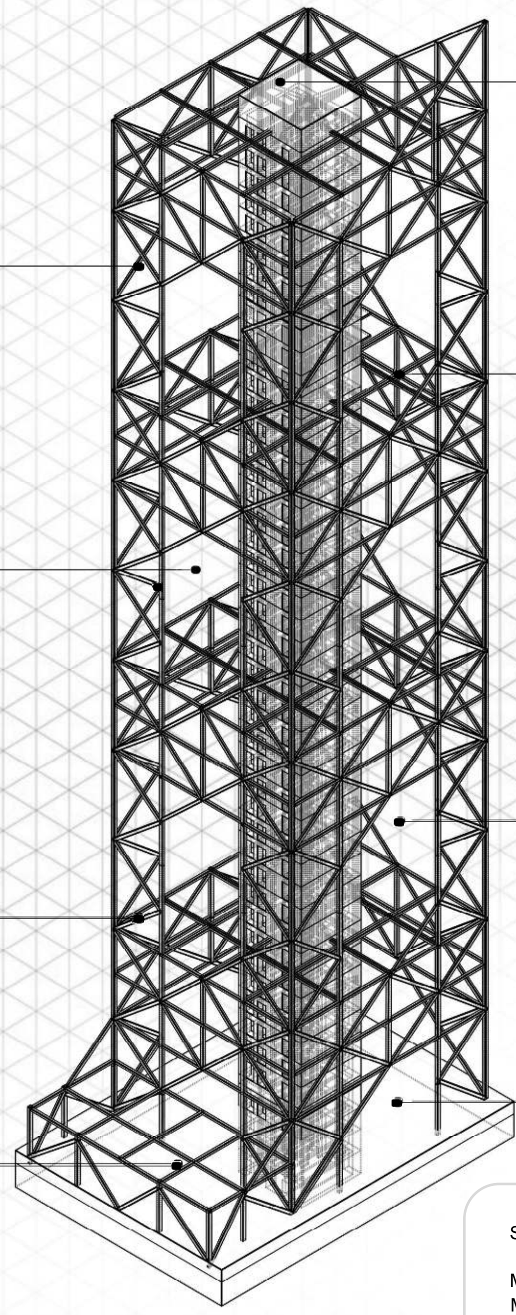
S
T
A
C
K
E
D

A PROTECTED EXTERNAL MEGAFRAME OF PERIMETER BRACING EXPANDS THE SECTIONAL DEPTH OF THE FLOOR PLATE TO ELIMINATE THE NEED FOR INTERIOR SHEAR WALLS THAT ARE INCOMPATIBLE WITH THE MODULAR CONTRUCTION METHOD

RIGID VOLUMETRIC MODULES HELD BY THE FRAME ARE REINFORCED WITH STEEL CONNECTORS INTERNALLY AND FROM ONE MODULE TO THE NEXT TO ENSURE PRECISE ALIGNMENT AND AVOID UNWANTED DEFORMATION

EFFICIENT TRUSS FORMS TRANSFER AND DISTRIBUTE LOADS, MINIMIZING MATERIAL USE BY ALIGNING LIGHTWEIGHT LINEAR ELEMENTS WITH THE LOAD VECTORS WHERE THEY ARE MOST EFFECTIVE

LONG SPAN WOOD BEAMS ABOVE THE DOUBLE HEIGHT GROUND FLOOR LEVEL TO ACCOMODATE A PERFORMANCE SPACE IN THE COMMUNITY COMPONENT OF THE PROGRAM, PLACED OUTSIDE OF THE TOWER FOOTPRINT TO AVOID POINT LOADS ON THE LONG SPANNING ELEMENTS



A MULTIPRONGED SOLUTION

A ROBUST CONCRETE CORE PROVIDES A SOLID BACKBONE FOR THE WOOD FRAME, IT IS A KEY COMPONENT OF THE LATERAL LOAD RESISTING SYSTEM WHILE PROVIDING A HIGHLY STABLE VERTICAL ALIGNMENT FOR ALL MEP AND CIRCULATION SHAFTS

TO OVERCOME THE HEIGHT LIMITATIONS OF MODULAR WOOD CONSTRUCTION A TRANSFER LEVEL IS PROPOSED AT APPROXIMATELY EVERY TENTH FLOOR BRIDGINF FROM THE MEGAFRAME TO THE CORE, THUS ISOLATING THE COMPARTMENT OF MODULES ABOVE FROM THOSE BELOW AND AVOIDING CONCERNS OF COMPOUNDING DRIFT WHILE SIMULTANEOUSLY LINKING THE CORE AND PERIMETER TO ACT AS A COHESIVE SYSTEM

EACH LEVEL OF MODULES IS SIMULTANEOUSLY SUPPORTED BY THE PLATFORM BELOW AND SUSPENDED WITH TENSION MEMBERS FROM THE PLATFORM ABOVE IN A BELT AND SUSPENDERS APPROACH TO INTRODUCE REDUNDANCY AND RESILIENCY TO THE SYSTEM

A THICK CONCRETE TRANSFER SLAB PROVIDES A SOLID AND STABLE BASE FOR THE STACKED ELEMENTS ABOVE, AN INDEPENDENT STRUCTURAL GRID CAN BE EMPLOYED FOR THE MINIMAL PARKING, STORAGE AND SERVICE REQUIREMENTS BELOW GRADE

International case studies and parametric analysis tools like Alpaca4D for Grasshopper provide ever increasing confidence that a timber structure could safely reach 150 m (140m proposed), but careful simulation of this specific system would need to continue as the project develops.

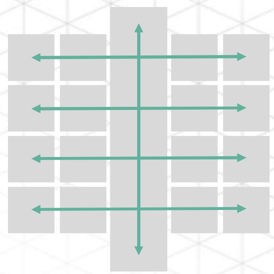
The real barrier to tall timber construction is the cost premium relative to concrete which exploits economic externalities (untaxed emissions) that cost society more than a timber subsidy would.

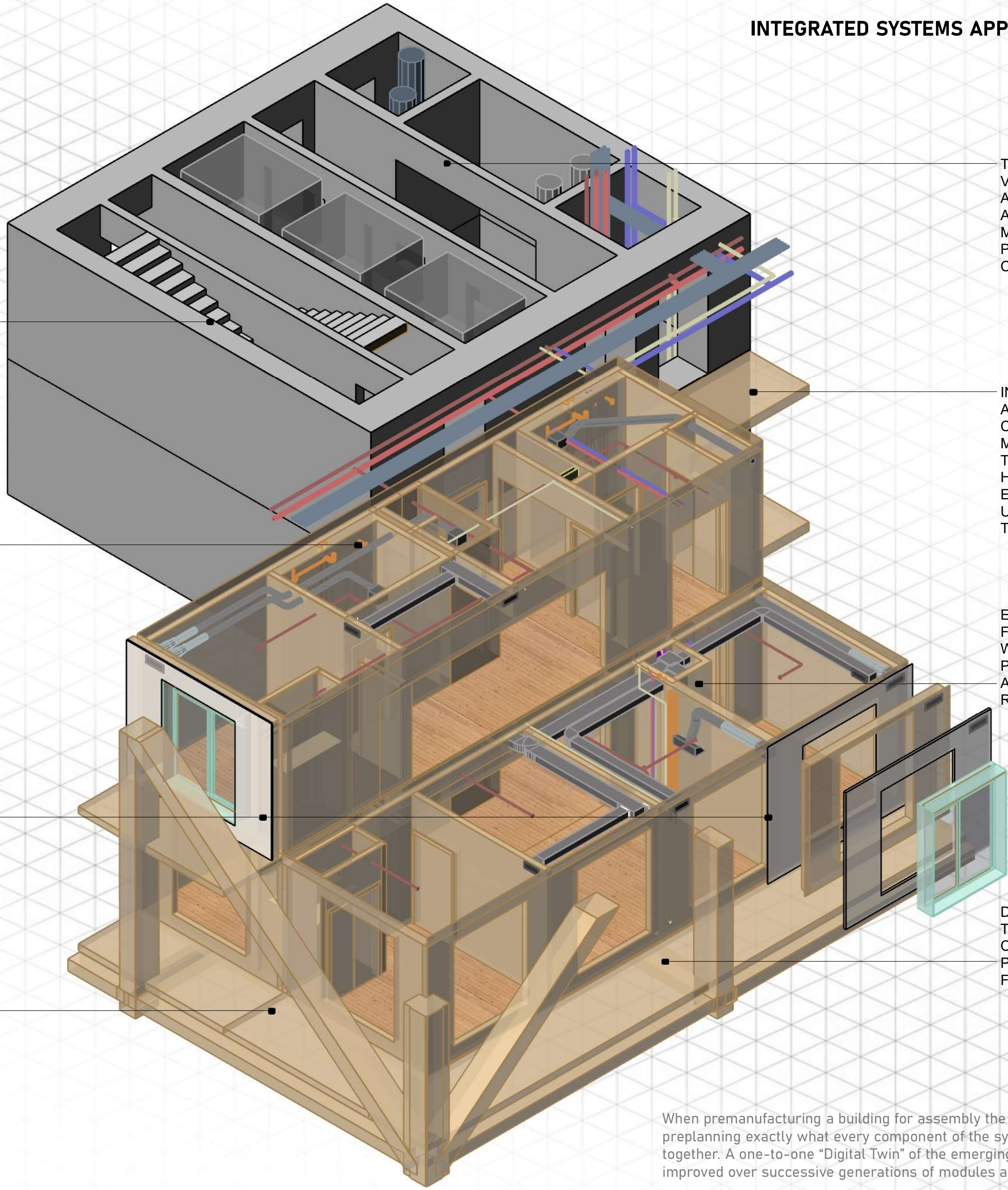
STRUCTURAL EMBODIED CARBON COMPARISON:

MODULAR CONCRETE	17,760 m^3 of CONCRETE	
MODULAR WOOD	5,700m^3 of CONCRETE	12,455m^3 of WOOD

TOTAL CARBON REDUCTION = 15,273 Tons of CO_2

INTEGRATED SYSTEMS APPROACH





THE EFFICIENT CORE CENTRALIZES VERTICAL SHAFTS FOR CONSISTENT AND PREDICTABLE ALIGMENT ACROSS FLOORS, IT ACCOMADATES MECHANICAL, ELECTRICAL AND PLUMBING RISERS, GARBAGE CHUTES, ELEVATORS AND STAIRS

A SPACE EFFICIENT SCISSOR STAIR ALLOWS FOR TWO EXITS FROM ALL LEVELS WITH NO DEAD-END CORRIDORS, THE LENGTH OF THE STAIRS AND A THREE BAY ELEVATOR GIVES THE KEY DIMENSION THAT THE MODULES ARE DESIGNED AROUND

INTERSTITIAL COORIDOR PANELS ARE PLACED BETWEEN THE CONCRETE CORE AND THE PREFAB MODULES TO ALLOW A DEGREE OF TOLERANCE IN ALIGNMENT, HORIZONTAL DISTRIBUTION ELEMENTS ARE INSTALLED UNDERNEATH AND CAN BE ADAPTED TO THE BUILT CONDITIONS

MECHANICAL, ELECTRICAL AND PLUMBIN EQUIPMENT CAN BE PREINSTALLED IN THE FACTORY TO SAVE TIME ON SITE, ALIGNMENT BETWEEN MODULES IS ACCOMODATED THROUGH MANUFACTURING PRECISION AND FLEXIBLE CONNECTORS AT JOINTS

EACH UNIT IS EQUIPPED WITH A FACTORY INSTALLED FAN COIL UNIT, WITH VERTICAL ALIGNMENT OF PIPES, DUCTS, AND CONDUIT IS ACHIEVED THROUGH EFFICIENT REPEATING FLOOR PLATES

LOW-COST WINDOW WALL AND HIGH-EFFICIENCY INSULATED PANEL CLADDING IS INSTALLED IN-SITU TO ALLOW CONTINUITY IN THE ENVELOPE LAYERS ACROSS MODULES AND TO MAXIMIZE THE SIZE OF EACH MODULE WITHIN SHIPPING CONSTRAINTS

DEEP STRUCTURAL ELEMENTS AT TRANSFER LEVELS CAN AVOID CLASHES WITH DUCTS BY PROVIDING ADDITIONAL FLOOR TO FLOOR HEIGHT AT THESE LEVELS

CANTILEVERED BALCONIES ARE AVOIDED THROUGH SUPPORT FROM THE PREIMETER FRAME, REDUCING BENDING MOMENTS AND THERMAL BRIDGING, WOOD BALCONIES ARE PROTECTED BY A WATER-RESISTANT MEMBRANE AND FLASHING THAT TIES INTO THE WALL ASSEMBLY

When premanufacturing a building for assembly the digital model is an essential tool for preplanning exactly what every component of the system will be and how they will all come together. A one-to-one “Digital Twin” of the emerging tower will guide construction and can improved over successive generations of modules as the system becomes established.

Base Case Cost Comparison

		CONCRETE		TIMBER		
	Square footage	**$/sq ft**	**Cost**	**$/sq ft**	**Cost**	**$/UNIT**
17 ST BASE CASE	202,700	$373.07	$75,622,000	$395.51	$80,170,000	$932,210
42 ST PROPOSAL	329,073	$406.15	$133,655,000	$529.39	$174,207,000	$558,357

Savings: $374,000 / Unit
(due to density increase)

Given the scale and complexity of this proposal a cost per square foot premium of 20% has been built into the proforma. Performing a sensitivity analysis on the estimate shows that even if the system entails a 100% cost premium compared to the 17 storey Base Case ($862/ft^2) the cost savings would still be approximately 1.5%, or $14,000 per unit. The key to feasibility here is volume of product in a single project resulting in massive economies of scale, while costs may be double in the end compared to the base case, the number of units achieved is increased by a factor of 3.5 resulting in a 75% higher return on investment if costs are kept under control, before even factoring in the benefits of expediting construction through modular prefabrication.

These savings are only possible if density bonuses are approved by the city with the condition that units provided are sustainable, affordable and family oriented, these targeted conditions are essential, it is important to note that blanket approvals of increased density in TOA Tiers will result in tall concrete buildings and erase the affordability gains because land value/costs will increase proportionally. Conditional approvals will allow land values to remain low and will instead tilt the economic advantage from mid-rise concrete buildings to high-rise wood buildings, an outcome that will significantly contribute to social and cultural goals.

Material Analysis & Embodied Carbon Results

Volume of wood products used (m³): **12,455** m³ (439,842 ft³)

U.S. + Canadian forests grow this in: **34** minutes

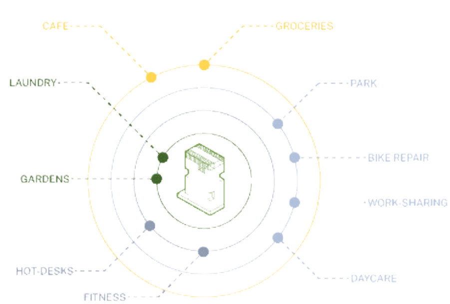
Carbon stored in the wood: **11,012** metric tons of CO_2

Avoided greenhouse gas emissions: **4,261** metric tons of CO_2

Total potential carbon benefit: **15,273** metric tons of CO_2

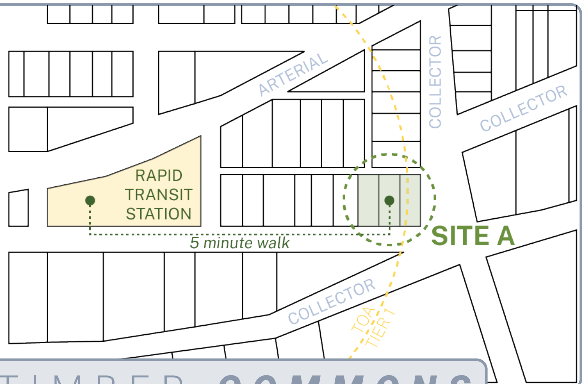
Equivalent of: **3,229** cars removed for a year
1,613 homes powered for a year

System_Eco(n) strives to be reminiscent of the forests that once blanketed this beautiful landscape and the trees from which the building is made. Both the green patina cladding and the branching triangular frames were composed with the form of a mighty douglas fir as inspiration. One could imagine a forest of dendritic towers regreening the skyline around this transit node, honouring the natural world that birthed this city and beginning to tread lighter on the world with efficient timber structures that reduce waste, purify the air, and nourish the soil, all while providing homes for people that are not just places to live but places where people love to live.



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.

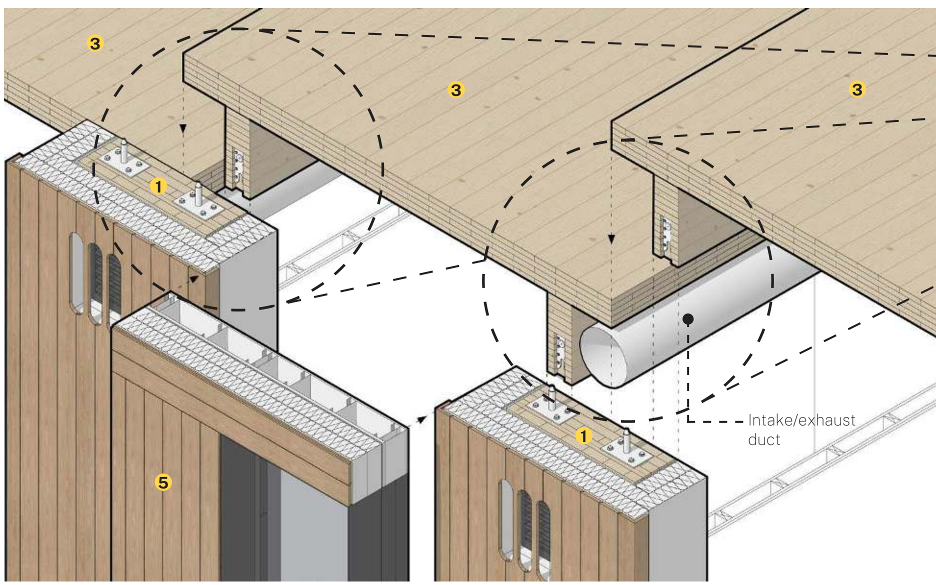


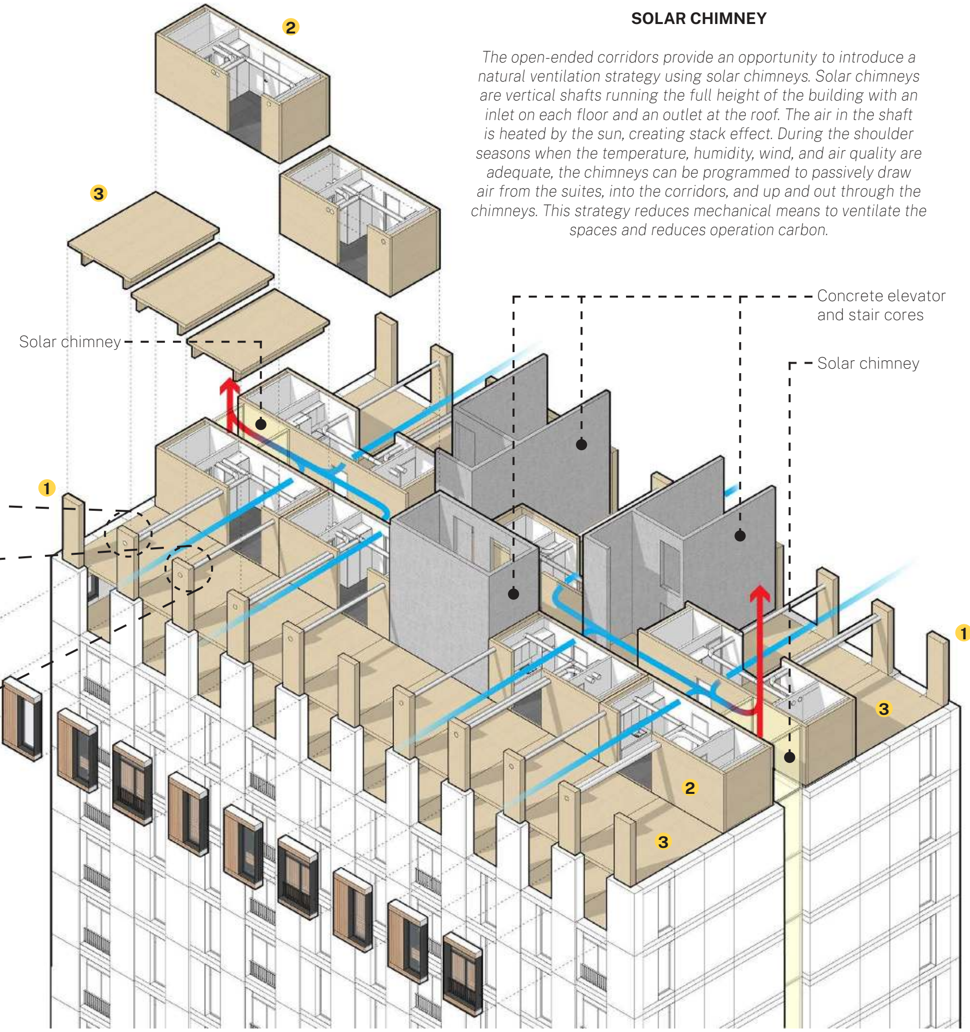
TIMBER **COMMONS**

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.

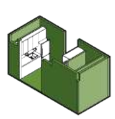




1 **EXTERIOR “WALLUMNS”**
GLT exposed on one side, CNC’ed wood-to-wood connections and mechanical penetrations

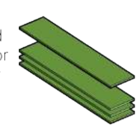
can be pre-clad

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

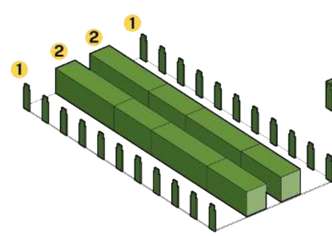


3 **PRE-ASSEMBLED SLAB CASSETTES**
5-ply CLT supported by pre-installed GLT beams, allowing for mechanical distribution between

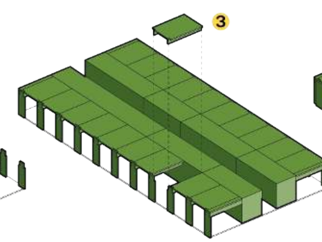
4 **CORRIDOR SLABS**
5-ply point-supported CLT, beamless corridor construction allowing for mechanical distribution



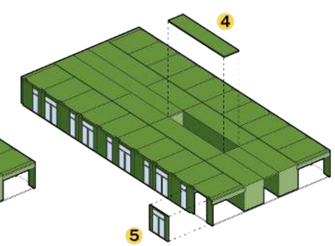
5 **PRE-FAB CLADDING**
Modular system, limited variety of panel types for efficiency



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



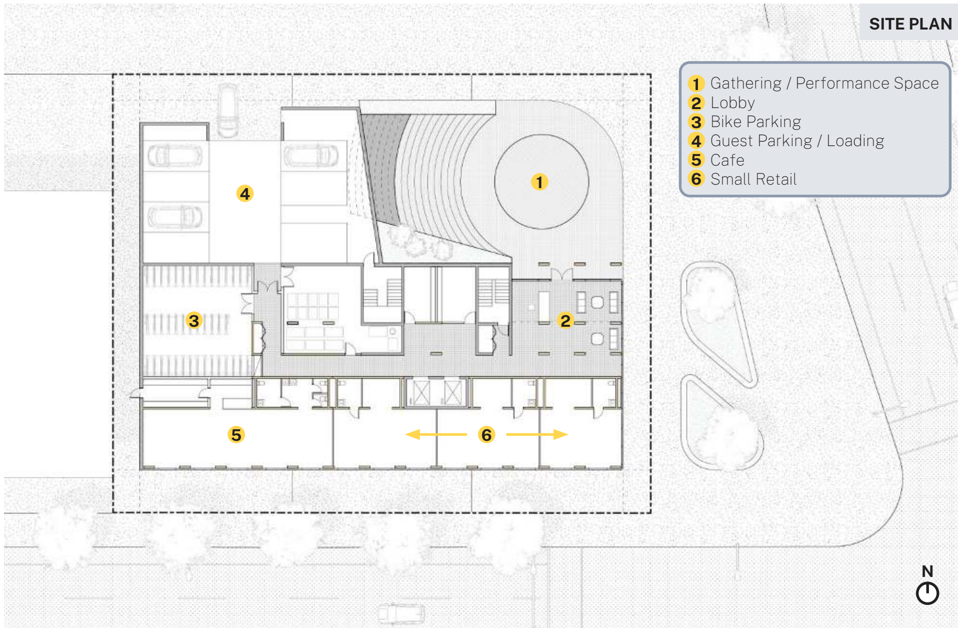
Slab-and-beam cassettes attached above



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

KIT ASSEMBLY

SITE PLAN



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 (#)	86
Bedrooms (#)	138
Amenity space (sq ft)	7,340
Non-residential (sq ft)	9,348

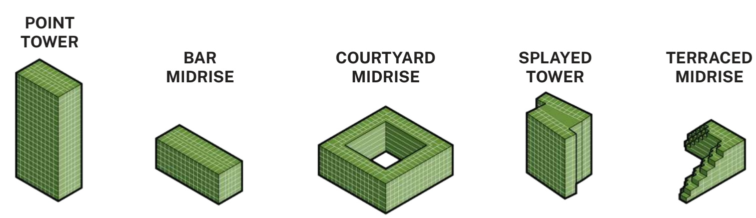
CONSTRUCTION COSTS

		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**

VIEW FROM NORTH-EAST

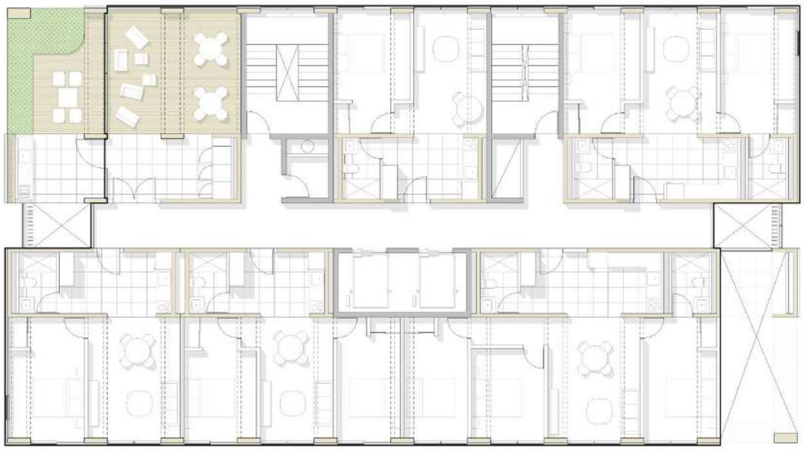


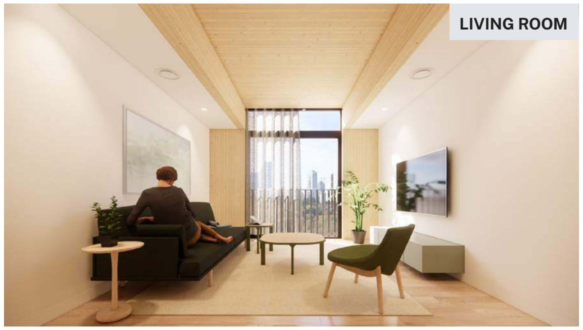
While we have opted for a point tower as a response to this project's site constraints, the modular system allows for assembly in varied typologies. Using the same cost- and time-effective kit of parts and sequencing, we can create radically different results that respond to context and need.

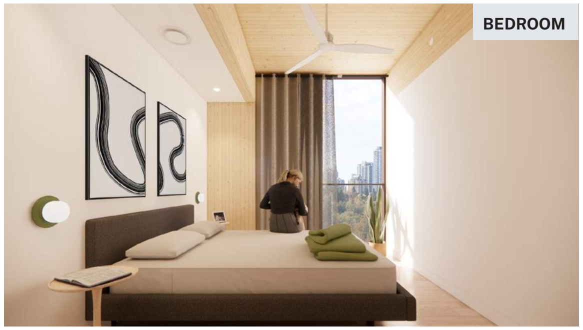
HOUSING *TYPOLOGIES*

TYPICAL FLOOR PLAN 1

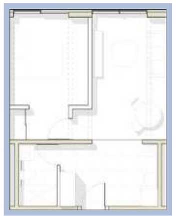
TYPICAL FLOOR PLAN 2



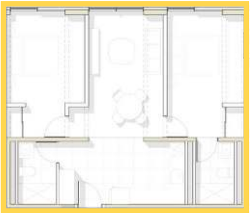




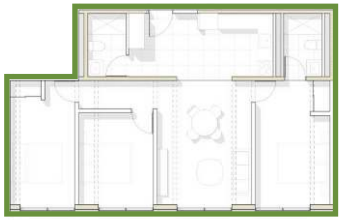
Using the **standard grid module** of 3.05m by 7.6m, we designed 1-, 2-, and 3-bedroom units that assemble into complete floor plates in varied configurations. **Mass timber elements remain exposed**, providing the biophilic warmth of natural wood. Kitchen/washroom modules align with service cores, opening 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.



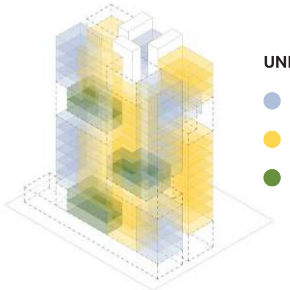
TYPICAL
1-BEDROOM UNIT
530 sq. ft.



TYPICAL
2-BEDROOM UNIT
785 sq. ft.



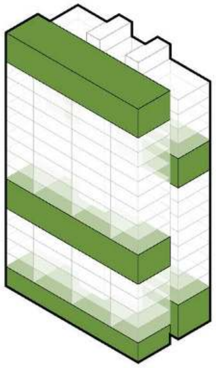
TYPICAL
3-BEDROOM UNIT
990 sq. ft.



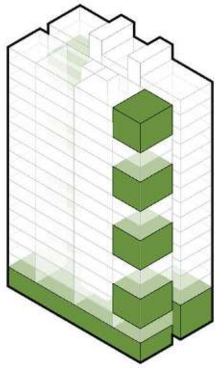
UNIT MIX

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

PRIVATE ***LIVING***

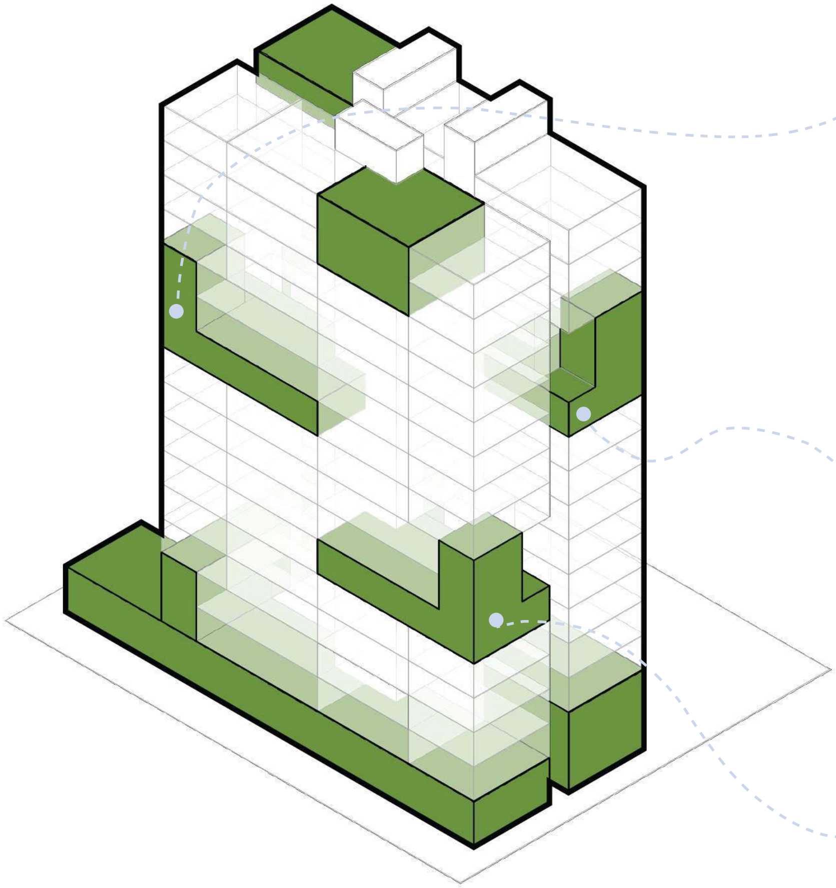


COMMUNAL SPACES DISTRIBUTION
Alternative 1

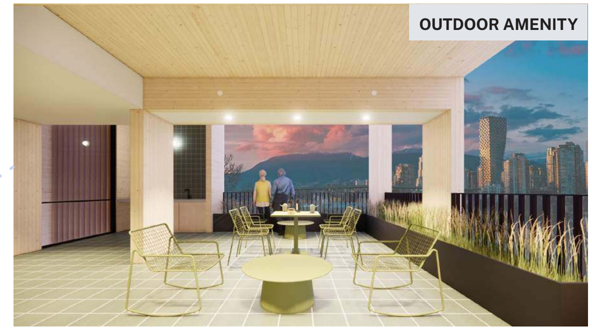


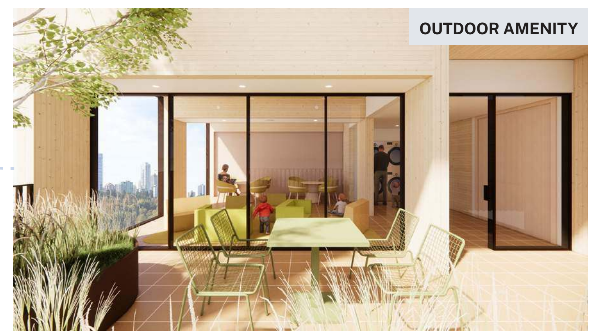
COMMUNAL SPACES DISTRIBUTION
Alternative 2

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***

Design competition DECODING TIMBER TOWERS

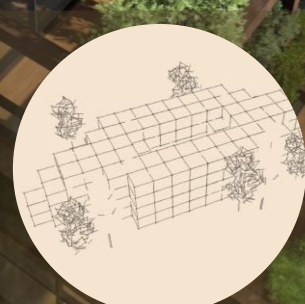
The New-wood Roots

“ The design fosters social connection…”

Our project embraces this legacy by providing affordable housing with a variety of unit types to support a rich, multicultural community. The design fosters social connection through shared spaces such as a community theatre and performance area, ultimately immortalizing the soul and layered history of British Columbia within the very fabric of the building.

The varied configurations of modular blocks combined with random arrangement of panels create a dynamic and visually compelling façade that transcends mere structure to become a vibrant expression of the community’s diversity and layered history. This interplay of forms and patterns evokes a sense of movement and vitality, much like the flow of cultural narratives. Architecturally, this approach breaks away from monotonous uniformity, embracing complexity. Artistically, the mosaic-like composition invites viewers to read the building as a embodiment of community spirit, resilience, and the beautiful coexistence of difference.

The block-based design approach embodies a harmonious balance between simplicity and versatility—streamlining building science and fabrication processes while unlocking a rich diversity of architectural expression. Each modular block acts as a fundamental building unit, crafted with precision to ensure structural efficiency, fire rating, and ease of assembly. The result is a dynamic interplay of shadow, texture, and volume—transforming functional simplicity into a canvas for diverse spatial experiences and aesthetic narratives conforming to the needs of the community.



“…Simplicity and Versatility”

finelinedesigners

The penthouse units elevate living standards, featuring generous spatial balconies that extend the indoor experience outward.

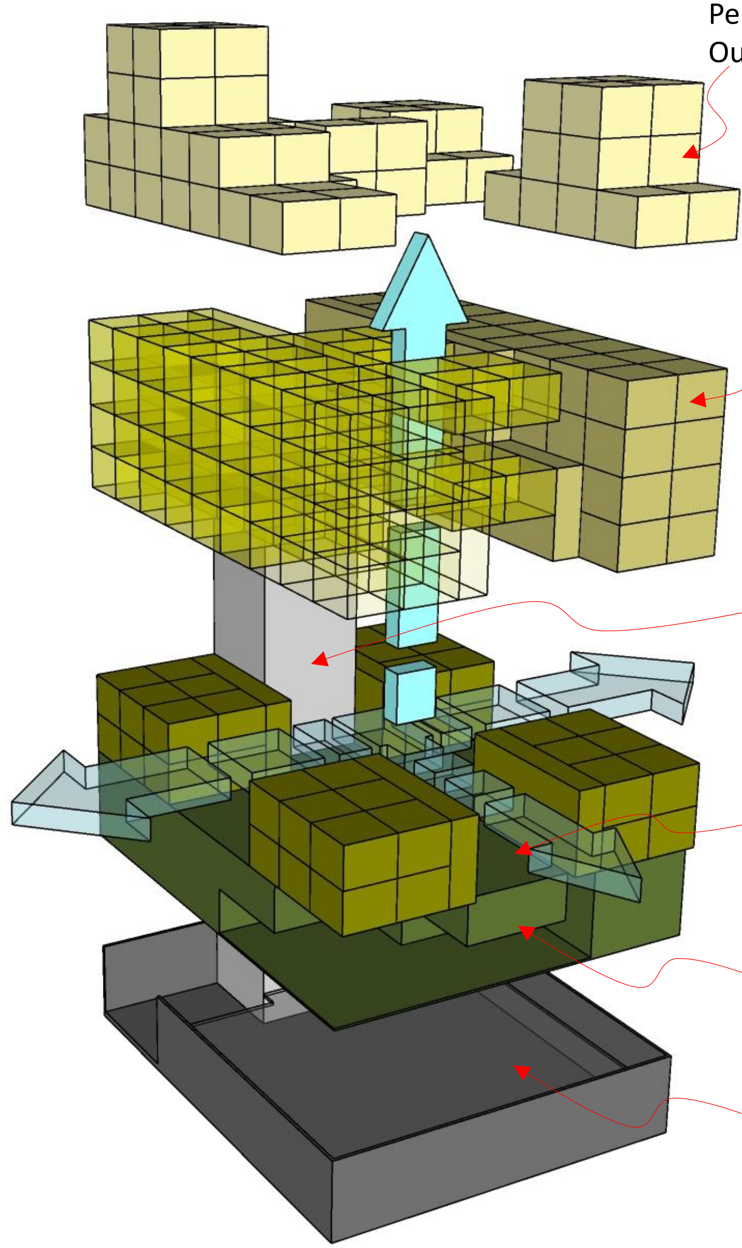
The upper residential levels are designed with flexibility in mind, offering a diverse range of unit types to accommodate varying lifestyles—from compact studio units for individuals to expansive multi-level family residences.

The third floor is designed as a mixed-use level, combining residential units with dedicated open space exclusively for residents. This floor integrates semi-private recreational areas—such as landscaped terraces, seating zones, or communal lounges

The first two floors of the building are dedicated to commercial and retail functions, strategically programmed to serve both residents and the surrounding community.

The basement level serves a dual function, acting as both the structural foundation of the building and a strategically integrated parking facility. The concrete basement is connected to a structural shaft housing all services and elevators.

"Floor plans that respond to evolving residential needs."



Building Zoning

finelinedesigners

The top levels of a building incorporating a *terrace effect* or *stepped massing* create visual and functional articulation in the overall form. This design approach allows for a diversified unit typology, enabling the integration of *private terraces*, *green roofs*, *balconies*, and *multi-level penthouse units*. Such stepped configurations break down the building's scale, enhancing urban form while maximizing access to natural light, ventilation, and outdoor living spaces. Additionally, this strategy increases the desirability of upper-level units by offering expanded spatial experiences, thereby enhancing both the livability and market value.

” a diversified unit typology ... enhancing both the livability and market value.”

The third level functions as a semi-private communal terrace or podium deck, designed to foster social interaction and a sense of community among residents. This elevated common area offers shared amenities such as gardens, seating, or recreational spaces, promoting commonality and a secure environment, physically separated from public access. Strategically located above ground level, it enhances safety, privacy, and visual openness —strategically positioned to encourage social interaction and foster a sense of community among occupants. Additionally, the building's form creates a wind tunnel effect—an aerodynamic phenomenon that can be harnessed for sustainable energy.

”... encourage social interaction and foster a sense of community among occupants.”

Ground-level pathways and sidewalks encroaches beneath a building's footprint. These transitional spaces serve as semi-covered pedestrian routes, blending exterior and interior zones. By encroaching under the structure, these elements offer shelter, visual interest, and a welcoming approach, enhancing the human scale of the architecture. These podium-level spaces are designed with flexibility and permeability, accommodating a mix of daily-use services—such as grocery, pharmacy, and convenience retail—alongside specialty shops that reflect the cultural and economic diversity of the neighborhood.

”...designed with flexibility..., accommodating a mix of daily-use services...”

COST BASE CASE ANALYSIS	BASE CASE	THE NEW-WOOD ROOTS
FSR	5.00	6.71
Lot size (sq ft)	25,540.00	18299.00
Building sq ft Above Grade	127,700.00	122708.74
Building efficiency (%)	85.00	85.00
non saleable/rentable (sq ft)	19,155.00	18406.31
saleable/rentable (sq ft)	108,545.00	104302.43
Total Stories above grade (#)	18.00	13.00
Total Stories (#)	21.00	16.00
Base floor (#)	1.00	1.00
Above 1st storey (#)	17.00	12.00
Stories below grade (#)	3.00	3.00
Units (#)	86.00	95.00
Bedrooms (#)	178.00	193.00
Amenity space (sq ft)	850.00	1500.00
Non-residential (sq ft)	3,000.00	18298.64

COST BASE CASE ANALYSIS	AREA	CONCRETE		MASS TIMBER	
Description	Square footage	$/sq ft	Cost	$/sq ft	Cost
Below grade	75000.0	$315	$23,625,000	$299	$22,425,000
Base floor	8700.0	$360	$3,132,000	$403	$3,506,100
Above 1st storey	119000.0	$385	$45,815,000	$431	$51,289,000
	Quantity	**$/unit**		**$/unit**	
Balconies	86	$25,000	$2,150,000	$25,000	$2,150,000
	Cost per month	**# Months**		**#**	
(Overhead/Construction	$50,000	18	$900,000	16	$800,000
TOTAL			**$75,622,000**		**$80,170,100**

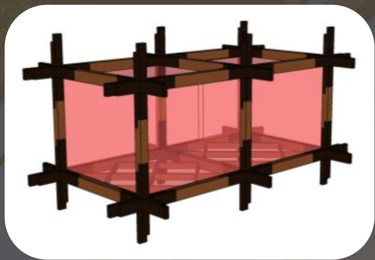
EMBODIED CARBON					
Total Building Sq Footage	Area	Concrete		Submission	
	Sq ft	Embodied Carbon kg/sq ft	Total Carbon kg/sq ft	Embodied Carbon kg/sq ft	Total Carbon kg/sq ft
	202,700.00	**6.69**	**1,355,864.35**	**2.69**	**546,112.31**

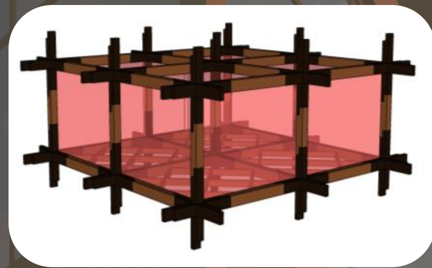
COST BASE CASE ANALYSIS	AREA	CONCRETE		THE NEW-WOOD ROOTS	
Desription	Square footage	$/sq ft	Cost	$/sq ft	Cost
Below grade	53766.8	$315	$16,936,542	$315.00	$16,936,542
Base floor	7534.7	$360	$2,712,506	$402.00	$3,028,965
Above 1st storey	115174.0	$385	$44,341,990	$433.00	$49,870,342
	Quantity	**$/unit**		**$/unit**	
Balconies	0	$25,000	$0	$25,000	$0
	Cost per month	**# Months**	**Cost**	**# Months**	**Cost**
(Monthly	$50,000	18	$900,000	16	$800,000
TOTAL			**$64,891,038**		**$70,635,849**

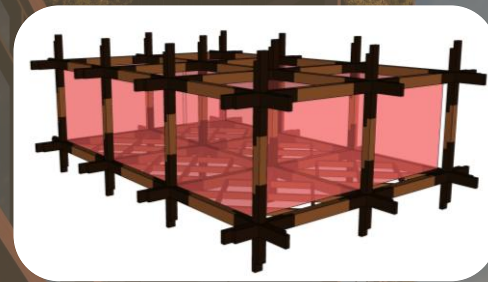
EMBODIED CARBON					
Total Building Sq Footage	Area	Concrete		Submission	
	Sq ft	Embodied Carbon kg/sq ft	Total Carbon	Embodied Carbon kg/sq ft	Total Carbon
	176,475.54	**6.69**	**1,180,448.42**	**2.69**	**475,458.64**

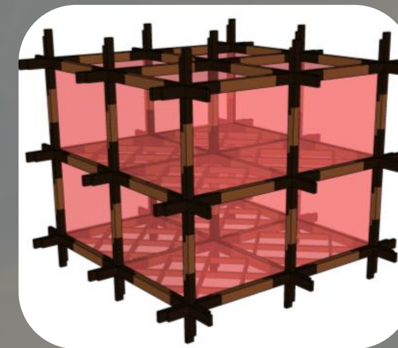
fine**line**designers

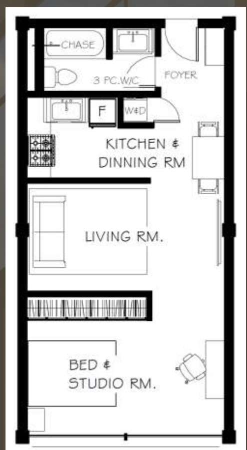
SAMPLE UNIT TYPES











4-BLOCK UNIT :

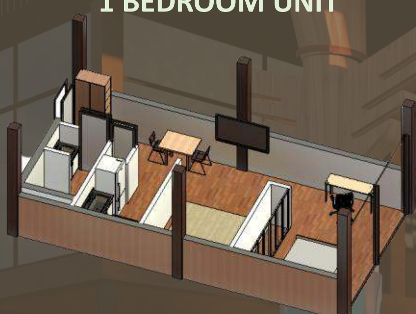
2 BEDROOM UNIT

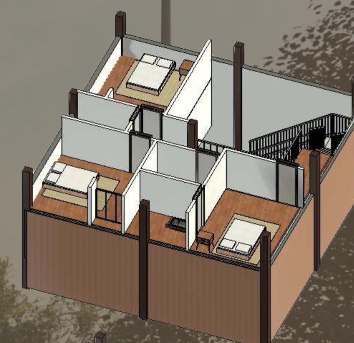
"…supporting evolving community dynamics and promoting long-term sustainability."

2-BLOCK UNIT :
STUDIO or
1 BEDROOM UNIT

6-BLOCK UNIT :
3 BEDROOM UNIT

8-BLOCK UNIT :
4-5 BEDROOM UNIT –LOFT TYPE

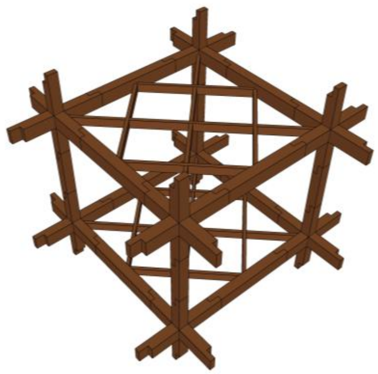




The residential units are conceived as modular ***blocks***, an architectural strategy that embraces both functional clarity and artistic expression. This block-based configuration creates a rhythmic composition across the façade, contributing to visual diversity and architectural identity. Each unit is designed with inherent *flexibility*, allowing spatial reconfiguration to accommodate varying household sizes, lifestyles, and cultural needs. Through a grid or structural bay system, partitions can be reimagined, enabling the seamless transformation of units—whether expanding a single residence, merging multiple units, or subdividing spaces for multi-generational living. This modular adaptability transcends traditional constraints, supporting evolving community dynamics and promoting long-term sustainability. The aesthetic variation produced by this diversity adds texture and depth to the architectural form, reflecting the individuality of its inhabitants while maintaining overall cohesion.

TYPICAL EXTERIOR WALLS

Their inherent modularity supports a ‘kit-of-parts’ approach, enabling designers to compose complex structures through simple, repeatable units. This mix-and-match capability allows the architecture to respond fluidly to different site conditions, programmatic needs, or aesthetic intentions, without compromising structural integrity.



…enabling designers to compose complex structures through simple, repeatable units.

The modular design approach elegantly addresses the logistical challenges of transporting raw materials, both to the fabrication facility and ultimately to the construction site. Each component is meticulously designed with transportability in mind, streamlining the journey from origin to assembly. Engineered timber elements, such as glulam (glued-laminated timber), are dimensioned with precision—not only for structural integrity but also to ensure ease of handling during transit and assembly. These glulam beams are sized to fit standard transportation vehicles, 2-hour fire rating, stackable, and practical deployment on site. To optimize the strength of glulam, joints are fabricated single pieces. Joints of pieces are structurally calculated along areas where stress is less and easier to connect which along straight components.

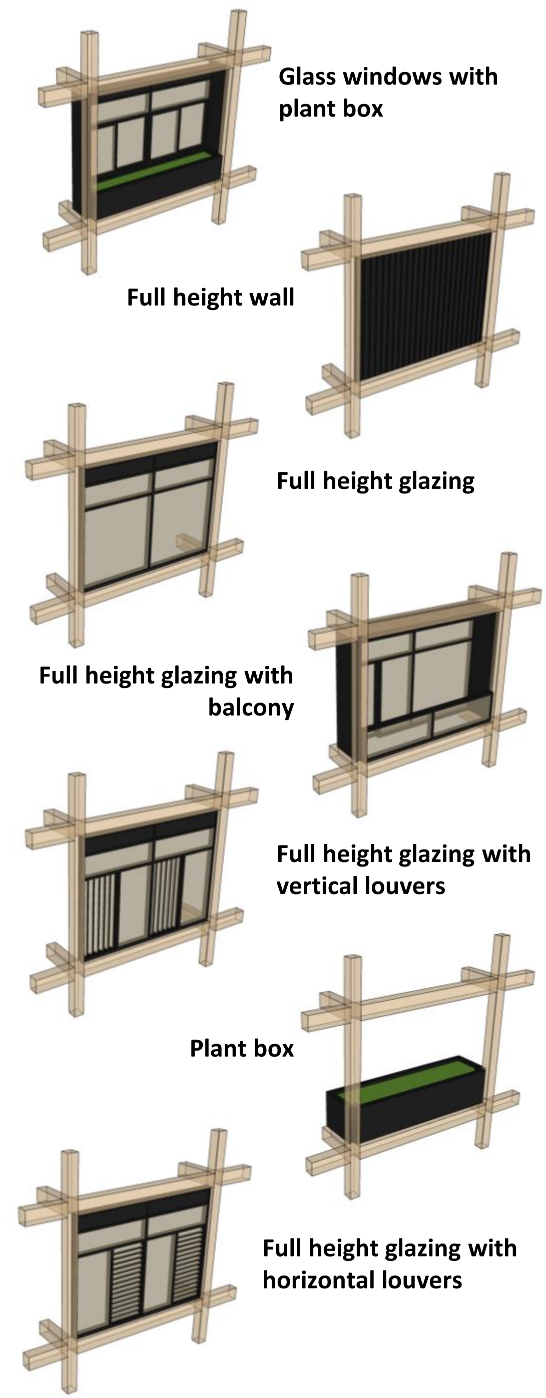
“Design supports not only logistical efficiency but also regional economic resilience.”

The wall systems are envisioned as a series of pre-insulated, pre-assembled panels—highly adaptable components that respond thoughtfully to the typical structural rhythm and dimensions of the building. Each panel is conceived as capable of being tailored in material, finish, and detailing to suit diverse architectural expressions and environmental conditions. Their geometry and construction are intentionally kept within a standardized framework, allowing ease of replication without compromising functionality.

This strategic simplicity opens the doors to local and small-scale fabricators, who can engage in the production of these panels without the need for highly specialized machinery or large facilities. Design supports not only logistical efficiency but also regional economic resilience.

This localization not only minimizes carbon emissions but also gives option of affordability of the construction. This design choice strategically addresses market vulnerability by decentralizing production: small and mid-sized workshops can fabricate the panels using accessible tools and conventional techniques

“…addresses market vulnerability by decentralizing production:”



"…the design doesn't just meet standards - it anticipates them."

The customizable nature of the design allows it to fluidly adapt to evolving building codes, zoning requirements, and sustainability standards—ensuring long-term relevance and regulatory compliance without the need for major structural overhauls. This inherent flexibility is not only a technical advantage but a future-forward design principle, making the architecture resilient in the face of shifting environmental policies and construction norms.

At the heart of the system is timber which acts as both a primary structural element and a climate-conscious material choice. Timber's ability to sequester carbon makes it a critical tool in the push for low-impact construction, effectively resulting in a negative carbon footprint when sourced and managed responsibly. As global building codes increasingly prioritize sustainability, emissions reduction, and renewable materials, this approach positions the structure at the forefront of progressive architectural practice.

By harmonizing modular flexibility with ecological responsibility, the design doesn't just meet standards—it anticipates them. It stands as a living framework that evolves with its context, all while embodying the warmth, authenticity, and regenerative potential of wood.

TREE FROG TOWER

The project site is within the unceded, ancestral, and traditional territories of the xʷməθkʷəy̓əm (Musqueam), Sḵwx̱wú7mesh (Squamish), and səlilwətaɁɬ (Tsleil-Waututh) peoples.

Ancient forests once covered this land which was shared by Indigenous peoples, salmon, black bear, and the Pacific tree frog. The frog is a powerful cultural symbol to Indigenous groups in British Columbia. They are believed to cleanse spaces and spirits through their recognizable croak and projecting tongue.

In accordance with this belief, an Indigenous housing provider, the *Frog Hollow Neighbourhood House*, will develop 80 units of affordable housing for the community. The proposed tower is to be constructed of locally sourced timber and to be known as the *Tree Frog Tower*.

TREE FROG TOWER

SITE

Site A is a consolidated 1700 sq m (18 300 sf) south-facing corner lot. It is located within Tier 1 of a Transit-Oriented Development Area with rapid transit and a bus exchange within a five minute walk. Shops, services, and extensive green space are all nearby in this historic neighbourhood.

URBAN DESIGN

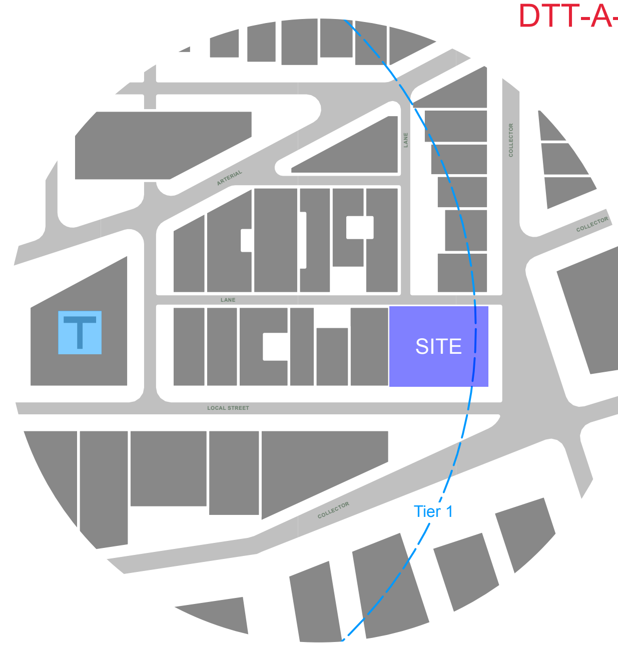
The adjacent local street will be closed to traffic and converted into a pedestrian mall with an arcade (covered walkway). The mall will link the existing transit hub to a new urban plaza paved with wooden 'bricks'. Directly below this plaza is a underground bicycle garage that will accommodate 800+ bicycles to encourage other modes of transportation.

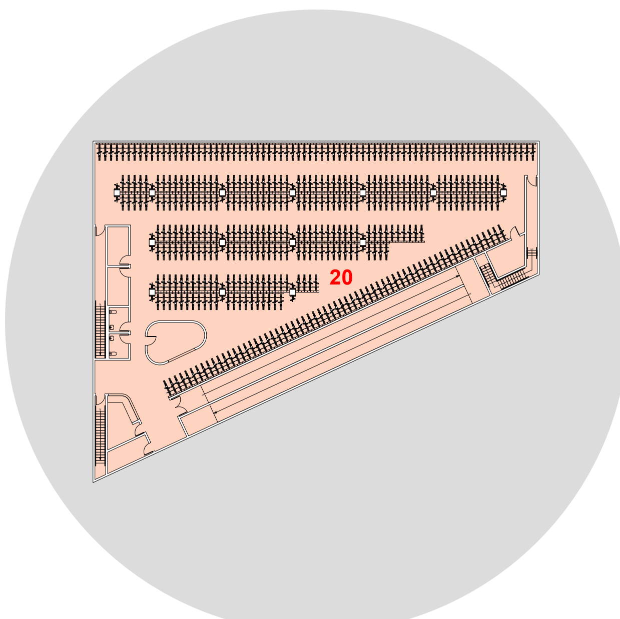
These urban interventions are intended to re-invigorate the neighbourhood and foster a more vibrant street culture.

ARCADE

The two-storey timber arcade offers shelter from rain and sun and will run the entire length of the block. Along the northside of the plaza the arcade is attached to the tower. It extends beyond the property line blending the public realm with private spaces.

The arcade's design is inspired by the wood rail trestles constructed in British Columbia and used to transport timber in the previous century. Borrowing from the Howe Truss structure, a glulam framework of diagonal and vertical members wraps around the tower perimeter.





1 loading bay
2 electric vehicle car share
3 garbage/recycling
4 garden
5 commercial/retail unit
6 mechanical/electrical/utilities
7 residential lobby
8 dumbwaiters
9 community kitchen
10 residential entry
11 public elevator
12 take-out window
13 house post
14 arcade
15 arcaded pedestrian mall
16 wooden 'brick' plaza
17 lily pond
18 bicycle garage entry and ramp
19 bioswale
20 underground bicycle garage

TREE FROG TOWER

PROGRAMME

The proposed 12 storey timber tower is anchored by a community kitchen and take-out window at the ground floor. Entrance to the tower residences is through the arcade. Smaller scaled retail spaces intended to encourage more local shops and businesses are also found at grade.

The second storey social centre shares outdoor space with a public picnic shelter with views to the plaza.

Levels 3 -12 provide 80 units of housing and a private rooftop amenity space.

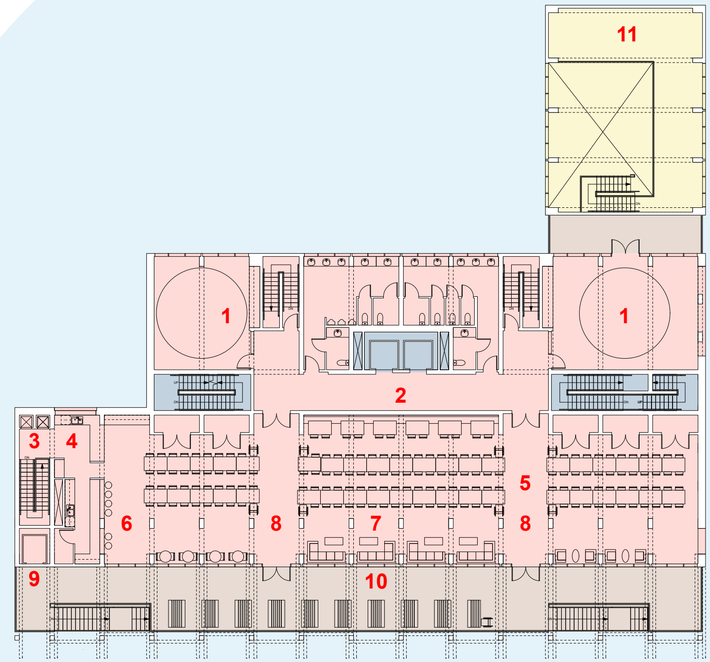
SOCIAL CENTRE

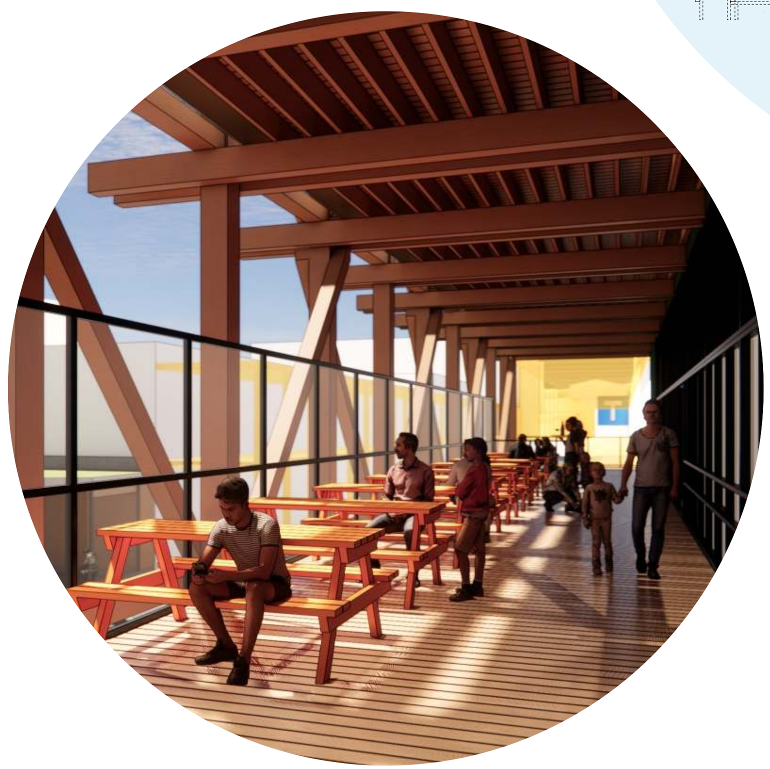
The social centre at second floor is to be operated by the *Frog Hollow Neighbourhood House*. This semi-private space is intended to encourage social interaction between building residents, family, friends, and the larger community.

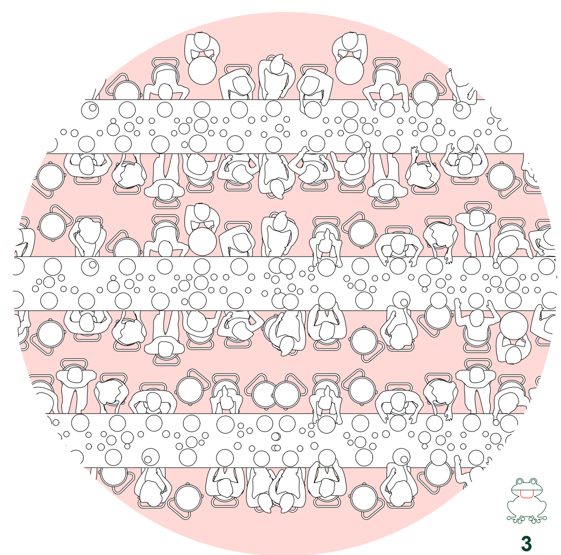
The centerpiece of the social centre is the grand dining hall which is designed for hosting feasts, banquets, and other special occasions focused on sharing a meal. Dumbwaiters and interior stairs connect the second floor servery with the ground floor community kitchen. Tables and chairs can be stored away so that the large gathering space can also function as a theatre or performance space.

Lounge areas, bar, gallery, and multi purpose rooms support the dining hall. The east multi purpose room with its small enclosed outdoor patio is scheduled to double as a daycare.

The social centre is accessed by shared stairs or a public elevator. The adjacent picnic shelter also functions as spill-out space for the dining hall. Tower residents have direct entry to the social centre by private elevators with restricted access.







1 multi purpose room
2 gallery
3 dumbwaiter
4 servery
5 dining hall
6 bar
7 lounge
8 entrance
9 public elevator
10 picnic shelter
11 retail mezzanine

TREE FROG TOWER

TIMBER TOWER DESIGN

The asymmetrical typical floor plan accommodates 8 studio, one bedroom, two bedroom, and three bedroom units per floor. The wider than average corridor is welcoming and provides ample space for wheelchairs and other mobility devices.

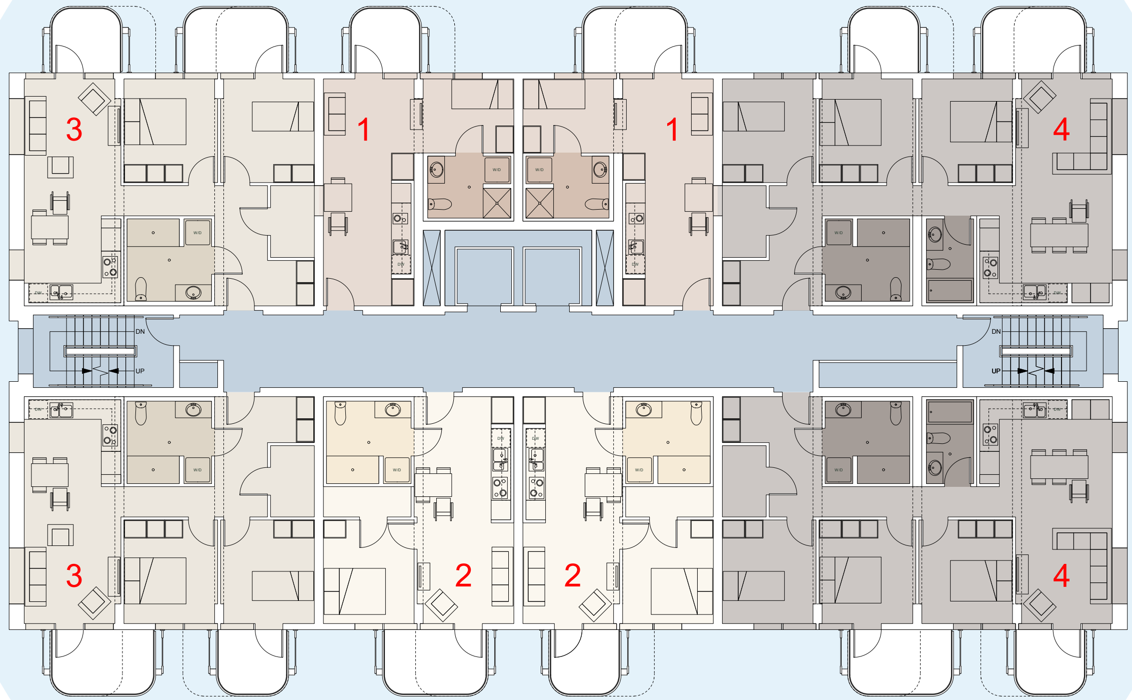
The unit layouts are designed to be adaptable offering occupants greater comfort and accessibility. A knock-out panel at the party walls between the studio and north-facing two and three bedroom units enables opportunities for multi generational living and other options. Suspended balconies provide access to private outdoor spaces.

A rooftop outdoor amenity space provides respite for residents. Planter boxes, a children's playground, and a barbecue area are proposed. Circular openings in the rooftop enclosure provide framed views to the mountains, river, and city beyond.

Due to the close proximity of the transit hub no underground parking is provided on site. An EV car share program located at the lane is proposed. As well, there is easy access to the underground bicycle garage.

PROJECT STATISTICS

FSR	5
Lot size (sq ft)	18 300
Building sq ft Above Grade	91 500
Building efficiency (%)	83
non saleable/rentable (sq ft)	87 295
saleable/rentable (sq ft)	4 205
Total Stories above grade (#)	12
Total Stories (#)	12
Base floor (#)	1
Above 1st storey (#)	11
Stories below grade (#)	0
Units (#)	80
Bedrooms (#)	140
Amenity space (sq ft)	0
Non-residential (sq ft)	14854



Levels 3 -12

1 studio
43 sq m (463 sf)
2 one bedroom
52 sq m (560 sf)
3 two bedroom
81 sq m (872 sf)
4 three bedroom
107 sq m (1 152 sf)

TREE FROG TOWER

CONSTRUCTION

The proposed 12 storey timber tower emphasizes prefabrication to address housing unaffordability and climate change.

CLT Floor Panels

Prefabricated cross-laminated timber floor panels used in multi-storey applications are very cost effective. Standard panel width, length and thickness available in British Columbia is proposed and determined the extent of a typical floor. Combined with a concrete topping for improved fire protection and acoustics the underside of the panels are left exposed for visual interest.

CLT Wall Panels

An elongated rectangular building core constructed of encapsulated CLT wall panels centers the structure. These shear wall assemblies capture the elevator and stair cores. Additional shear walls at demising and end wall locations run perpendicular to the building core.

CLT walls and floors at all common areas are covered with a non-combustible gypsum board to enhance fire resistance and address building code requirements. Non-load bearing interior walls are also to be constructed of CLT panels.

Glulam Posts and Beams

Between the encapsulated CLT walls, a network of exposed glulam posts and beams enables spacial flexibility. Located along a 3.3 m (11'-0") module east-west grid, the beams and columns with steel connections are stacked vertically down to the concrete foundation slab.

North and south-facing curtain walls are also constructed of prefabricated CLT panels. Deep punched windows are featured at end shear walls locations cladded in black green metal panels.

CONSTRUCTION COSTS

		Concrete		Submission	
	Square footage	$/sq ft	Cost	$/sq ft	Cost
Below grade	0.0	$315	$0	$0	$0
Base floor	9149.0	$41	$375,109	$403	$3,687,047
Above 1st storey	82351.0	$13	$1,070,563	$431	$35,493,281
	Quantity	$/unit		$/unit	
Balconies	120	$0	$0	$25,000	$3,000,000
	Cost per month	# Months	Cost	# Months	Cost
Schedule Costs (Monthly Overhead)	$50,000	18	$900,000	16	$800,000
TOTAL			**$2,345,672**		**$42,980,328**

Note: concrete slab-on-grade including reinforcement and concrete topping are factored costs.

1 CLT floor panels
2 CLT wall panels
3 glulam post and beam
4 structural grid system
5 rooftop amenity
6 typical studio unit
7 typical one bedroom unit
8 social centre
9 picnic shelter
10 EV car share parking
11 garden
12 residential elevator lobby
13 retail space
14 *portico*
15 urban plaza
16 underground bicycle garage
17 bioswale

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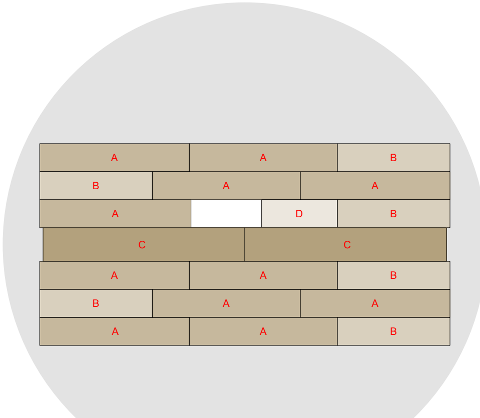

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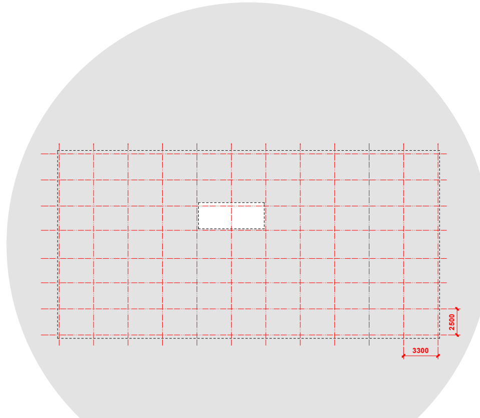

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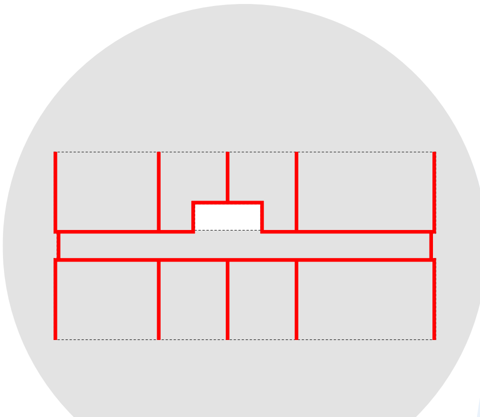

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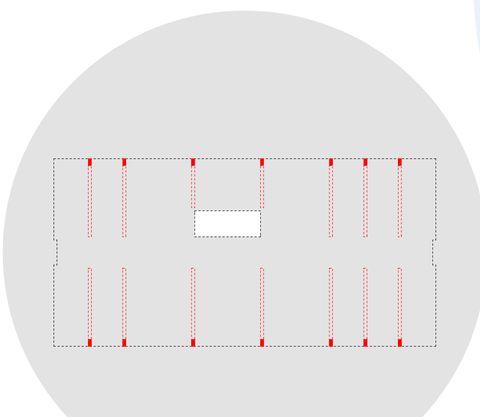

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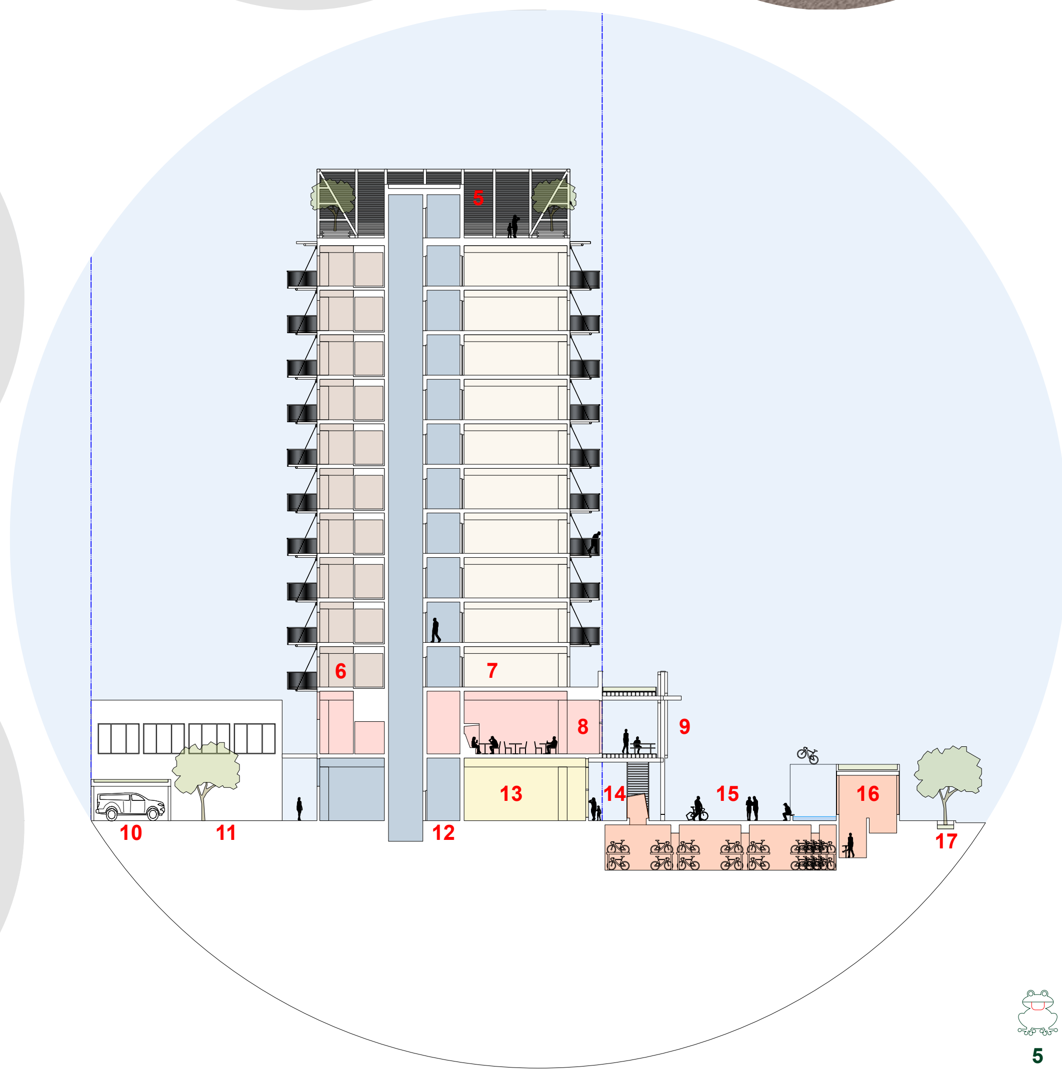


TREE FROG TOWER

PREFABRICATION

Prefabrication improves affordability. Faster construction times reduces costs while increasing environmental benefits. Improved quality control in a factory settings results in fewer errors and less waste. British Columbia's mass timber market offers a range of prefabricated wood products.

CLT panels for floors, roofs, interior, and exterior walls as well as glulam columns and beams.

The proposed suspended balconies are manufactured off-site. Their cost efficient and flexible design includes a CLT panel floor that is visible from below.

Modular options such as the family washroom pods are dropped into place between beams. Kitchen units and standardized plywood storage cabinets that replace fixed closet spaces are also manufactured off-site. Specialties such as the deep windows are customizable with tailored finishes.

1 suspended balcony

2 CLT wall (encapsulated)

3 family washroom pod

4 CLT exterior wall panel

5 CLT floor panel (with concrete topping)

6 window box

7 CLT interior wall panel

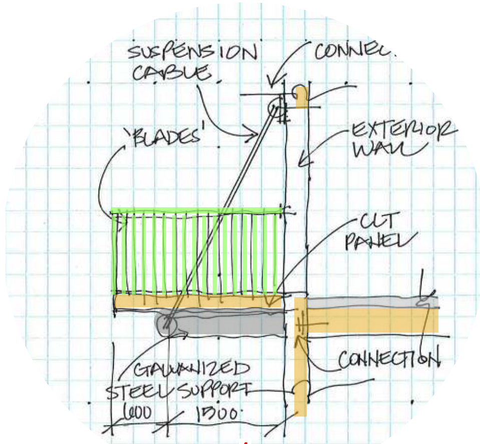
8 glulam post and beam

9 plywood storage cabinets

EMBODIED CARBON

		Concrete		Submission	
	Sq ft	Embodied Carbon kg/sq ft	Total Carbon	Embodied Carbon kg/sq ft	Total Carbon
Total Building Sq Footage	91500.0	6.69	**612045.33**	2.69	**246135**

The strategy to focus of prefabrication and ocally-sourced timber products aids in reducing embodied carbon. The potential re-use and recyclability of CLT walls and floor panels as well as glulam posts and beams furthers that goal.



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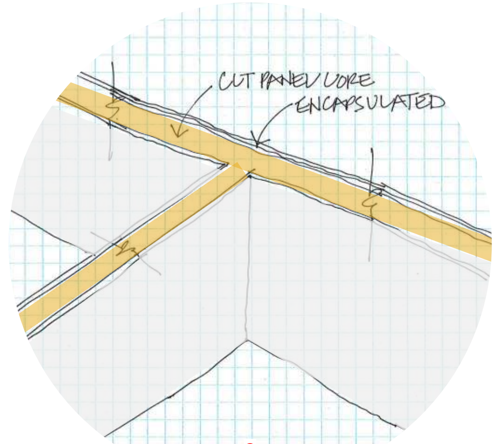

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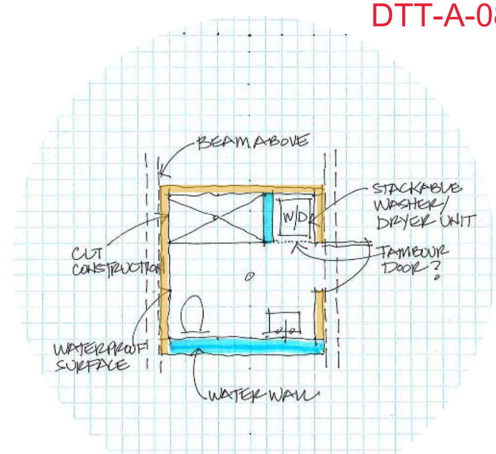

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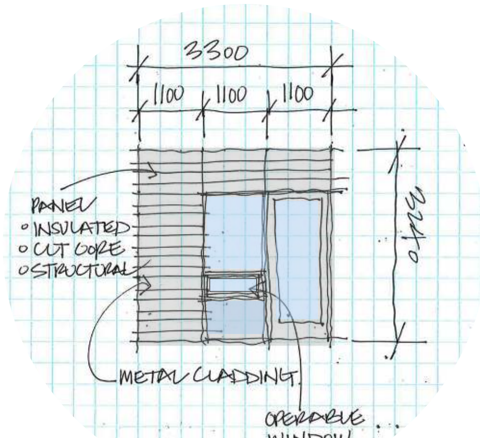

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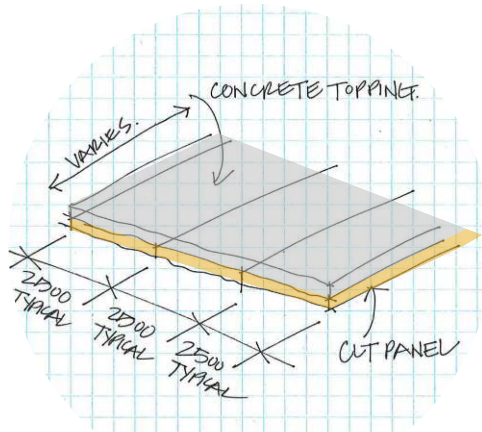

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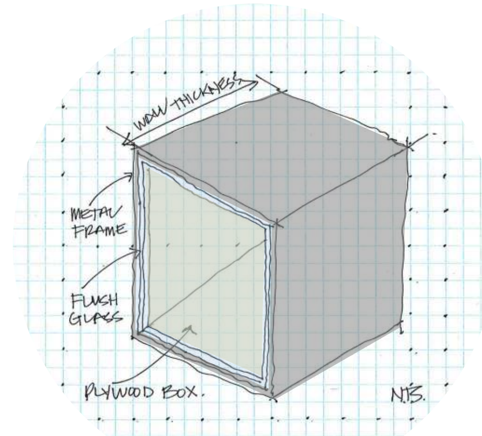

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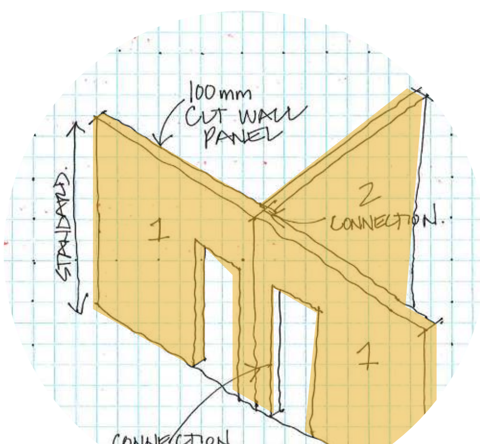

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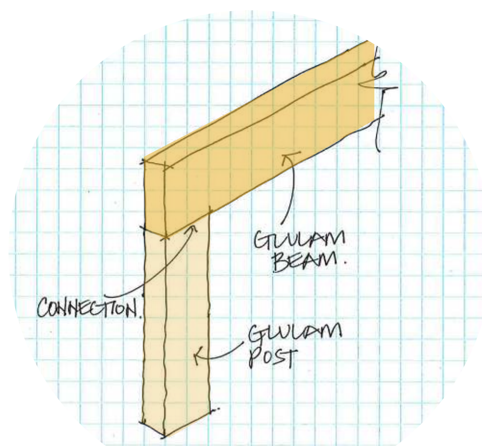

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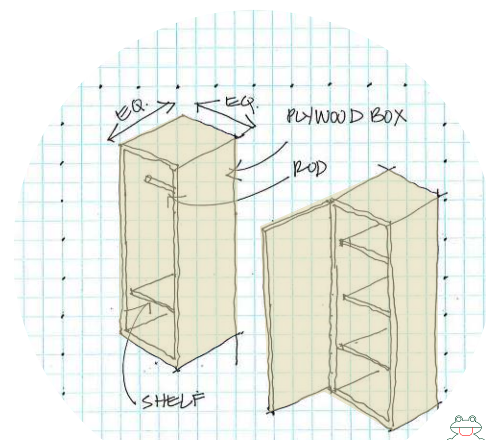
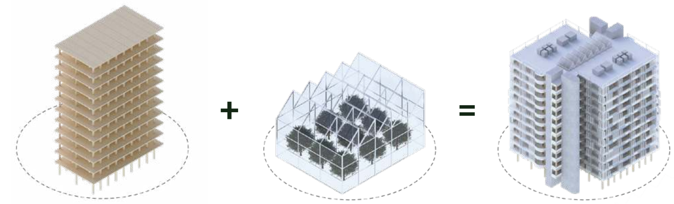


9

A Timber Tower Wearing a Greenhouse Coat

Current timber towers strike a hard line between interior and exterior. In fact, it is often difficult to tell that a tower is made of mass timber from the outside. We propose a timber tower that wears a greenhouse coat. On one hand, this coat offers residents a third space between mechanically conditioned space and exterior unconditioned space: adaptable for different seasons and living configurations. On the other hand, this coat unveils the mass timber structure of the building while sheltering it from the elements. The result is a tower with a timber structure that can be *experienced and seen*. The tower becomes a billboard for a city reimagined and rebuilt through mass timber.

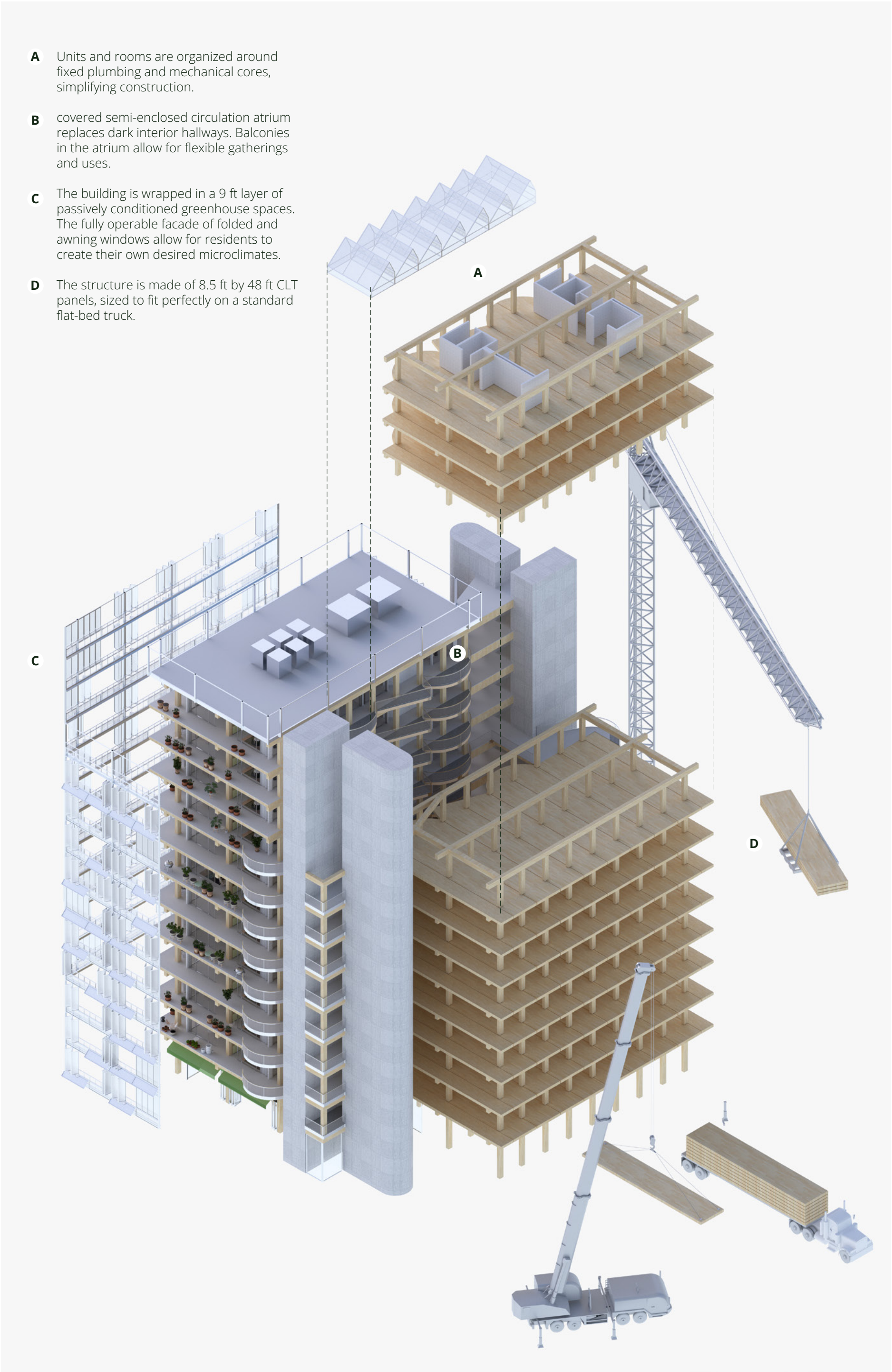
Location: Site A, TOA Tier 1
Total Stories: 12
Total SF: 89,303 sf
FSR: 4.88



Systemization and Standardization: A Kit-of-Parts Design

Rather than a fixed design, the tower is a system of architectural parts that uses off-site factory fabrication to reduce cost, material waste, and construction time. Nearly all of the timber structure is made from a single repeated structural bay, sized for shipment on a flatbed truck. The facade of the building utilizes kit-of-parts greenhouse components that mirrors the structural grid. While highly standardized, the structure in the greenhouse is freed from fixed walls and offers maximum possibility of use.

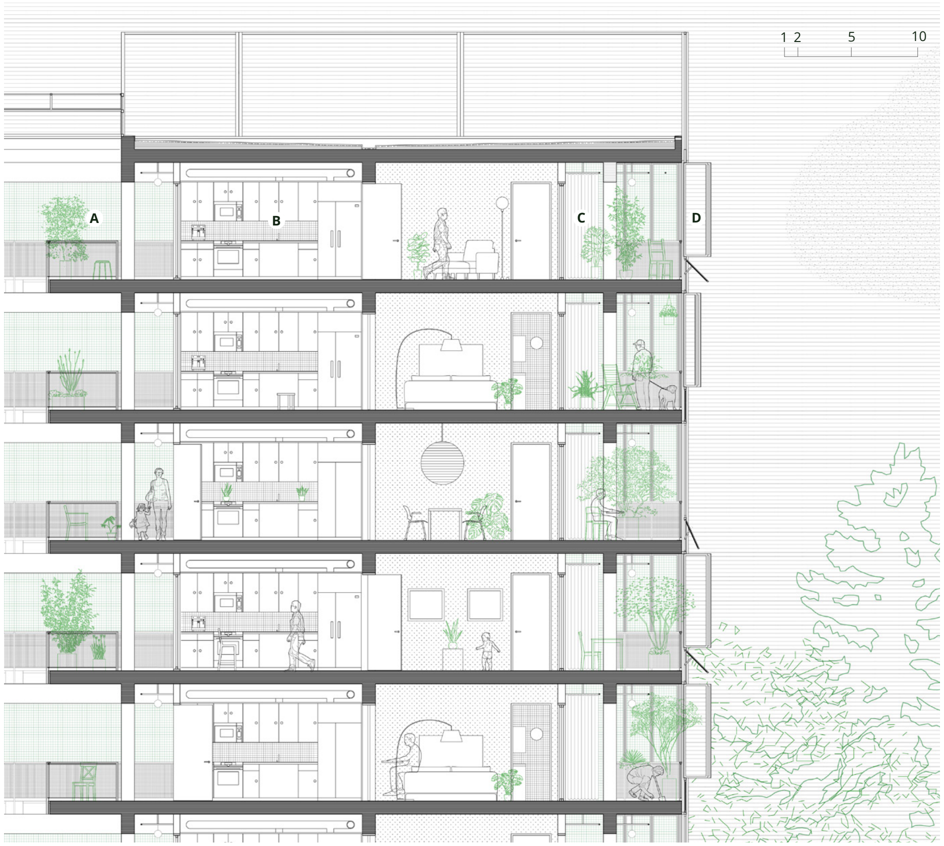
View from the southwest corner.



Construction diagram showing the systemization and standardization.

Climate Change Mitigation and Adaptation: Reducing Embodied Carbon *and* Operational Carbon

The adoption of mass timber in tower construction is critical to mitigating climate change as the world's population continues to grow and urbanize. While mass timber construction aids by reducing embodied carbon, our proposal also reduces operational carbon by balancing active and passive conditioned living spaces. This approach can greatly reduce the energy consumption of the building over its lifespan. The addition of greenhouses as living spaces also allows residents to take advantage of British Columbia's mild year-round climate, adjusting their homes to differing comfort levels.



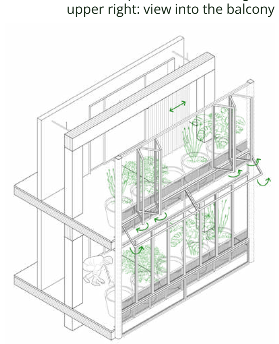
- **A** Covered, semi-enclosed circulatio atrium with balconies for gathering.
- **B** Enclosed and conditioned units.
- **C** Unconditioned greenhouses living spaces.
- **D** Folding and awning windows allow for individualized climate control.

upper left: partial section
lower left: ventilation diagram
lower left: operable facade diagram
upper right: view into the balcony

Summer: Units can fully open for cross-ventilation, passively cooling each home.

Winter: Both conditioned spaces and greenhouses can be closed off separately, creating microclimates in each home.

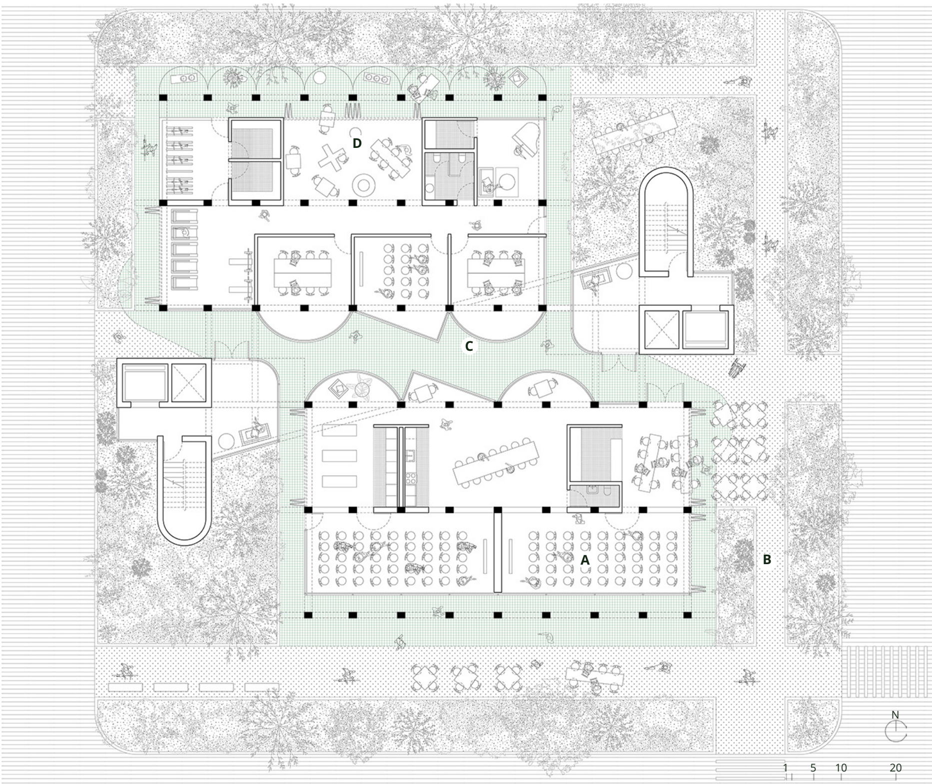
Fall/Spring: Residents can open and close off spaces according to their desired comfort.



View inside a greenhouse living space, which reveals the mass timber structure while sheltering it from the elements.

Site Integration and Social Interaction: A Porous Tower Open to All Sides

Located in Site A and TOA Tier 1, our proposal fully embraces the proximity to transit and retail by merging with the life of the city at ground level. The tower meets the groundnot as a single mass, but as a series of smaller volumes that allow visitors, air, and light to flow in from all sides. Visitors can walk through the center of the building and see the soaring residential atrium and balconies overhead. The different orientations and positions of the volumes at ground level allow for multiple facades. Public-facing programs, including community meeting rooms, performance spaces, and a cafe meet the busy street intersection, while more intimate programs including a daycare faces the quieter alleyway and opens up to ample outdoor play area.



A Spaces facing the busy street corner are programmed as community meeting rooms that can be combined into a larger performance space.

B Operable facades allow for retail programs such as a cafe to spill out into the adjacent sidewalk and landscaped areas.

C A covered outdoor arcade can be used for temporary gatherings such as a farmer's market.

D The quieter, alley-facing side of the building provides a more sheltered space for a daycare that opens into ample outdoor play areas.

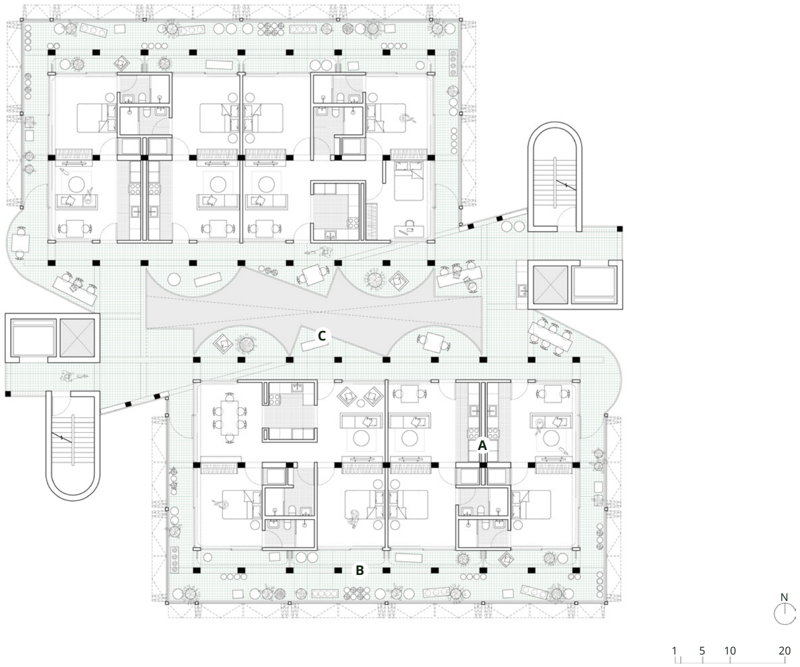
upper left: ground floor plan
lower left: view into the daycare space
upper right: view into the atrium
lower right: view into the coffee shop

A semi-enclosed and covered atrium space replaces the dark interior hallways of the typical tower. Balconies cantliever off the hallways over the atrium, creating additional shared living spaces that are naturally lit from above and from the open ends of the building.

The ground floor of the tower is porous and approachable from all sides. Visitors can walk through the center of the building without having to go inside.

Quality of Life: Flexible Units Surrounded by Light, Air, Greenery, and Timber

Each of the tower's units are surrounded by greenhouses that extend living space into the threshold between indoors and outdoors. Every single room can be opened up to a greenhouse space, creating a connection to the outdoors and bringing in light and air. Curtains, sliding doors, folding windows, and awning windows allow residents to adapt these spaces to their desired levels of comfort and privacy. The exposed timber structure of the greenhouses frames every view looking out from the interior to the exterior. While each unit is fully private, the greenhouse spaces create room for possible shared uses, and can be opened up or divided by residents as desired.



The exposed timber structure of the greenhouses frames every view from an interior room looking outwards.

A Units are organized around modular and prefabricated kitchen and bathroom cores, allowing for surrounding spaces to be configured as either one, two, or three-bedroom units.

B Each room opens up to a greenhouse space that can be used as private or shared living spaces.

C Circulation space in the tower is oriented around a light-filled atrium, lined with cantilevered balconies that create additional flexible uses and amenity spaces for residents.

upper left: typical floor plan
lower left: peripheral space diagram
upper right: view into the bedroom
lower right: view into the living room

Greenhouse used as separate balcony.

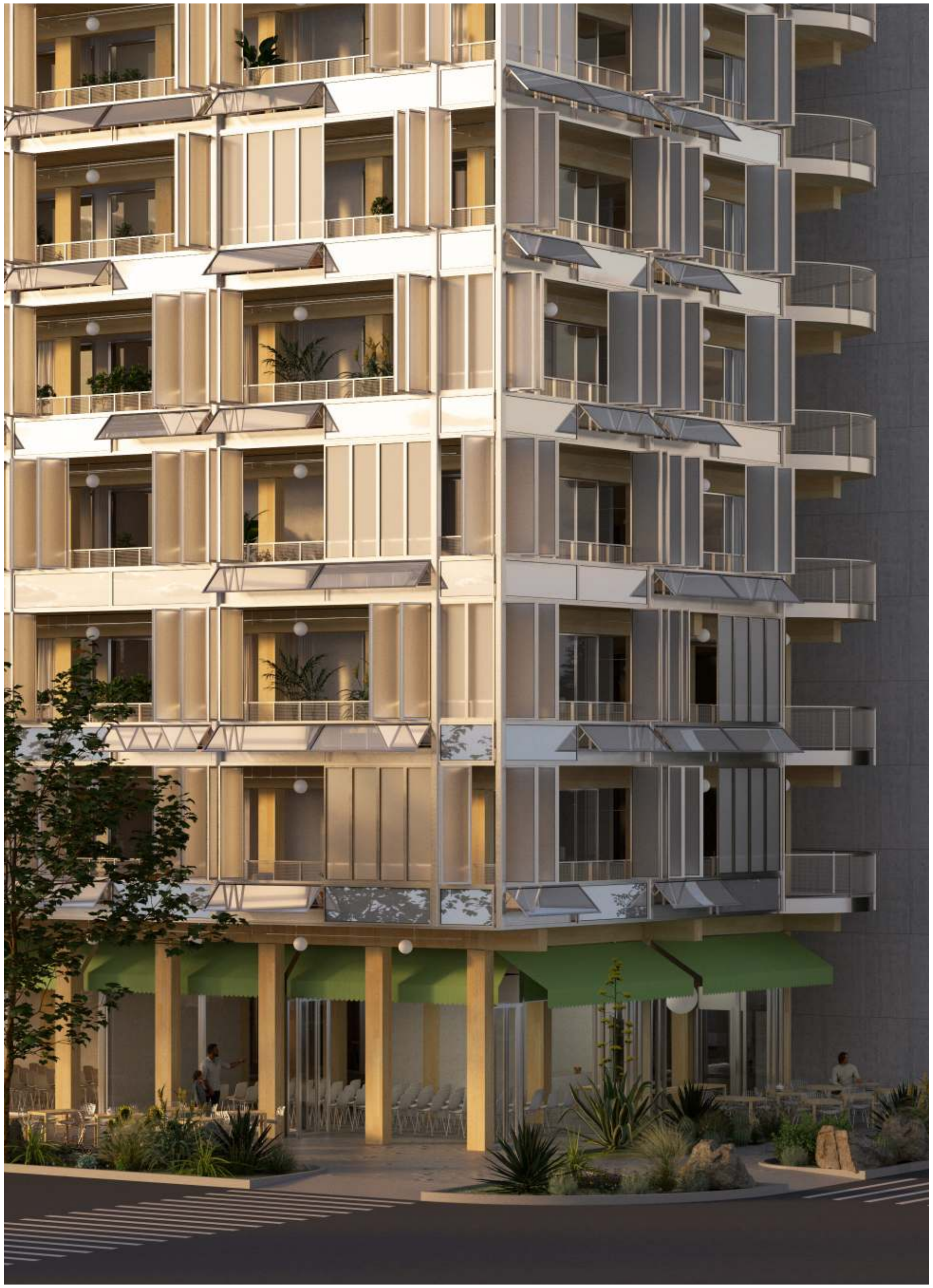
Greenhouse used as extension of living space.

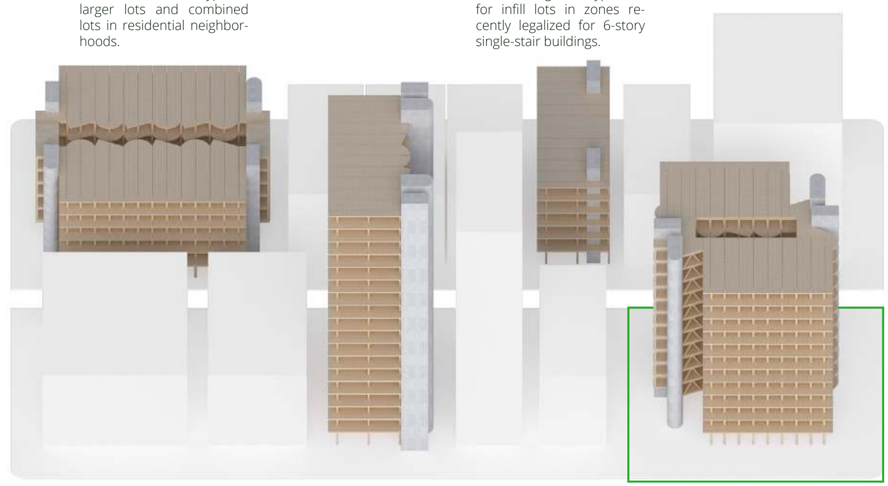
Greenhouse used as shared gathering space.

While each unit is fully private, the greenhouse spaces create room for possible shared uses, and can be opened up or divided by residents as desired.

Impact: A Template for Diversifying Mass Timber Housing Typologies

As a modular structural system based on the standard shipping size of a CLT panel, our design can be adapted for sites across the city zoned for different residential densities. In addition to high-rise towers, our kit-of-parts approach can be used for other recently legalized typologies that can create huge impact, such as mid-rise single-stair buildings. Our proposal is a tool for aligning mass timber construction with recent zoning and building code reform allowing for denser and taller timber residential buildings.





above: replicability diagram
left: view from southeast corner

Industry and Policy Recommendations

Maximize Off-Site Manufacturing

Mass timber is well-suited for off-site prefabrication, where panels, beams, and columns are manufactured in a controlled factory environment. Combined with a fully pre-fabricated facade, our proposal reduces on-site construction time, labor costs, and noise pollution, which is particularly beneficial for high-density urban infill projects.

Optimize Project Timelines

By embracing prefabrication and modular construction techniques, developers can achieve a faster "speed to market," leading to quicker returns on investment. Our proposal further reduces project timelines by sizing CLT panels for optimized transport and maximizing repetitive construction elements.

Showcase Mass Timber

Conduct testing and reform building code to allow more exposed mass timber in high rise towers. Educate the wider community on the benefits of mass timber buildings, such as the positive health impacts of biophilic design. This can help generate market demand. Our design celebrates the beauty of the mass timber structure from both inside and outside.

Design with Adaptability

Produce standardized mass timber components with adaptable structures in mind. These structures should be suited both for a range of site conditions and zoning envelopes, as well as for different interior layouts and uses. Our proposal demonstrates how a standardized structural system can still create variation in implementation.

Proforma

	Base Case	**Our Proposal**	**Rationale**
FSR	5	4.88	
Lot Size	25,540 sf	18,300 sf	
Building SF (Above Grade)	127,700 sf	89,303 sf	
Building Efficiency	85%	83%	Larger circulation spaces also double as flexible, shared living spaces in the building.
Total Stories (Above Grade)	18	12	
Total Units	86	66	
Total Bedrooms	178	110	The floorplan layouts can adapt to different unit mixes of 1, 2, and 3 bed units.
Amenity Space	850 sf	3,740 sf	Each floor has amenity spaces for residents.
Non-Residential Space	3,000 sf	6,672 sf	The entire ground floor is designated for retail and/or community use.
Building SF (Below Grade)	75,000 sf	8,100 sf	

Construction Costs	**Base Case**	**Our Proposal**	
Below Grade/Parking	$22,425,000	$2,421,900	Reduced parking to only one below grade level with accessible parking.
Base Floor	$3,506,100	$2,890,316	
Above 1st Storey	$51,289,000	$35,398,461	
Balconies	$2,150,000	$990,000	Balcony costs reduced since they are fully covered, and part of prefab structure.
Schedule Costs	$800,000	$700,000	Reduced construction schedule due to highly repetitive structure and prefab façade.
Total	**$80,170,100**	**$42,400,677**	

	Total Building SF	**Embodied Carbon kg/sq ft**	**Total Embodied Carbon**
Embodied Carbon	97,403 sf	2.69	262,014

MASS TIMBER (FOR THE MASSES!)

PREFAB

Mass timber construction has become increasingly popular for being sustainable, fast to build, and aesthetically appealing. It also presents a unique opportunity to develop a holistic building system, streamlining project delivery from concept through to completion.

While this building typology continues to evolve, it remains vulnerable to regulatory challenges and market risks, resulting in cost premiums that are exempt from more traditional wood frame and concrete construction methodologies. To overcome these hurdles and maximize mass timber's potential, we are proposing a provincially mandated pre-fabrication corporation, partnering with public and private companies in delivering a regionally-focused mass timber strategy for improved design development, procurement, fabrication, and construction.

BC Prefab (BCPF) will benefit project stakeholders, designers, and contractors alike, providing design-assisted software, integrated online pricing, and pre-regulated fabrication facilities. Collectively, BCPF will help reduce risk and expedite timelines, opening up opportunities for increased economies of scale and wider diversity of building typologies.

We have identified the following six problems that BCPF provides solutions for to help us deliver Mass Timber for the masses!

INCONSISTENCY ACROSS INDUSTRY PROFESSIONALS

Mass timber is poorly understood by professionals, requiring specialized fabrication and construction

DEVELOP A TOOLKIT OF PRE-APPROVED COMPONENTS

Integrate design-for-assembly principles to meet code standards

LOGISTICAL CHALLENGES IN SHIPPING COMPONENTS

Although prefabrication offers speed, larger components are constrained by transportation limitations and crane capacities

USE BC TIMBER AND EXPAND PREFAB FACTORIES

Support local industry, reduce transportation-related complications, and optimize shipping and packing of components

PROTRACTED PERMITTING APPROVALS

Complex zoning, permitting, procurement, and construction processes add risk, cost, and delays

STANDARDIZE PRE-APPROVED BUILDING COMPONENTS

Streamline the design process and design approvals, allowing for accelerating permitting

INCONSISTENT APPROVAL STANDARDS

Mass timber and prefabrication face restrictive regulations not fit for the factory-based fabrication process

COMPONENT INSPECTION DURING FABRICATION PROCESS

Reduce construction time, improve quality control, and lower on-site disruption

HIGH UPFRONT COSTS CREATE RISK

Mass timber is subject to market vulnerability, and remains too expensive for wide adoption without standardized systems

PROVINCIALLY SUPPORTED INITIATIVE TO OFFSET RISKS

Incentivize public/private partnerships, allowing collaborations to work within a provincially standardized system

LIMITED DESIGN CREATIVITY AND ADAPTABILITY

Restrictive fabrication opportunities lead to overly uniform buildings limiting design flexibility and site compatibility

EMBED ADAPTABILITY WITHIN BUILDING SYSTEMS

Establish a building system to accommodate varied unit types, building forms, and ever-changing zoning policies

THE STEPS

1 PROJECT SETUP
Design team accesses the BC-PREFAB website to download the plug-in software

2 CONCEPTUAL DESIGN
Utilize the software to help establish the base building structure within the site parameters

3 DESIGN DEVELOPMENT
Refine and reinforce the design identity through customized detailing and component integration

4 PRICING / TENDER
As the design evolves, a real-time pricing summary is generated on the website, providing convenient reference for clients and contractors

5 FABRICATION + TRANSPORTATION
Fabrication of components and transportation logistics are managed by the company to ensure safe and timely deliveries

6 CONSTRUCTION
On site, components are installed with sequenced simplicity and efficiency

7 ADAPTIVE REUSE
Once built, the modular, stacked design enables buildings to adapt and evolve with minimal disruption and without compromising structural integrity

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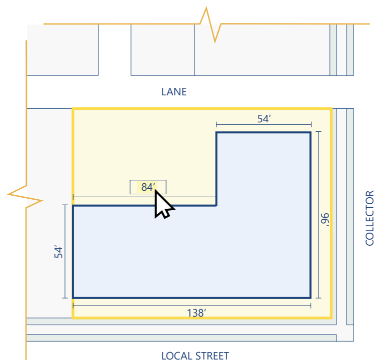
STEP 1 + 2:

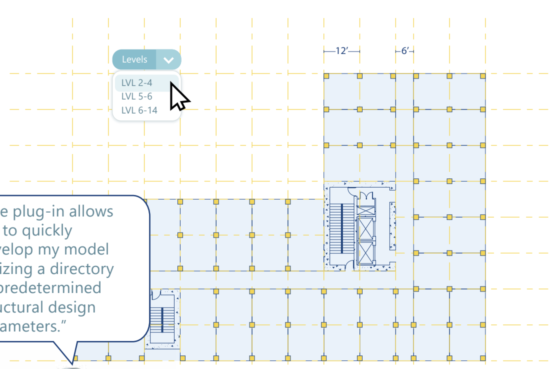
Enter Site Parameters



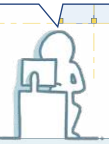
Enter Project Details	
Site Area	150' x 122'
Total LVLs	14
Podium	4
Tower	10
Concrete	LVL 1
FSR Target	5
Development Scenario	Market Rental

Next: Formulate Grid

Generate Structural Grid



"The plug-in allows me to quickly develop my model utilizing a directory of predetermined structural design parameters."



Next: Layout & Program

PROJECT SETUP

The BCPF+ Plugin is designed for seamless integration into standard architectural workflows using typical software, ensuring that systematized prefab logic can be incorporated without disrupting existing design practices.

The project begins with the typical setup: importing the site, setting property lines, levels, and laying out the foundation (optionally with parking levels). The plugin supports early-stage decisions by anchoring the structural grid to a standardized 12'x12' column spacing, optimized for prefabricated mass timber assemblies while maintaining 6' spacing for hallways. Core placement and structural framing are generated with prefab compatibility in mind, establishing a clear spatial and structural rhythm from the outset.

This structural grid allows for the building footprint to easily align with zoning guidelines, allowing for simple and efficient layouts within conventional site geometries. The volumetric form can be quickly manipulated in response to prescribed building setbacks, stepping, and maximum permitted building heights.

"We need to optimize our project proforma within the constraints of the existing site geometry. How quickly can we establish a structural grid layout to help determine our overall unit mix and yield?"

CONCEPTUAL DESIGN

With the concrete foundation and core elements placed, the BCPF+ plugin enables the creation of a massing model within the predefined structural grid. At this stage, the structural grid is an empty base for the tower layout, becoming the shell for future adaptive reuse purposes.

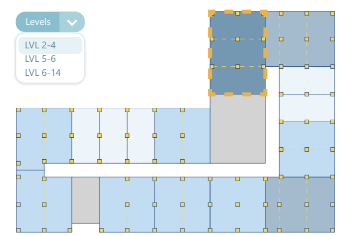
For this proposal, we have implemented a layout that focuses on maximizing unit efficiency as well as facilitating a community. The flexibility of the system allows us to customize the structural form to efficiently enable these programs. We can now assign spaces for units, amenities, and services while maintaining the fixed mass timber and concrete elements, with corridors serving as anchors.

STEP 3a:

Customize Layout + Program

Program List

- 3 bed
- 2 bed + den
- 2 bed
- 1 bed + den
- Studio
- Community Theatre
- Amenity
- Commercial
- Services / Admin
- Create Program



DESIGN DEVELOPMENT: UNIT PLACEMENT

Thanks to the standardized dimensions and prefabricated components within the BCPF+ plugin, unit layouts are pre-developed and automatically placed based on the selected module size, entry location, and window access. Each layout is pre-validated for compliance with the most up-to-date building codes, allowing for faster design coordination and streamlined approvals.

The system also adapts intelligently to constraints. For example, both a 3-bedroom unit and a 1-bedroom + den + lock-off suite occupy the same three-module footprint. However, if the module is positioned away from a corner, the 3-bedroom layout is excluded due to insufficient window frontage. The plug-in filters viable layouts based on orientation and access, reducing the risk of design conflicts later in the process.

CHECK UNIT LAYOUTS

Typical Unit Layouts

"I have access to a diverse library of unit typologies that can be easily integrated into the structural grid."

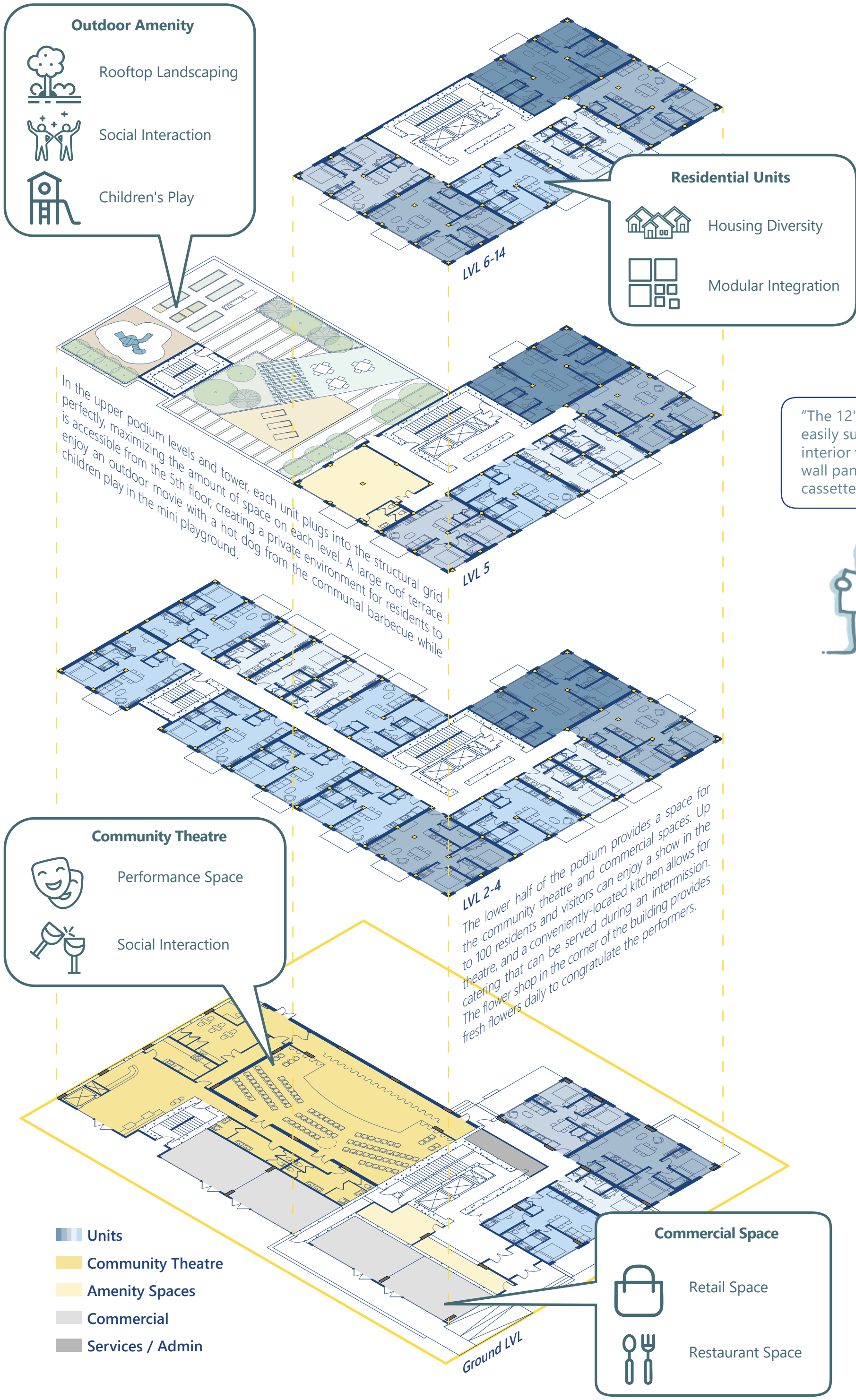
Next: Customize Components

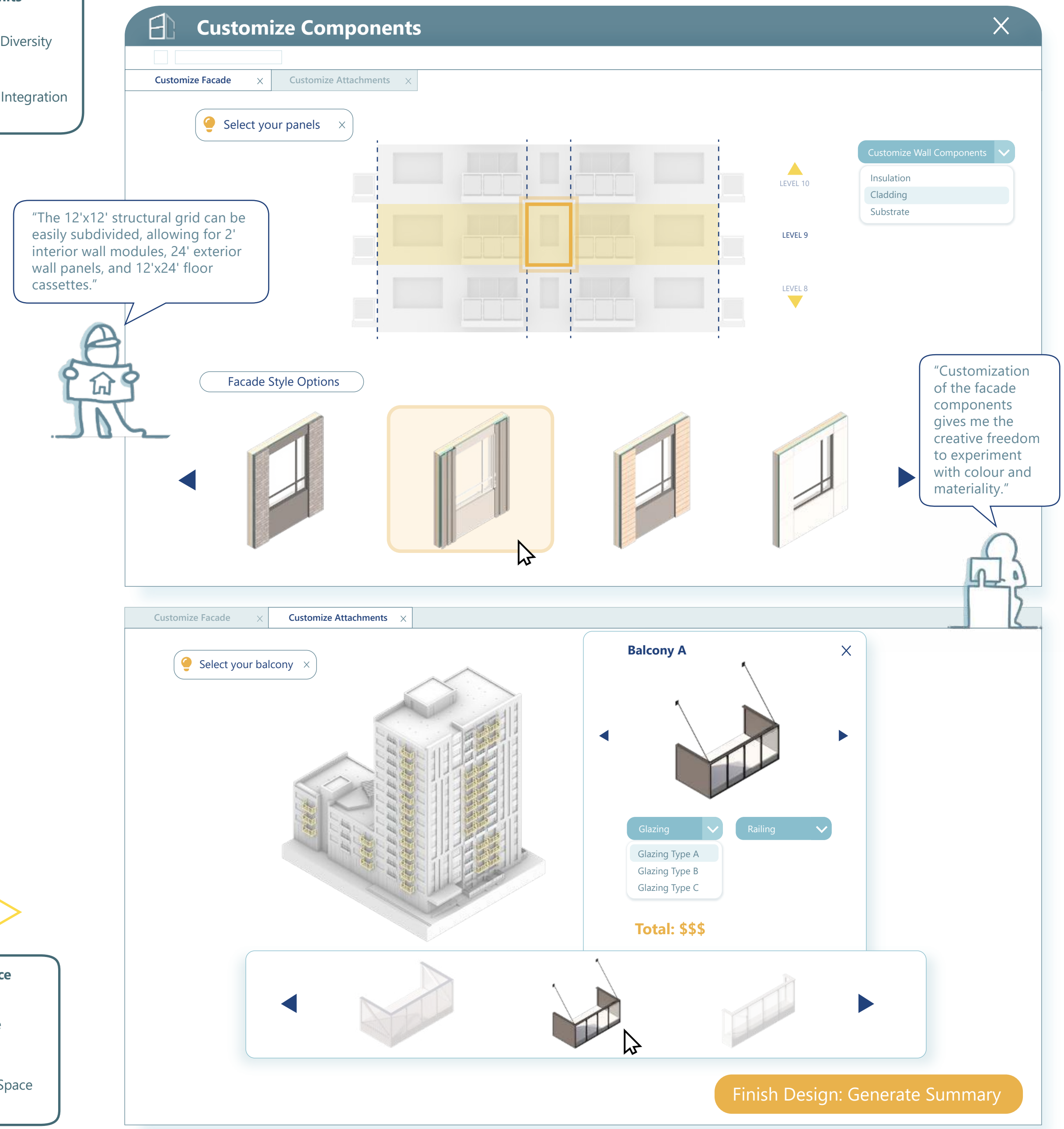
DTT-A-10

STEP 3b:

DESIGN DEVELOPMENT: COMPONENTS

To save on cost and increase flexibility, components are broken down into smaller prefab parts and assembled on-site. The BCPF+ plugin functions as a design interface for selecting, configuring, and visualizing these components. It allows architects to tailor both internal structure and external expression from a curated library of pre-validated elements, balancing customization with system efficiency. As choices are made, costs update in real time, helping teams stay within budget while optimizing design.





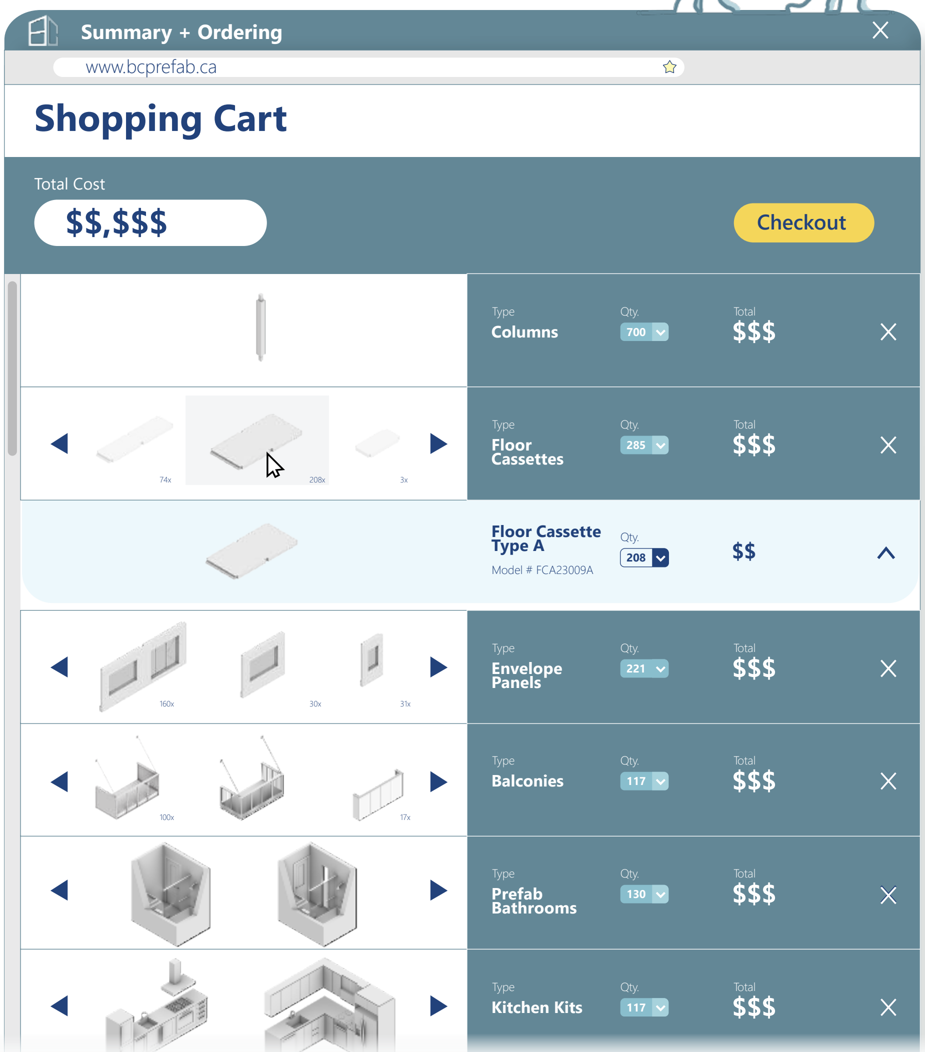
STEP 4:

PRICING / TENDER

After completing steps 1-3, a digital receipt is generated detailing all components, associated costs, availability from nearby BC Pre-Fab plants, delivery logistics, and recommended assembly sequencing. This package serves as both a permit-ready submittal and a construction-ready kit, streamlining the approval process and reducing uncertainty before fabrication begins.

This system enables contractors, consultants, clients, and other stakeholders to review and approve the project's proforma with transparency throughout the design process. It also facilitates easy reordering of components in the event of damage, future renovations, or building repurposing.

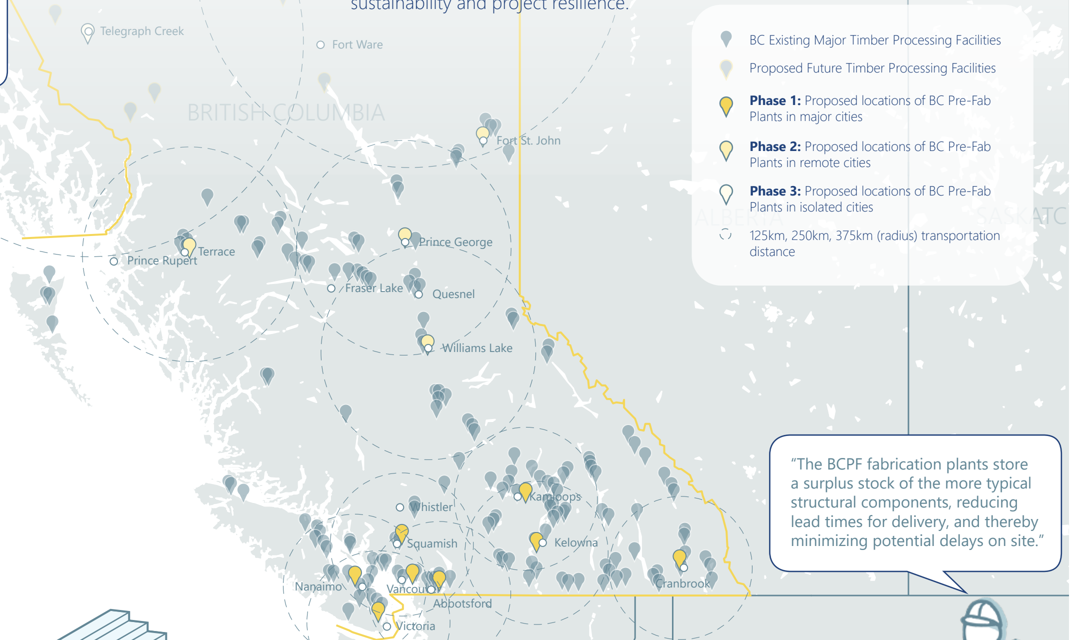
"The real-time cost calculator reduces pricing uncertainty, expedites tendering, and allows for a more proactive value engineering process."



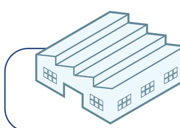
STEP 5:

FABRICATION + TRANSPORTATION

All timber materials are sourced from processing facilities across British Columbia to ensure regional availability. BC Pre-Fab plants will be strategically located in major cities to minimize the transportation distance of large mass timber components. These plants will be developed in three phases, aligned with population density across the province. Additional timber processing facilities will be established in northern regions where such infrastructure is currently limited. By distributing multiple fabrication sites throughout B.C., delivery can be efficiently coordinated to both urban and remote locations—enhancing sustainability and project resilience.



"The BCPF fabrication plants store a surplus stock of the more typical structural components, reducing lead times for delivery, and thereby minimizing potential delays on site."



The BC Prefab plants will be easy to build and take apart so they can change locations according to demand. Components are produced and inspected in BC Prefab Plants in controlled environments to produce higher quality parts and lower waste.

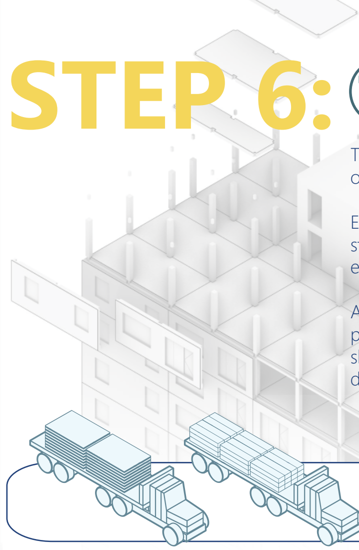
STEP 6:

ASSEMBLY + CONSTRUCTION

The concrete foundation and first floor are poured before the mass timber components arrive on site.

Each component is designed for assembly workers to put together in a matter of minutes, while strategic sequencing and a comprehensive assembly checklist generated by the BCPF+ system ensures each piece is installed just-in-time.

Average assembly times for each floor cassette is 10 minutes; columns are 8 minutes; envelope panels are 22 minutes; and balconies are 2 hours. After approximately 30 days of structure and shell assembly, interior walls and pre-fab rooms are installed, bringing total assembly time to 150 days.



Components are packed strategically onto trucks to allow for the maximum parts transported while adhering to maximum dimensions. Delivery is planned so each set of parts arrives just in time to be assembled into each floor of the tower minimizing on site storage needed.

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The stacked structural grid allows for simple geometric building volumes that can be applied to a wide diversity of site configurations. The stacked floor plates mitigate the need for structural transfers and plumbing offsets.

The podium level adjoins the neighbouring side-yard property line, allowing for an appropriately scaled street wall transition. The west orientated podium roof presents an opportunity for common outdoor space with excellent solar exposure

Each building facade expression is uniquely defined by a composition of components that can be easily manipulated based on their contextual orientation, and interchanged for future adaptive re-use.

The community theatre and commercial edge activates the smaller scaled local street, promoting pedestrian interaction and public engagement.

The tower form anchors the site corner adjacent to the main street intersection, with the main building entry fronting onto the collector road for clear way-finding and convenient resident access.

"The pre-approved fabrication process pro-actively streamlines our municipal occupancy review and approval"

SUBMISSION PROFORMA

FSR	5
Lot size (sq ft)	18,300
Building sq fr Above Grade	91,500
Building efficiency (%)	85
non saleable/rentable (sq ft)	13,725
saleable/rentable (sq ft)	77,775
Total Stories above grade	14
Total Stories (#)	15
Base floor (#)	1
Above 1st storey (#)	13
Stories below grade (#)	1
Units (#)	117
Bedrooms (#)	179
Amenity space (sq ft)	5,016
Non-residential (sq ft)	6,600

CONSTRUCTION COST

		Concrete		Submission	
	Square	$/sq ft	Cost	$/sq ft	Cost
Below grade	18,300	$315	$5,764,500	$299	$5,471,700
Base floor	10,500	$360	$3,780,000	$403	$4,231,500
Above 1st storey	81,000	$405	$32,805,000	$431	$34,911,000
	Quantity	$/unit		$/Prefab Unit	
Balconies	100	$25,000	$2,500,000	$15,000	$1,500,000
Juliet Balconies	17	$20,000	$340,000	$10,000	$170,000
	Cost per	#Months	Cost	#Months	Cost
Schedule Costs	$50,000	18	$900,000	10	$500,000
Total			$46,218,700		$44,323,860

CARBON SUMMARY

Produced by TimberX and WoodWorks calculator

		Concrete		Submission	
	Sq ft	Embodied	Total	Embodied	Total
Footage	109,800	6.69 kg/sq ft	734454	2.6 kg/sq ft	285480

Volume of wood products used: **96,355 ft^3 (2,728 m^3)**

U.S and Canadian forests grow this much wood in: **7 minutes**

Carbon stored in the wood: **2453 metric tons**

Greenhouse gas reductions: **949 metric tons**

Total potential carbon benefit: **3403 metric tons**

TIMELINE LEGEND

- Conceptual Design
- Design Development
- Pricing / Tender
- Fabrication + Transportation
- Construction

PREFAB

BCPF TIMELINE

1 MONTH — 12 MONTHS — 1 MONTH — 12 MONTHS — 10 MONTHS — 3 Years COMPLETE!

TRADITIONAL TIMELINE

6 MONTHS — 24 MONTHS — 2 MONTHS — 24 MONTHS — 4.6 Years COMPLETE!

STEP 7:

Durability and Maintenance

Over time cladding systems deteriorate, particularly with in the diverse range of Pacific Northwest climates. BCPF digitally tracks and catalogues each and every installed building component, allowing building owners and operators to pro-actively identify and resolve potential cladding issues quickly and effectively without invasive inspection work. This targeted maintenance model will monitor existing building systems, helping to reduce long-term costs, waste, and embodied carbon.

Adaptive Design

Each building structure is designed and built as an independent frame, into which interior modules and cladding components are integrated. Over time, if ownership transitions and programs shift, these building elements can be readily replaced and/or reconfigured accordingly. In theory, a strata residential tower could be re-purposed into a variety of alternative typologies, including student housing and non-market single resident occupancies. Unit modules and facade components can be replaced and reconfigured, aligning with changing tenant demographics without compromising the integrity of the existing structure.

Our building re-purposed as a new housing typology

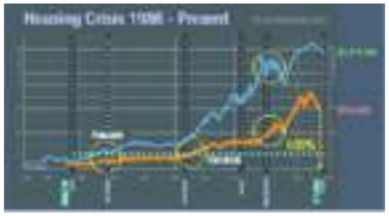
The unit mix is remodulated in response to a programmatic change, and the cladding replaced to generate a new building identity, all within the constraints of the existing structural grid.

Future Expansion

As more BCPF facilities are built in and around the province, a broader partnership can evolve with regional suppliers and manufacturers across Canada. This model unlocks broader material choices, expanded reach, and climate-specific adaptation, all while preserving core components that remain standardized. As BCPF scales up, it will remain flexible enough to adapt to code changes and industry needs, without sacrificing efficiency, collaboration, or design freedom

Open System Collaboration

Rather than locking into a propriety model, BCPF envisions an open standard; a coordinated framework that embraces opportunities for private partnership. As adoption grows, new manufacturers and suppliers can integrate into the system, aligning with its design standards and digital protocols. This model encourages innovation, customization, and design diversity, while maintaining compatibility and compliance.



HOUSE PRICES BROKE ABOVE THE CMCH AFFORDABILITY THRESHOLD IN 1990, CONDOS FOLLOWED IN 2003. BY 2016 INDUSTRY INSIDERS REPORTED PRICES OUT OF CONTROL. TODAY, ADJUSTED FOR INFLATION, MEDIAN HOUSEHOLD INCOME IN THE GVRD IS 1.7% LOWER THAN IN 1986.

TheDensityFallacy

The false belief that by giving away density & height government will lower house prices is a fallacy. In fact, the opposite is true. Increasing building size 'lifts land values,' triggering crises in housing affordability. Once developers overpay for land, everything else about the project goes up in price. Then, the point of sale, all costs are passed on to the consumer.

The right way to achieve affordability is to improve access to land by building highways and IRTS: *interregional transit systems*. In addition, along the new transit routes, government must deliver GAHP doors in sufficient quantity to meet or exceed demand. GAHP contracts on title restrict resale to 'purchase price + COLA.' A published depreciation schedule is used to calculate the value of any home improvements. In every other way GAHP title is the same as free hold ownership.

In our view, re-imagining towers in heavy timber as a strategy to guarantee affordability is a chimera born of the Density Fallacy. It contradicts the Urbanarium's stated core mission in the competition brief: "*demonstrating a path to housing affordability and a low-carbon future.*" Even the claim that '3.5 million homes are needed by 2030' must also be taken with a grain of salt… *It sounds like more tower hype.*

THE 3 TOWERS APPROVED BY COUNCIL JULY 2025. TOWER URBANISM THROWS OUT THE BABY WITH THE BATH WATER: TOWERS ESCHEW BOTH AFFORDABILITY AND GOOD URBANISM.

At full build out, the IRTS strategy houses 2.8 million Canadians behind 1.3 million GAHP doors (IRTS is shown opposite; the range of housing types are the subject of this entry). Given the distorted conditions in the housing markets, we see GAHP as the only practical alternative.

IRTS: Four New Interregional Transit Lines

Regional transit will take people where the Skytrains cannot go—into the regional periphery, and into our neighboring regions. LRT|streetcar will reach places where there is still land available for GAHP. Four new lines are envisioned complimenting the Skytrain's original three:

> LINE 4: THE ORANGE LINE rides along the historic BC ELECTRIC R.O.W. still entirely under government ownership. It extends from North Vancouver to Chilliwack and beyond, a distance of 130 km, supporting 0.8 million people living behind 360,000 GAHP doors. The 'O' Line operates a subway under the downtown section of Burrard Street. The tunnel connecting Granville Island to Lonsdale Quay provides a third crossing of the Burrard Inlet.
>
> LINE 5: THE SNOW LINE, an extension of the Canada Line, it enters the Burrard Tunnel before adding a Diesel Motor Unit (DMU) in North Vancouver. The DMU furnishes the power needed to climb alpine grades on the way to Whistler. The 'SNO' Line delivers a one seat ride from YVR to Whistler further enhancing the sky destination's status of the #1 sky hill in North America. Future Winter Olympic Games can be hosted, building new tramtowns as Olympic Villages for the athletes.
>
> LINE 6: THE UBC-SFU LINE will provide service between UBC and SFU, saving the costs of extending the Skytrain to UBC, and building a Gondola to SFU. The 'U' Line will travel along historic streetcar alignments on W 4th Avenue, Granville Mall, Hastings Street, before riding on Gaglardi Way and Como Lake Road. Riding on a second deck below the Lions Gate Bridge it will extend a a fourth crossing to the North Shore.
>
> LINE 7: THE NORTH SHORE | NORTH FRASER LINE will connect Horseshoe Bay and Hope. A new bridge will be built across (a renamed) Indian Arm, connecting the North Shore and North of Fraser communities. The service will replace the WCE, saving renting track space from the CPR. Many of the new GAHP doors served by the 'N' Line will be built on the foothills of the Coast Mountains, continuing trends already in place.

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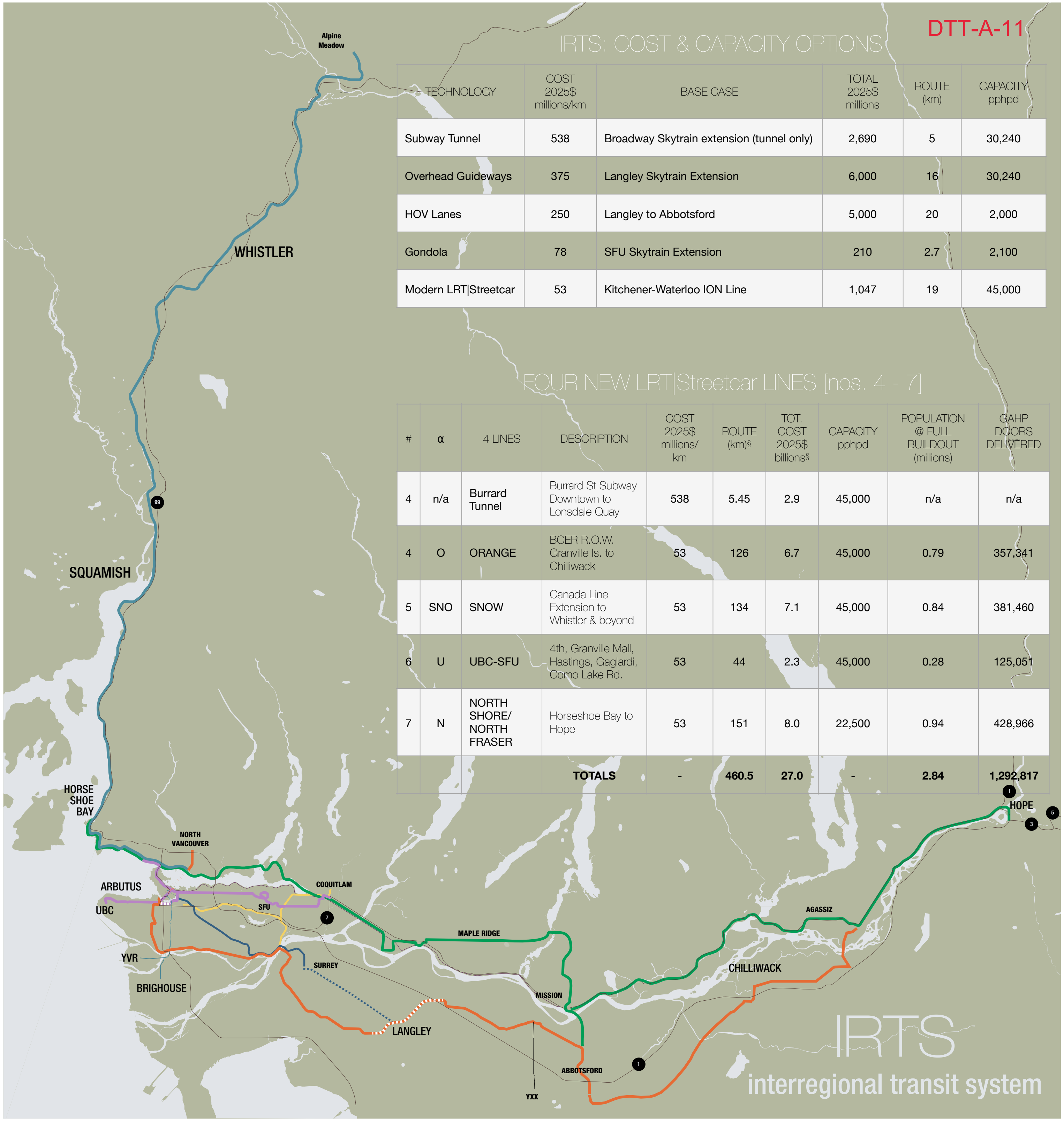


IRTS: COST & CAPACITY OPTIONS

TECHNOLOGY	COST 2025$ millions/km	BASE CASE	TOTAL 2025$ millions	ROUTE (km)	CAPACITY pphpd
Subway Tunnel	538	Broadway Skytrain extension (tunnel only)	2,690	5	30,240
Overhead Guideways	375	Langley Skytrain Extension	6,000	16	30,240
HOV Lanes	250	Langley to Abbotsford	5,000	20	2,000
Gondola	78	SFU Skytrain Extension	210	2.7	2,100
Modern LRT|Streetcar	53	Kitchener-Waterloo ION Line	1,047	19	45,000

FOUR NEW LRT|Streetcar LINES [nos. 4 - 7]

#	α	4 LINES	DESCRIPTION	COST 2025$ millions/ km	ROUTE (km)§	TOT. COST 2025$ billions§	CAPACITY pphpd	POPULATION @ FULL BUILDOUT (millions)	GAHP DOORS DELIVERED
4	n/a	Burrard Tunnel	Burrard St Subway Downtown to Lonsdale Quay	538	5.45	2.9	45,000	n/a	n/a
4	O	ORANGE	BCER R.O.W. Granville Is. to Chilliwack	53	126	6.7	45,000	0.79	357,341
5	SNO	SNOW	Canada Line Extension to Whistler & beyond	53	134	7.1	45,000	0.84	381,460
6	U	UBC-SFU	4th, Granville Mall, Hastings, Gaglardi, Como Lake Rd.	53	44	2.3	45,000	0.28	125,051
7	N	NORTH SHORE/ NORTH FRASER	Horseshoe Bay to Hope	53	151	8.0	22,500	0.94	428,966
			TOTALS	-	**460.5**	**27.0**	-	**2.84**	**1,292,817**

Neighborhood Infill

The TOA legislation (more properly TOT—*Tower Oriented Transit*) borrows from the timeless urbanist principle of using a 5 minute walking distance as the radius describing a neighborhood (400 m | 0.25 mi | 126 acres). Victoria's legislation then goes off the rails giving a free pass to the tower builders.

We use a 12.5 minute walking radius (1,200 m | 0.75 mi | 790 acres) as the *Neighborhood Infill Footprint* (pictured above). We consider 12 minutes an 'easy walking distance' to rail transit service. In addition we see new towns building out into Squamish-Whistler & the Fraser Valley. Both *Tramtowns & Neighborhoods* figure prominently in our strategy to *End the Housing Crisis.* Each are planned to add 10,000 new residents at full buildout using the products we illustrate here: vernacular cottages, rows and courtyard houses. Significantly, while the tramtowns achieve 36 u/ac density, the rate of neighborhood infill is spread over a larger footprint, penciling out at 5.75 u/ac to add the same number of units as a tramtown. This will reduce another Tower Scourge—neighborhoods maltreated for over 3 years by construction activity spewing from every Frankenstein Tower site. Towers really only belong downtown. Human scale stick frame is for the neighborhoods and tramtowns. It, completes in half the time of a tower or less, with many times less neighborhood disruption, reno-eviction, and destruction of heritage.

THE COMPETITION STATION SITE 'T' AS GAHP

A bidding feature of our submission is that, by inflecting to LRT|Streetcar, and moving the stop to RTS Square, the station site is freed up and can develop as GAHP. LRT|Streetcar stops are really just so much lipstick on a pig. Not only does this add tremendous flexibility for their location, it saves a king's ransom for construction and maintenance of both underground and elevated stations. The Canada Line today is hamstrung by short station platforms. If it were riding on the street the problem would not present.

Skytrain stations are a major contributor to the system's prohibitive construction costs (11-times higher than LRT|Streetcar in tunnels; 7-times higher in guideways). Station maintenance and upkeep needlessly adds to operation costs. Because the stations are so costly, they end up being spaced too far apart forcing riders to take buses at both ends of a Skytrain trip. That adds carbon and cost.

A tramstop only requires rain cover and and a data and electrical connection to power lights, a ticket machine, and read-outs announcing the next service. All of it can be accommodated curb-side at an infinitesimal cost of any Skytrain station.

The Skytrain & Towers paradigm is a carbon & energy hog. Either in guideways or concrete, the Skytrain—a gold-plated people mover developed for fairs and airports—underperforms every other comparable transit technology—and uses concrete by the truck load to complete stations, tunnels and guideways. The towers, as reported in the media, are high-priced chips for off-shore investors, spiking land prices to the point where Canadians can no longer afford to raise families (we detail the falling birth rate below), much less buy a place to call home. This in Canada… the largest democracy by land mass. We have not run out of land, far from it. But government has run out of ideas.

OCCASIONAL STAGE, SUNDAY FARMER'S MARKET: RTS SQUARE, THE NEW 'URBAN ROOM'

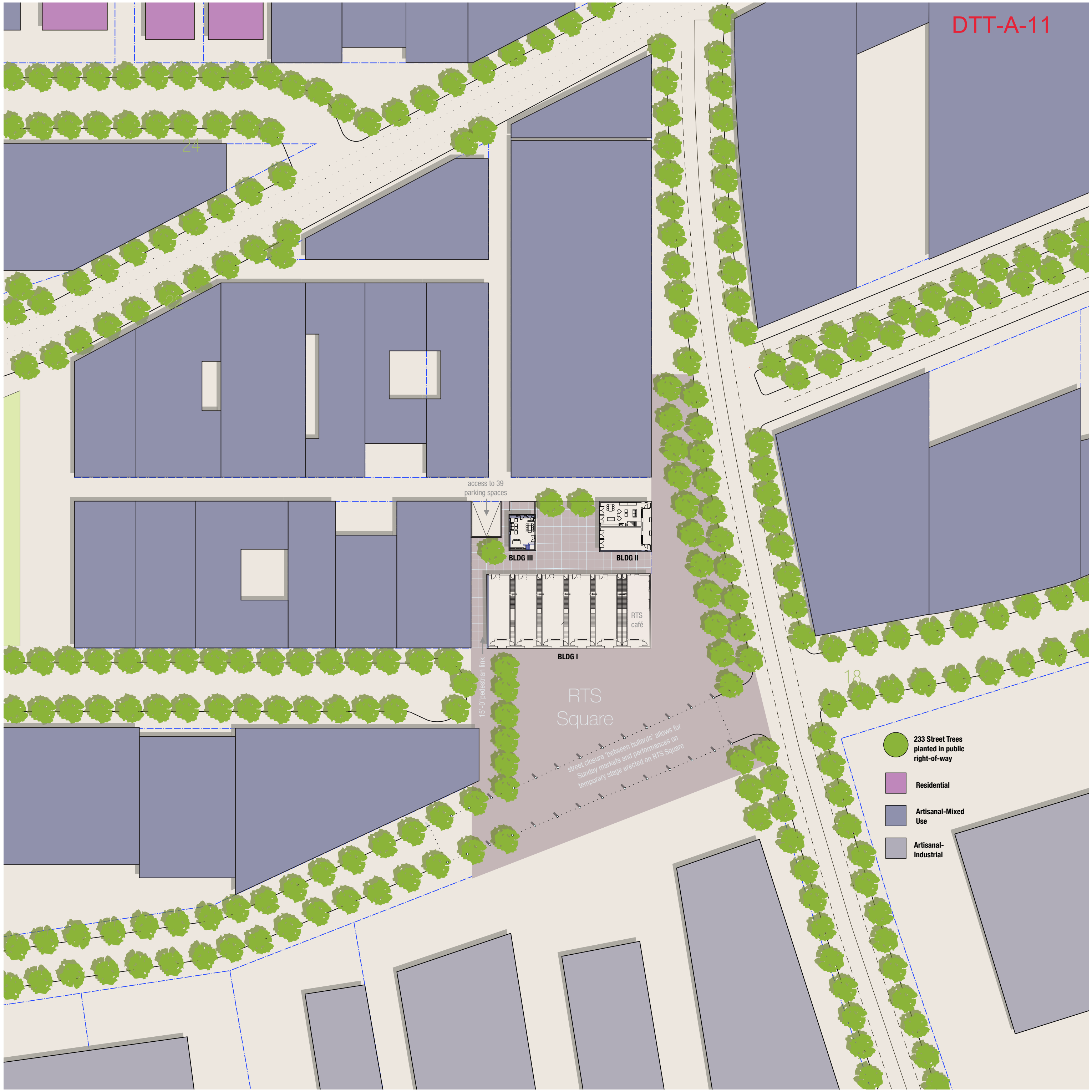
Good urbanism is measured in terms of what the city gives for free… In our case, an 'urban room' is created by de-mapping part of one street and paving over part of another. Using bollards to regulate traffic in a manner that is transparent to pedestrians we have created a 'full scale plaza' from otherwise left over space. Using the entire specially paved area—temporary closures support outdoor stages, and Sunday closures public farmer's markets. The produce can ride the LRT|streetcar saving on transportation costs.

artisanal | ɑːˈtɪzən(ə)l

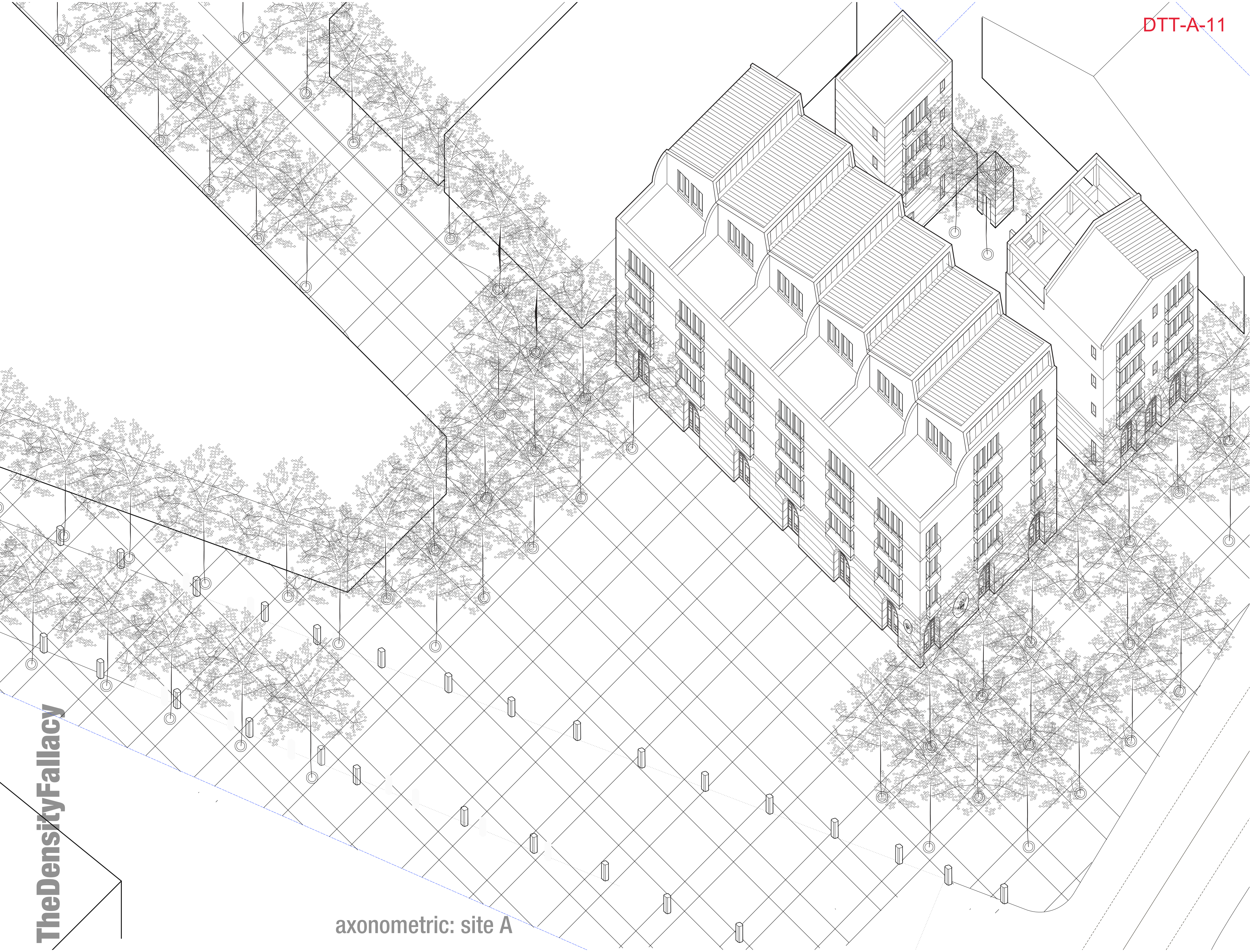
- [adjective] relating to or characteristic of an artisan: artisanal skills | artisanal workshops.
- (of a product, especially food or drink) made in a traditional or non-mechanized way: artisanal cheeses.

Tramtowns and a new Neighborhood infill code specify artisanal and industrial uses that are non-toxic, non-polluting and low-decibel. Included in the mix are services, offices, retail & residential. We've added 'Ron's RTS café' to animate Site A's choice corner location… now fronting a new Village Square. Café tables can spill into the square further enhancing this small-business opportunity.

TheDensityFallacy



regulating plan: site A



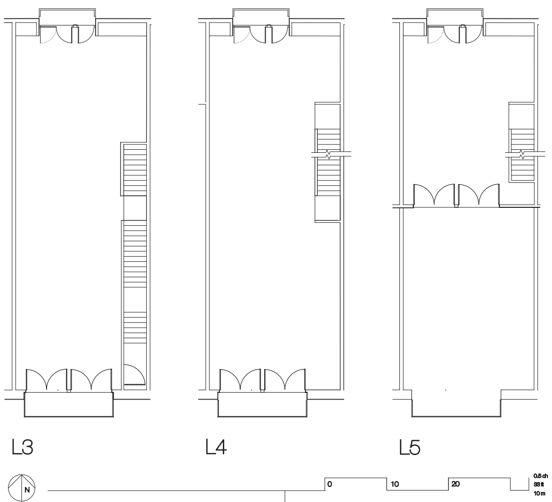
axonometric: site A

TheDensityFallacy

BLDG I: 4.5 LEVEL STACKED UNITS

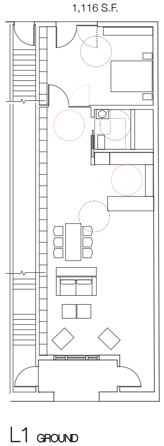
2.5 LEVEL STACKED TOWNHOUSE

3,346 S.F.



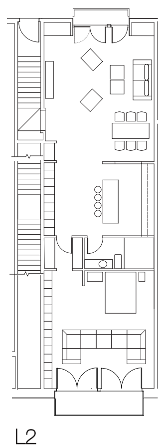
1 LEVEL ACCESSIBLE

1,116 S.F.



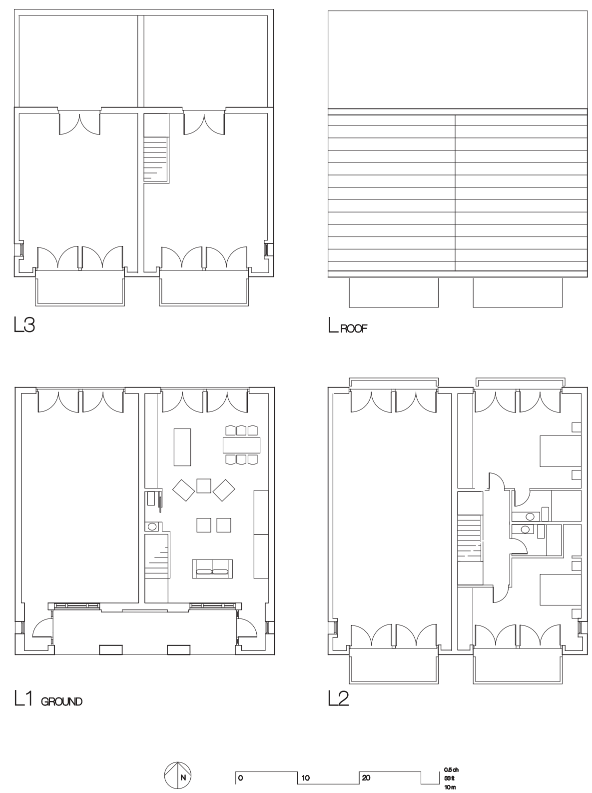
1 LEVEL FLAT

1,127 S.F.



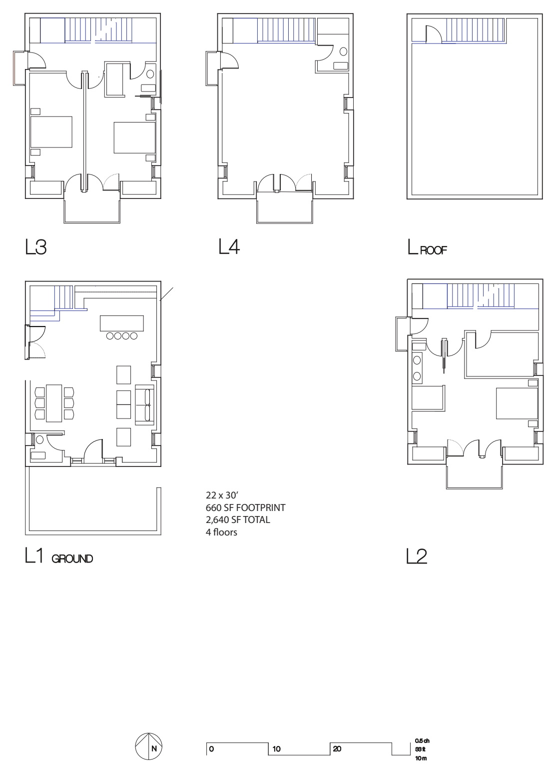
BLDG II: 2.5 LEVEL TOWNHOUSE

1,214 S.F. EACH SIDE



BLDG III: 4 LEVEL HOUSE

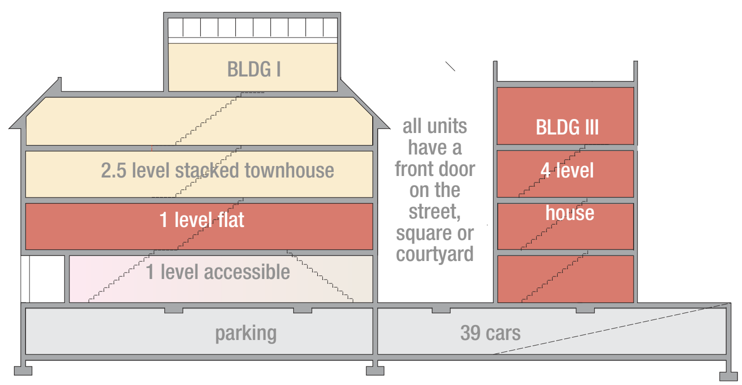
2,640 S.F.



TheDensityFallacy

unit plans &

schematic section



CONSERVATION IS (STILL) KEY

The competition misses an important opportunity by using a fictitious site. What opportunity? *Historic preservation of our vernacular built culture*. The extant built environment—including trees—are a 'sink' for affordable housing, local history (memory), first growth timber and carbon. All must be preserved.

Modern technology makes possible remaking old buildings into new ones. *We would have preferred to revitalize the buildings on the competition site rather than send them to the landfill and build new ones*. The landfill option is being replayed in all our neighborhoods as human scale frame is destroyed to make way for the carbon & energy hogs: Skytrain & Towers.

Great profits for the 1%… Scorched earth for everyone else.

Pro Forma & Embedded Carbon

1. PRO FORMA

Stick frame construction can be delivered in the $150 to $200/SF range for construction, not including underground parking and 7% profit margin. GAHP contracts on title add land at the cost for $1, guaranteeing affordability in perpetuity.

By making the assumption that the transit serving the competition site is LRT|streetcar, we have created an example of how a GAHP site can be born everyday. Rather than take up a full block in the neighborhood, LRT|streetcar stops curb side, freeing up land for better (more affordable) uses.

In our case, the transit stop would be called "RTS Square" sharing the same name with the new 'heart' of the neighborhood. Smiles all around!

2. EMBODIED OR CAPTURED CARBON

By honoring the west coast vernacular, this design side-steps the embodied carbon sweepstakes, pivoting to capture carbon instead (just count the more than 200 new trees shown on the Regulating Plan).

Traditional west coast architecture, built from renewable, value-added, forestry products presents a very manageable burden to anthropogenic climate change. It also reinvigorates one of our most venerable industry sectors—the coastal forest.

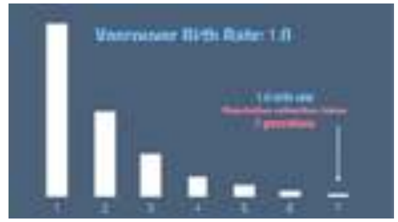
We show 233 street trees capturing carbon as leaves, branches, bark, wood and root systems. By boosting the urban forest, rather than boosting Tower profits, we can account for the last bits of GHGs that will never be completely eliminated. With one or two exceptions that prove the rule, all trees shown in this presentation are planted on public R.O.W. as part of a municipal CCS: *carbon capture strategy*. Our design exposes the ideology of the Skytrain & Towers 'growth machine:' a Tower industry sector, seeking to end-run any and all opposition with expedient claims and promises. Meanwhile, real growth (i.e. the birth rate) plummets to half-replacement levels. If it keeps up this way, the science tells us it will all be over in seven generations.

How Towers Damage Lives, Economies & Neighbourhoods

THERE IS NO POSSIBLE WORLD WHERE BUILDING TOWERS NEXT TO MAKES FOR GOOD URBANISM. YET THIS IS NOW A COMMONPLACE IN VANCOUVER, WHERE THE PLANNING DEPARTMENT ISSUES PLANS BONUSING THESE CONDITIONS AND THEIR GUIDELINES ILLUSTRATE HOW TO CIRCLE THE TOWERS AROUND THE COTTAGES. THIS IS WHAT PASSES FOR PROFESSIONALISM?

THE CMHC GUIDELINE IS FOR HOUSING TO BE AVAILABLE AT 30% OF HOUSEHOLD INCOMES. TODAY, THESE PRICES HAVE MORE THAN DOUBLED, CUTTING DISPOSABLE INCOME IN HALF. WITH 50% LESS MONEY IN CIRCULATION, NEIGHBORHOOD BUSINESSES ARE CLOSING IN RECORD NUMBERS. THAT'S TOO BAD BECAUSE SMALL BUSINESSES LIKE 'RON'S CAFÉ' ARE THE BACKBONE OF EMPLOYMENT IN THE CANADIAN ECONOMY.

TOWER ZONES BREED ALIENATION. LARGE POPULATIONS SHARE THE SAME NEIGHBORHOODS, YET LACK OF SUPPORT FOR SOCIAL FUNCTIONING IMPEDES NEIGHBORS INTERACTING WITH ONE ANOTHER. HALLWAYS AND ELEVATORS DO NOT SUPPORT HIGH LEVELS OF SOCIAL MIXING. IN OUR BUILDINGS ALL UNITS OPEN THEIR FRONT DOORS INTO A STREET, SQUARE OR COURTYARD. RON'S CAFÉ, THE WEEKLY FARMERS MARKET, AND THEATRE ON RTS SQUARE ARE ALL EXAMPLES OF HIGH-LEVEL SUPPORT FOR SOCIAL MIXING. SHUT INSIDE TINY, PUNY, CONDO APARTMENTS RESIDENTS WITHDRAW AND FALL VICTIM TO DOWNWARD SPIRALS OF ISOLATION.



UNIT SIZE IS NOT THE ONLY THING THAT IS SHRINKING. FAMILIES THAT WISH THEY COULD HAVE FOUR CHILDREN OPT FOR TWO. THOSE THAT MIGHT HAVE HAD TWO CAN ONLY AFFORD ONE IN THESE GOVERNMENT-INDUCED ECONOMIC REALITIES.

CANADA'S FUTURE IS AT STAKE AT THE VERY SAME TIME THAT THE MENTAL AND PHYSICAL HEALTH OF OUR POPULATION IS BEING PUT AT RISK. GIVE YOUR HEAD A SHAKE, WHO'S REALLY PROFITING FROM THIS?

HAVE YOU HEARD THE NEWS? FEWER CONDOS ARE COMING TO MARKET; BUILDING IS MORE ROBUST IN THE FRASER VALLEY THAN DOWNTOWN; AND MOST (BUT NOT ALL) FOREIGN INVESTMENT IS FROM COMMUNIST CHINA. 'GOLDEN VISAS' ARE RESPONSIBLE FOR THE REGION'S POPULATION GROWTH AS LOCAL BUYERS (CANADIANS) CAN'T AFFORD TO RAISE A FAMILY OR BUY A HOUSE. IS HEAVY TIMBER REALLY A REALISTIC SOLUTION? OR JUST MORE CONDO HYPE PROMOTING YET ANOTHER POTEMKIN SOLUTION?

Fewer condo units coming to market in Metro Vancouver as presales slump

[Vancouver Sun: Fewer Condo Units Coming to Market… 16 AUG 2025]

Michael Ferreira, Anthem Properties (photo); MLA Canada; Barrett Sprowson, Peterson Real Estate; Nathanael Lauster; David Ley…

Towers—heavy timber or carbon-heavy concrete, steel & glass—are loosing ground: "Not only has the volume of new projects shrunk but so has the scale... [Most] projects in the Fraser Valley are for smaller wood-frame."

Why? "… land prices went crazy… developers paid too much" The cause? "Reduced foreign investment [mostly from Communist China]." The proof is in the pudding, "BC Developers wrote a joint letter to provincial and federal governments Relax asking to relax 'the rules on foreign buyers, foreign buyers taxes and bans'"

People are asking for their money back, "Presale buyers of units at [a downtown' 60-storey tower have asked for their deposits back... Asking prices are between 25 and 30 per cent lower"

May 2016: This is not to deny that money flowing into Vancouver, quite often (though not solely) from China, is driving housing costs, especially at the luxury end of the market (which in the City of Vancovuer, let's face it, includes all single-family houses). I don't think that is in dispute." Nathanael Lauster, industry expert witness at trial and booster. [Crafting the narrative: wealth migration, growth machines and the politics of housing affordability in Vancouver, Canada." David Ley et al. Downloaded 17 AUG 2025].

October 2017: resales for condos "were rising by over 50 and nearly 60 percent in some areas." [Ferreira]

THIS IS OUIR FUTURE UNLESS WE TAKE DECISIVE ACTION TO STOP THE PROFIT ENGINES. HUMAN SCALE URBANISM IS NOT AN ATOMIC BOMB, BUT IT CAN REVOLUTIONIZE CANADA'S FUTURE. THIS VIEW WAS CREATED BY THE YOUNGEST MEMBER OF OUR TEAM, A GRADE 12 STUDENT USING CHAT GBT TO ENHANCE THE IMAGE OF WHAT COUNCIL APPROVED IN JULY 2025. THE CHAT GBT ENHANCEMENT UPDATES THE APPROVED PROJECT TO SHOW WHAT FUTURE HAS IN STORE. VIEW CONES CANNOT STOP THIS. GOVERNMENTS WILL APPROVE EVERY NEW TOWER PROPOSAL UNLESS AND UNTIL WE DO SOMETHING ABOUT IT.

TheDensityFallacy

building areas

SUMMARY			
SITE	122.5	150.0	18,375.0
15’ SIDE ACCESS	122.5	15	1,837.50
BLDG I FSR			2.0
BLDG II FSR			0.25
BLDG III FSR			0.14
TOTAL FSR			**2.42**
AREA CALCULATIONS	L	W	
BLDG I FOOTPRINT	135.0	61.5	8,302.5
4.5 LEVELS			37,361.3
BLDG I FSR			2.0
BLDG II FOOTPRINT	42.0	43.3	1,816.5
2.5 LEVELS			4,541.3
BLDG II FSR			0.2
BLDG III FOOTPRINT	22.0	30.0	660.0
4 LEVELS			2,640.0
BLDG III FSR			0.1

density calculation

				SF
GROSS UP FACTOR	0.56			
6 Lots/Gross Acre	6.0	122.5	33	24,255
One Acre		66	660	43,560
SITE A		122.5	150.00	18,375
Total Building Area				44,542.50
Equivalent Acres				1.8
Dwelling Unit				800
Total Units				56
Density (u/ac)				**102**
Total Cars				**39**

COURTYARD BUILDING

Type to enter text

This entry demonstrates the Density Fallacy, the belief that in order to lower house prices we must build towers, by achieving a remarkable gross density of 102 dwelling units per acre (FSR 2.4).

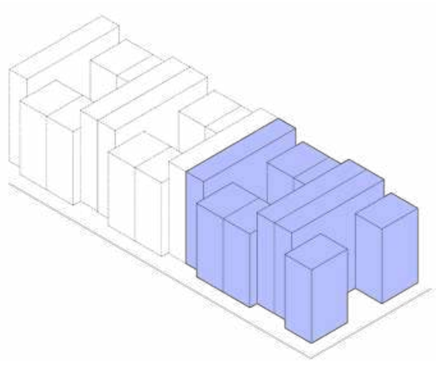
Every unit in this entry has its own street address, opening its own front door directly on the street, square or courtyard. A full

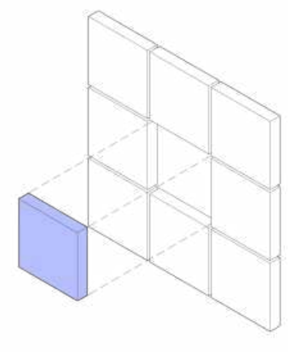
TheDensityFallacy

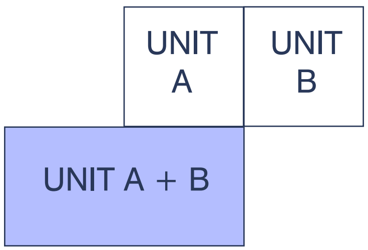
WHEN GOVERNMENT POLICY IS DIRECTLY RESPONSIBLE FOR INFLATING FAMILY HOUSING TO THE MOON, FAMILIES HAVE FEWER BABIES. THOSE THAT MIGHT HAVE HAD FOUR, OPT FOR TWO. OTHERS ‘DOWNSIZE’ FROM TWO TO ONE. BC HAS THE LOWEST BIRTHRATE IN CANADA ALONG WITH THE YUKON TERRITORY.

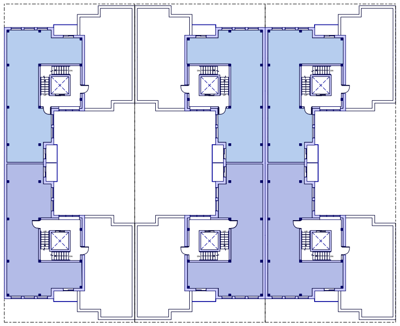
BOSQUE HOUSING

BOSQUE HOUSING IS A MID-RISE TIMBER CONSTRUCTION BUILDING IN SEARCH OF IMPROVING NOT ONLY THE AFFORDABILITY OF HOUSING BUT THE QUALITY OF SPACES CREATED. THE WORD BOSQUE, MEANING FOREST, HIGHLIGHTS THESOURCE OF MATERIAL AS WELL AS THE INTEGRATIONS OF VARIOUS SYSTEMS AND PROGRAMS TO WORK TOGETHER.

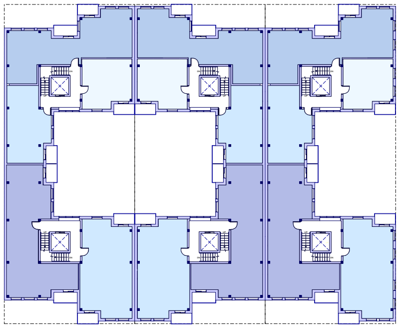




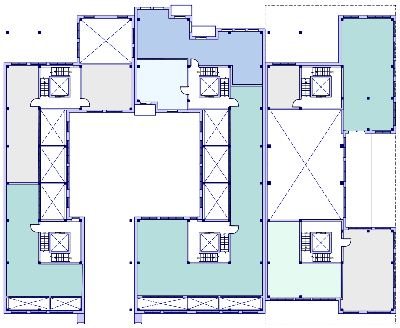




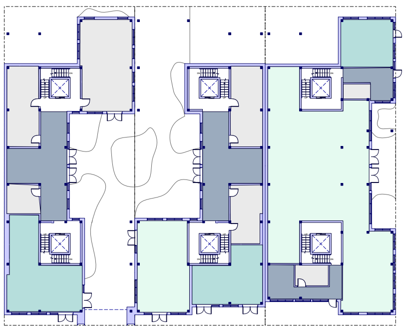
RESIDENTIAL DIAGRAM (LVLS 8 TO 9)



RESIDENTIAL DIAGRAM (LVLS 3 TO 7)



MEZZANINE DIAGRAM (LVL 2)



GROUND FLOOR DIAGRAM (LVL 1)

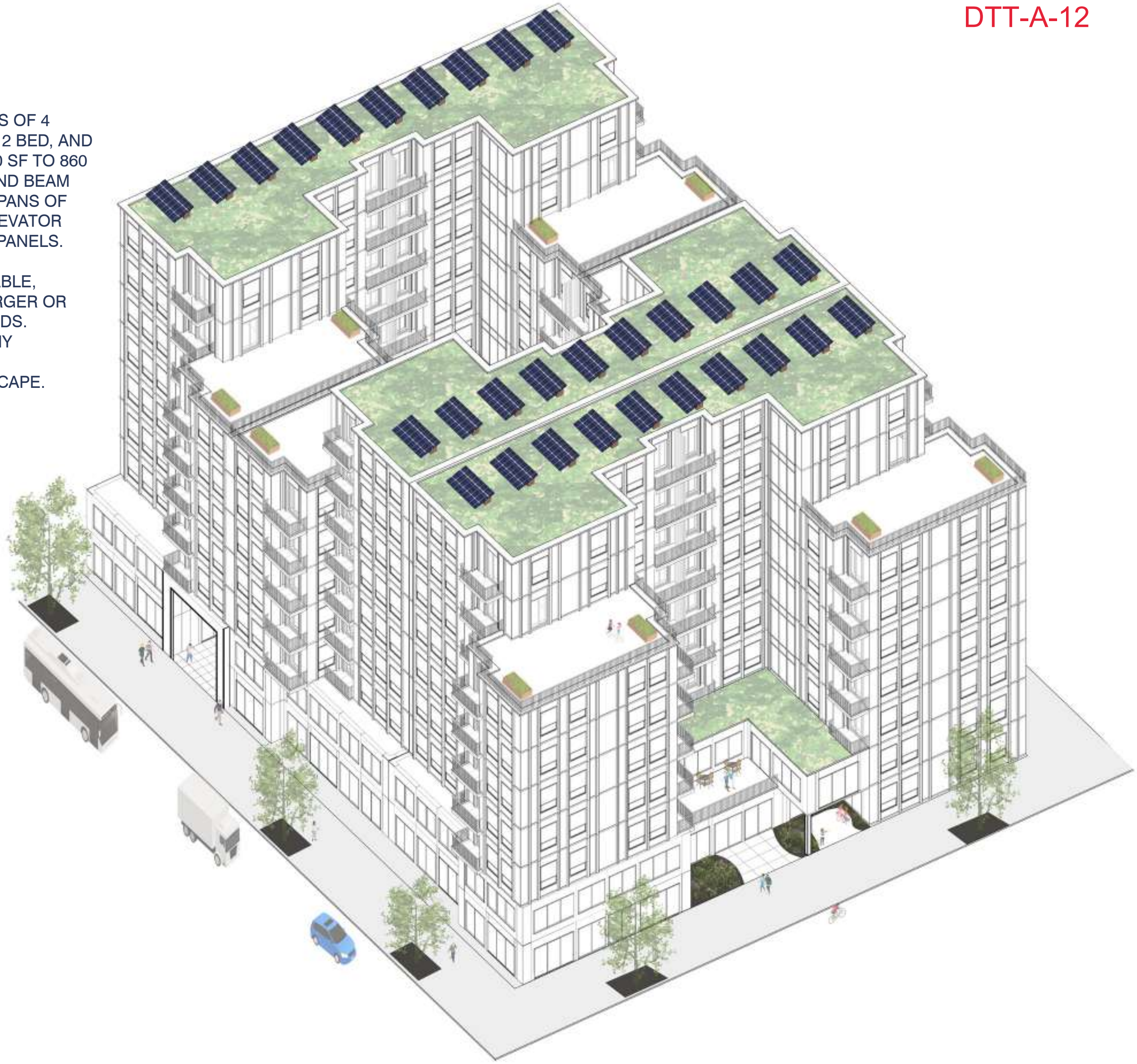
OPTIMIZIING MID-RISE TIMBER CONSTRUCTION

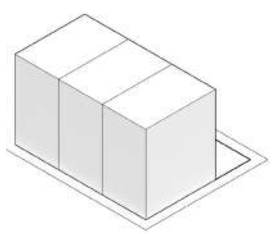
THE RESIDENTIAL PROGRAM COMPRISES OF 4 DIFFERENT UNIT TYPES- STUDIO, 1 BED, 2 BED, AND 3 BED APARTMENTS RANGING FROM 340 SF TO 860 SF. UNITS SIT WITHIN A GLULAM POST AND BEAM STRUCTURAL SYSTEM, WITH OPTIMAL SPANS OF 14-18 FEET. THE CENTRAL STAIR AND ELEVATOR CORE IS MADE UP OF CLT SHEAR WALL PANELS.

THE UNITS ARE LAID OUT TO BE ADAPTABLE, WHETHER CONVERTING UNITS INTO LARGER OR SMALLER SIZES PER THE TENANTS' NEEDS. ALL UNITS ARE PROVIDED WITH BALCONY ACCESS WITHIN THEIR UNITS, EITHER TOWARD THE COURTYARD OR STREETSCAPE.

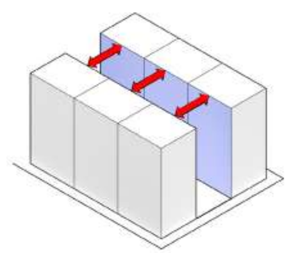
KEY LEGEND

- STUDIO
- 1-BED
- 2-BED
- 3-BED
- RESIDENTIAL/ SHARED LOBBY
- RESIDENTIAL AMENTITIES
- COMMERCIAL
- INSTITUTIONAL

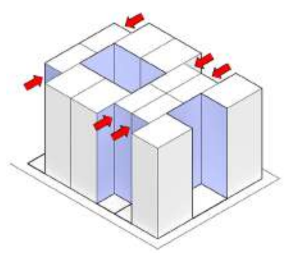




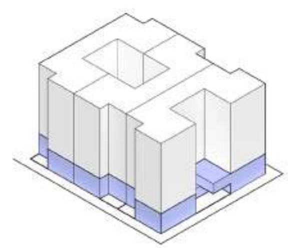
BASE MASSING: MAINTAIN LOT LINE SEPARATION IN BUILDING DEVELOPMENT



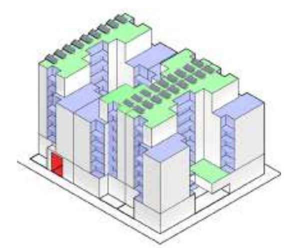
COURTYARD: PROVIDE NATURAL LIGHT AND VENTILATION THROUGH UNITS



SETBACKS: CREATE VARIETY OF DIFFERENT UNIT TYPES AND EXPAND SIDEWALK USAGE

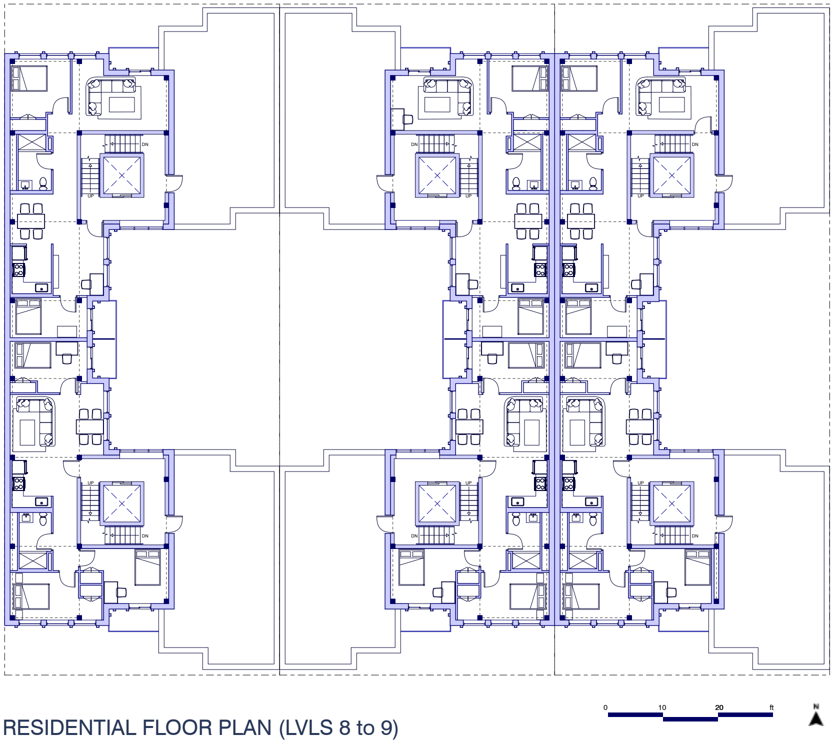


PODIUM: ALLOCATE COMMERICAL AND INSTITUTIONAL USES FOR COMMUNITY

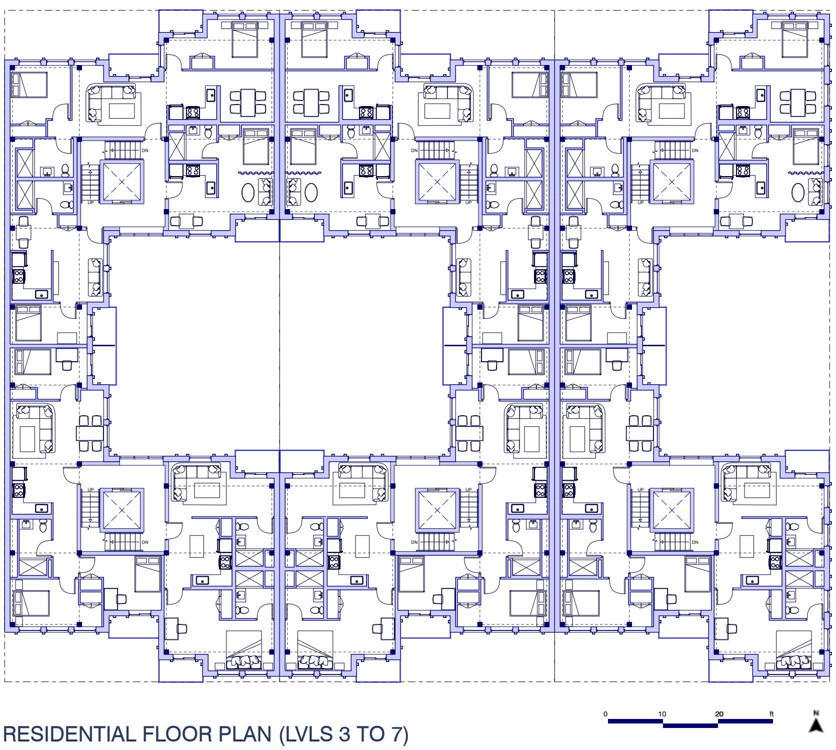


ECOLOGICAL SYSTEMS: REDUCE ENERGY USAGE AND STORM WATER RUNOFF

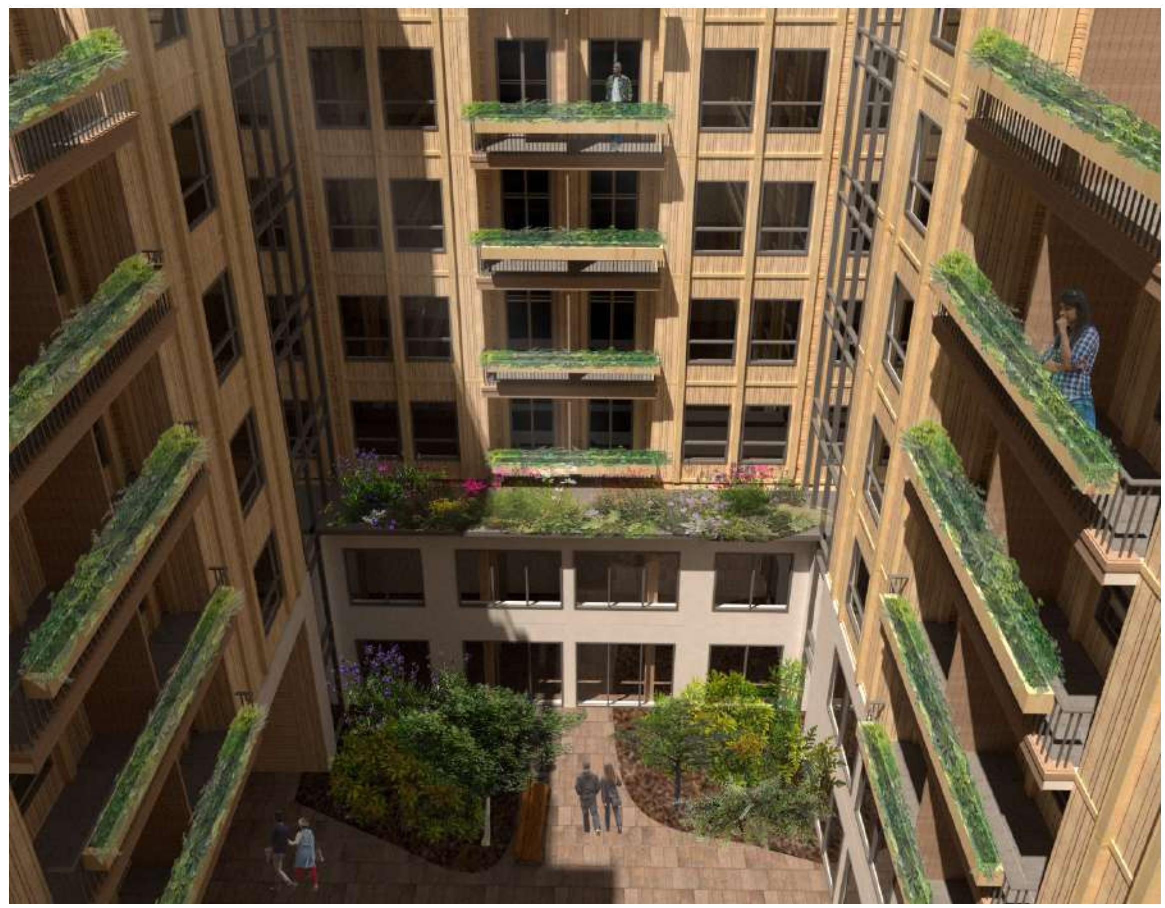
DTT-A-12



RESIDENTIAL FLOOR PLAN (LVLS 8 to 9)



RESIDENTIAL FLOOR PLAN (LVLS 3 TO 7)



CARVING GROUND USE PROGRAMS FOR COMMUNITY

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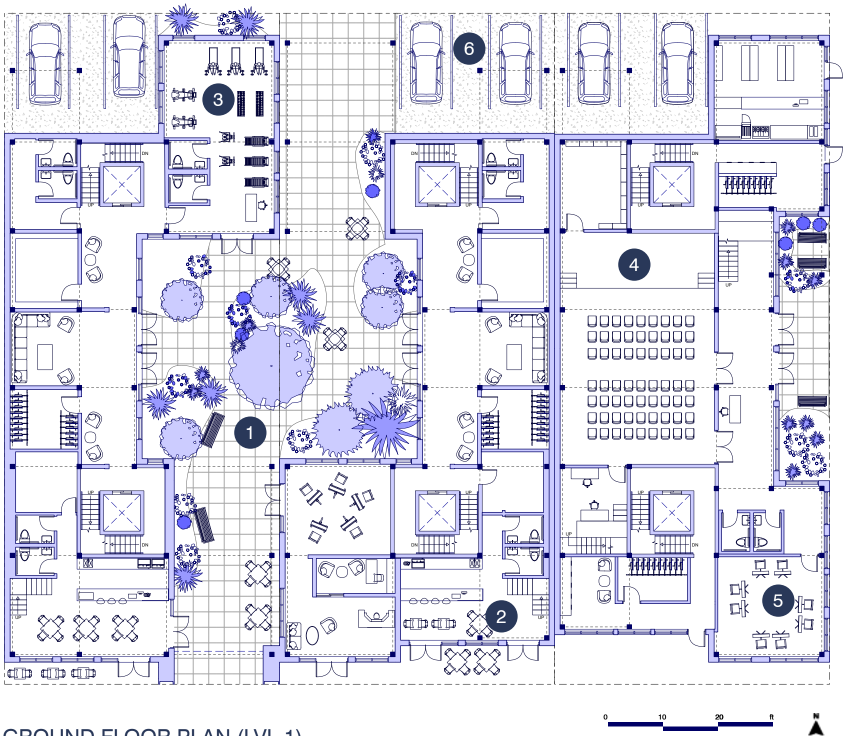
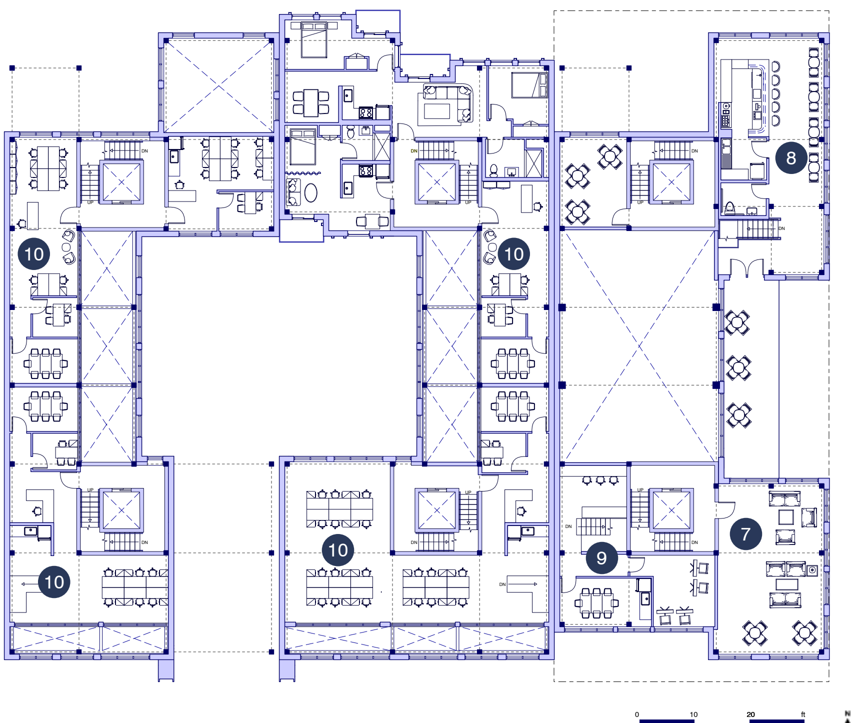


GROUND FLOOR PLAN (LVL 1)

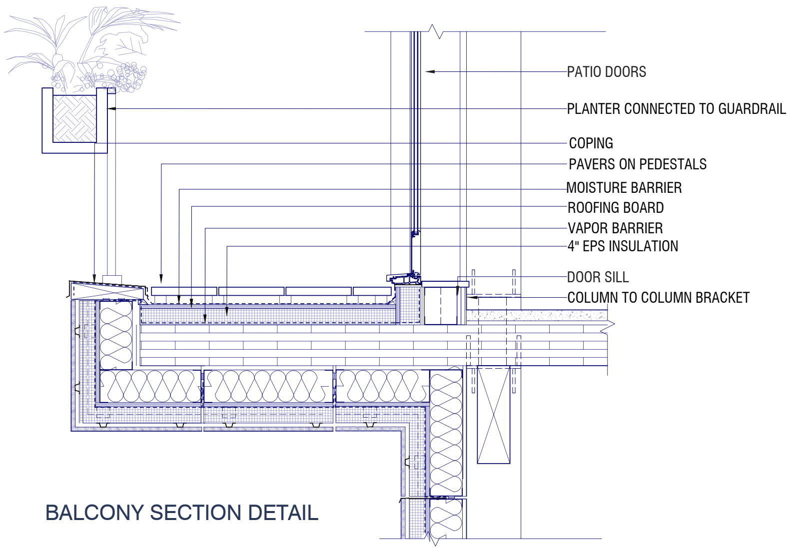
1. BOTH RESIDENTS AND VISITORS CAN ENJOY OUTDOOR SEATING ALONG THE COURTYARD AND TAKE IN THE WOODEN LANDSCAPE.
2. STOP BY THE CAFE TO ENJOY COFFEE AND PASTRIES ALONG THE MAIN TRANSIT STREET WITHIN A COMMERCIAL OVERLAY DISTRICT.
3. DOUBLE-HEIGHT GYMNASIUM PROVIDED FOR RESIDENTS TO EASILY ACCESS AT ALL HOURS OF THE DAY AND NIGHT.
4. COMMUNITY AND THEATRICAL GATHERINGS SET TO ENGAGE INTERACTION BETWEEN COMMUNITY AND VISITORS FOR CULTURAL VISIBILTY.
5. PRACTICE ROOM AT THE MAIN STREET INTERSECTION INTRIGUE PEOPLE PASSING BY AND HIGHLIGHT MUSICAL EXPRESSION AND EDUCATION.
6. LIMITED SET OF PARKING DUE TO TRANSIT ZONE LOCATION. AT THE VERY LEAST , ACCESSIBLE ROUTE PROVIED FOR ALL PARKING SPACES TO BUILDING.



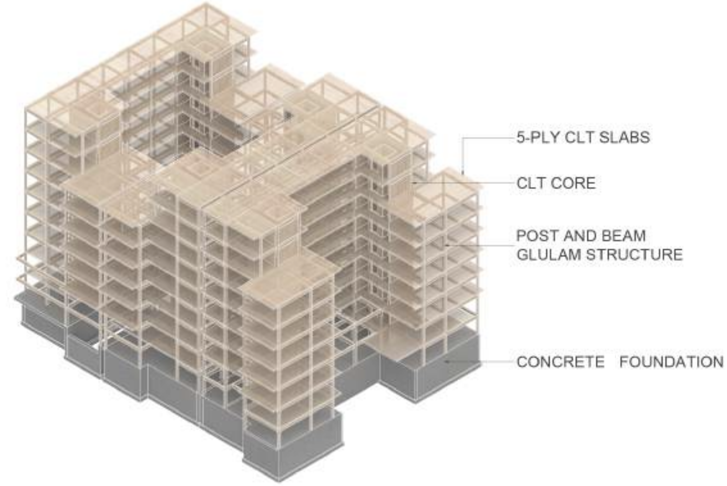
MEZZANINE FLOOR PLAN (LVL 2)

7. RESIDENTIAL LOUNGE PROVIDED AS AN AMENTITY IN MIXED USED BUILDING DEVELOPMENT WITH VISTA OF LIVELY PUBLIC ACTIVITY.
8. LOCAL BAR ADJOINED WITH THEATRICAL PROGRAM FOR EVENTS, CELEBRATIONS AND PERFORMANCES.
9. ADMINISTRATIVE ROOMS BEHIND ASSEMBLY PROVIDE PERFORMERS , STAFF OR VOLUNTEERS SPACE FOR MEETINGS, DIRECTING, OR REST.
10. OFFICES PROVIDED WITH LOTS OF NATURAL LIGHT AND OPEN SPACE IMPROVE WORK ENVIRONMENT EXPERIENCE.

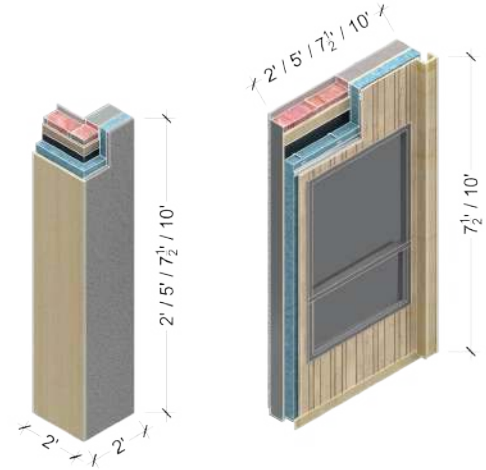
DTT-A-12



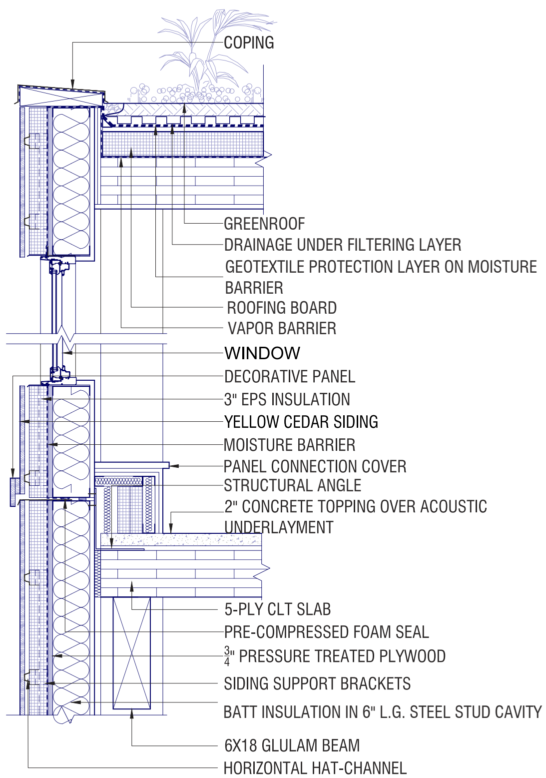
BALCONY SECTION DETAIL



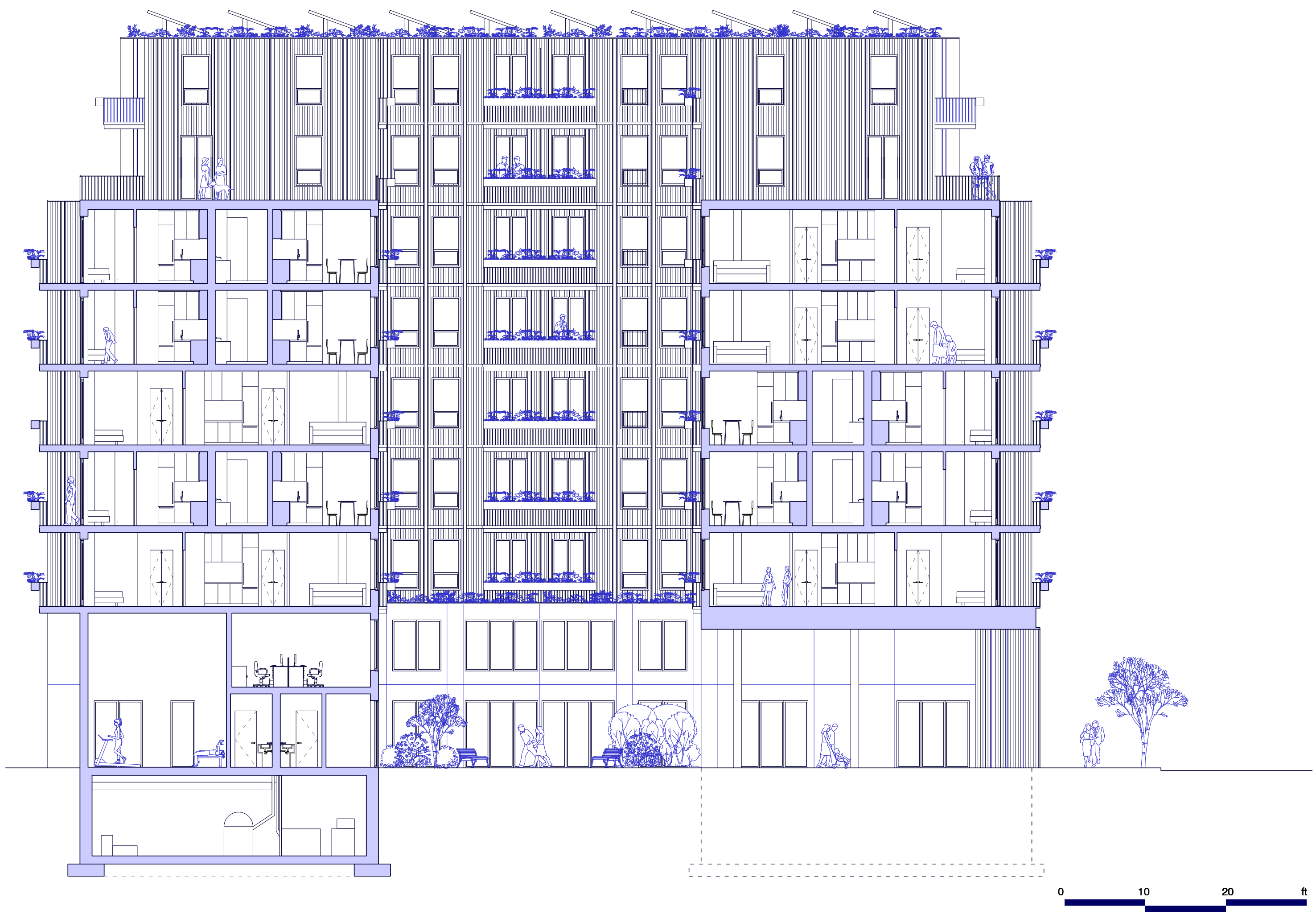
STRUCTURAL AXONOMETRIC



MODULAR WALL PANEL ASSEMBLIES



WALL SECTION DETAIL



DEALING WITH LIMITATIONS

DTT-A-12

ZONING
INTERIORIZING SETBACKS TO ENABLE COURTYARD TYPOLOGIES IN LINE THE GOALS OF TRANSIT ZONING TO CREATE URBAN SPACES THAT ARE MORE DIVERSE AND ACCOMMODATING TO PEDESTRIANS AND COMMUTERS.

EGRESS
SINGLE STAIRWAY DESIGN TO ACCOMMODATE MORE EFFICIENT BUILDING TYPOLOGIES THOUGH PROXIMATE ACCESS TO THE CORE. THIS WILL MAXIMIZE HABITABLE AREAS AND PRODUCE MORE BEDROOMS TO INCENTIVIZE DEVELOPMENT.

DESIGN EXPERTISE
DEVELOPING BUILDING CODES ALONG WITH A MASS TIMBER CONSTRUCTION INDUSTRY WHICH HAS NOT YET FULLY INTEGRATED ITSELF YIELDS POTENTIAL FOR THE EXPANDED APPLICATION OF THE MATERIAL IN BUILDING CONSTRUCTION SUCH AS A FIRE RATED STRUCTURAL CORE WITH A CLT SHAFT.

ECONOMIC
INCENTIVES FOR THE USE OF MASS AS AN ALTERNATIVE CONSTRUCTION MATERIAL FOR IT SUSTAINABLE QUALITIES CAN YIELD IN THE LONG RUN AN INDUSTRIAL SECTOR WHICH WILL MAKE MASS TIMBER MORE AND MORE OF A VIABLE ALTERNATIVE

Volume of wood products used:
4,449 cubic meters (157,118 cubic feet)

U.S. and Canadian forests grow this much wood in:
12 minutes

Carbon stored in the wood:
3472 metric tons of carbon dioxide

Avoided greenhouse gas emissions:
1664 metric tons of carbon dioxide

Total potential carbon benefit:
5136 metric tons of carbon dioxide

Equivalent to:

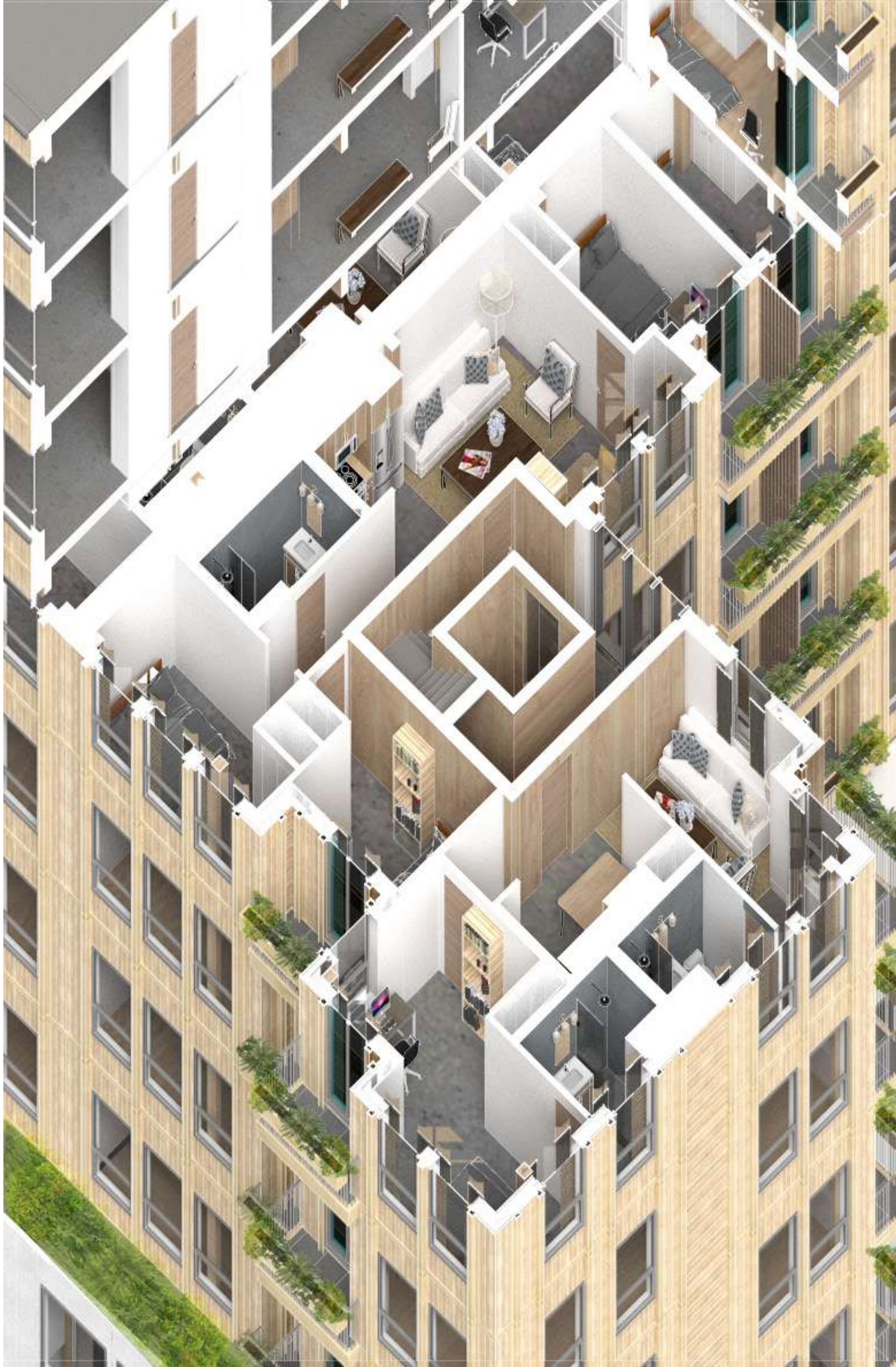
1086 cars off the road for a year

Energy to operate 542 homes for a year

ZONING INFO	
FSR	4.89295082
Lot size (sq ft)	18,300
Building sq ft Above Grade	89541
Building efficiency (%)	25
non saleable/rentable (sq ft)	13431.15
saleable/rentable (sq ft)	76109.85
Total Stories above grade (#)	9
Total Stories (#)	10
Base floor (#)	2
Above 1st storey (#)	7
Stories below grade (#)	1
Units (#)	74
Bedrooms (#)	168
Amenity space (sq ft)	5598
Non-residential (sq ft)	12029

CONSTRUCTION COSTS					
		Concrete		Submission	
	Square footage	$/sq ft	Cost	$/sq ft	Cost
Below grade	10344.0	$315	$3,258,360	$315	$3,258,360
Base floor	11907.0	$360	$4,286,520	$403	$4,798,521
Above 1st storey	77634.0	$385	$29,889,090	$431	$33,460,254
	Quantity	$/unit		$/unit	
Balconies	144	$25,000	$3,600,000	$25,000	$3,600,000
	Cost per month	# Months	Cost	# Months	Cost
Schedule Costs (Monthly	$50,000	18	$900,000	14	$700,000
TOTAL			$41,933,970		$45,817,135

EMBODIED CARBON					
		Concrete		Submission	
	Sq ft	Embodied Carbon kg/sq ft	Total Carbon	Embodied Carbon kg/sq ft	Total Carbon
Total Building Sq Footage	99885.0	6.69	668132.7627	3.44	343604.4



CEDARWEAVE TOWER

HOW MIGHT TIMBER INNOVATION DELIVER REPEATABLE, CULTURALLY GROUNDED HOUSING FOR DIVERSE URBAN COMMUNITIES?

CONTEXT & VISION

Cedarweave Tower is a proposed Tier 1 Transit-Oriented Affordable (TOA) mass timber high-rise that advances the ambitions of the Decoding Timber Towers competition. The project seeks to “decode” tall timber design by integrating four interdependent pillars of design excellence—Liveability, Affordability, Sustainability, and Repeatability—into a replicable prototype for equitable urban housing. Situated on unceded Indigenous land in Metro Vancouver, the tower acknowledges the importance of cultural exchange while advancing modular and prefabricated construction methods.

The system employs cross-laminated timber (CLT) floor panels and glulam columns to form an 18-storey residential tower rising above a three-level podium. This podium acts as a civic and commercial commons, hosting spaces that extend the life of the building into the surrounding community. Residential modules are organized around a compact core, while cantilevered forms and interlaced podium programs create moments of shared gathering and cultural expression. The name Cedarweave embodies this vision: interlacing Coast Salish cultural motifs, modular timber construction, and the social threads of community belonging.

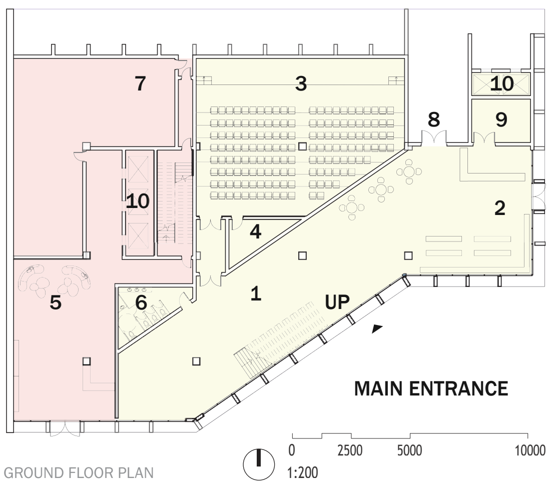
FOUR PILLARS (LASR)

The design is measured against four interrelated pillars of performance. ***Liveability*** prioritizes vibrant, culturally inclusive spaces that enrich everyday experience. ***Affordability*** ensures the project is financially viable while delivering a significant proportion of below-market homes. ***Sustainability*** emphasizes passive design strategies and low-carbon timber systems that reduce environmental impact across the building’s lifecycle. ***Repeatability*** establishes standardized, modular systems that can be adapted and reproduced across future TOA sites.

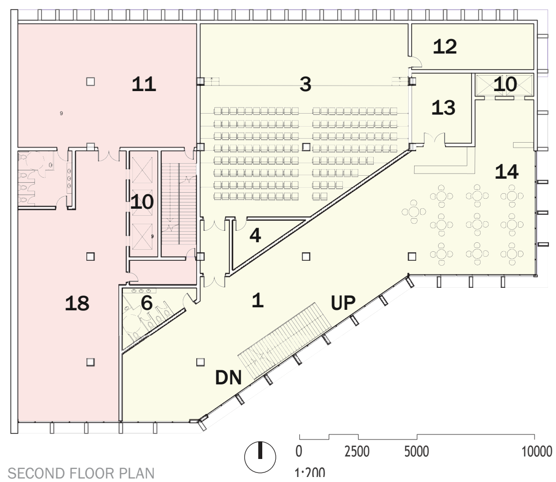
By advancing each of these pillars, Cedarweave Tower proposes a new paradigm for transit-oriented affordable housing. Here, affordability is not only expressed in numbers but in the capacity to belong, to share daily rituals, and to weave new traditions into ancestral ground. In this spirit, the project is envisioned not as a singular gesture but as a prototype for future policy frameworks and industry standards. It responds directly to the TOA mandate for 8–20 storey density while setting a precedent for embedding mixed retail, civic, and cultural amenities within mid-rise developments.


Third Floor Grocery / Grid Market

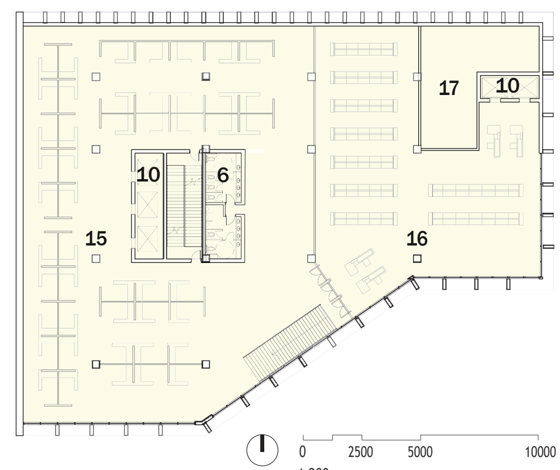

Ground Floor Cafe



GROUND FLOOR PLAN



SECOND FLOOR PLAN



THIRD FLOOR PLAN

1. GALLERY / EXHIBITION
2. SHOP / CAFE
3. THEATRE
4. THEATRE CONTROL
5. RESIDENTIAL LOBBY
6. WASHROOM
7. RESIDENTIAL BIKE PARKING
8. LOADING BAY
9. STORAGE
10. ELEVATOR
11. ENTERTAINMENT ROOM FOR RESIDENCE
12. THEATRE STORAGE
13. RESTAURANT STORAGE
14. RESTAURANT
15. GRID MARKET
16. GROCERY
17. GROCERY STORAGE
18. GYM

RESIDENTIAL
PUBLIC

COMMUNITY-CENTRIC PODIUM

The podium of Cedarweave Tower is conceived as a cross-cultural gathering place that anchors the development in everyday community life. Spanning the first three levels with generous 4.5 m ceiling heights, it offers open, adaptable volumes for public use. A stepped form and transparent gallery blur the threshold between inside and out, inviting neighbors and visitors alike. Acting as a civic living room, the podium hosts Indigenous exhibitions, immigrant-run shops, cross-cultural performances, and daily amenities such as a theatre, grocery, café, and rooftop garden—programmed in collaboration with local residents and First Nations partners.

PROGRAM & USER EXPERIENCE

The ground floor opens with a public market hall and café that encourage daily interaction. Above, a flexible performance hall supports cultural events, meetings, and the arts, while a community kitchen and gallery enable workshops and exhibitions. Active uses are placed at street level, quieter communal spaces above, all connected by stairs, terraces, and local art. Outdoor terraces and the podium roof garden expand opportunities for gathering and urban agriculture. Architectural details reference Coast Salish weaving patterns, symbolically tying Indigenous and immigrant narratives together.

Residents pass through this civic commons daily, meeting familiar faces and sharing experiences. By uniting places to shop, dine, celebrate, and rest, Cedarweave Tower embeds social cohesion directly into the building’s form and program.

A SYSTEM THAT PENCILS BY DESIGN.

Cedarweave dedicates 30% of homes at ~80% AMR and funds this without grants by (1) eliminating the underground parkade in favour of car-share and high-capacity bicycle parking, and (2) covenanted re-investment of a share of podium NOI into housing operations. The Building Statistics table demonstrates how a compact core, stacked “wet bands,” and a disciplined net-to-gross support this cross-subsidy with stable operating margins. This answers the brief’s request for an affordability business case rooted in a base-case pro forma.

REPEATED PLATES, LOWER RISK.

The fourth and fifth plans illustrate an A/B pairing that alternates up the tower: the identical CLT slab outline (and façade module) repeats every floor, while unit layouts flip or mirror around a constant services spine. For delivery, this repeatability compresses detailing, approvals, shop-drawing cycles, and on-site coordination; for operations, it simplifies maintenance and turn-over. In short, the plates repeat so the process repeats—precisely the systemization the competition seeks.

TIME IS MONEY—WHERE TIMBER WINS.

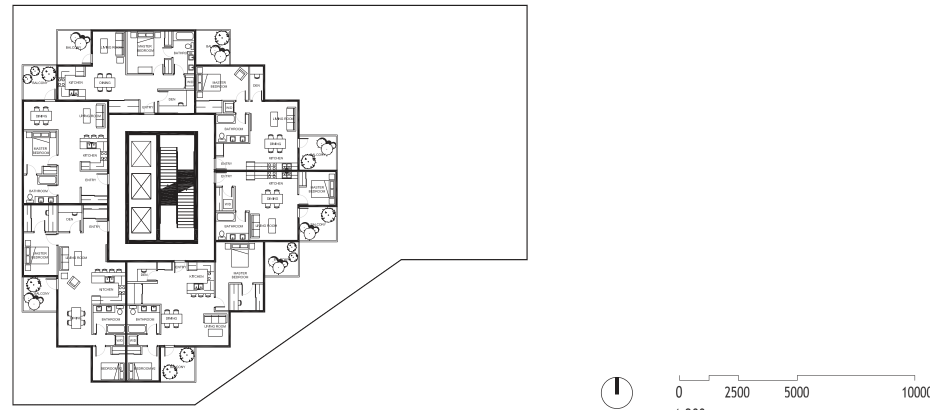
The Construction Costs table sets our submission against the concrete benchmark: timber still carries a higher above-grade $/ft² in many markets, but a shorter schedule from standardized parts (CLT cassettes, glulam posts, unitized façade) reduces general conditions and interest carry. Faster dry-in and earlier occupancy bring revenue forward, narrowing the apparent cost gap while meeting the brief’s aim to streamline delivery of large-scale low-carbon housing.

AFFORDABILITY BEYOND RENT.

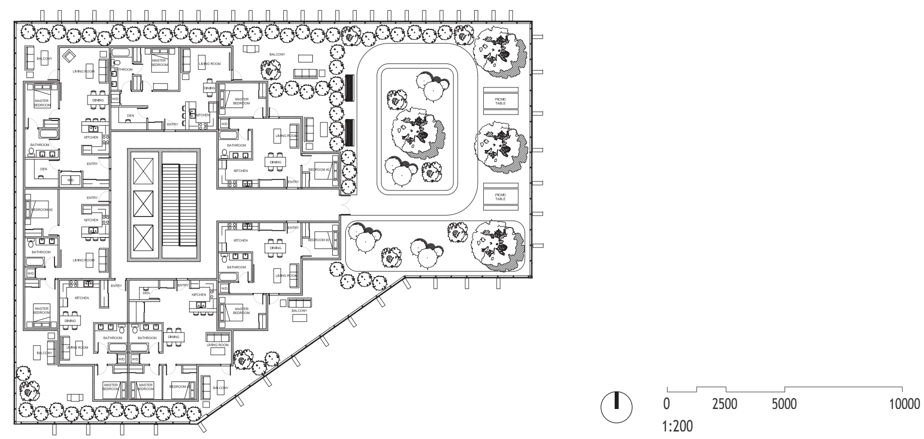
Savings for residents accrue monthly in three places: (1) rent (discounted units), (2) mobility (car-lite living enabled by transit and bike infrastructure), and (3) utilities (a passively tempered envelope and mixed-mode ventilation reduce operational loads). These household savings lower arrears risk and strengthen the project’s long-term financial resilience—affordability as both a tenant benefit and a project-stability strategy. (The brief explicitly invites entrants to link building delivery to life-cycle costs and operations.)

CARBON THAT UNLOCKS FINANCE.

The Embodied Carbon table reports whole-building A1–A3 results using recognized tools (WoodWorks/EC3/BEAM): the timber scheme achieves ≈4.28 kgCO2e/ft² versus ≈6.69 kgCO2e/ft² for the concrete baseline—about a 36% reduction for the same above-grade area. Clear carbon accounting, as requested by the brief, positions the project for green-finance instruments and policy incentives that further improve affordability.



FIFTH FLOOR PLAN



FOURTH FLOOR PLAN

Building Statistics	Number
FSR	8.01027322
Lot size (sq ft)	18,300
Building sq ft Above Grade	146588
Building efficiency (%)	85
non saleable/rentable (sq ft)	21988.2
saleable/rentable (sq ft)	124599.8
Total Stories above grade (#)	18
Total Stories (#)	18
Base floor (#)	1
Above 1st storey (#)	17
Stories below grade (#)	0
Units (#)	180
Bedrooms (#)	261
Amenity space (sq ft)	2884
Non-residential (sq ft)	29678

CONSTRUCTION COSTS					
		Concrete		Submission	
	Square footage	$/sq ft	Cost	$/sq ft	Cost
Below grade	0.0	$315	$0		$0
Base floor	11840.0	$360	$4,262,400	$403	$4,771,520
Above 1st storey	134748.0	$405	$54,572,940	$431	$58,076,388
	Quantity	$/unit		$/unit	
Balconies		$25,000	$0	$25,000	$0
	Cost per month	# Months	Cost	# Months	Cost
Schedule Costs (Monthly Overhead)	$50,000	18	$900,000	14	$700,000
TOTAL			**$59,735,340**		**$63,547,908**

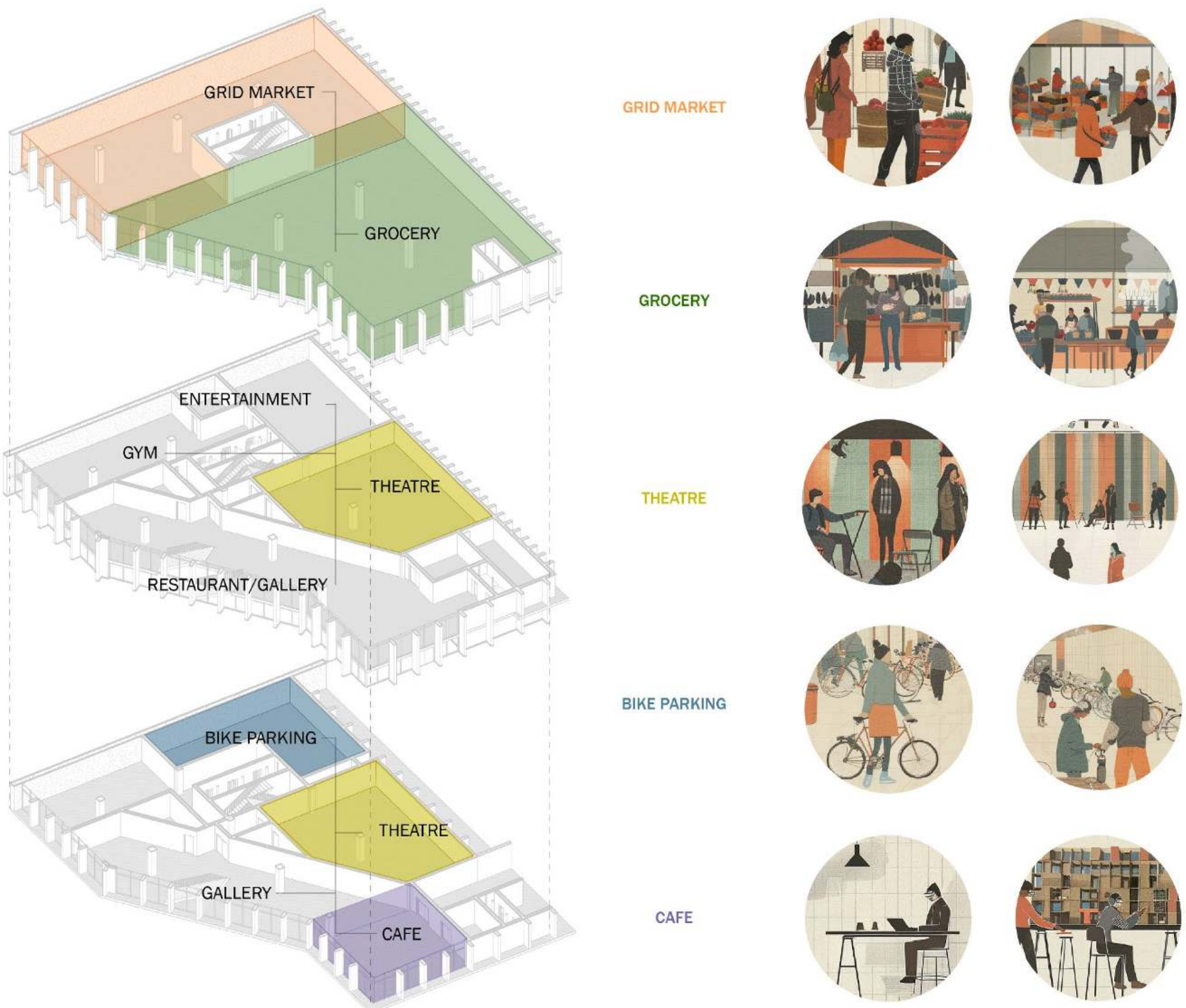
EMBODIED CARBON					
		Concrete		Submission	
	Sq ft	Embodied Carbon kg/sq ft	Total Carbon	Embodied Carbon kg/sq ft	Total Carbon
Total Building Sq Footage	146588.0	6.69	**980530.0638**	146588	**4.28**

PODIUM-AS-CLIMATE-DEVICE.

Cedarweave's three-level podium concentrates everyday programs—market "grid" stalls, full-service grocery, café/restaurant, theatre/cinema, gallery, gym, and a secure bike hub—into an all-season civic living room. By pulling high-trip uses on site and stacking them under a shared shell, the project reduces resident travel demand, consolidates heating/cooling loads, and shares back-of-house infrastructure across tenants. The result is lower per-capita operational energy and a resilient neighbourhood anchor that functions year-round, not just in fair weather.

PASSIVE FIRST, SYSTEMS SECOND.

A repeatable 3 × 3 m structural grid organizes cantilevered balcony "boxes" as built-in brise-soleil, providing self-shading in summer and rain protection without mechanical complexity. Slender floor plates, generous operable windows, and exteriorized circulation where appropriate enable mixed-mode ventilation—natural ventilation on shoulder days, high-efficiency heat recovery in winter. The podium roof and terraces are planted to temper microclimate, manage stormwater, and create pleasant outdoor rooms that extend the life of the building into the public realm.



ALL-ELECTRIC AND FUTURE-PROOF.

The tower is designed around an all-electric services stack: centralized or distributed air-source heat pumps for space conditioning, HRVs for each residential riser, and heat-pump water heating with recirculation controls. Sub-metering for residential, commercial, and common areas supports performance-based operations and tenant transparency. Demand-response-ready controls (night set-back, pre-cool/heat, limited peak shedding) position the building to participate in utility incentive programs without sacrificing comfort.

WATER, LANDSCAPE, AND MATERIALS.

Blue-green roofs detain stormwater, support pollinator habitat, and host community plots with drought-tolerant planting. Indoors, low-flow fixtures and leak-detection on risers reduce potable demand. The structure employs CLT floor cassettes and glulam posts/beams with dry connections; exterior walls use unitized, demountable panels. This Design-for-Manufacture-and-Assembly (DfMA) approach minimizes waste, accelerates dry-in, and enables replacement at end-of-life—key steps toward a circular materials economy.

EMBODIED CARBON—MEASURED AND MANAGED.

As documented on Page 3, whole-building A1–A3 embodied carbon for the timber submission is significantly lower than the concrete baseline (≈36% reduction for the same above-grade area). The project team specifies products with EPDs, prioritizes low-carbon concrete in the limited foundation work, and tracks assemblies in a bill-of-materials that can be verified with tools such as EC3/BEAM. The standardized kit produces repeatable quantities, improving carbon predictability across future TOA sites.

OPERATIONS THAT SUSTAIN AFFORDABILITY.

Sustainability is tied to household economics. The no-parkade, bike-first strategy lowers construction and operating costs while enabling car-lite living; the podium's on-site services further cut transport emissions and monthly expenses. A maintenance-light envelope and repeatable details reduce service calls and downtime, keeping strata/operating fees in check and extending component lifespans.
What the diagram shows.

POLICY SIGNAL.

By proving that a standardized timber kit can deliver low-energy operations, verifiable embodied-carbon reductions, and a year-round civic commons, Cedarweave offers a template municipalities can adopt: encourage all-electric, car-lite podiums with on-site daily needs; recognize unenclosed climate buffers as performance features; and reward repeatable low-carbon assemblies with predictable approvals.

ONE MODULE, MANY BUILDINGS.

Cedarweave is organized by a single, repeatable 3×3 m module that governs structure, services, and façade. CLT floor cassettes span between glulam posts on this grid; the same 3 m width defines unitized wall panels and balcony “box” elements. Because the geometry, connections, and tolerances are constant, the system scales cleanly—across floors, across sites, and across future TOA projects.

ONE SLAB; TWO FITS; ENDLESS STACKS.

The residential tower repeats an identical floor slab while alternating A/B unit fits (as seen in Levels 4–5). Kitchens and baths align within a vertical wet band, keeping risers, shafts, and exhausts in the same places on every level. The result is fewer unique parts, shorter coordination loops, and a learnable rhythm for trades—repeat the plate, repeat the process.

ASSEMBLY YOU CAN SCHEDULE TO THE DAY.

Components arrive pre-numbered and weather-protected: glulam columns and beams, CLT cassettes with preformed penetrations, and clip-on façade panels with windows pre-installed. Dry connections limit wet trades; balcony boxes slot into the grid as shading/rain devices without bespoke details. This DFMA workflow creates a predictable crane rhythm, quicker dry-in, and less site congestion—key to delivering affordable housing at speed.

ADAPTABLE WHERE IT COUNTS.

The module is fixed; the enclosure and program are flexible. Podium bays accept different community uses (market, theatre, café, daycare) without changing the frame. On the tower, the same plate supports multiple unit mixes and façade expressions. Jurisdictions can “tune” counted enclosure (e.g., open verandas vs. fully enclosed perimeter) to meet local FSR or energy targets without retooling the system.

OPERATIONS MADE SIMPLE.

Standardized, unitized façade panels are replaceable from a manlift; interior dry-fit timber linings are demountable for quick repairs and upgrades. Repetition creates a stable spares catalogue, clearer O&M manuals, and fewer surprise details—lowering lifecycle costs while keeping homes in service.


Residential Interior


Ground Floor Cafe


Lane Side Bike Parking/ Loading Bay

WHAT THIS PROJECT CHANGES

POLICY RECOMMENDATIONS

1. Civic-commons cross-subsidy. Require a fixed share of podium NOI to fund affordability in perpetuity.
2. Car-lite standards. Reduce/waive parking minimums at transit and trade them for bike capacity and on-site services.
3. Performance-based approvals. Provide a predictable path for standardized mass-timber kits (pre-reviewed details, clear fire/egress pathways).
4. Recognize climate buffers. Treat unenclosed verandas/arcades as performance devices in area/FSR accounting.
5. Carbon disclosure. Mandate A1–A3 embodied-carbon reporting at permit, unlocking green-finance incentives.

INDUSTRY IMPACT

- *Demand aggregation.* Repeating one kit across sites stabilizes orders for CLT, glulam, and unitized façades—driving price normalization.
- *Delivery playbook.* Fewer part types, clearer logistics, and dry connections shorten shop-drawing cycles and site duration.
- *Workforce upskilling.* DFMA assembly and façade cassette replacement become standard practice, reducing maintenance risk for owners.

USER/TENANT BENEFIT

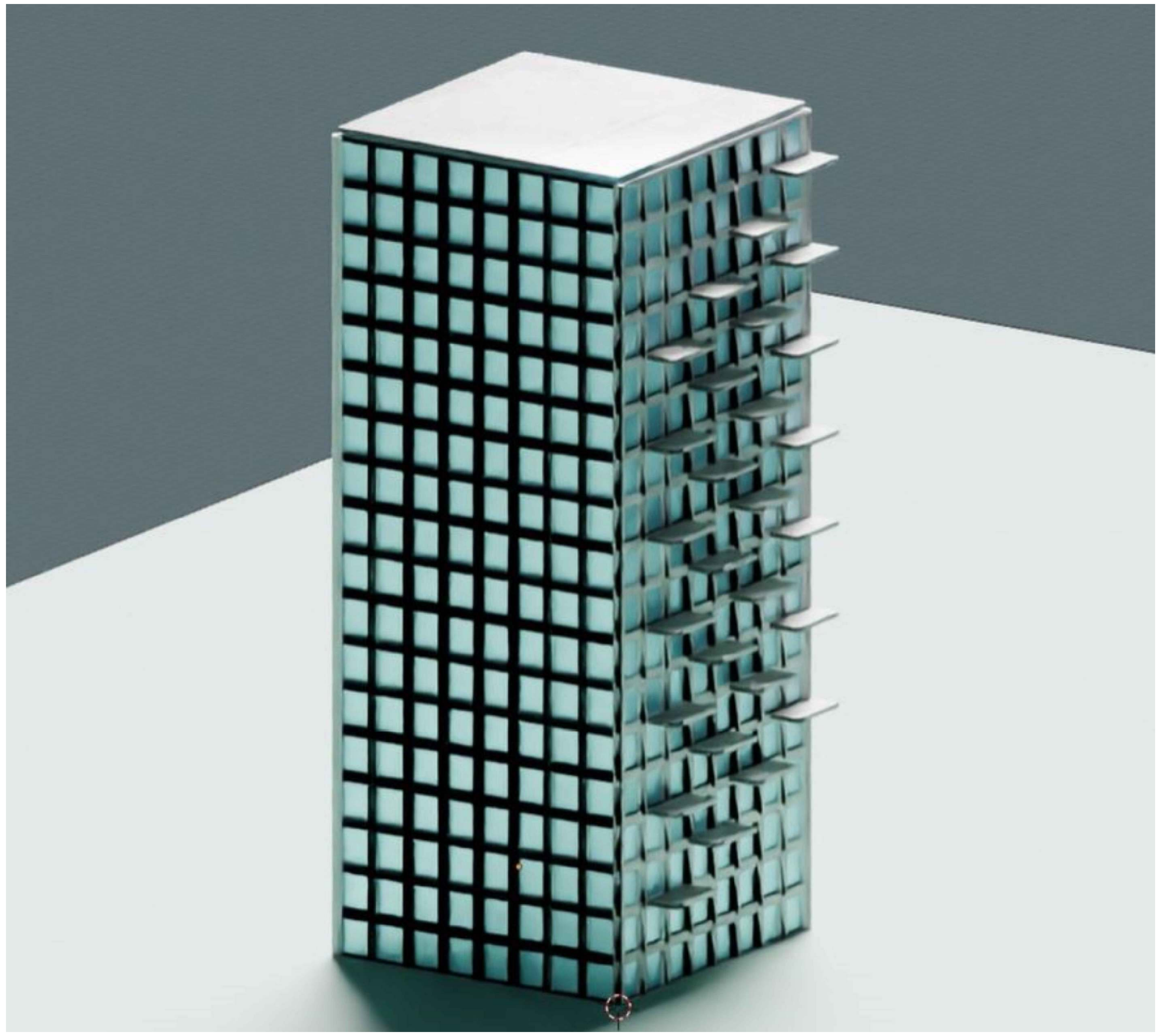
- ***Lower monthly costs:*** discounted rent for 30% of homes, car-lite living, and mixed-mode comfort that trims utility bills.
- ***Daily convenience:*** groceries, childcare-friendly amenities, and cultural programs within a short walk of homes and transit.
- ***Belonging:*** Indigenous-led curation and local operators make the podium a familiar place, not just a lobby.

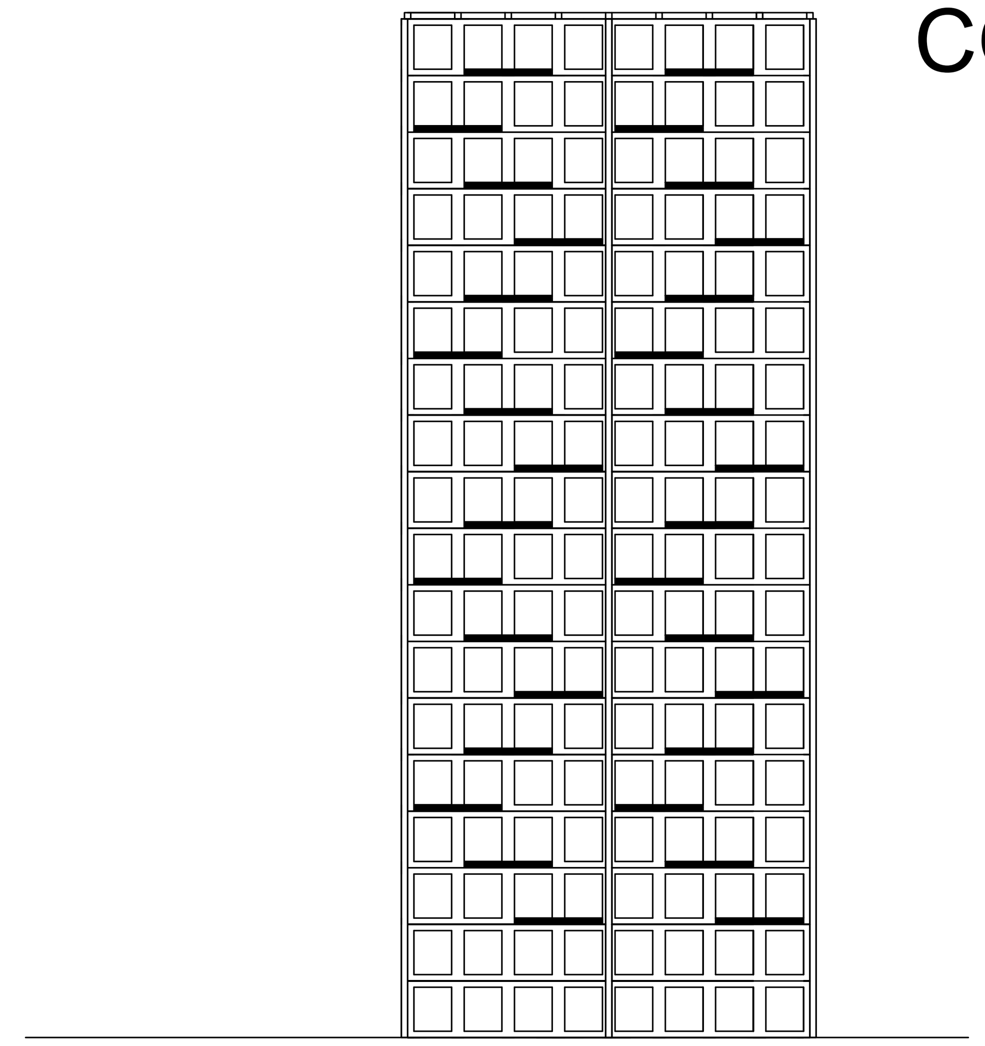
CLOSING STATEMENT

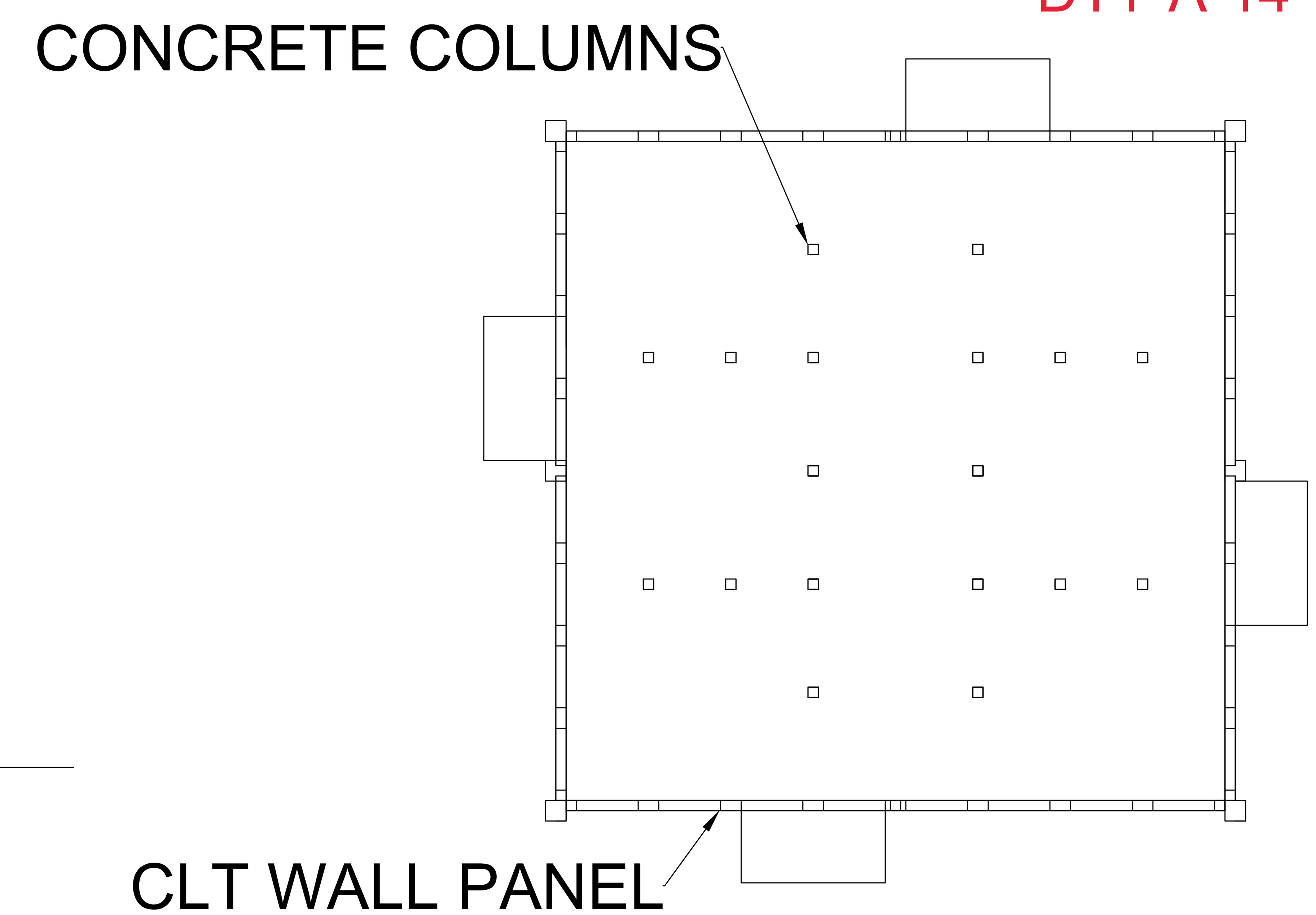
Cedarweave Tower is more than a single building; it is a policy-aligned, industry-ready prototype. By weaving cultural life with a standardized mass-timber system, it shows how cities can scale low-carbon housing without sacrificing dignity, affordability, or craft. Replicated across TOA sites, the approach shortens time-to-keys, lowers embodied carbon, and strengthens the social fabric—demonstrating a practical path for building higher, building smarter, and building together.

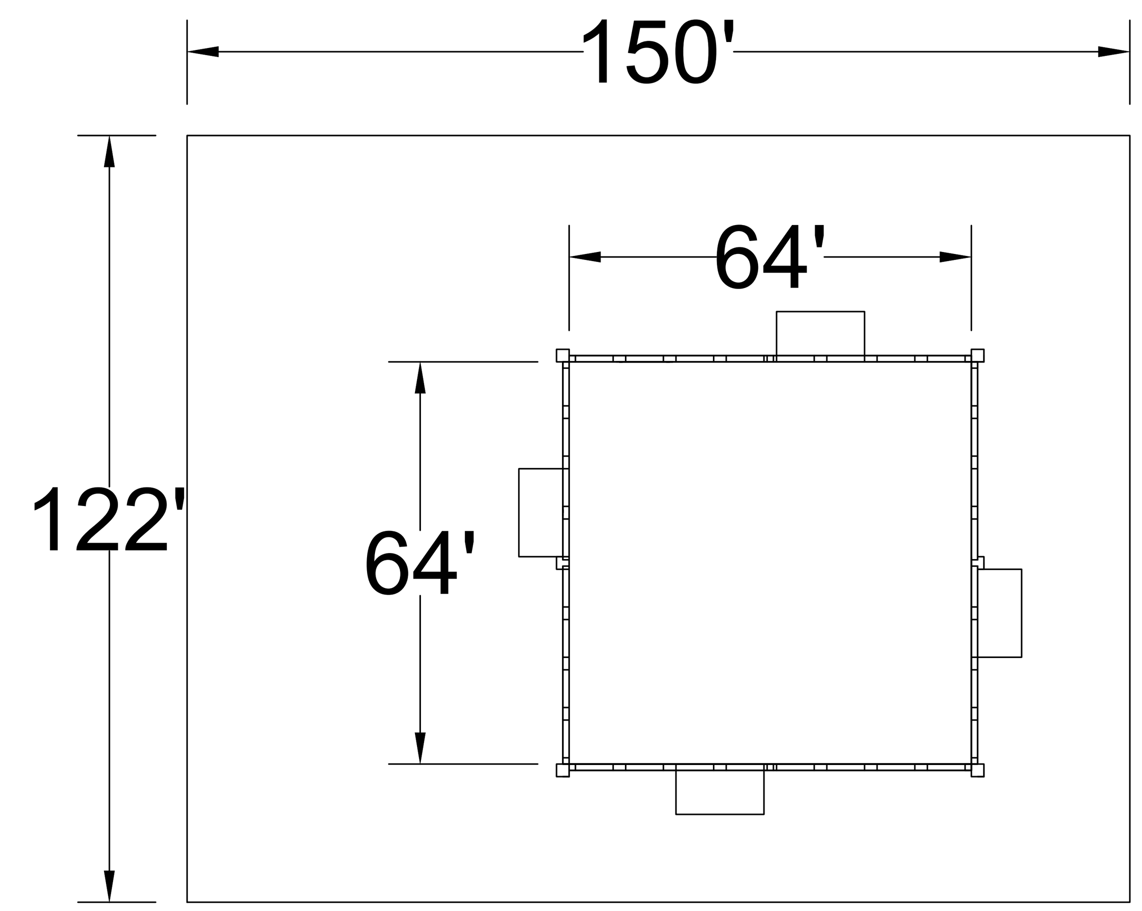
DTT-A-14

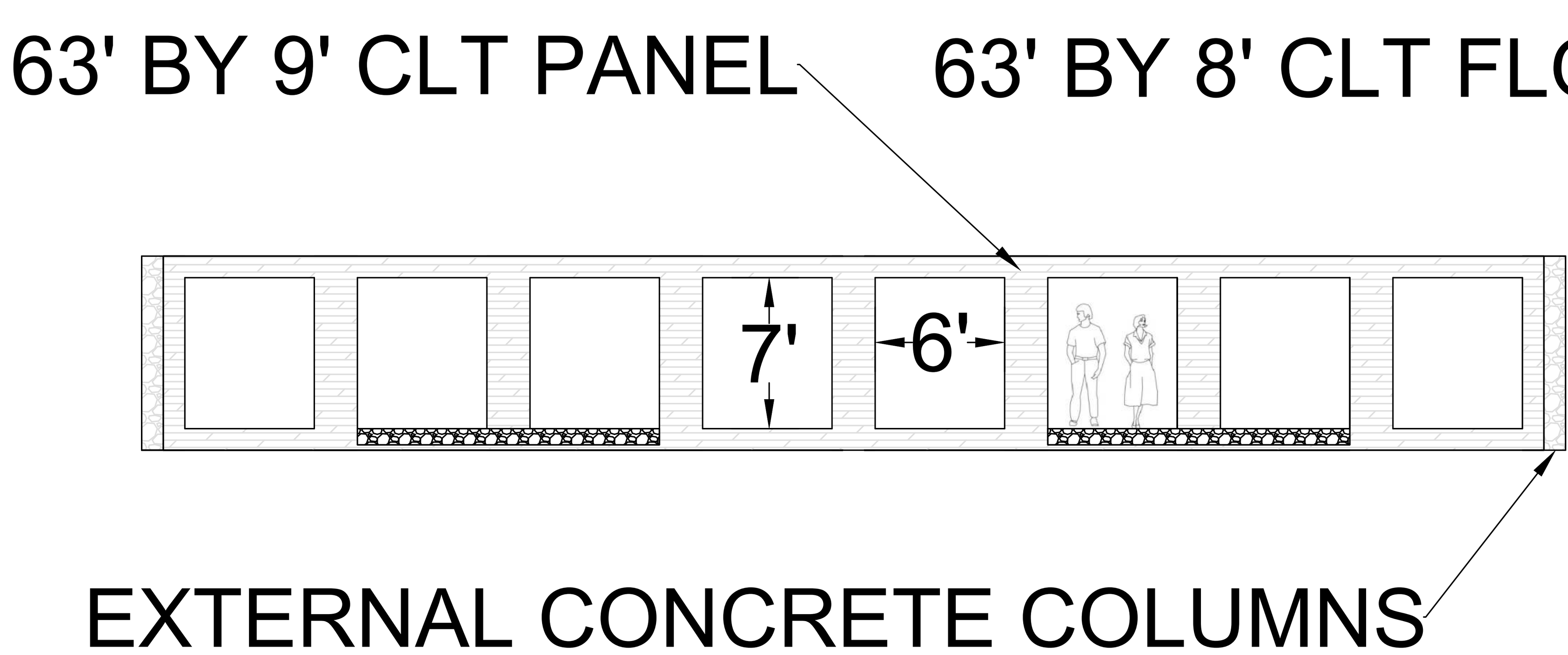
HYBRID MASS TIMBER TOWER

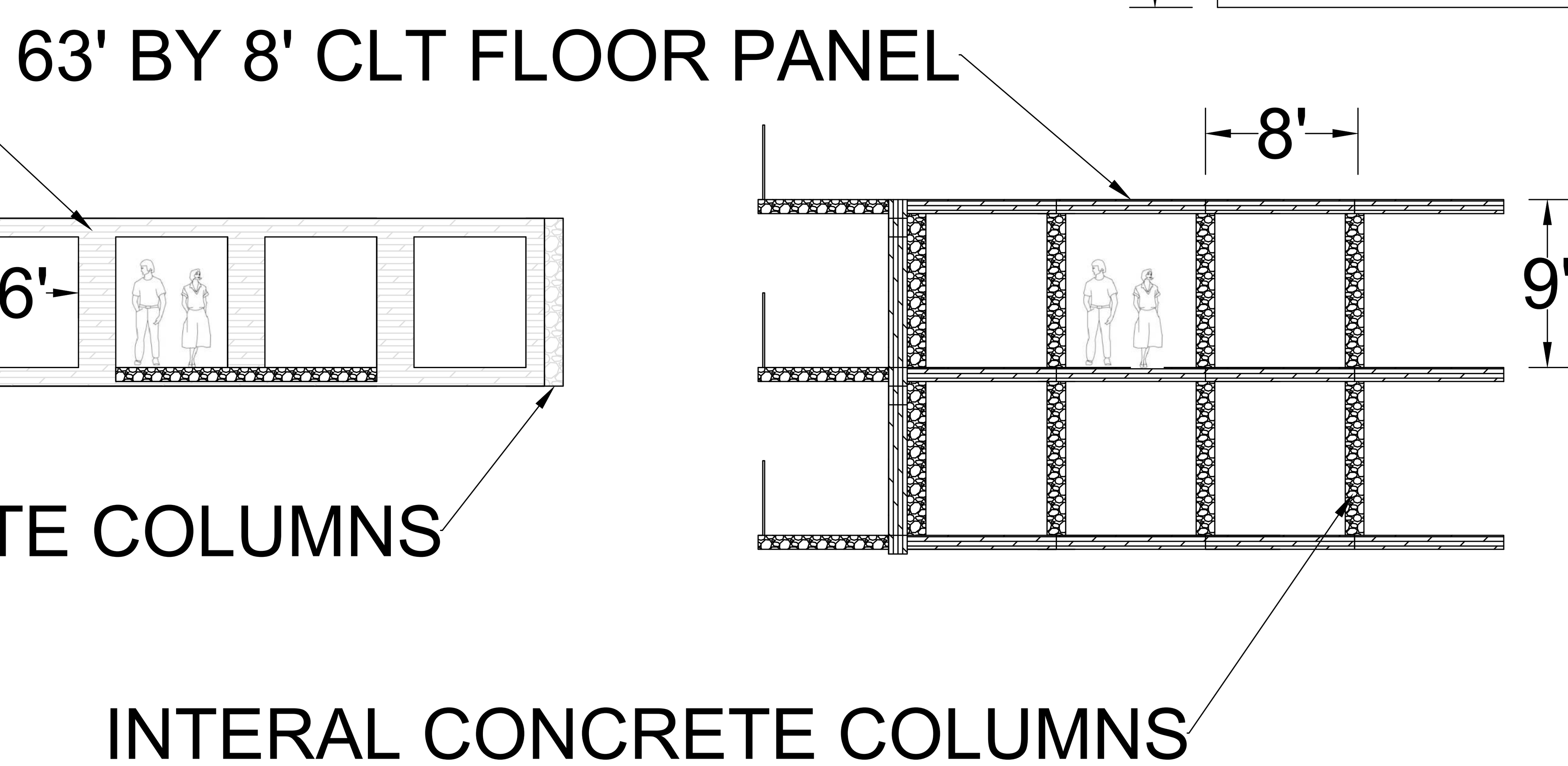


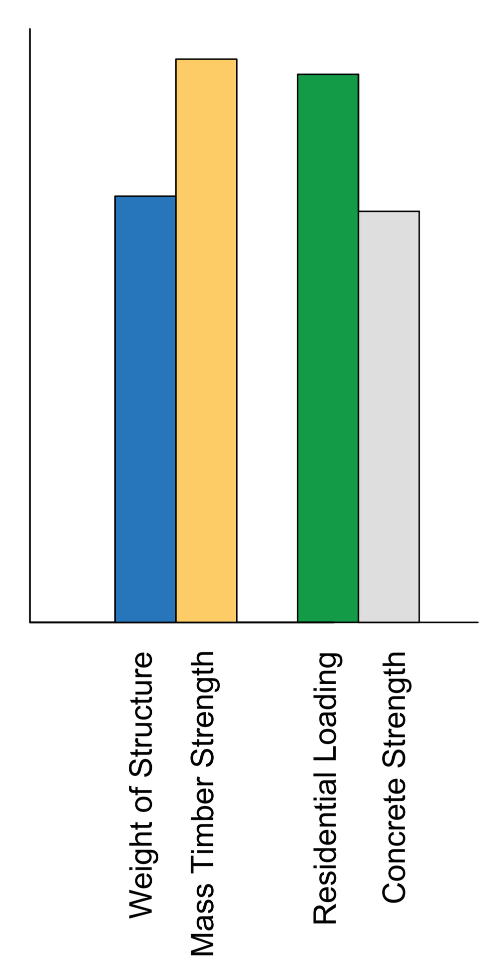












THE DESIGN OF THE HYBRID MASS TIMBER TOWER FOCUSES ON MULTIPLE OPTIMIZATIONS TO REDUCE MATERIAL USE, SPEED UP CONSTRUCTION, AND BALANCE THE USE OF MASS TIMBER AND CONCRETE COMPONENTS.

THE MAIN STRUCTURE CONSISTS OF CLT PANELS LOCATED AROUND THE PERIMETER OF THE TOWER. PLACING THE CLT PANELS AROUND THE PERIMETER IMPROVES STRUCTURAL EFFICIENCY AND ELIMINATES THE REQUIREMENT FOR A CONCRETE CORE.

THE PROPOSED DESIGN USES THE LARGEST CLT PANELS AVAILABLE IN NORTH AMERICA. A SINGLE PANEL WILL STRETCH THE WIDTH OF THE TOWER AND THE HEIGHT OF A SINGLE FLOOR.

EACH PANEL IS MODULAR FOR IMPROVED CONTRACTIBILITY AND HAS 8 WINDOW OPENING REDUCING THE VOLUME OF TIMBER REQUIRED. THE FLOOR SYSTEM UTILIZES SIMILARLY SIZED CLT PANELS THE SPAN THE WIDTH OF THE TOWER.

CLT PANELS CAN SPAN LARGE DISTANCES WHEN SUPPORTING THEIR SELF WEIGHT BUT ARE LIMITED TO ~20' SPANS WHEN SUPPORTING RESIDENTIAL LOADING. THIS DESIGN PROPOSES USING TEMPORARY SHORING OF THE CLT FLOOR PANELS DURING CONSTRUCTION AND THE PLACEMENT OF INTERNAL CONCRETE COLUMNS TO REDUCE SPAN DISTANCES.

THE GOAL OF THIS DESIGN IS TO USE THE PERIMETER CLT PANELS TO SUPPORT MOST OF THE SELF WEIGHT OF THE TOWER. THE CONCRETE COLUMNS WILL THEN MAINLY SUPPORT RESIDENTIAL LOADING. THE CONNECTIONS BETWEEN THE CLT PANELS AND THE CONCRETE COLUMNS WILL ALSO BE DESIGNED TO ALLOW CONSTRUCTION TO PROGRESS WHILE THE CONCRETE CURES.

THE RESULT OF THESE OPTIMIZATIONS IS A HYBRID MASS TIMBER CONCRETE STRUCTURE THAT IS MORE AFFORDABLE, FLEXIBLE, FASTER TO CONSTRUCT, AND MORE ENVIRONMENTALLY FRIENDLY THAN TRADITIONAL CONSTRUCTION METHODS

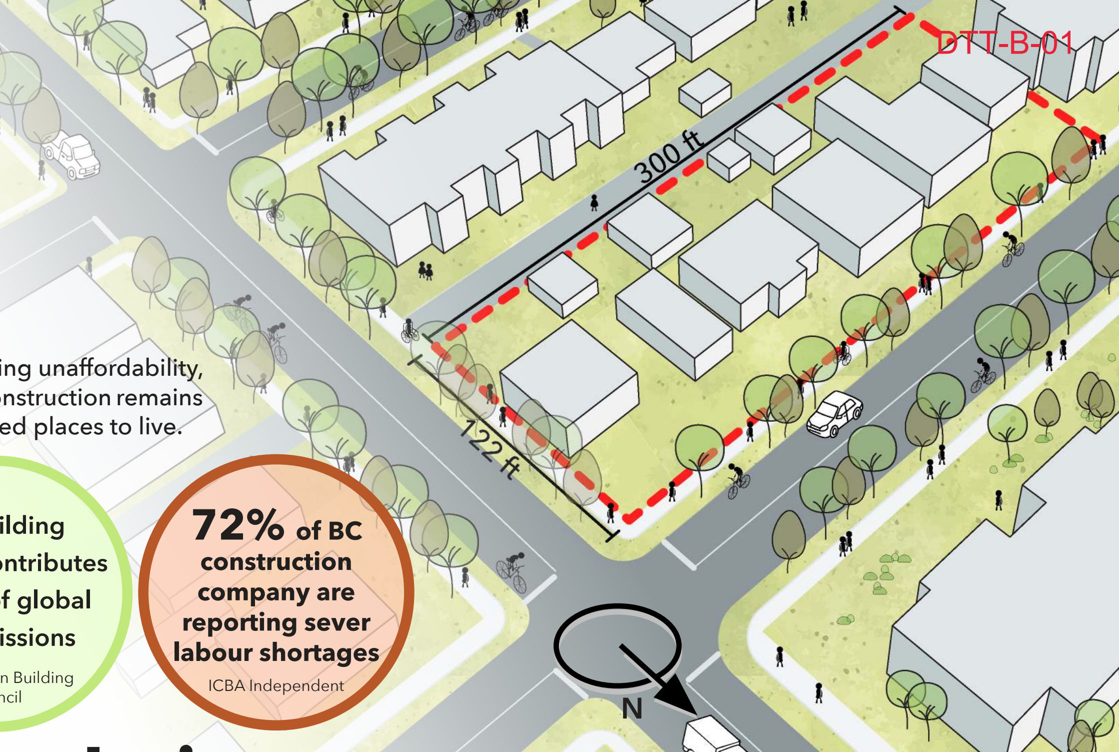
DTT-B-01

ROOTED IN RESILIENCE

decoding affordable Indigenous housing with mass timber

problem statement:

The City of Vancouver is facing the interconnected challenges of climate change, housing unaffordability, and a critical need for Indigenous housing rooted in cultural identity. Yet conventional construction remains carbon-intensive and inefficient, often failing to create inclusive and community-oriented places to live.



1/3 of Vancouver's unhoused are Indigenous
BC Non Profit Housing Association, 2023

Rework accounts for: **~12%** of total construction value **27%** of total construction time
Becht & AXAXL

6/10 Canadians surveyed have little or no sense of community
YMCA Canada

The building industry contributes **39%** of global CO_2 emissions
World Green Building Council

72% of BC construction company are reporting sever labour shortages
ICBA Independent

the vision:

To create vibrant, sustainable communities where mass timber design celebrates nature, supports intergenerational living, and fosters connection through ***housing affordability, systemized construction, and Indigenous-led design approaches***.

study site

The study site is located in *TOA Tier 2* where the surrounding context is primarily *low-rise residential*. It is within a five-minute walk of rapid transit, shops, services, and green space, making it highly accessible and well-connected.

The property consists of a large block-end assembly of *six 50′ x 122′* lots, totalling 36,000 square feet. It is a north-facing site that fronts onto a local residential street, with lane access at the rear. The site lies on the shared territories of the *Musqueam, Squamish, and Tsleil-Waututh Nations*. It is situated in a seismic zone and experiences frequent rainfall, which are important considerations for design and construction.

existing site conditions

housing types: single-family homes, duplexes, townhouses, often with private yards

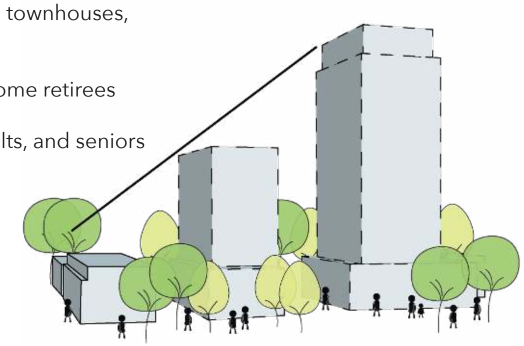
households: primarily families, couples, and some retirees

age groups: mix of children, middle-aged adults, and seniors

height limit: up to 2.5 storeys

density : 2.5 FSR

zoning: RT-4 (Two-Family Dwelling District)



This development is driven by the *Seven Laws of Life–Health, Happiness, Humbleness, Generations, Generosity, Forgiveness, and Understanding*. It ensures that the built environment reflects these values in the way homes are shaped, spaces are shared, and community is nurtured. The proposed "decodes" advocate for widespread applicability and repeatability of mass timber. With consideration of life cycle costs and operations of the building, it aims to fill in the gap between building code, zoning, & other regulations and the delivery of sustainable developments.

DTT-B-01

comparative advantages of mass timber

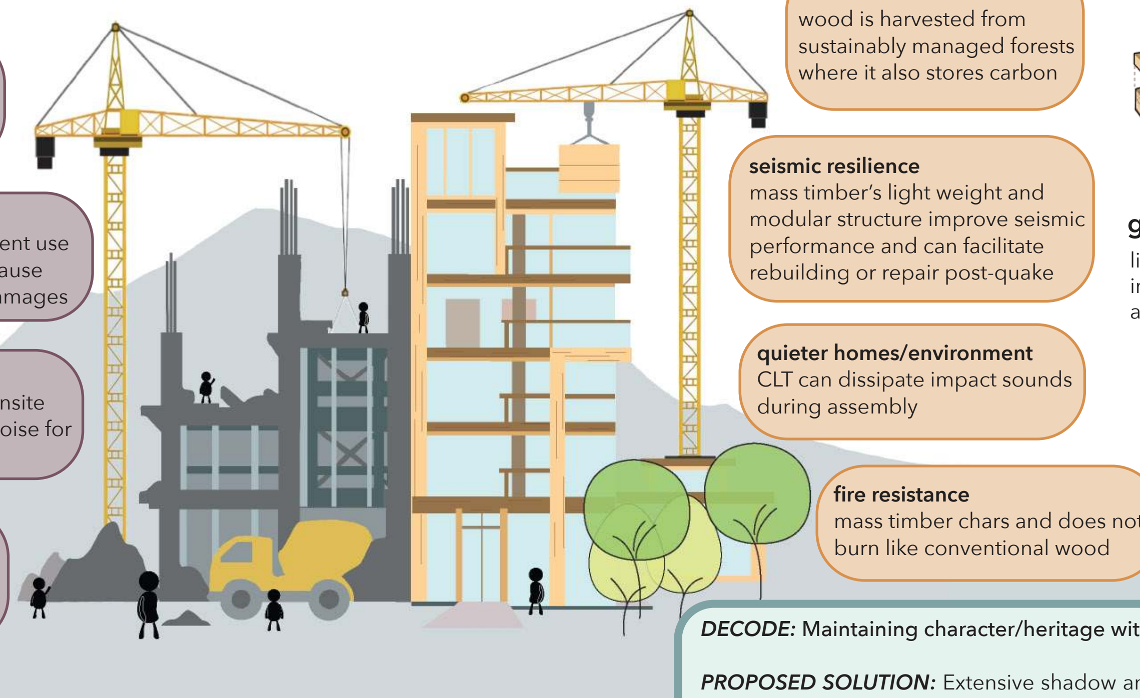
Highlighting how mass timber builds like Lego: fast, light, and green, while concrete is slow, heavy, and carbon hungry.

slow to build
concrete needs time on site to solidify before it can support the weight of floors above

non-renewable resource
mining for gravel, sand and cement use up valuable resources and can cause irreversible natural landscape damages

higher noise levels
dense concrete transfers noise, onsite construction will produce more noise for surrounding neighbours

higher labour costs
require larger crews over longer periods making the process labour intensive



fast to build
prefabricated modular mass timber is designed for assembly, making it fast to build, less labour-intensive, and cost-efficient

renewable resources
wood is harvested from sustainably managed forests where it also stores carbon

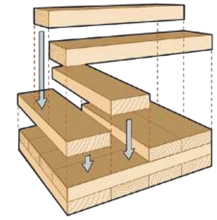
seismic resilience
mass timber's light weight and modular structure improve seismic performance and can facilitate rebuilding or repair post-quake

quieter homes/environment
CLT can dissipate impact sounds during assembly

fire resistance
mass timber chars and does not burn like conventional wood

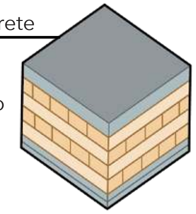
timber components

A giant IKEA kit of beams, walls, and panels: prefabricated in factories and assembled with precision on site.



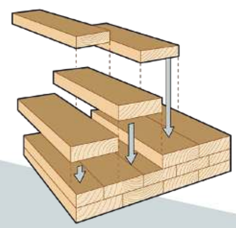
cross-laminated timber

large engineered wood panels layered and stacked in alternating directions and glued together to be used in floor, roof, load-bearing and core walls



gypsum-concrete topping

lightweight layer poured over CLT floors to improve fire resistance, sound insulation, and provide a smooth base for finishes



glued-laminated timber

bonding layers of dimensioned lumber with durable adhesives to create strong, versatile beams and columns

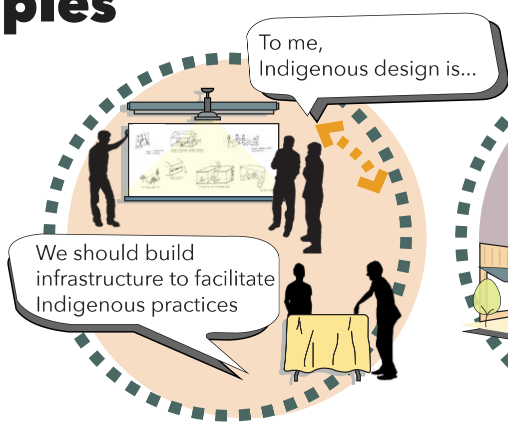
DECODE: Maintaining character/heritage with specfic infill guidelines

PROPOSED SOLUTION: Extensive shadow and view cone studies ensure 8–12 storey buildings minimize community impact, with modular assembly reducing acoustic and construction disruptions. An exemption is sought for mass timber buildings to bypass infill regulations given their prefabricated modular nature.

guiding principles

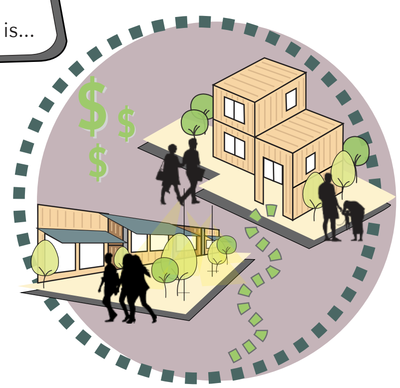
sustainability/resilience

Prioritizing energy efficiency, renewable systems, and low-carbon materials to reduce emissions while ensuring long-term environmental & economic sustainability



Indigenous led design

Guided by Indigenous leadership to celebrate cultural identity and ancestral knowledge while shaping housing that reflects community self-determination

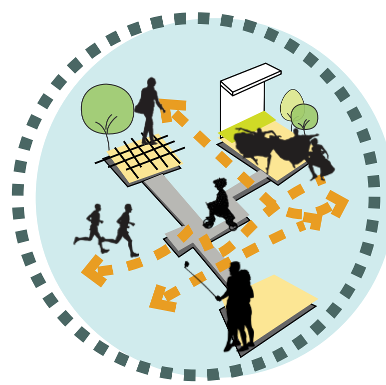


affordability

Streamlined building methods and supportive financing mechanisms ease upfront expenses, enabling broader access to high-quality housing

accessibility/inclusivity

Design features remove physical and social barriers, ensuring people of all ages and abilities can participate fully in community life

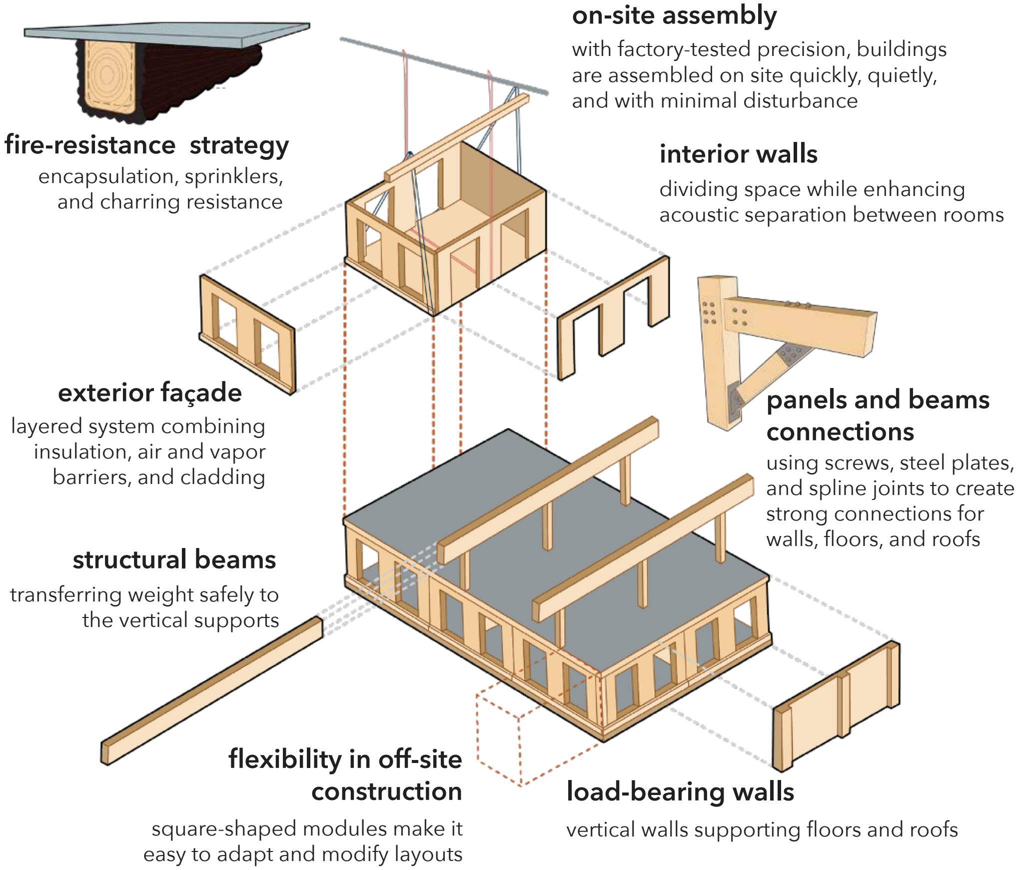


liveability/sociability

Thoughtful layouts and inviting common areas cultivate vibrant daily life, encouraging interaction and strengthening neighborhood bonds

building assembly

Mass timber is designed for assembly, not traditional construction. Prefabricated beams, walls, and façades are manufactured offsite, then quickly assembled on a slab foundation. This approach reduces labor, time, and disruption while delivering flexible, durable, and low-carbon buildings.



Mass timber buildings require protected connectors, durable envelopes, and careful detailing to meet safety and energy codes. This includes ensuring fire protection, weather resistance, and acoustic performance, while also addressing challenges like shrinkage, wood variability, and thermal bridging to deliver safe, efficient, and long-lasting multi-storey construction.

DECODE: Code complexity & Labour skills gap

BARRIER: Navigating fire ratings and exposed timber rules is challenging and there are few contractors are trained in CLT and glulam assembly.

PROPOSED SOLUTION: The BC Building Code 2024 now allows encapsulated mass timber construction (EMTC) up to 18 storeys for residential mixed-use.
Each building of this development will comply with the EMTC regulations for safety, ensuring adherence to structural, fire protection, and accessibility standards that safeguard both residents and the broader community.

ground floor floor plan

5th floor floor plan

studio | accessible 1 bed | 1 bed + 1 den | 1 bed | 2 bed | 3 bed | 4 bed

retail/commerical/ workspace | lobby/ maintenance | community/ cohousing spaces

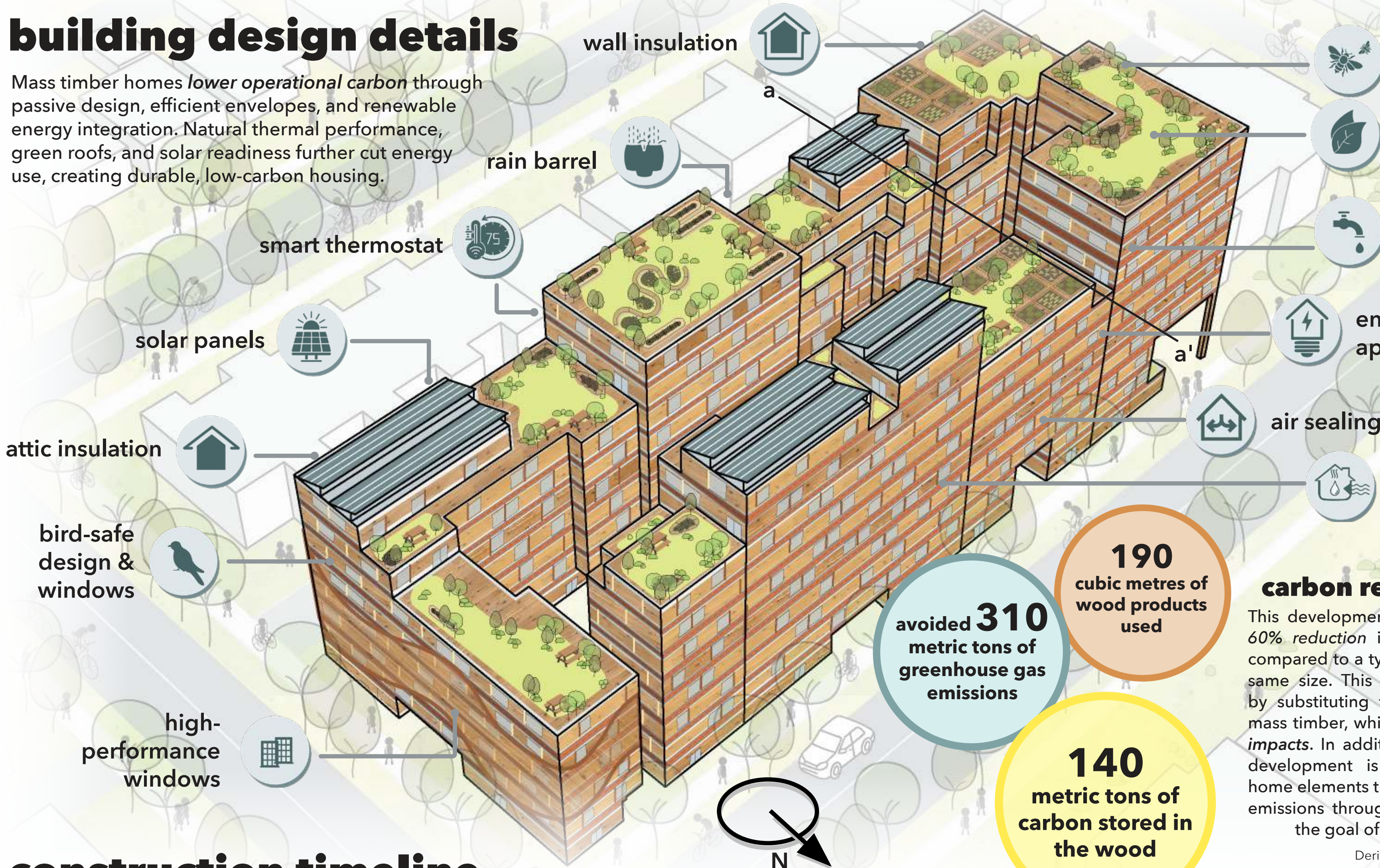
studio	15 units	residential net area	134,850 sf
accessible 1 bed (ADA/elder)	13 units	retail/commercial/workspace (1st floor)	11,000 sf
1 bed + 1 den	15 units	daycare/community use	2,500-3,000 sf
1 bed	40 units	amenity space	11,081 sf
2 bed	50 units	non-rentable common space	26,318 sf
3 bed	28 units		
4 bed (cohousing pods)	10 units		

social rationale

This development offers a wide variety of unit types, ranging from studios and accessible suites to larger family units and cohousing pods, ensuring inclusivity across household needs. Cohousing elements including shared kitchens, dining and living areas, and resource-efficient communal spaces helps to promote collective energy management and reduce per-capita energy use. Complementing the diverse housing mix, Indigenous-owned local-serving retail and flexible community spaces will provide vital services and third spaces.

building design details

Mass timber homes ***lower operational carbon*** through passive design, efficient envelopes, and renewable energy integration. Natural thermal performance, green roofs, and solar readiness further cut energy use, creating durable, low-carbon housing.



190 cubic metres of wood products used

avoided **310** metric tons of greenhouse gas emissions

140 metric tons of carbon stored in the wood

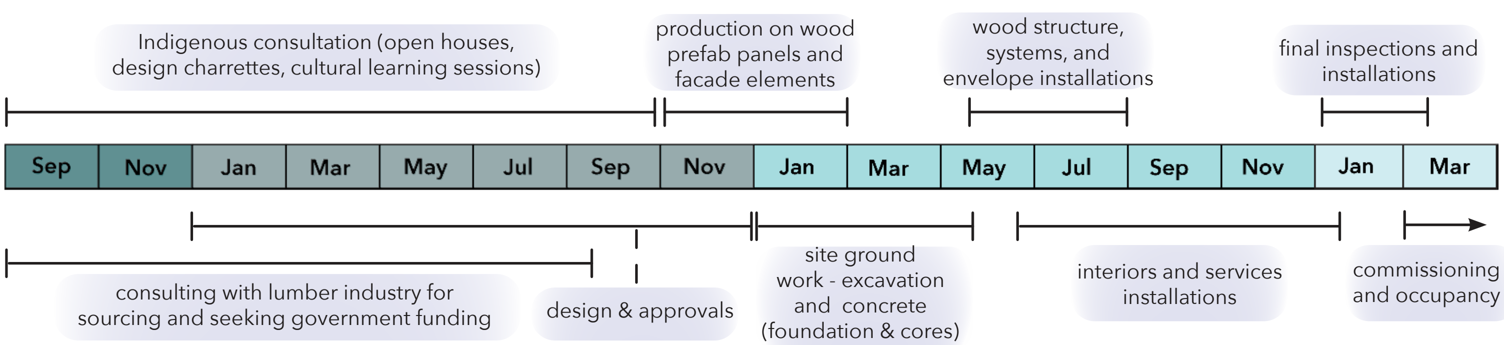
carbon reduction rationale

This development achieves an estimated *55-60% reduction* in upfront embodied carbon compared to a typical concrete building of the same size. This reduction is primarily driven by substituting the traditional concrete with mass timber, which significantly ***lowers carbon impacts***. In addition, the buildings within this development is designed with sustainable home elements that reduce operational carbon emissions throughout its lifecycle, supporting the goal of achieving a net-zero building.

Derived from WoodWorks Carbon Calculator

construction timeline

The mass timber construction timeline accelerates delivery by streamlining structure assembly, prefabricated panels allow the wood structure and envelope to rise far faster than traditional concrete, minimizing disruption on-site.



DECODE: Supply Chain & Approvals

BARRIER: Limited supplier base, and variable comfort among Authorities Having Jurisdiction.

PROPOSED SOLUTION: Support federal/provincial investment in Canadian CLT/Glulam aims to diversify supply and stabilize costs.
Formalize streamlined peer-review/third-party inspection protocols to reduce delays and redundant soft costs.
Create catalogues of pre-approved mass timber systems and provide training for building officials on EMTC and risk pathways, helping reduce permitting delays and overly cautious default decisions.

day in the life

Beyond addressing the urgent need for affordable housing, this mass timber development reflects Indigenous values of stewardship and kinship, where wood is more than a material but a *living connection to land and culture*.

Designed as both housing and a space for cultural preservation and celebration, it welcomes Indigenous peoples from diverse nations across Canada. Here, mass timber nurtures not just the buildings, but a way of living together–grounded in care, belonging, and collective well-being.

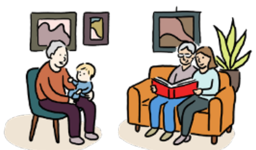
DECODE: Separation to neighbours/exposure protection

BARRIER: On RT lots, meeting exterior wall fire-resistance and unprotected opening limits next to low rise residential can pinch windows and push setbacks.

PROPOSED SOLUTION: Seeking flexibility in building separation requirements, as the design strategically pushes towards setbacks to create a more engaging and interactive streetscape. Direct proximity to neighbouring buildings is limited, minimizing potential impacts while complying with acoustic and fire code regulations.

community build **confidence and safety** together in a self-defense class

in shared gardens framed by wood, the community grow food together– building self-sufficiency, resilience, and connection through **urban agriculture**



elders share stories, **connecting generations** under one roof

neighbors of all ages cook together, sharing recipes, culture, and stories while **honour traditional food practices**

priotizing infrastructure to promote **active modes of travel** while reducing reliance on cars, making everyday travel enjoyable

in the warm and bright ambience of mass timber, it caries the natural aroma of wood creating a sensory-rich community space

perfect for **Indigenous-led** *practices* like drumming and Coast Salish weaving to fill the space with culture, teaching, and community

over a rooftop barbecue, neighbours share food, jokes, and plans for the upcoming **community pop-up event**

a sauna can serve as a modern way to honour the tradition of fire in urban Indigenous culture, echoing the role of sweat lodges as **places of ceremony, healing, & connection**

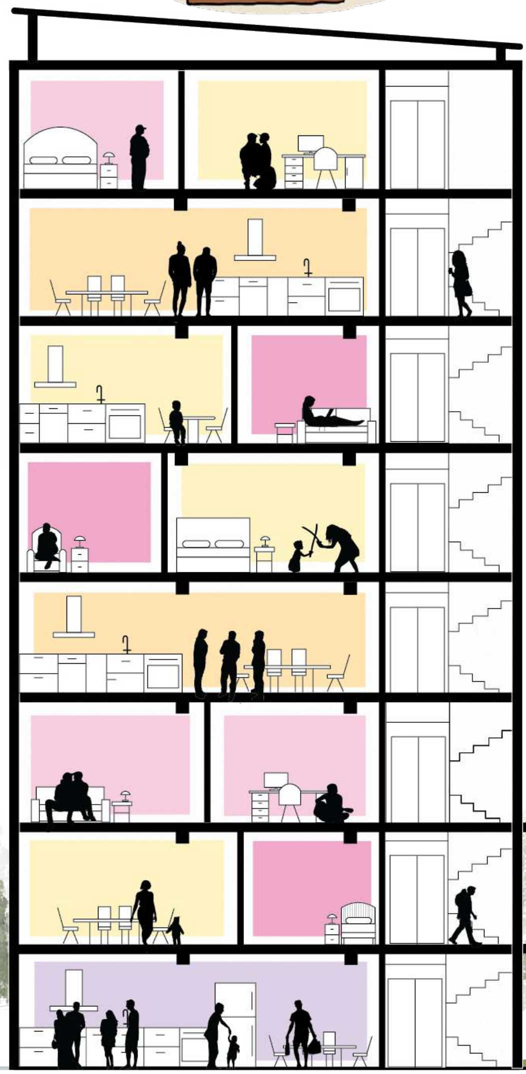
with an **Indigenous-owned** bike workshop (**commercial use**) right on the block, neighbors can fix and maintain their rides without leaving the community

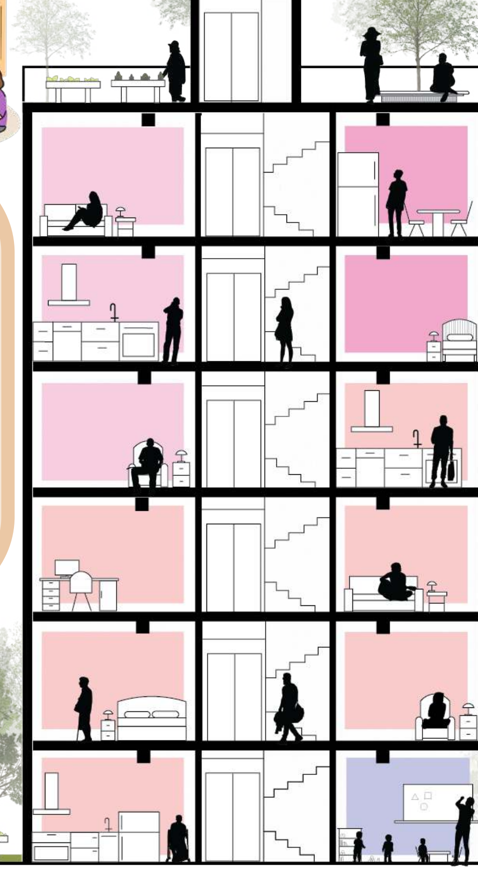
easy and afforable **daycare** drop-off, right at home

DECODE: Mixed-use isn't generally permitted in low-density residential zones.

BARRIER: Current zoning RT-4 districts allow multiplex/duplex/infills; ground-floor retail is not a listed outright use.

PROPOSED SOLUTION: Rezoning to RM-8 district with exception of 8-12 storeys and increased density. Seeking allowances for mass timber buildings in off-arterial mixed-use locations, supporting revenue diversification and enhancing the potential for higher development returns.





section a-a'

pro forma

FSR	4.79	# of storeys	8-12 storeys
lot size	36,600 sf	# of residential units	171
net building size	175,447 sf	# of bedrooms	307
efficiency	85%	amenity space	11081 sf
non saleable/rentable	26317 sf	non-residential	14280 sf

		concrete cost		mass timber cost	
below grade	0	$315/sf	$0	-	$0
based floor	18,468 sf	$360/sf	$6,648,480	$300/sf	$5,540,400
above 1st storey	156,979 sf	$405/sf	$63,576,495	$250/sf	$39,244,750
exterior hallway (2^{nd}&3^{rd} floor)	1200 sf	$250/sf	$300,000	$200/sf	$240,000
labour	175,447sf	$29/sf	$5,087,964	$18/sf	$3,158,046
schedule costs	$50,000	18 months	$900,000	16 months	$800,000
			$76,512,93		$48,983,196

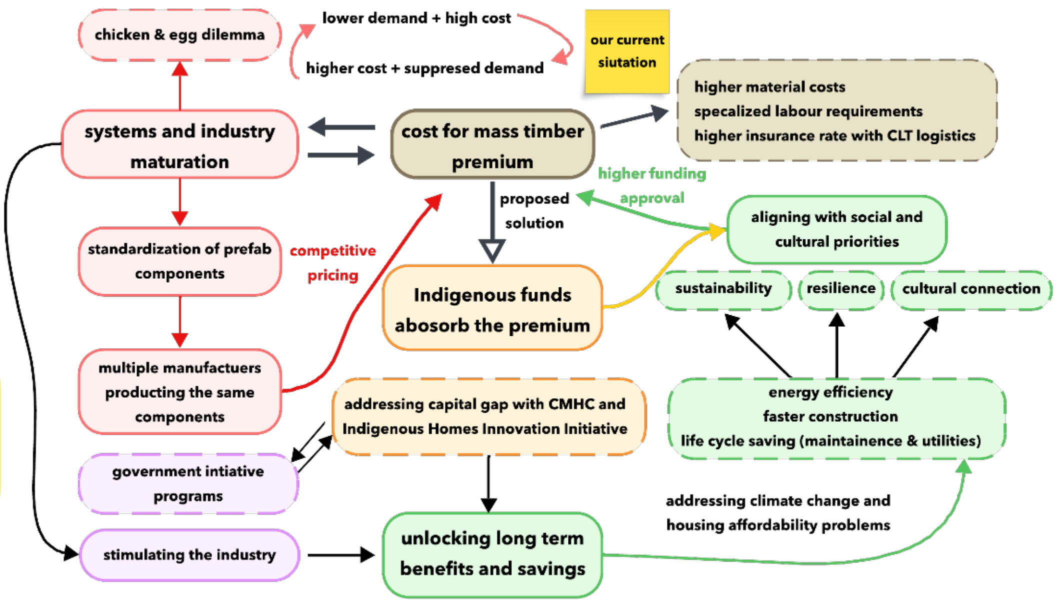
DECODE: Material premium, insurance & finance

BARRIER: Conservative risk pricing for mass timber increases builder's risk premiums and financing.

PROPOSED SOLUTION: Expand actuarial data from Canadian and international mass timber projects to demonstrate performance parity in fire and water risk, and partner with CMHC and provincial insurers to pilot reduced premiums for projects meeting enhanced moisture and fire protection protocols. Demonstrate lower lifecycle risk to help lenders price more competitively.

economic rationale

An 8–12 storey mixed-use mass timber development in Vancouver shows clear economic advantages, with total costs nearly ***36% lower*** than concrete construction ($48.9M vs $76.5M), largely due to ***reduced labour, faster schedules, and lighter structural systems***. While mass timber currently faces higher material premiums and specialized labour costs, these can be offset through Indigenous funds, government initiatives, and industry standardization.



LALP HOME

Our Vision:

Our vision for Lalp is not only to raise the bar for affordable, and livable government provided housing, but to do so by utilizing innovative, yet proven mass timber pre-fabrication strategies. Guided by core industrial engineering and lean construction principles, the project will be constructed very efficiently. Furthermore, the project aims for holistic financial and environmental sustainability by facilitating residents' economic participation. Finally, the residence's inclusion of Indigenous-inspired spaces thoughtfully recognizes and honors the local First Nations communities and their land.

Key Goals:

- Easily built point supported CLT prefab design
- Quick organized construction with zero delays
- Provide all needs for the lower and middle classes
- Enhance land with native spaces

Construction Process

Lean Construction:

Just-in-Time (JIT) Delivery

JIT Relies on factory supplied construction material, such as mass timber being delivered only when ready for asembly. For Lalp House construction, timber will only be ordered/delivered at the time the next floor is ready to be assembled. This will prevent excess inventory on the construction site, an important consideration since both buildings will be under construction simultaneously.

Slot & Tab Assembly

A method from the metal assembly playbook, reimagined with prefab mass-timber. Slot and tab assembly reduces incorrect part installation instances and reduces assembly time on site. It is also easily achievable with modern timber CNC milling machinery.

CEDAR HAUS (Square)

FSR	4.1
Lot size (sq ft)	18,300
Building sq ft Above Grade	74400
Building efficiency (%)	85
non saleable/rentable (sq ft)	11160
saleable/rentable (sq ft)	63240
Total Stories (#)	11
Stories below grade (#)	0
Base floor (#)	1
Above 1st storey (#)	10
Units (#)	84
Bedrooms (#)	144
Amenity space (sq ft)	3100
Non-residential (sq ft)	2700

CONSTRUCTION COSTS

		Concrete		Submission	
	Square footage	$/sq ft	Cost	$/sq ft	Cost
Below grade	0.0	$315	$0	$45	$0
Base floor	6400.0	$360	$2,304,000	$45	$288,000
Above 1st storey	68000.0	$405	$27,540,000	$45	$3,060,000
	Quantity	$/unit		$/unit	
Balconies	0	$25,000	$0	$25,000	$0
	Cost per month	# Months	Cost	# Months	Cost
Schedule Costs (Monthly Overhead)	$50,000	18	$900,000	12	$600,000
TOTAL			$30,744,000		$3,948,000

EMBODIED CARBON

		Concrete		Submission	
	Sq ft	Embodied Carbon kg/sq ft	Total Carbon	Embodied Carbon kg/sq ft	Total Carbon
Total Building Sq Footage	74400.0	6.69	497663.088	2.5	186000

FIR HAUS (Rectangle)

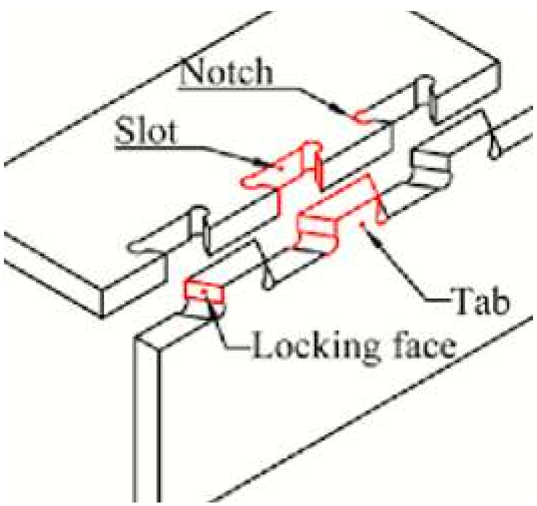
FSR	3.6
Lot size (sq ft)	18,300
Building sq ft Above Grade	65600
Building efficiency (%)	85
non saleable/rentable (sq ft)	9840
saleable/rentable (sq ft)	55760
Total Stories (#)	12
Stories below grade (#)	6
Base floor (#)	1
Above 1st storey (#)	5
Units (#)	75
Bedrooms (#)	60
Amenity space (sq ft)	4400
Non-residential (sq ft)	4800

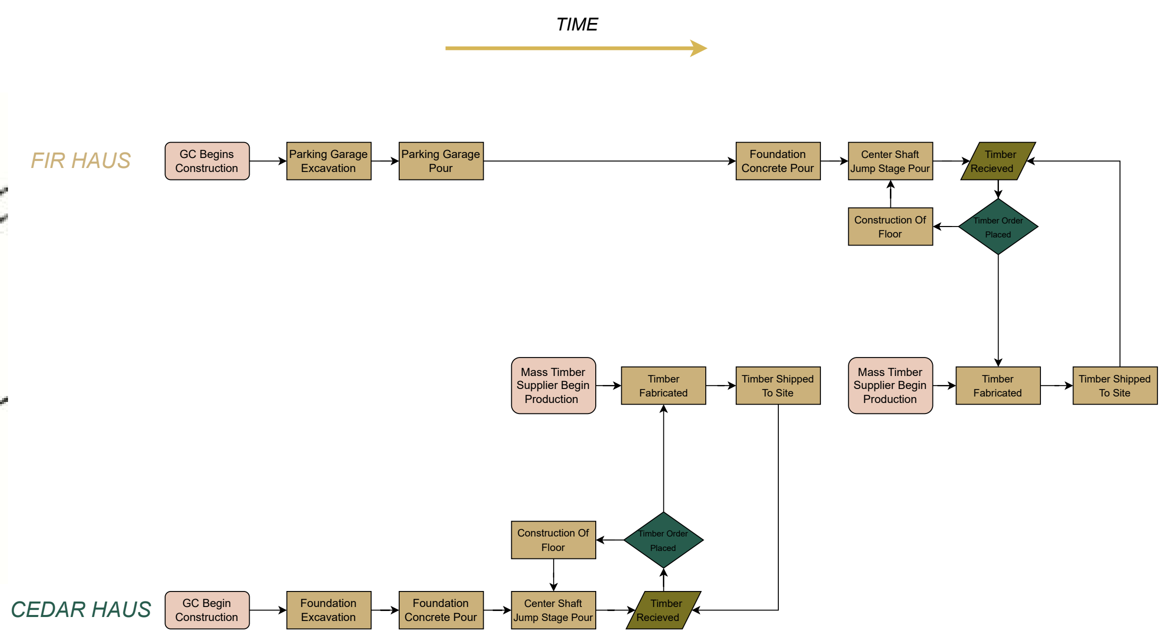
CONSTRUCTION COSTS

		Concrete		Submission	
	Square footage	$/sq ft	Cost	$/sq ft	Cost
Below grade	38400.0	$315	$12,096,000	$45	$1,728,000
Base floor	9600.0	$360	$3,456,000	$45	$432,000
Above 1st storey	56000.0	$405	$22,680,000	$45	$2,520,000
	Quantity	$/unit		$/unit	
Balconies	0	$25,000	$0	$25,000	$0
	Cost per month	# Months	Cost	# Months	Cost
Schedule Costs (Monthly Overhead)	$50,000	18	$900,000	12	$600,000
TOTAL			$39,132,000		$5,280,000

EMBODIED CARBON

		Concrete		Submission	
	Sq ft	Embodied Carbon kg/sq ft	Total Carbon	Embodied Carbon kg/sq ft	Total Carbon
Total Building Sq Footage	104000.0	6.69	695658.08	2.5	260000

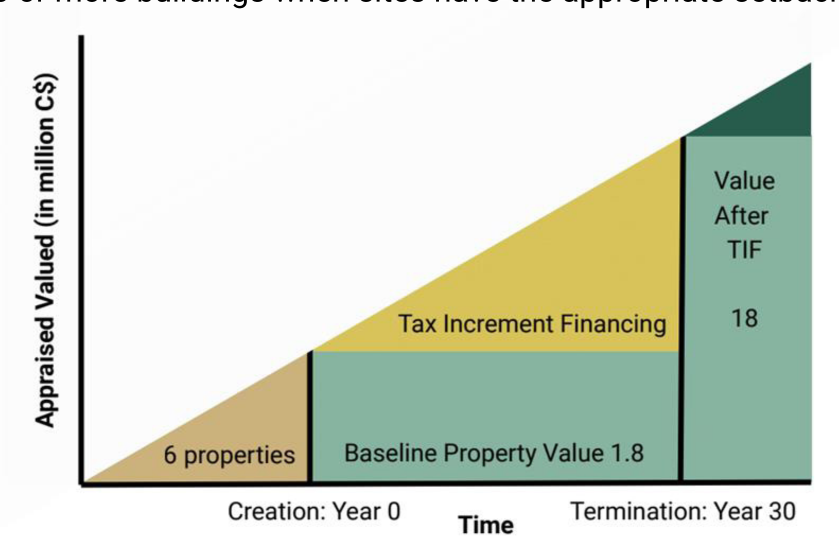




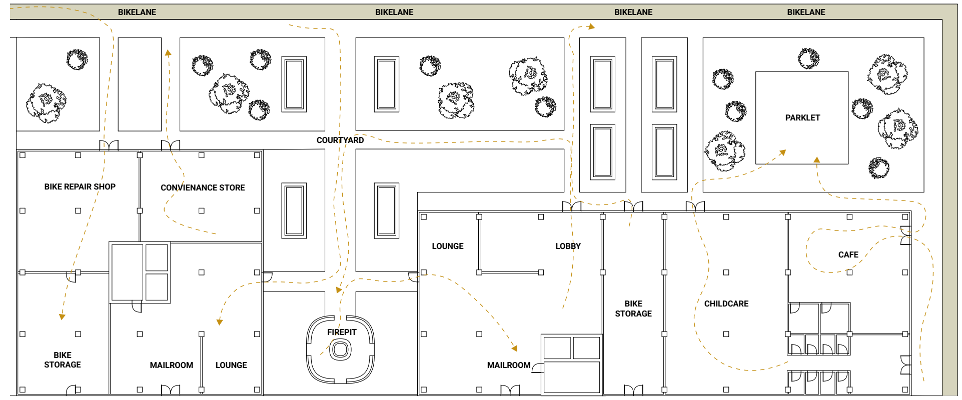
Zoning

Relationship to existing building code: where is it compliant and where does it challenge BC building code and why are these changes proposed: The two units fit under new zoning regulation, but the hybrid building is new with two buildings on one site plan.

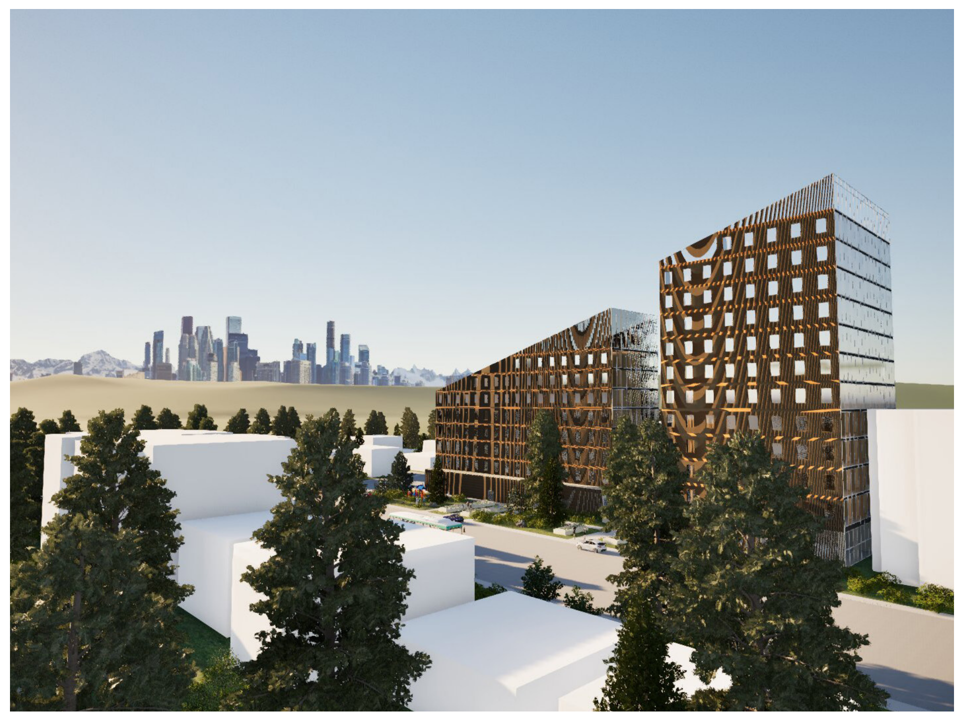
The existing zoning is commercial MX which fits within: “Within residential zones, additional nonresidential uses beyond the minimum street front requirement are allowed, provided residential uses comprise at least 50% of the total building square footage. Within nonresidential zones, there are no additional mixing requirements beyond ground floor requirements.” This however, challenges the single structure. It is proposed to allow for two or more buildings when sites have the appropriate setbacks.



This graph shows the change over the next 30 years with renters. Because the tax base will remain at the same rate (roughly estmated to be 300,000 C$ per 6 lots = 1,800,000 C$). This will be the tax rate over the next 30 years. It is estimated that it will be at a minimum valuation of 18 million after the 30 years.

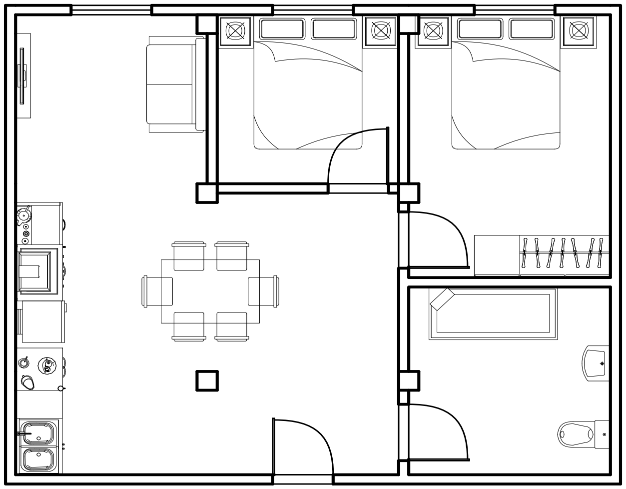


The property will buy land for a bike lane in the street and convert it to a one way, smaller street from 10 to 9.5 foot width. This will be a traffic calming measure and increase biking safety for residents.

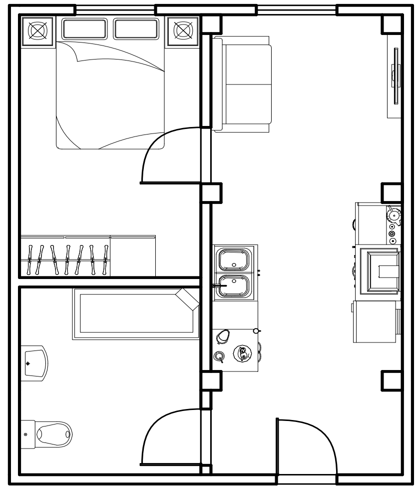


Floor Plans | Pricing | Liveability

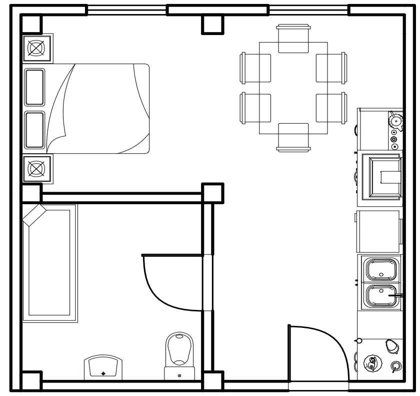
DTT-B-02



Two Bed (750 sq. ft.):
70 units, 1875C$



One Bed (500 sq. ft.):
55 units, 1500C$



Studio (400 sq. ft.):
20 units, 1125C$

A tax increment area (TIA) or tax increment financing (TIF) is a way for the BC government to fill in gaps of manufacturing the more expensive mass timber units. Due to high demand for affordable housing, it will take more time to fill all of the units and turn them into profits. To speed up this process, this and subsequent units will be financed with TIF to freeze current rates for the next 30 years, or until 2055. This would need to be overseen by government appointed board.

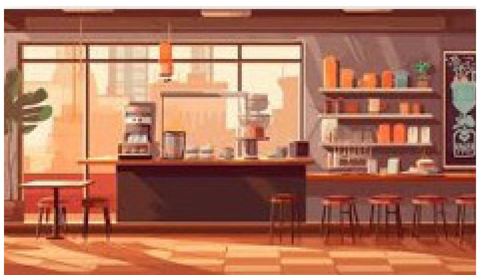
Championing Change Through Sustainability

Socioeconomic:

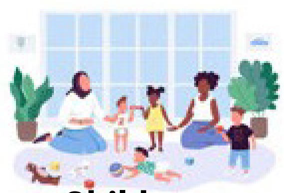
The following building amenities and commercial locations will help contribute to both social stability and economic growth by providing all needs in a quick-to-access location, within the mass timber prefab setting.

Bike Storage

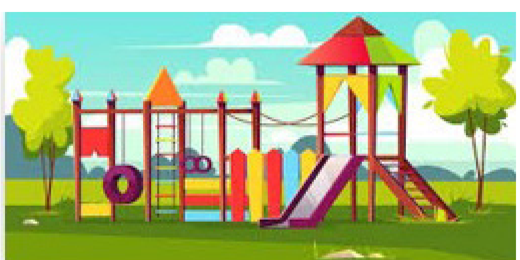
Bike Repair Shop



Cafe



Childcare



Parklet

Environmental:

This project will have less upfront carbon emissions than traditional rebar and construction-based techniques. The trees sequester and will contain carbon. Furthermore, timber isn't toxic, so PPE will still have to be worn by workers on site but will have less long lasting consequences compared to concerns on inhaling when concrete dust is present. Those working on Spruce unit will need extra precautions given the inherent nature of digging and pouring concrete below grade for the underground parking garage.

This building is environmentally sustainable and LEED Gold certfied with electricity from solar, wind, and other renewables.

MOVING WOODS

Resource - Community - Variation

INTRODUCTION

The theme ***Decoding Timber*** and its relationship to the broader district is explored through spatial, architectural, and ecological ideas. Landscapes and environments become exemplars of timber construction and mid-scale building typologies. The concept of an archipelago shapes the urban fabric: clusters of buildings dispersed among open, ravine-like corridors that cut across streets and public spaces, offering an alternative to the dominance of the abstract grid. Instead of rigid order, this approach proposes a system of expandable and interconnected forest fragments, neighbourhoods, and communities. This integration suggests a deeper relationship between forests and forest products, beyond material specification, by linking ecological, economic, and cultural values back to the forest itself.

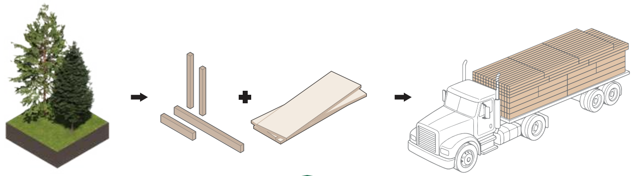
Varied patch clusters, each with distinct scales, typologies, and open-space conditions, establish a dynamic framework of limits, proximities, and contrasts. Transformation within and between clusters encourages creative competition, fosters ownership, and reinforces social identity. Courtyard typologies, in particular, generate strategies of community-making: deck-access housing and neighbourhoods are strongly tied to pedestrian-oriented courtyards, where streets become shared social spaces. The courtyards themselves create instant communities.

At the city's transit hub, boundaries between interior and exterior space are pushed to an extreme. Defined by three concentric circular forms—including a tree library—the hub becomes both an infrastructural node and a celebration of timber architecture.

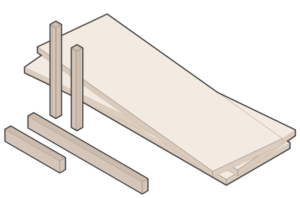
Ultimately, this urban vision situates resource, industry, and community locally, with mass timber as its central medium. Timber here is more than material: it is an essential resource that moves from forest to manufacturer to people, reconnecting the city to its environment. Through housing, affordability, climate action, and design, timber becomes the framework for a new kind of city - ***Moving Woods.***

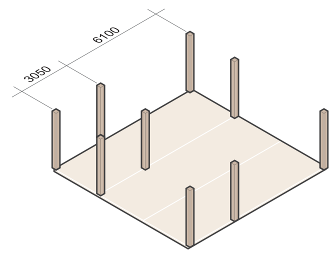
Within Site B // L Building Courtyard

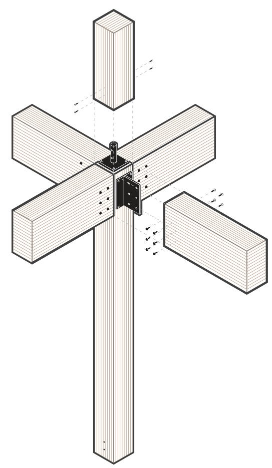
Goals + Key Moves // Low-Carbon, Standard Construction, Local, Variations

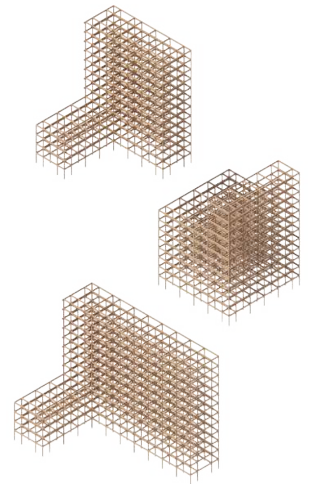


1.
Local Resources and Transporation // Reduces Embodied Carbon + Construction Time









2.
Five Local Standard Mass Timber Sizes // Glulam + CLT Mass Manufacturing

3.
Standard Column Spacing // Standard Sizes + Ease of Construction

4.
Easy + Quick Timber/Steel Hybrid Constrction // Lower Carbon Emissions

5.
Modular + Endless Structure Configurations // Quick Expansion + Program Variety

Site B - Whole Block - Plan

Resident Walkway // Front Entrances // Screens - Venetian Blinds - French Doors

FSR	4.59214318
Lot size (sq ft)	13,186
Building sq ft Above Grade	60552
Building efficiency (%)	85
non saleable/rentable (sq ft)	9082.8
saleable/rentable (sq ft)	51469.2
Total Stories above grade (#)	12
Total Stories (#)	12
Base floor (#)	1
Above 1st storey (#)	11
Stories below grade (#)	0
Units (#)	58
Bedrooms (#)	86
Amenity space (sq ft)	8310
Non-residential (sq ft)	8310

Proforma

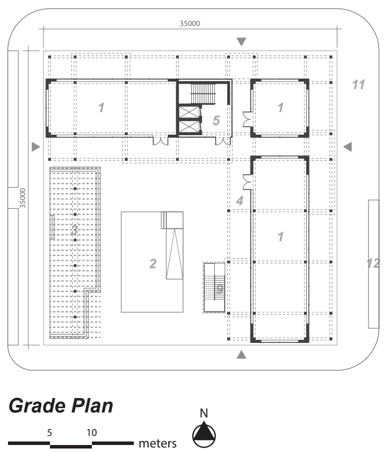
Using the standard pricing, we achieved a slighly more expensive build but in much less time with modular building and standard mass timber product sizing

CONSTRUCTION COSTS

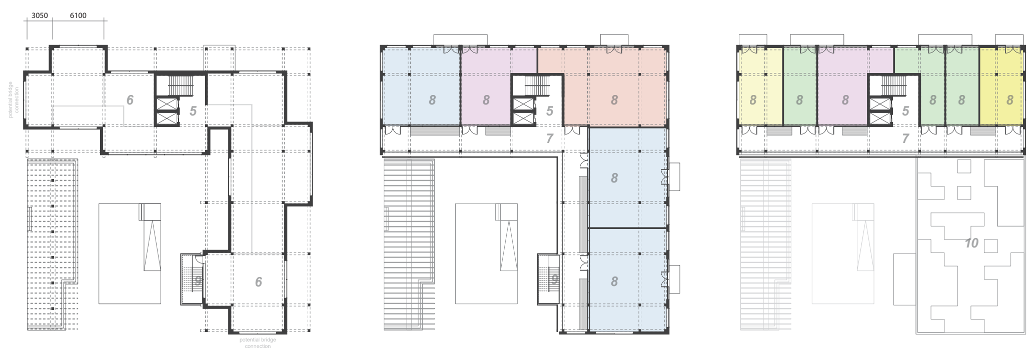
		Concrete		Submission	
	footage	$/sq ft	Cost	$/sq ft	Cost
Below grade	0.0	$315	$0	$0	$0
Base floor	3396.0	$360	$1,222,560	$403	$1,368,588
Above 1st storey	57156.0	$405	$23,148,180	$431	$24,634,236
	Quantity	$/unit		$/unit	
Balconies	40	$25,000	$1,000,000	$25,000	$1,000,000
	month	# Months	Cost	# Months	Cost
Overhead)	$50,000	18	$900,000	14	$700,000
TOTAL			$26,270,740		$27,702,824

EMBODIED CARBON

		Concrete		Submission	
	Sq ft	Carbon	Total Carbon	Carbon	Total Carbon
Total Building Sq Footage	60552.0	6.69	405033.539	2.69	162884.88



Grade Plan



2nd Floor Plan

3rd-4th Floor plan

5th-12th Floor Plan

L Building Floor Plans - Project Data

KEY

1. commercial/amenity
2. sponge courtyard
3. trellis
4. loggia walkway
5. core
6. community/flex space
7. exterior walkway
8. units
9. exterior stair
10. rooftop terrace
11. sidewalk
12. verge

LEGEND	QUANTITIES	
studio	24	studio
1 bedroom	16	1 bedroom
2 bedroom	10	2 bedroom
3 bedroom	6	3 bedroom
4 bedroom	2	4 bedroom

8 storeys
58 units
86 bedrooms

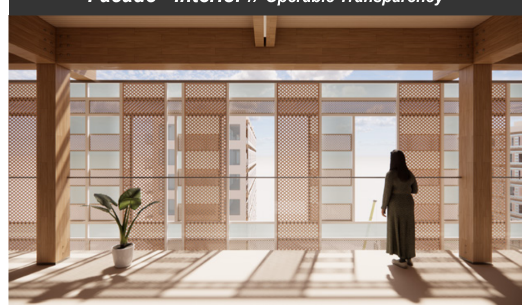
Volume of Wood Used: 2846 m³	US/CAD Forest Growth: 2846 m³ of wood in 8 minutes	Carbon Stored in Used Wood: 2535 metric tons of CO2	Avoided Greenhouse Gas Emissions: 981 metric tons of CO2	Carbon Benefit: 3516 metric tons of CO2	Equivalent to: 743 Cars off the road for a year	Equivalent to: Energy to operate 371 homes for a year

Using the Woodworks carbon calculator we calculated the stats of a single L-Building typology. The volume of wood stated consists of the structure, flooring, ceiling, and interior wallframing of our design.

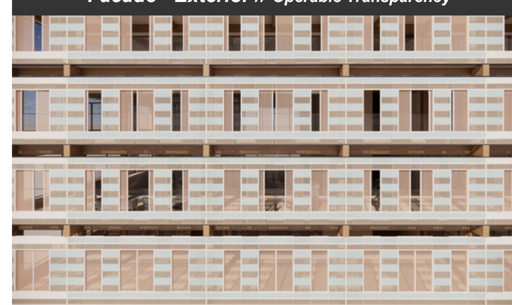
L-Building Typology - WoodWorks Carbon Calculator

The modular screen friezes function as adaptive climate-control systems, regulating solar gain, shading, and ventilation. Organized as coordinated yet varied sequences, they introduce a layer of responsiveness without uniform repetition. Operable panels and Venetian blinds provide residents with direct control over thermal comfort and daylighting. At the urban scale, these vertical elements articulate the skyline, mediating between the city and the riverfront while reinforcing their spatial and visual connectivity.

Facade - Interior // Operable Transparency



Facade - Exterior // Operable Transparency



Our proposal replaces the conventional grid of single-family blocks with a decentralized urban scheme, where the "city neighbourhood" is reimagined as a series of fragmented clusters. These smaller neighbourhood "islands" are separated by voids, open/ravine-like corridors that intertwine with streets and pedestrian routes. The voids operate as unclaimed yet collective space, forming fractal patterns of courtyards and public realms that host temporal programs with overlapping cycles of activity. By preventing continuous, undifferentiated massing, these voids allow the city to breathe ecologically, socially, and spatially.

Site B demonstrates this vision at the block scale, a city within a block. The site footprint extends across the full 130m length of the block and is subdivided into 35m x 35m modules, separated by two 12.5m-wide pedestrian streets. This module is mirrored across the east–west axis, reinforcing walkability and permeability within the larger block.

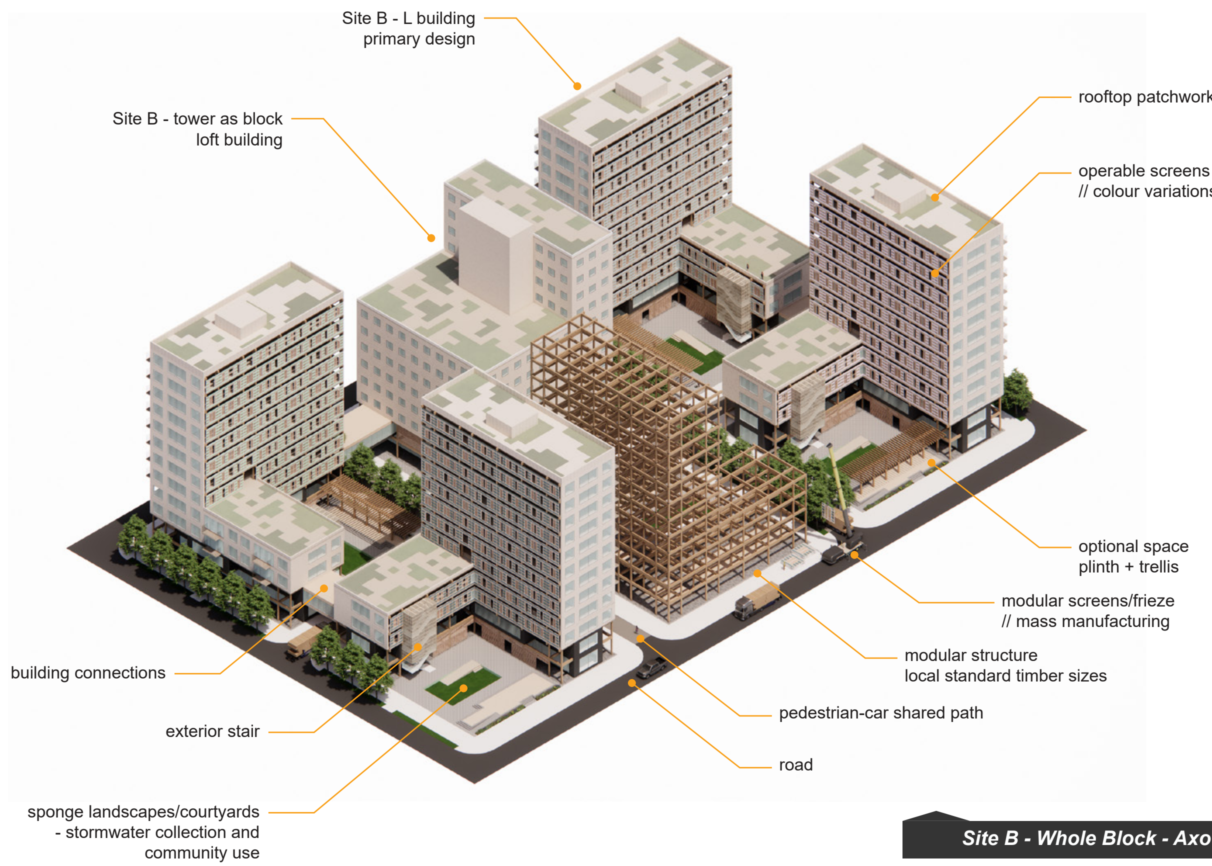
Timber is central to the project, specified across multiple building typologies: tower-like courtyard apartments, loft-style block buildings, and hybrid mid-rise forms. Site B, together with sites A, C, and D, anchors a larger cluster system, extending connections to neighbouring islands and embedding itself in a dynamic, relational urban fabric.

On the block's north side, two ***L-Shaped Courtyard Buildings*** frame a shared collective space. Each L-type is defined by a taller north-facing wing and a lower street-facing leg, with open sides oriented inward. Circulation is organized through single-stair towers with open internal walkways overlooking the courtyards. At the hinge of each L, stair and elevator cores integrate with screened façade elements that act as environmental modifiers.

Between these two L-shaped types sits the ***Tower as Block/Loft building***, a modular structure that spans the full depth of the block. Its recessed ground floor accommodates colonnaded service areas, an adaptable makerspace, and a food hub or supermarket. Above, the second floor provides office space, while the upper levels house loft apartments. A communal roof terrace extends from the tower's upper wing, providing elevated outdoor space and reinforcing the project's emphasis on collective living.

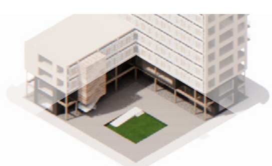
The sponge landscapes and courtyards integrated into the ***L Building*** typology serve a dual purpose: they provide welcoming spaces for community use while also functioning as stormwater collections systems. Beneath the new urban fabric, an integrated system can capture and direct runoff, facilitating the hydrological support of adjacent forest fragments and reinforcing the ecological integrity of surrounding neighbourhood clusters.

Site B - Whole Block - Looking West



Site B - Whole Block - Axo

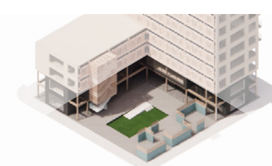
Site B - Optional Space Variations



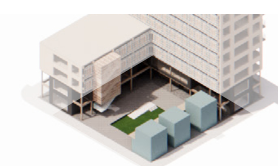
Larger Courtyard

Plinth + Trellis

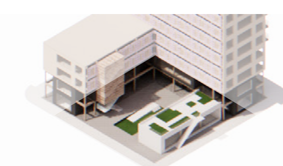
Plinth + Trees



Exterior Rooms



Laneway Housing



Single Storey Arm

Loft + L Building

1.

Maker/Service Space // An all-inclusive space for small markets, events, and individual creators. Also being a service area for the supermarket and block maintenance.

2.

The open wood loggia becomes a protected space for civilians to walk and gather. It provides privacy for the commercial/amenity spaces while reducing heat gain when screens are used.

3.

Community Spaces between 'L' buildings can be connected through bridges. This allows for easier travel and more socialisation, while framing areas of the block.

4.

This trellis + courtyard space, and rooftop is just one option that this building type can take for in. This creates another space that can be used for several events, activities, or just for leisure.

5.

The shared car-pedestrian path puts focus on a transit/bike oriented neighbourhood. This lowers carbon emissions and allows for more space to be allocated to people and greenery.

6.

The frieze screen and semi-outdoor walkways act as a privacy facade for the residents. This mechanism not only provides privacy but aids in heat control through light control and provides more space.

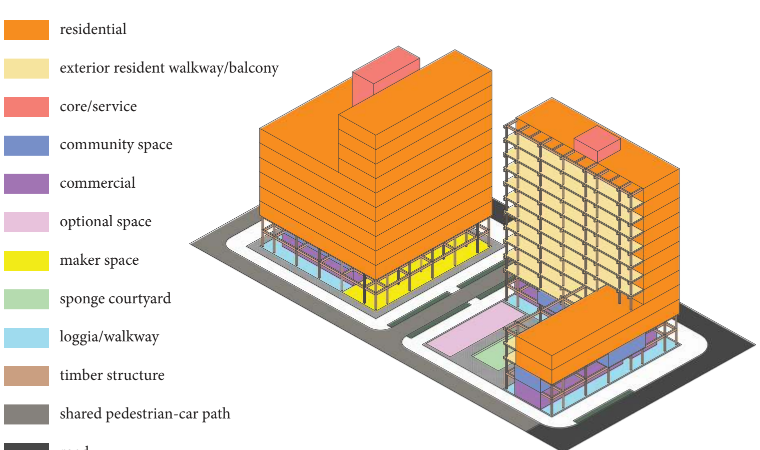
Site B's architecture integrates single-point stair access, L-shaped courtyard buildings, and loft blocks to express both social and environmental values. Its tectonic character is articulated through frieze-like façade screens, semi-outdoor walkways, timber loggias, courtyards, and an adaptable maker/service spaces. Degrees of enclosure and ownership provide residents with flexible opportunities to appropriate space according to need and desire. At the block scale, the integration of trees, varied building and courtyard orientations, and a shared car–pedestrian path create layered experiences and adaptable patterns of use across time and situation.

Our methodology for ***Site B*** has been an open search for diverse solutions at both the block and half-block scales. We explored a spectrum of massing conditions and building typologies, from patchwork groupings to singular standalone forms, before applying a set of repeatable yet varied types. The aim is to demonstrate how local standard mass timber sizes can generate meaningful, affordable, and well-designed urban environments. This approach highlights the compositional richness of the system, offering strategies not only for ***Site B*** but also for broader application across the city's patchwork of clusters and islands. The existing grid would cease to function as the primary organizing framework, instead serving as a foundational principle subject to adaptation, interruption, and unforeseen interventions. ***Site B's*** city block, within the context of a larger cluster, would no longer be regarded simply as parcels for construction but as a flexible, "combinable archipelago." In this way, the city block transforms into a tool for compositional exploration.

Within ***Site B***, these alternatives are distributed to create new intensity and diversity, replacing the single-house block with a more complex system of open spaces, public realms, and civic elements. Select forest fragments, an expanded common bridge, new parks, stellae and a major transit hub which includes the tree library as structural lattice, strengthen the city–river relationship and anchor the site within its ecological and cultural context. ***Sites A, B, C, and D*** maintain their existing locations but are reinterpreted through modular and repeatable types that adapt to each condition. Together, they form part of a larger archipelago cluster, where each site contributes a distinct role within the collective whole.

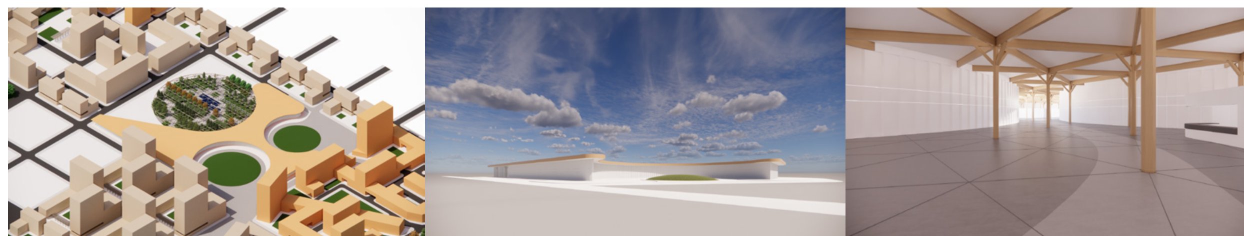
Our design also responds to TOA tiering by accommodating a range of building heights and densities. The combined cluster of ***Sites A + C*** in Tier 1 features 12–20 storey buildings, ***Site D*** explores a mix of 8–20 storeys despite being within Tier 3, and our main site, ***Site B***, in Tier 2, contains 8–12 storey buildings. Despite these variations, the patchwork archipelago shares common architectural elements such as sponge courtyards, loggias, commercial and community spaces, and a diverse mix of housing typologies.

Site B - Program Diagram - Loft + L Building



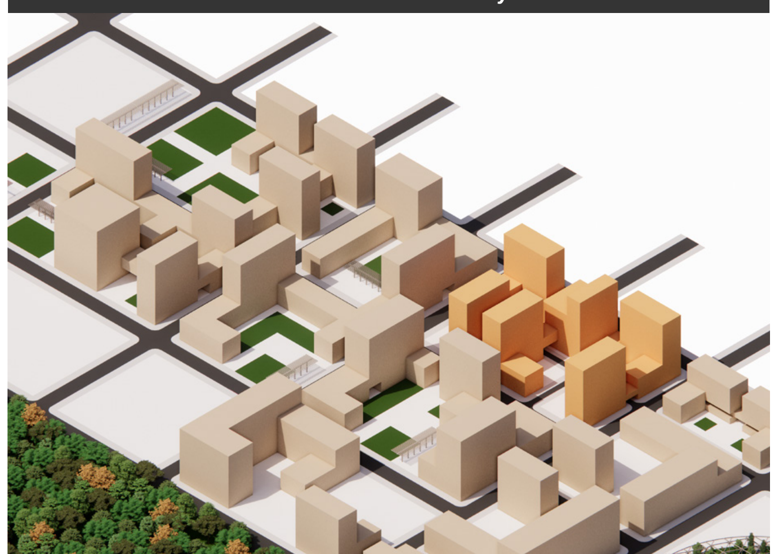
Site Plan - Potential Massings

1. Site A+C   2. Site B   3. Site D   4. Transit Hub   5. Tree Library
6. Waterfront Park   7. Expanded Bridge + Ramp Park   8. Stellae   9. Forest Fragments   10. Future Clusters/Voids/Islands



Transit Hub // Commercial - Transportation - Leisure - Amenity

Site B - Tier 2 - 8-12 storeys



Site A+C - Tier 1 - 12-20 storeys

Site D - Tier 3 - 8-20 storeys

DTT-B-03

Timber as catalyst opens new possibilities for public design by shaping infrastructure, parks, and monuments. Through this lens, ***Site A+C*** is envisioned as a dense, connected cluster where streets, buildings, and parks interweave to create generous public space for community use and adaptation. ***Site D*** acts as a mediator between city and river, introducing a continuous public path and a series of waterfront parks.

An expanded bridge becomes both infrastructure and civic stage that supports safe travel and is capable of hosting celebrations and events. The stellae reinterprets timber as monument, expressing its structural and material qualities in a vertical landmark. Across all sites, the integration of forest fragments elevates timber's role further: serving as local resources, ecological patches, and carbon-sequestering landscapes embedded within the urban framework.

timber as catalyst an URBAN EXPANSION

Urban Massing Aerial

Expanded Bridge Commons + Parks + Stellae

Site D - Waterfront

Site A+C - Courtyards and Building Connections

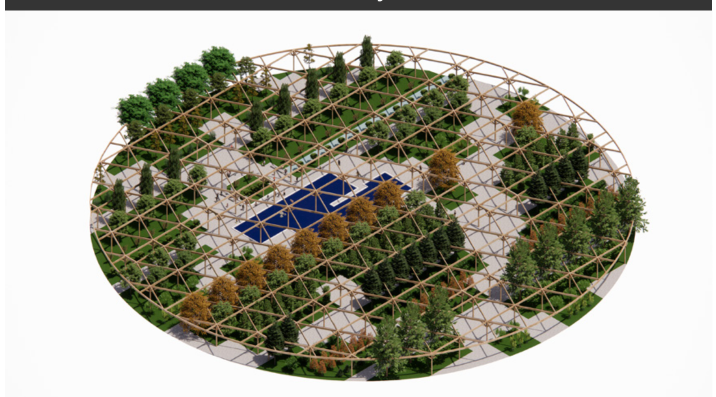
Stellae

timber as catalyst a TREE LIBRARY

British Columbia is home to some of the most revered and majestic trees, deeply rooted in the cultural and spiritual lives of Indigenous peoples. These trees such as the Western Red Cedar, Douglas Fir, Lodgepole Pine, Sitka Spruce, and Arbutus, hold profound significance, shaping not only the landscape but also the history and traditions of the region. The tree library/park showcases these trees in a monumental park setting under and between a timber lattice. These trees have provided materials for shelter, clothing, tools and art as well as for building homes, tools, and boats as well for holding lodges and tipis. The are living symbols of strength, wisdom and spiritual connection, deeply intertwined with the cultural heritage and natural history of the region. For Indigenous peoples, these trees are holding practical resources and sacred beings, reflecting a profound respect for the natural world.

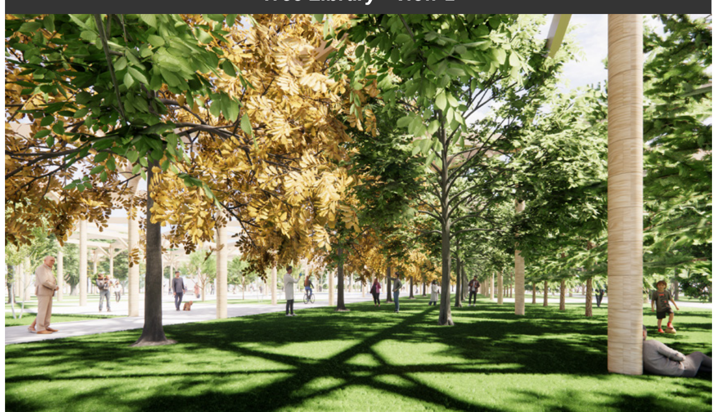
The Tree Library/Park celebrates this heritage by showcasing these species within a monumental park, framed beneath and between a timber lattice. More than a collection, it is a place of teaching and storytelling, where histories and traditions are shared through audio, signage, and immersive experiences. It is both a gathering space and a living archive, demonstrating the ecological benefits of forests, their role in climate resilience, and the enduring potential of timber as a building material.

Tree Library - Axo



Tree Library - View 1

Tree Library - View 2



Tree Library - View 3

Fantastic Future (FF)

DTT-B-04

- **Provide the opportunity to do more than live affordably in poverty**
- **Moving from Affordable to Wealthy**
- **The most valuable resource in a region is an educated population**

Our Goals: Aggressive Affordability,Seriously Sustainable, Radically Reproducible,Exactly Entrepreneurial

Development Scenario
Private Training Institute
Objective: Deliver housing that enables residents to afford more in the future
Design Priorities: Efficient construction, Maximum affordability, Minimum operational resources

Secondary Goal - Find ways to make society more affordable.
Is it possible to reduce the cost of living in Canada? Part of the reason that labour is cheaper in China and other countries is that the cost of living is lower. If automation and AI are reducing the need for labour, wages will not go up. How do we reduce the cost of living without reducing the quality of life and eliminating opportunity?

Is it possible to reverse the supply chain issues that enforce large markups at each step until everything is more expensive in North America than the rest of the World? Can we enable convenient cooperation or reintroduce competition to reduce costs? Can we buy directly from farmers and eliminate the multiple middlemen that raise prices by over 300%? Can the ability to handle large volumes reduce markups and transportation costs?

For a staggering 97% of recorded human history, power rested with hereditary landowners who ruled a dependent peasant class. This chilling historical precedent raises a critical question for the future: Can we avoid simply replacing the old feudal system with a new one, where robot owners rule a permanently unemployed class, locking us into yet another era of inherited, centralized control?

Indigenous statement
Site B is located on the unceded, ancestral, and traditional territories of the xʷməθkʷəy̓ əm (Musqueam), Sḵwx̱wú7mesh (Squamish), and səlilwətaɁɬ (Tsleil-Waututh) peoples.

At Fantastic Future (FF), our ambition transcends mere affordability. We're not just building housing; we're cultivating a launchpad for boundless futures, free from financial constraints. Rejecting the illusion of affordability created by subsidies, Fantastic Future works to offer a radical vision based on long-term feasibility and independent operation.

We understand that hope, not just happiness, is the true bedrock of a life worth living. Experts agree: a happy life thrives on hope. Consider the stark reality of social media: even those with outwardly enviable lives can be deeply unhappy when their goals feel out of reach. Hope is the fuel for aspiration.

That's why FF is designed to ignite a critical mass of hopeful entrepreneurs. We know entrepreneurs represent the largest class of millionaires, outnumbering even CEOs and trust fund beneficiaries. To foster this vibrant community, FF will operate as a Private Training Institute under BC law. By strategically setting tuition below $4000, we bypass the BC approval process, giving us the freedom to hand-pick every student and resident. Residence will be capped at five years, ensuring a dynamic, forward-moving community. And while primarily student residences, units can also be rented to the public, offering flexibility and integration.

Floors	#	Ht	Total
Timber	12	11	132
Concrete	3	16	48
Total			**180**

Affordable for All	
Min Wage/Hour	$17.40
Monthly Wage	$3,010.20
Affordable Rent	$903.06
Net Pay after tax	**$2,515.88**
Rent	$600.00
Food	$800.00
Tuition	$100.00
Transit	$46.00
Cellphone	$30.00
Total Expenses	**$1,576.00**
Savings	**$939.88**

Construction Cost			
	Concrete	**Mass Timber**	**FF**
FSR	5	5	9.7
Below Grade - Concrete	75,000	75,000	72,000
Above Grade - Concrete	127,700		108,000
Above Grade - Timber		127,700	245,952
Total SF	202,700	202,700	425,952
Saleable/rentable SF	108,545	108,545	165,600
Amenity - SF	850	850	29,200
Units	86	86	960
Beds	178	178	1,440
Hard Cost	**$75,622,000**	**$80,170,100**	**$122,888,480**
Project Cost			
Months	18	16	10
Land	$13,000,000	$13,000,000	$13,000,000
Soft Cost	$11,343,300	$12,025,515	$18,433,272
ACC/DCC	$3,168,326	$3,168,326	$0
Financing	$6,852,512	$6,380,835	$3,869,896
Project Cost	**$109,986,156**	**$114,744,792**	**$158,191,658**
Cost/SF	$1,013	$1,057	$955
Cost/Unit	$879,326	$932,210	$128,009
Cost/Bed	$424,843	$450,394	$85,339
% more/bed	497.83%	527.77%	
Embodied CO2 - KG	1,355,864	546,112	2,529,306
Carbon KG/SF	6.69	2.69	5.94
Carbon KG/Unit	15,765.86	6,350.14	2,634.69
Carbon KG/Bed	7,617.22	3,068.05	1,756.46
% more CO2/bed	333.67%	74.67%	

Supplier Statement
All technology used is currently operational and 95% **non USA**

Aggressively Affordable

DTT-B-04

- **Affordable shelter, food, water, transport - No excuses**
- **Trying to solve a problem, not all problems. Perfection is the enemy of good**
- **Buy in bulk, avoid the poverty tax - Smaller volumes cost more / unit**

The goal is to make FF affordable to anyone with a minimum wage job. This will not solve all problems for everyone. Perfection will not be the enemy of the good.

Rooms - University students are satisfied with residence accommodations. The target is a price less than that of a university residence, food plan, laundry, and transit. The maximum lease term is 5 years. FF is not intended to be a permanent solution. It is a stepping stone.
The rooms will be 150 SF with a window or 195 SF double occupancy without a window. All rooms have a private bathroom. The soundproofing will be the luxury suite level of STC 60 and IIC of 66.
Rooms are 10'x14' or 10'x19.5' with 10' ceilings for more vertical space. All beds can descend from the ceiling, Murphy style, or over desks. Extra people cost $100/month. No pets.
Options:

- up to 2 queen beds
- up to 4 Twin XL beds - bunk bed style
- Expanding conference table can fit when beds are up

Food - FF offers food plans and 24-hour food options to compensate for no private kitchens. Bulk purchasing is much cheaper. If Thailand rice is purchased/shipped by the 27ton 20' container, it costs ⅓ the $1/lb at retail. Similar discounts can be had for other products when bought by the container.
In discussions with a local greenhouse, FF can save 50% over grocery stores while helping the greenhouse expand by signing long term contracts. The over rice special will be a single, inexpensive, nutritious daily meal option for those without food restrictions.

Transport - A discounted Translink pass is mandatory. Modo EV cars, Gogoru scooters, Silence EV cars, ebikes, etc. will be available for rent. The ability to handle containers up to 40' TEU size makes FF radically cheaper to operate.

Communications - Free Wifi, cheaper cellphone coverage through a Mobile Virtual Network.

Building Amenities - The primary fitness area is in the basement with a full selection of fitness equipment and shower facilities. The basement shower, toilet, and sink facilities are built into containers so they can be moved outside to support street festivals. The food court is open 24 hours for gatherings. There is a nearby park and riverfront recreation areas.

Absolute minimum - Staying in the capsule room in basement, shower at the fitness center, and eating the over rice special will save $900/month. 4/room will cost only $250/person.

Is 150SF too small?
The 140SF UBC Nanosuites include a kitchenette, bathroom, desk, and murphy bed. In studies, residents are very happy due to privacy and low cost. FF rooms will be similar with better sound proofing, transit options, and entrepreneurial facilities.
Capsule hotels in Japan are as low as $20/night. Panda Pods in Richmond costs almost $100/night. FF will also offer them in the basement. It will be mainly for conferences. There are several hotels completely underground in Copenhagen.
A German UBoat of 1500SF held 35 crew. Crew slept in 43 SF stacked 3 high next to torpedoes for up to 6 months without windows, showers, food choice, or fresh air. Cruise ship rooms are about 160SF and 30% windowless.

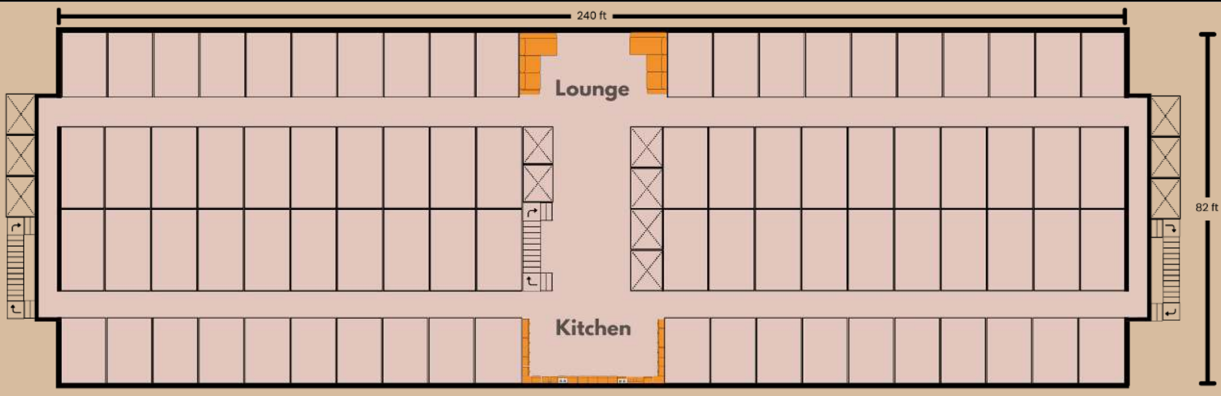
Floors
Common Area 1 - Free shared kitchen and seating area. There is a stove, oven, microwave, air fryer, dishwasher, washer-dryer, and an assortment of cooking tools. Most people will use the wash and fold service in basement. Robots will deliver laundry to your room.

Common Area 2 - Lounge area, cafe dishes/laundry/storage box/trash dropoff, and expanding furniture storage. Robots will pickup automatically from here so it won't open your room.
Automation
Room Delivery - The elevators are designed to be used by wheeled robots. Room doors slide so robots can deliver goods without human intervention. This also enables on-demand storage. You can request that a storage box be delivered to your room from the AutoStore storage in the basement by a robot.
Drone Delivery - Sending and receiving products via a quadcopter reduces traffic , cost and time.
Vending machines - Small quantity purchases come from vending machines for 24hr access.

CO2 Kg/yr in operation	Ave YVR	FF
Products, recreation, and services	3,800	1,900
Flights	2,100	2,100
Food	2,200	1,200
Fuel for cars	1,400	0
Home heating and electricity	1,400	200
Bus, transit, and rail travel	270	270
Total per person	**11,170**	**5,670**
Ttl savings for FF residents KG/yr	0	**7,920,000**

Rooms	SF	Monthly
UBC	140	906.34
SFU	103	1040.00
Panda pod	24	2898.00
Best Western	350	7501.00
APT Living	150	1500.00
FF - Window Rm	140	600.00
FF - Inside Rm	195	700.00
FF - + 1 person		100.00
FF - Capsule	24	300.00

Meal Plan	Monthly
UBC	$918.76
SFU	$820.25
Meal kit - meat/veg	$719.20
Fresh Prep - meal kit	$904.00
FF - Standard	$800.00
FF - 3 standard, 4 vege	$600.00
FF - Vegetarian	$500.00
FF - Over rice special	$200.00

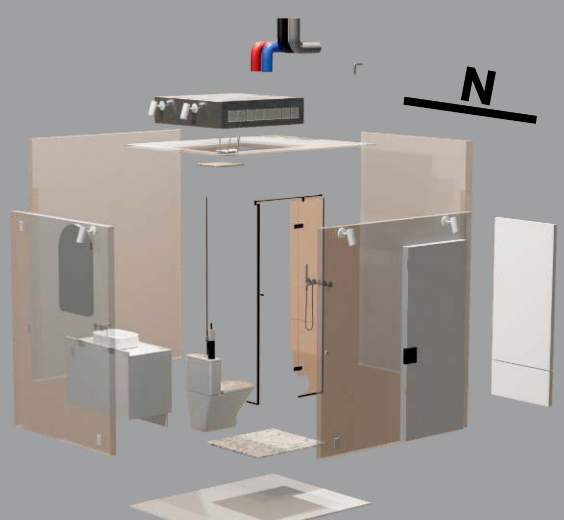


Radically Reproducible

- **Mass-produced building components**
- **Maximum automation**
- **Faster is better**

- **After conducting a survey of successful mass timber projects and consulting with local experts on best practices, we applied these insights to our development scenario.**
- **The basic design came from a tour of Fast/Epp. We modified their basic design from the BCIT residence. Each floor is 10 feet tall, which makes routing the utilities through the hallways easy instead of inside walls. Kalishnikov told us that tailoring our mass timber sizes to their manufacturing machines would save 15-20%**
- **To save time on the foundation, FF will use the WeiBuild rebar robot. It will read the plans, cut, and bend all the rebar segments. The rebar will be tied together with a tomorobot. It will reduce the time and manpower by 35%.**
- **For the tower, the bottleneck is the crane. Singapore has developed the Skyjust AI automated crane. It will bring a prefab component to the correct location without the need for a crane operator or two people using guide ropes. This reduces crane time by 25%. Since it is computer-controlled, operating more than 1 at a time is easy.**
- **The key to fast assembly is prefab. However, volumetric prefab achieves speed at the cost of high transportation costs. Low on site labor cost is replaced by drivers. FF uses efficient panelized prefab walls and floors from Kalishnikov with cladding from Centura.**
- **The most labor-intensive, expensive part of housing is the bathrooms and kitchens so FF uses a prefab pod. The Smart Bathroom Pod provides the water source heat pump for environmental control, Internet, TV, sensors, lights, and power in one quick install. Automated sliding room doors are integrated into bathroom pods with lower slider for automated deliveries. Energy savings are controlled by the sensors in the pod. The pod is connected to hallway utility chases that runs under a drop ceiling. The only additional work that would be additional power outlets farther into the room.**

- **If a different building was designed using the kits of parts and a similar design with less ambitious goals. The underground section would exist for parking and the podium would exist to provide services and amenities to the residents The Broad Group's achieved a build speed of 10 prefab steel stories in 1 day. FF should be able to build a 12 story mass timber tower in less than a month. The cost/bed could be 20% less with a less expensive podium.**



Smart Bathroom Pod

Pod is 8.5ft tall to fit in 10' tall room
Hallway is 8' with 2 foot chase above it.
Water source heat pump on top for heating/cooling.
Water and power connections to chase above hallway.
Waste water passes through floor into lower unit before connecting to hallway.
Internet is wired for reliability with a separate secure internal network.
Fire Sprinklers - inside and top SW corner
Exterior N side has a NFC reader to control the motorized door. There is a smaller automated door for robotic deliveries.
There is a smart mirror for messages, calendar, general information, and pod configuration.

Optional kitchen pods
On the S wall, exterior connections exist for a small or large kitchen pod.

Goal: To complete all required connections with 1 installation

Construction Schedule

- 8 days to install each elevator/stair metal frame - 2 - 6 story pieces
- Rebar cutting/bending and wiring robots reduce labor time by 30%. After it dries, the concrete floor, walls, and ceilings will be ground and polished by robots for 80% labor savings.
- BCIT Tall Timber did 20K SF of CLT per week. The Singapore-proven automated Skyjuster cranes reduce crane time by 25%. It is possible to operate more than 1 crane at a time without risk of collision. With a floor plate of 16K SF, each floor should take around 3 days.
- Bathroom Smart Pod installation is significantly faster than traditional on-site bathroom construction. While a traditional bathroom installation can take up to 25 days and involve multiple trades, a bathroom pod can be installed in as little as 2 hours, including crane time and connection.
- A kitchen takes from 2-4 weeks, but a pod can be installed in a day. FF will have a single kitchen pod per floor, lowering the cost/SF.
- Robots would polish, paint, and carpet the concrete
- Robots for drywall and painting will speed the finishing.
- The first version would take around 10 months with pre-planning. Subsequent versions with better efficiency and a smaller podium would take less time.

Fire Prevention

Besides the sprinkler system, FF has outside wall hydrants with battery supported power outlets. The main limitation of drones is battery power and payload capacity. By supplying the Chinese flying drone with water and power via a hose, it can either fight fires for hours without landing or clean the side of the building. FF water and power will be able to power fire fighting drones up to 500m away.

Standard room

- A queen size bed
- Desk undeneath bed
- Bathroom Pod
- Dresser
- TV

Seriously Sustainable

- **Minimize Construction Carbon**
- **Prioritize the reduction of operational resource usage**
- **Do both on per capita basis**

DTT-B-04

While the brief focuses on embodied carbon in the build, sustainability is about the whole lifecycle including operations. It is easy to minimize carbon per SF by adding space. If nobody lives there, it will be low carbon too. FF calculates based on resources/person. FF will save by operating with hotel efficiency.

Build - FF does not eliminate concrete because the program space is required. The strength and durability of concrete will be necessary to support flying cars and shipping containers. The timber portion is highly reproducible and can be quickly erected. The higher CO2/SF is due to luxury partition standards.

Power - Electricity from BC Hydro is 98% renewable. Onsite energy generation would not be significant and would increase maintenance costs. Most new clean power projects are indigenous owned and 45% cheaper than the past. Hotels save 20% of power by turning off power to vacant rooms.

Transport - The rental EV fleet has removable batteries. During a recent earthquake, Taipei used the Gogoru scooter battery charging banks for emergency city power. Battery banks will make FF more efficient and resilient through off-peak charging. Passenger and cargo drones will bypass gridlock. To encourage cycling, three Giken automated bike parks will securely park 612 bikes and retrieve in an avg of 8 secs. Of non-air travel carbon, FF reduces CO2 by 60%.

Cargo - Trucking requires 25 times as much carbon to transport 1 ton per mile as shipping. Shanghai is 5X as far as Los Angeles, but it causes 5X less carbon. As a bonus, there are fewer tariffs. Cargo containers are the most efficient method of cargo handling so FF can handle 40' containers. 28%-50% of transport carbon is attributed to the last mile due to numerous small package deliveries.

Carbon - The average Metro Vancouver resident generates 5.2 tons of carbon per year, not including products and services purchased from elsewhere. FF can easily eliminate the 2.8 tons used for cars and home heating. With another 2 tons from food and shared resources, the estimated carbon reduction is 51% or 5.47 tons/person/yr. Slow behavioural changes should increase savings by another ton/yr.

Food - In Canada, 41% of food is avoidably wasted. A lot of it ends up in landfills despite composting programs. One study indicates that the average Canadian's total food carbon footprint is 2,270 kg of CO2-eq per year, with meat products accounting for 61%. If FF can reduce waste, meat consumption, and transport CO2, it would save over 1 T of CO2/person/yr. Ea ton of food waste = 3 tons of CO2.
By using long-term contracts with local greenhouses, FF can save close to 50% on produce while helping the greenhouses expand capacity. EV trucks will eliminate CO2 from transport to the Fraser Valley

Shared Resources - How often does a stove, laundry machine, or dishwasher get used in the average home? FF reduces surplus purchasing/carbon by providing shared usage of laundry machines, kitchens, manufacturing tools, storage space, etc. For example, by aggregating most of the compute power of FF in a local containerized water-cooled cloud, waste heat can be collected for use.

Trash - Each Canadian throws away about .5kg of garbage/day and a third comes from packaging. Small grocery store items have a lot of packaging. Instead of buying small quantities wrapped in plastic and Styrofoam, FF buys large quantities in up to shipping container size.

Water - Metro Vancouver uses 384 L/day/capita. A Metro Vancouver hotel resident uses 85 L/day. By using grey water retention, hotels save an additional 25%. The grey water tanks will also retain rainwater to avoid overloading storm drains.

Refuse, Reduce, Reuse, Repurpose, Recycle - The 5Rs are built into every decision in FF. With storage, tools, and expertise, whatever FF can not repair and reuse, can probably be recycled. Residents will be encouraged to use materials for their ventures. There is a refill shop in one of the retail spaces.

Heating/Cooling - Water Source Heat Pump (WSHP)
A wshp is quieter, smaller, requires less maintenance, and is 10x more efficient than an air source heat pump. It is slightly more expensive. Each room will have a WSHP connected to the building water loop and the hallway for ventilation.

Instead of adding an expensive geothermal loop, FF will use a wastewater energy transfer system like the False Creek Neighbourhood Energy Utility. Heat is extracted or dumped into the sewer system. An additional cooling feed will come from the river.

Large heat source water tanks will make sure that FF always has hot water. Some rooms will be hotter than others and when cooling the building, the heat can be extracted to heat water. The computer server room, kitchen, and manufacturing equipment will be very hot. The commissary kitchen has large cold rooms. The heat taken from these sources can be used to heat other rooms or water.

A healthy building should have at least 5 air changes per hour. FF will exceed that standard with large air ducts running down the hallways. The heat recovery ventilation system and dehumidifiers will maintain the air at a comfortable temperature without excess heat loss or gain.

While concrete creates a heat island, mass timber has 1/10 the thermal conductivity. FF adds greenery to the concrete portions for attractiveness and to reduce heat.

Construction vs Operational CO2
The base case for concrete would cost 7.6MG of CO2/bed. For mass timber construction, it will be 3.1MG/bed. A saving of 60%. FF will use 1.75MG of CO2/bed for a savings of 77% over concrete and 43% over straight mass timber. This is despite having a massive concrete podium, more internal wall, and thicker floor. Per capita is the only fair way to measure CO2 usage.

In operation, the building will reduce CO2 by 5.7Mg of CO2/person/yr vs the average in Metro Vancouver. Using a conservative occupancy of 1440, FF will save the entire CO2 construction budget in less than **4 months** by moving people into the building.

There is an incorrect assumption that electric passive houses solve all operational environmental costs. People don't just sit in warm homes. They need transport, food, etc.

FF is not the solution for all cases. It tries to solve it's use case really really well.

Annual	YVR	FF	Ttl FF in KG	% Reduction
Trash - Kg	183	73	66,576	60.00%
Water - L	140160	23269	29,853,806	83.40%
Food Waste - Kg	396	158.4	203,227	60.00%

Exactly Entrepreneurial

- With AI and humanoid robotics, only entrepreneurs are automation proof
- Try to mitigate as many barriers to success as possible
- For ea $ spent, how much stays in community? Large Co=14%, Small Co=48%

DTT-B-04

At FF, we've engineered more than just a residence; we've crafted an entrepreneurial ecosystem where growth is inevitable and opportunity is ever-present. Our rigorous vetting process ensures a community of driven business builders, with a specific commitment to supporting Indigenous entrepreneurs.

This isn't passive learning; it's an active immersion: every meal features industry-specific networking tables , and every weeknight offers free talks on cutting-edge opportunities. The pace accelerates with Friday company pitch nights and intensive weekend sprints dedicated to launching new ventures. Capping it all off, Sunday evenings are reserved for crucial funding pitches.

Our model is rooted in powerful economics: unlike large corporations that recirculate only 14% of their revenue locally , small businesses keep a robust 48% within the community. By fostering more unique small businesses, FF directly contributes to a richer, more dynamic local economy and a truly vibrant community.

5 E's of Startup Creation

Education: Residents can offer paid or free classes, benefiting from an expanded network. Free evening talks are available for convenience, and mentors are matched with residents.

Evaluation: Weekly pitch meetings provide feedback on ideas from industry experts.

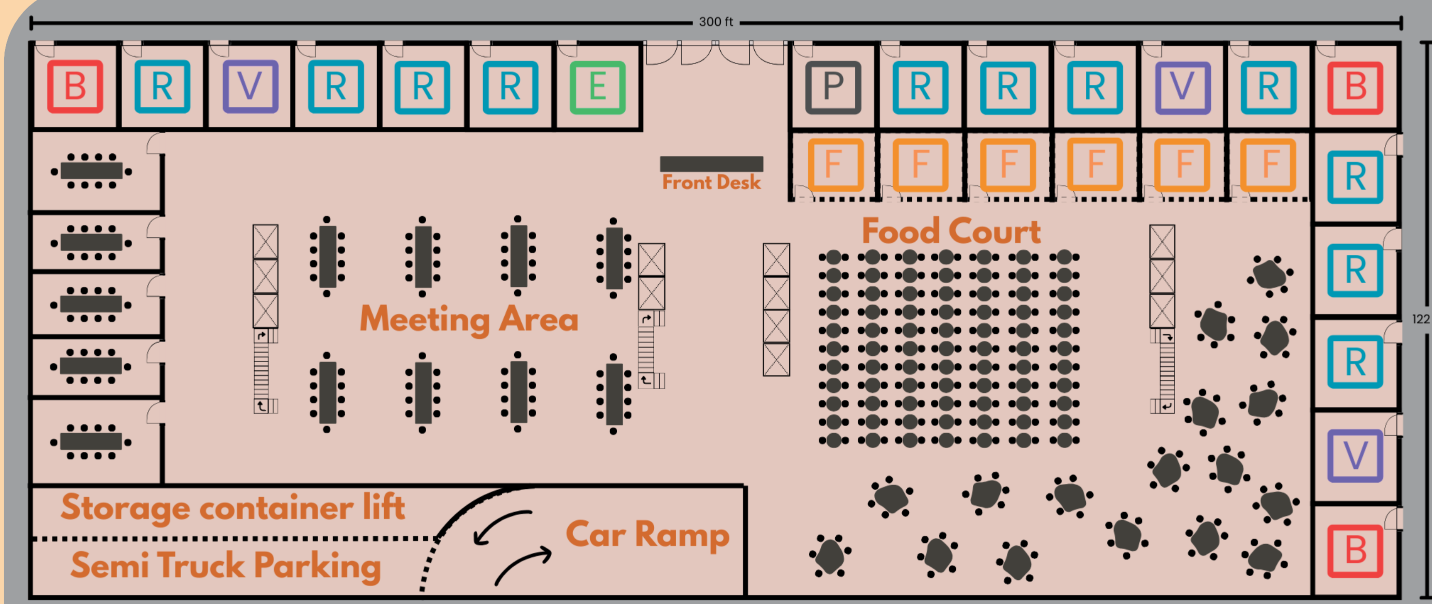
Experimentation: This phase focuses on achieving product-market fit, which can be costly and time-consuming. FF offers affordable solutions: retail options available for short-term rental (a day or less), less expensive prototyping tool rentals compared to purchases, and volume discounts on components and ingredients. Keeping burn low is critical during this stage.

Execution: After product or service testing, the next hurdle is building the founding team. FF's network helps connect individuals with skills to contribute to new ventures, even if they don't have their own startup idea.

Expansion: FF partners with various groups to assist with funding, manufacturing, and sales channels.

Facilities - available for rent

- Coworking
  - Offices
  - Meeting rooms
  - Classrooms
  - Print Shop
  - Video, podcast studios
- Shipping/Receiving/Storage
  - The purchasing dept will aggregate orders to reduce cost/CO2
  - Drone delivery
  - Cold storage for volume food handling
  - Storage for up to 40' containers
  - Parking for commercial vehicles
  - Automated cargo pod handling
- Manufacturing
  - Commercial Kitchen
  - Tool Library for small tools
  - CNC machines for wood, metal, fabric, 3D printing, electronics, etc
  - Workshops for prototyping robots, vehicles, metal, wood, etc.
- Retail
  - 6 Food Court stalls
  - 13 Popup stores at street level
  - Offer a single product for sale in refill stores
  - Vending machines for automated retail
  - Trucks and carts available for rent to test mobile retail
  - Fulfillment service for online stores
- Compute
  - Local Cloud Servers
  - High speed Internet with satellite backup



E-Battery Swap for E Bikes and scooters
R-Popup Retail
V-Vending Machines
P-Automated Package Pickup/Dropoff
B-Automated bike park, ATM, and basement fire escape stairs
F-Food Stalls

Unique Features

Storage container lift can raise/lower a fully loaded 40 foot container to the 2 basements
Exterior Utility Connections - Between each storefront, there are water, power, and drainage connections for street vendors or RVs
Drone Umbilical Connections - Each corner supports tethered fire fighting/rescue drones.

Plausible Project

- **No subsidies required**
- **Community support**
- **Boost Metro Vancouver Economy**

- A plausible project should include the land, hard costs, soft costs, and financing.
- Land around the skytrain is going for $13M per acre. Site B is a little under an acre.
- FF is a Private Training Institute with below-market affordable housing. Metro Vancouver has a policy of waiving the ACC/DCC charges for below-market housing and student housing. The savings are estimated at $35M due to the large number of units. There will be other development charges but they will be negligible compared to the ACC/DCC charges in other development scenarios.
- The project is eligible for 100% construction financing through the CMHC Student Housing Loan program. After construction, it would be eligible for a 50 yr mortgage. Reducing build time and using CMHC financing reduces the financing cost considerably.
- To further reduce costs, anything that can be sponsored will be. It will look like a business school where every meeting room, wall, and chair has a sponsor logo.
- With an estimated project cost of **$158M**, the Cap Rate will be approx 5.35%. Once the residents get businesses started, the cap rate should rise to 10%. The average cap rate for rental property in Metro Vancouver is around 2.2%.

The calculations use 1 person per room. Our projection is that it will be closer to 1.5 per room not including the capsule rooms that we expect to be mainly used for short term stays.

FF Rental Cap Rate			
Project Cost	$109,986,156	$114,744,792	$158,191,658
Rent/unit/month	$3,000	$3,000	$650
Added revenue/mon			$932,000
Total Revenue/yr	$3,096,000	$3,096,000	$18,672,000
Expenses/yr	$774,000	$774,000	$9,712,800
Cap Rate	2.11%	2.02%	5.66%

Future Proofing

Flying EVs - Self driving cars will increase the number of cars on the road. Higher Density means slower traffic. Fast transport will fly. Drone ambulances will be necessary.

Drone Ports - The drone ports on the podium and roof can launch and receive drones like in Schenzhen for 10 min package delivery to your room. Automated cargo and battery swapping.

Exterior Utility connections - Mobile businesses can park nearby without annoying generators. The neighbourhood can be reconfigured daily.

Container modularity - Need more fridge space, add a reefer container. More capsule hotels, more compute, more bathrooms, etc. All in containers. Drop them down to the basement. Remove when done.

AutoStore - This Norwegian company stores boxes 4x as efficiently as ordinary racks. Rain gear can be stored for use when needed. Rental items can be retrieved by robot.

City Scale Utilities - City scale utilities are less expensive than building scale and can be managed by highly skilled professionals with proper backup.

Automated doors - Allow robot delivery to your room of packages, laundry, and storage boxes.

Community Links

The street side of the building is designed to be walkable and inviting with 10+ doors per 300' of frontage. The basement container washroom facilities can be moved to the street for inexpensive festivals and connected to municipal utilities via our outside connections. Our bulk deals enable us to offer discounts to nearby businesses and residents.

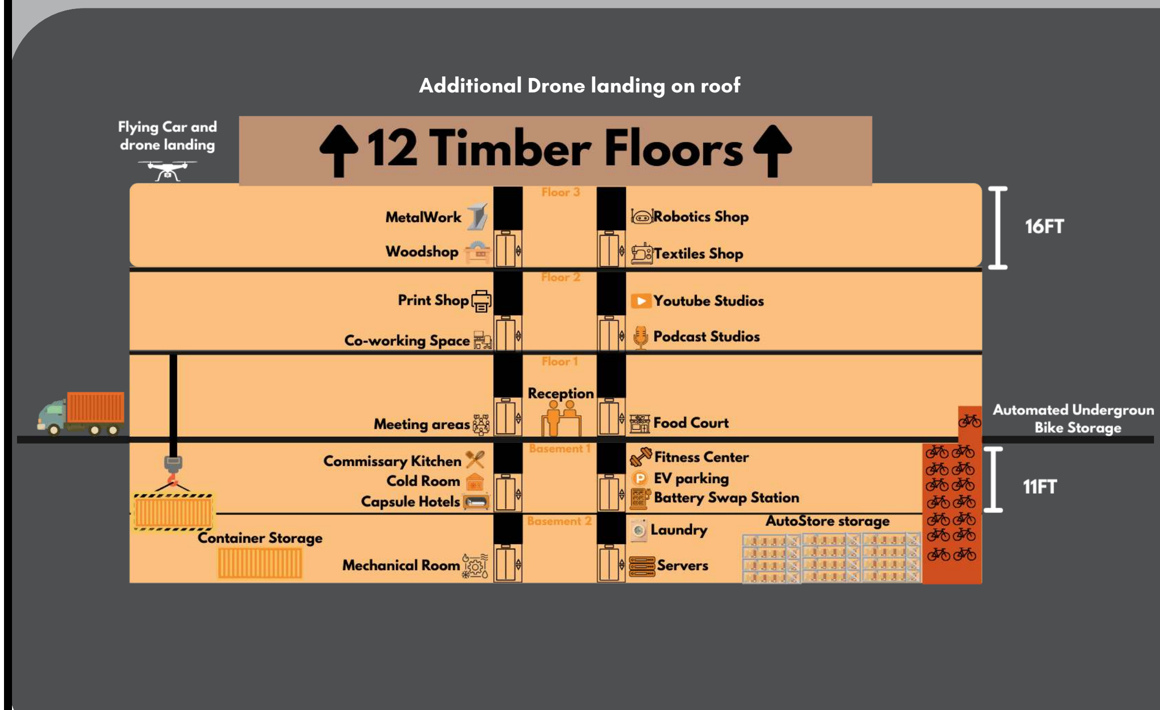
FF living will not be for everyone. Memberships, classes, equipment rentals, products, and food will be sold to non-residents. This will ensure that the facilities are utilized to capacity, maximizing revenue.

The outdoor large screens will provide information on events, flash sales, news, and important sporting events.

Rules that should be changed

- No strata units without kitchens - Less expensive strata units enable ownership
- Max of 4 bedrooms per self-contained residence unit off campus.
- Tower max floor plate of 8000 SF - Floor plate sizes enabled by better fire protection.
- Allow zero lot lines
- Farms can only sell 10% of their produce directly. By BC law, the rest has to go through a marketing board, which marks it up.

Our housing regulations are a self-inflicted wound, directly obstructing affordable housing and escalating homelessness through arbitrary occupancy limits. This isn't accidental; it's the stark consequence of municipalities prioritizing 'minimums' over the fundamental right to shelter. We must redefine our approach, moving from superficial appearances to genuine safety, prohibiting only true hazards and allowing dignified, modest living instead of forcing people to live on the street.



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.

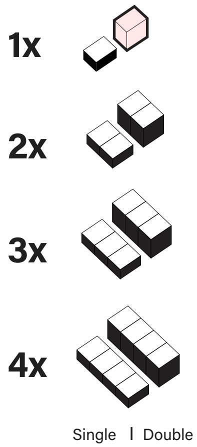
Through simple, repeatable forms, vibrantly composed to shape inviting spaces in-between, we can weave vertical villages - places where movement and gathering foster connection. In doing so, we nurture healthy communities while tackling the challenges of affordability and climate change.

Project Data

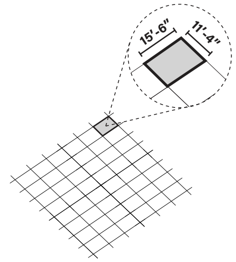
Site Area	Project Area	Floor Space Ratio
36,600 SF	146,766 SF	4.0

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%

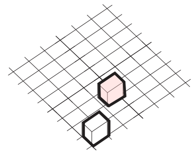
Step 01
Panelized Modules For Living



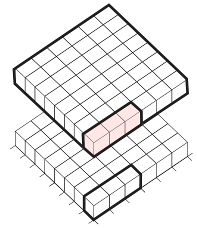
A **Living grid**
Standardized 15′-6″ x 11′-4″ grid to accommodate flexible living spaces and future commercial uses.



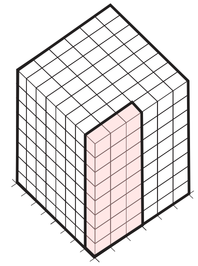
B **Panelized modules**
A double-height volumetric framework that allows 175 sq.ft panelized modules to stack.

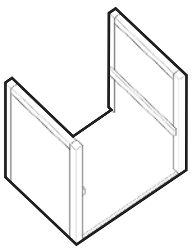


C **Baseline floor plate**
Panelized modules stacked and assembled in baseline 6,500 sq.ft tower floor plate sizes.

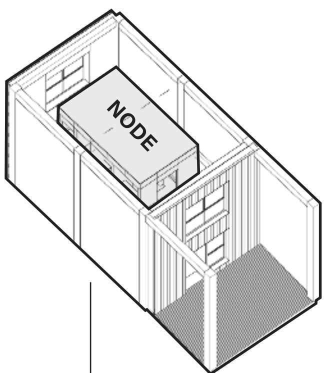


D **Baseline density & efficiency**
Floor plates replicated on all floors for max. efficiency.

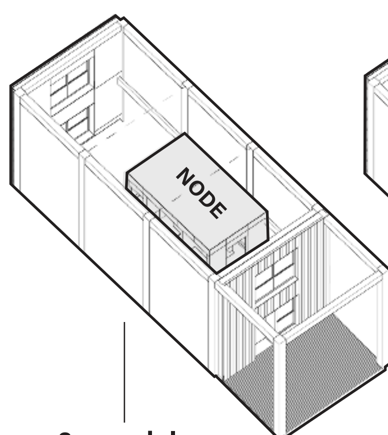




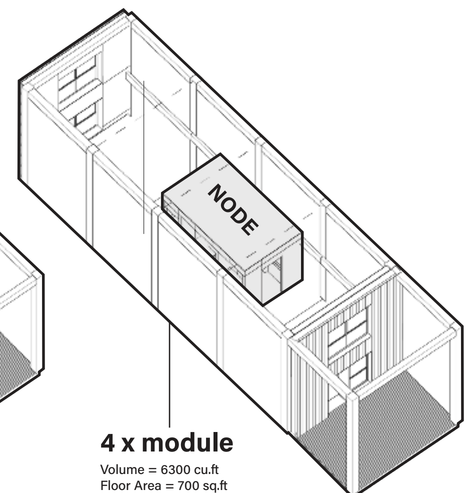
1 x module
Volume = 1575 cu.ft
Floor Area = 175 sq.ft
Total Buildable = 350 sq.ft



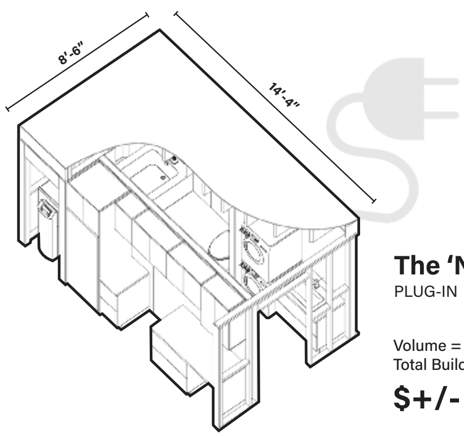
2 x module
Volume = 3150 cu.ft
Floor Area = 350 sq.ft
Total Buildable = 700 sq. ft



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

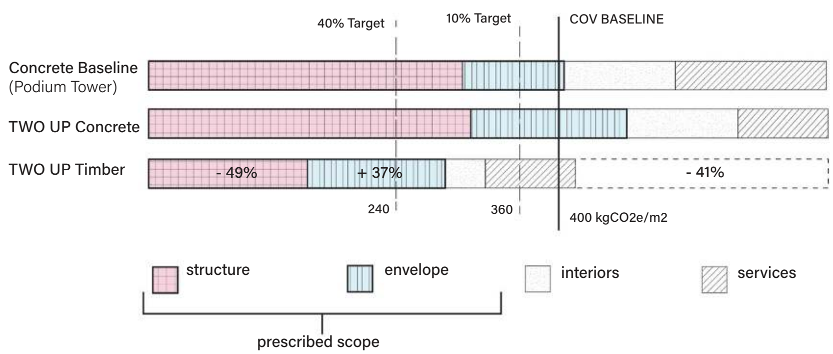


The 'NODE'
PLUG-IN

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.

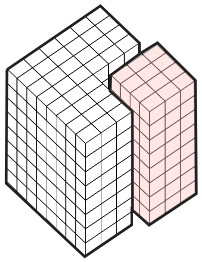
TWO UP Timber

41% **less whole life carbon**

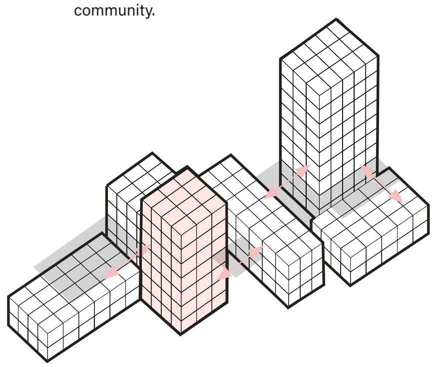
DTT-B-05

Step 02
Human-Scale Communities

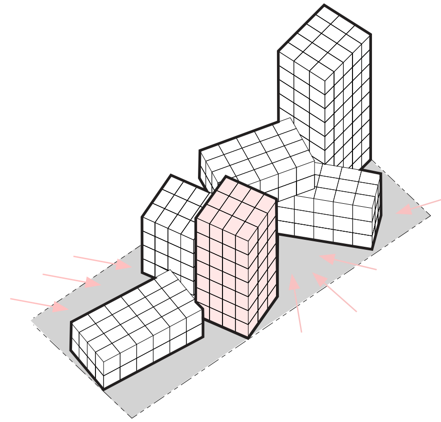
E **Dissect**
B. The massing is broken down into smaller volumes, offering dual-aspect floor plates that maximize daylight, ventilation, and views. Simplicity of form ensures construction efficiency, while the composition can create a more human-scaled rhythm.



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.



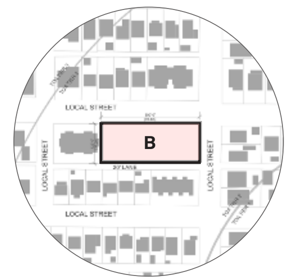
G **Place**
D. Volumes are angled to invite the community in, enhance streetscape vibrancy, and optimize unit performance by improving aspect, privacy, and airflow.



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

Overall Building Axo & Circulation

Site B



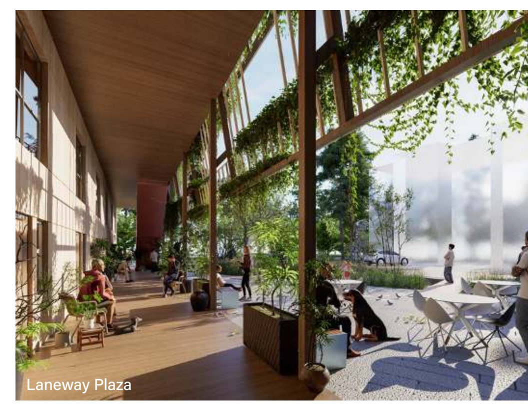
- Located in TOA Tier 2
- Within 5 minute walk of rapid transit, shops, services and greenspace.
- Large block-end assembly of sixe 50' x 122' lots.
- North-facing peoperty fronting onto local residential street with lane access at the rear.

Amenities

Neighbourhood **1 x Street Plaza** **1 x Cafe** **1 x Event Space** **1 x Bathhouse** **1 x Childcare**	City Farming **# of Grow Boxes** **12** Bike Stalls **350** Gathering Space **28,362.9 SF**
Roof Top Amenity **10,774.67 SF** Essentials **1 x Bike Amenity** **1 x Flex Space** **1 x Work Space** **1 x Community Kitchen**	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.

DTT-B-05

Loose Fit, Long Life

Carbon & Cost Reduction Rational

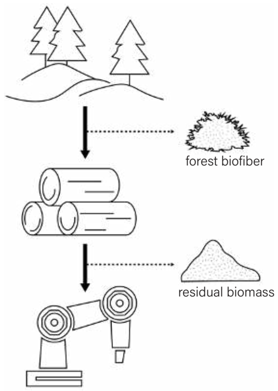
The most sustainable building is the one that already exists, the next most sustainable building is the one that will stay in use for a long time ensuring its materials remain in use. The best way to do that is to make it the space adaptable to change.

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

BUILD NOTHING
No Transfers - No Parkade - No extensive excavation

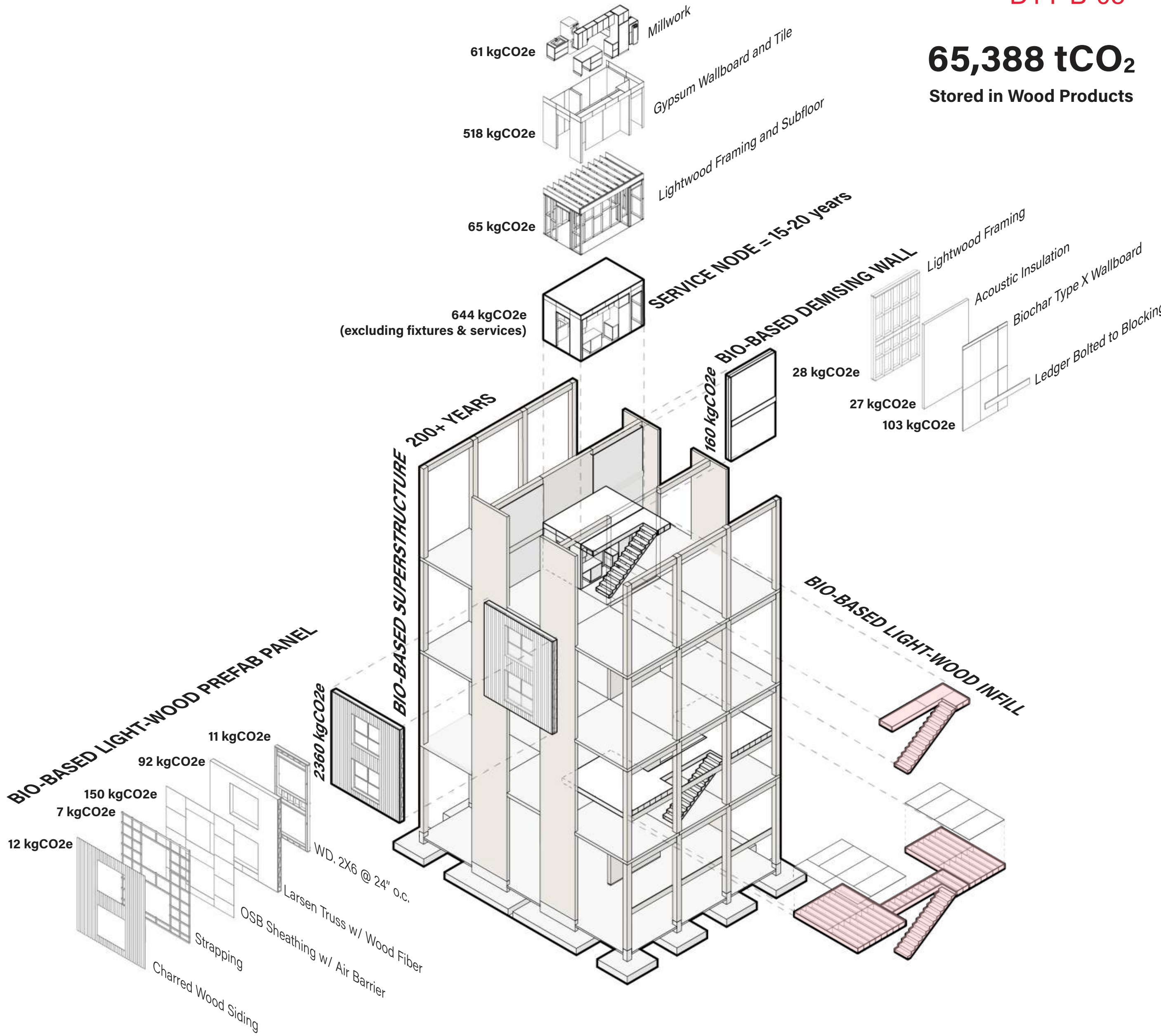
BUILD LESS
No interior fit-out beyond service node
20% less conditioned area.

BUILD CLEVER
Stacked structural grid increases material efficiency
Reduced foundations with longer spans.
Designed for Flexibility and Adaptability.
No concrete topping on Mass timber.
Light wood infill to reduce fibre.

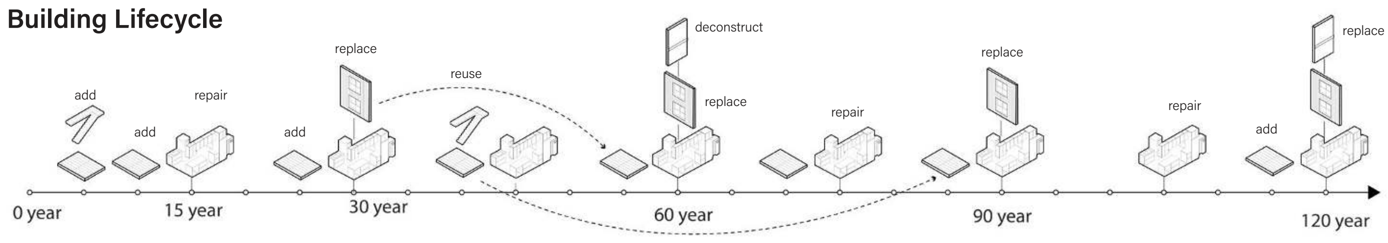
BUILD EFFICIENTLY
Bio-based carbon-storing, regenerative, non-extractive building materials.
M&E within nodes.
Local Sourcing.
Prefabrication

MINIMISE WASTE

65,388 tCO_2
Stored in Wood Products



Building Lifecycle



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.

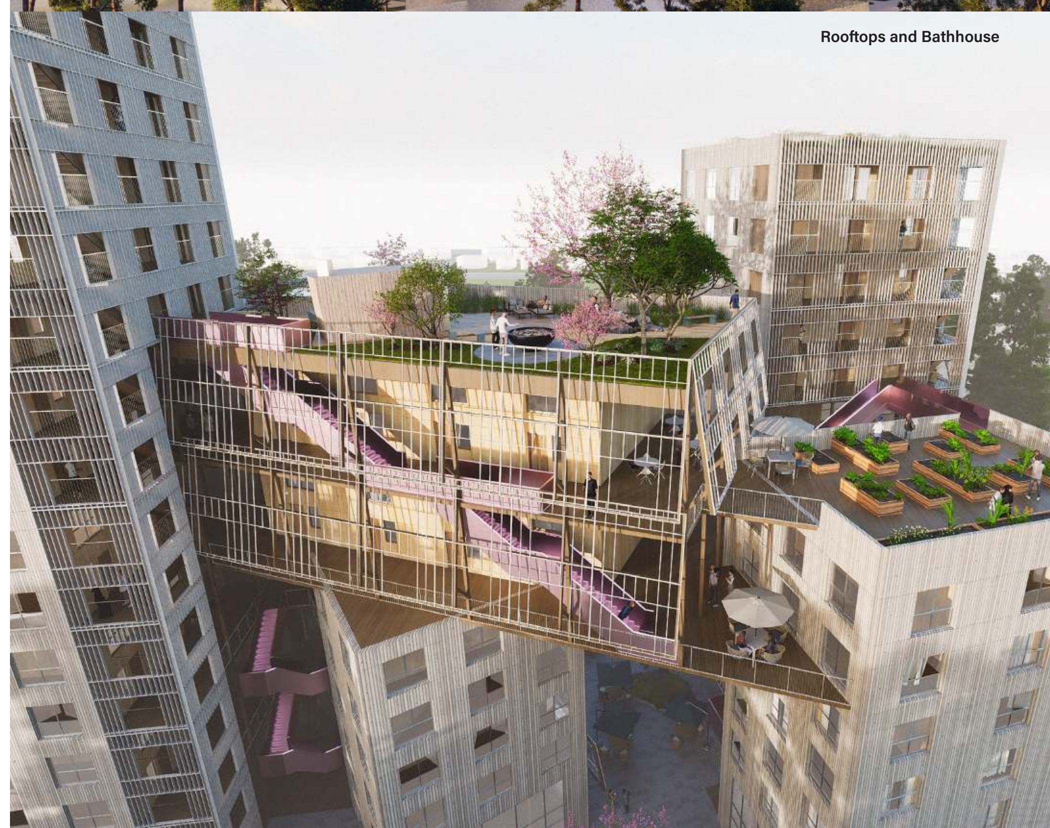
Level 05 Plan

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

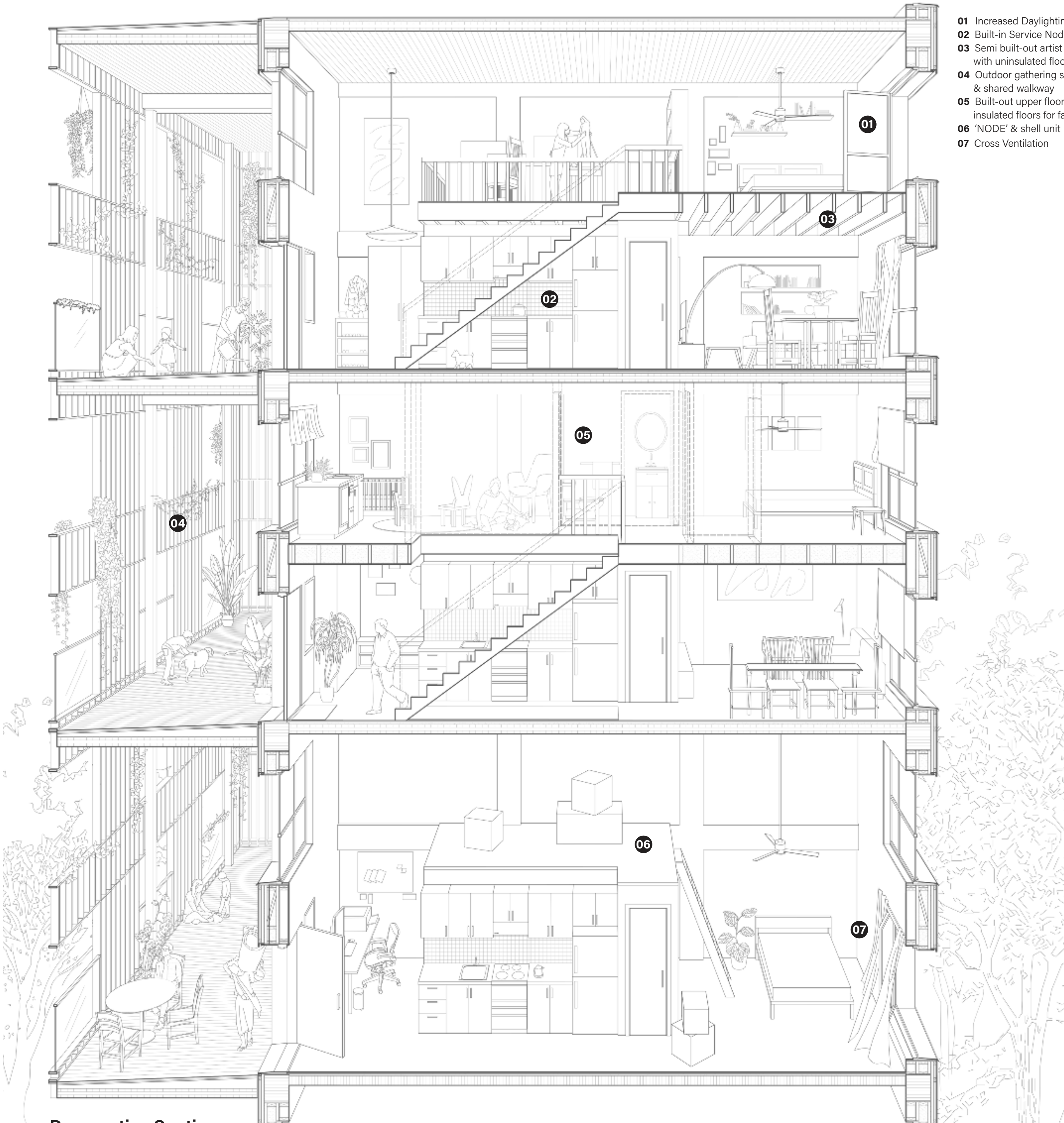
DTT-B-05

Skyline View



Rooftops and Bathhouse

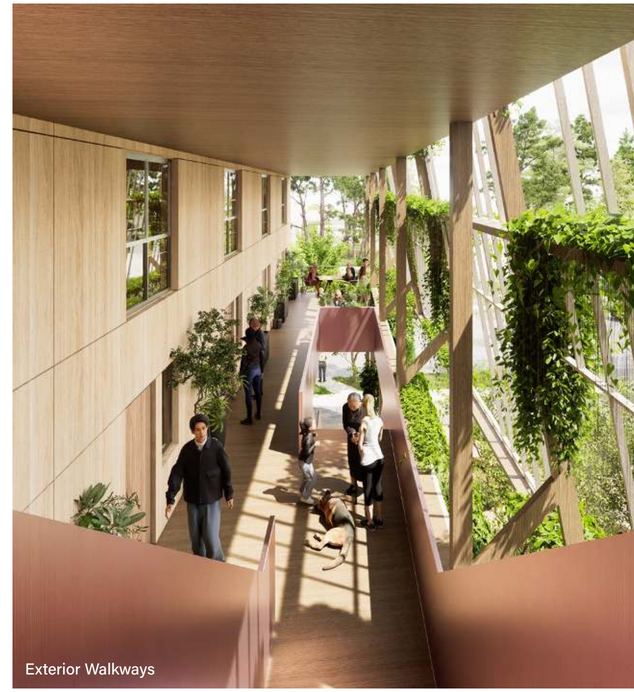
DTT-B-05



Perspective Section

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

Rooftop Gardens



Exterior Walkways

Connecting People and Space

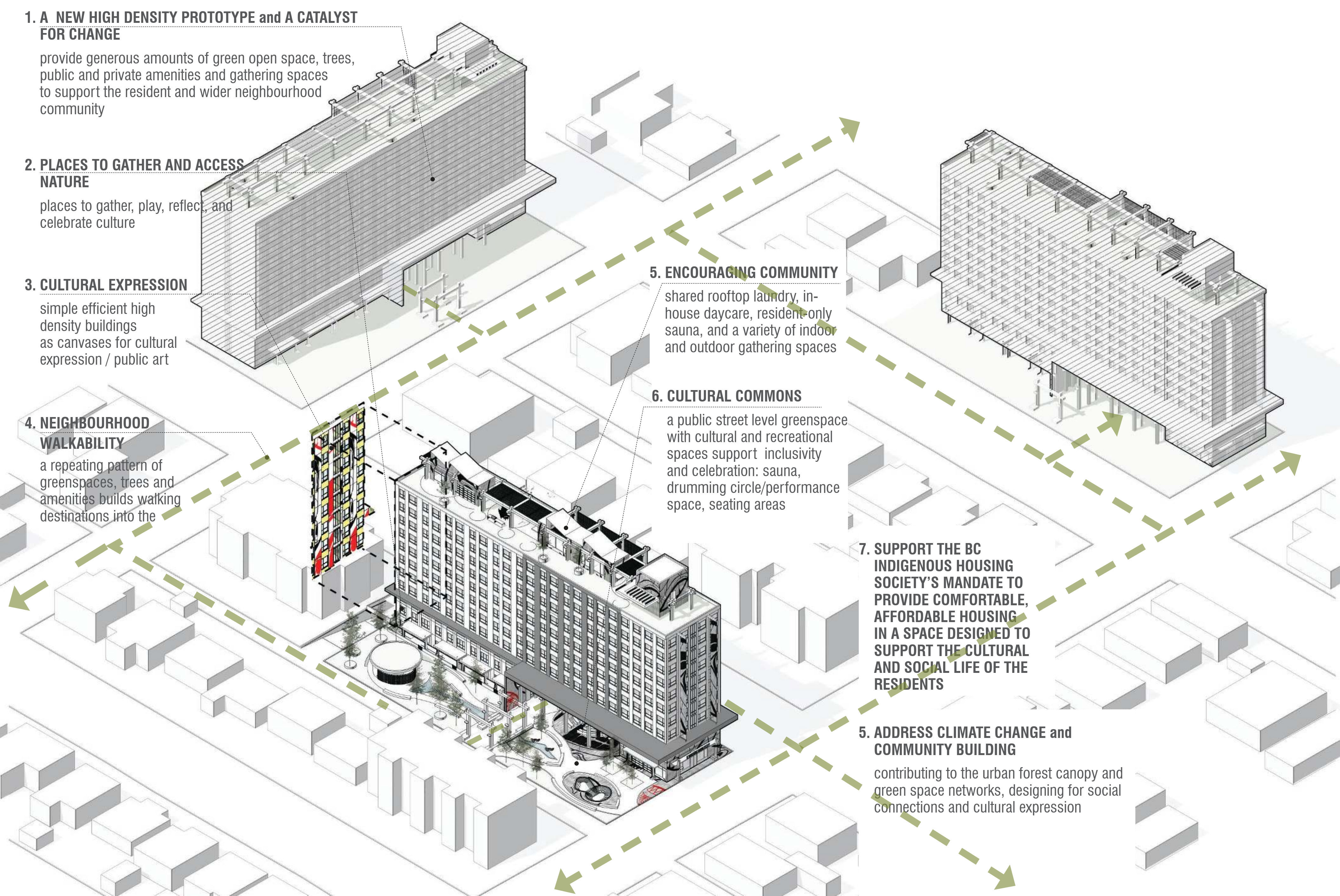
Dual-Flow Community

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.

KEY INTENTIONS



1. A NEW HIGH DENSITY PROTOTYPE and A CATALYST FOR CHANGE

provide generous amounts of green open space, trees, public and private amenities and gathering spaces to support the resident and wider neighbourhood community

2. PLACES TO GATHER AND ACCESS NATURE

places to gather, play, reflect, and celebrate culture

3. CULTURAL EXPRESSION

simple efficient high density buildings as canvases for cultural expression / public art

4. NEIGHBOURHOOD WALKABILITY

a repeating pattern of greenspaces, trees and amenities builds walking destinations into the

5. ENCOURAGING COMMUNITY

shared rooftop laundry, in-house daycare, resident-only sauna, and a variety of indoor and outdoor gathering spaces

6. CULTURAL COMMONS

a public street level greenspace with cultural and recreational spaces support inclusivity and celebration: sauna, drumming circle/performance space, seating areas

7. SUPPORT THE BC INDIGENOUS HOUSING SOCIETY'S MANDATE TO PROVIDE COMFORTABLE, AFFORDABLE HOUSING IN A SPACE DESIGNED TO SUPPORT THE CULTURAL AND SOCIAL LIFE OF THE RESIDENTS

5. ADDRESS CLIMATE CHANGE and COMMUNITY BUILDING

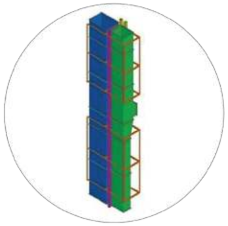
contributing to the urban forest canopy and green space networks, designing for social connections and cultural expression

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

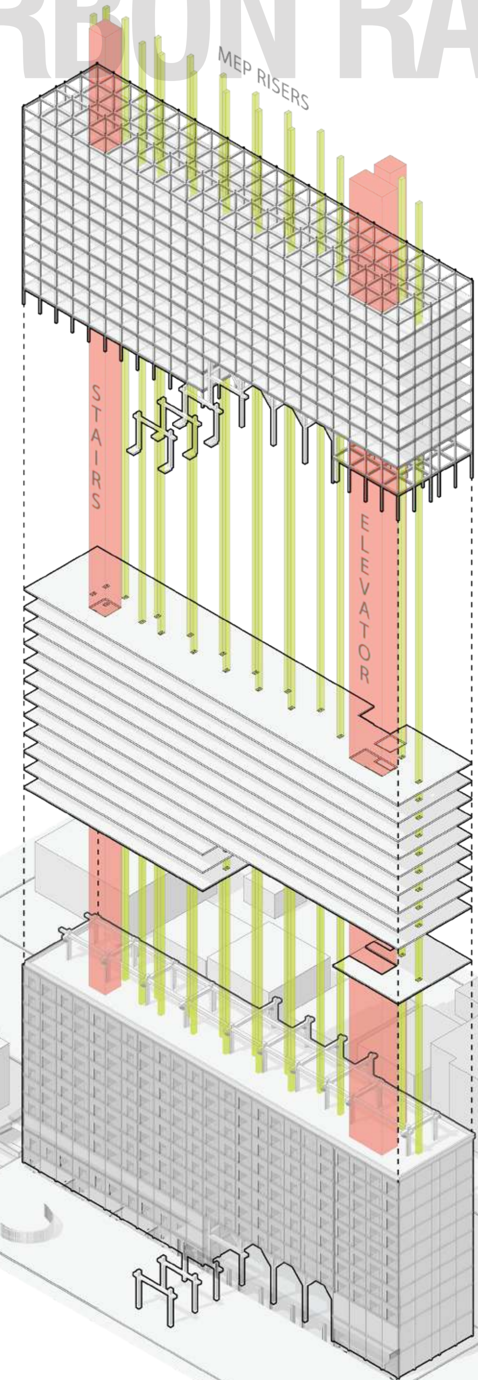
in-situ prefab MEP riser

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

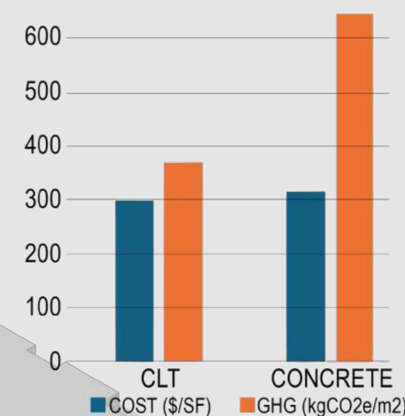
5% CHEAPER THAN CONVENTIONAL CONCRETE

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.

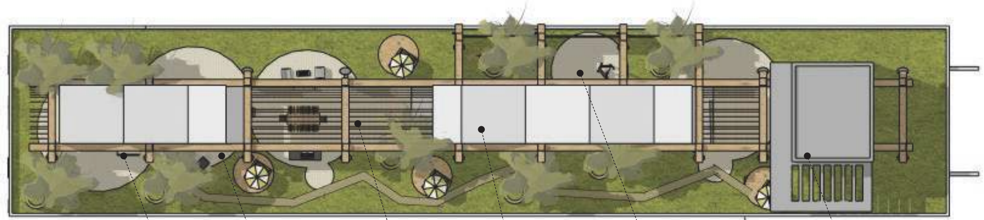
Inviting neighbours to share on-site green, open space and witness or participate in cultural activities follows the BC Indigenous Housing Society's Seven Laws of Life: Health, Happiness, Humbleness, Generations, Generosity, Forgiveness and Understanding.

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

site plan



roof plan

west / street elevation

north / street elevation

east / neighbour elevation

south / lane elevation

DTT-B-06

DATA + STRUCTURE + UNITS

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**

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.

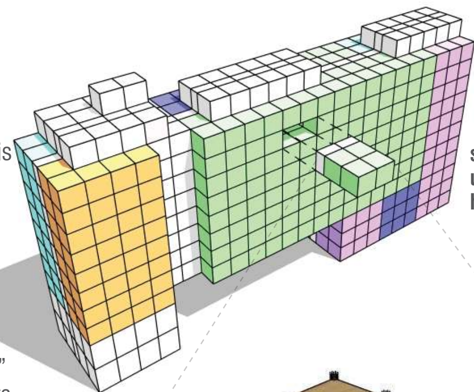
Building Form and Location

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.

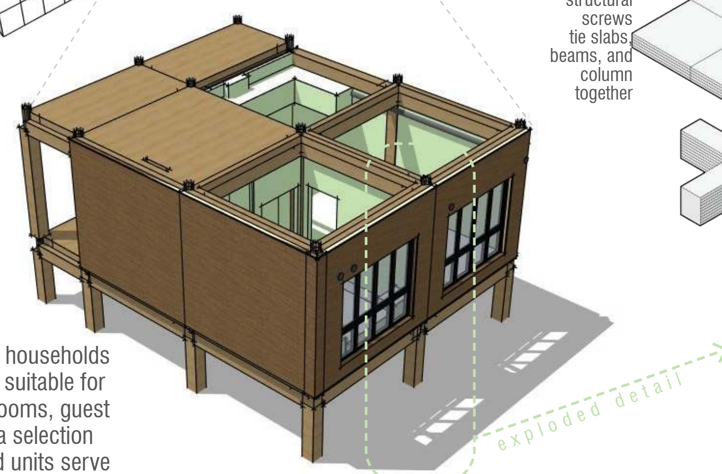
Dwelling Units

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.

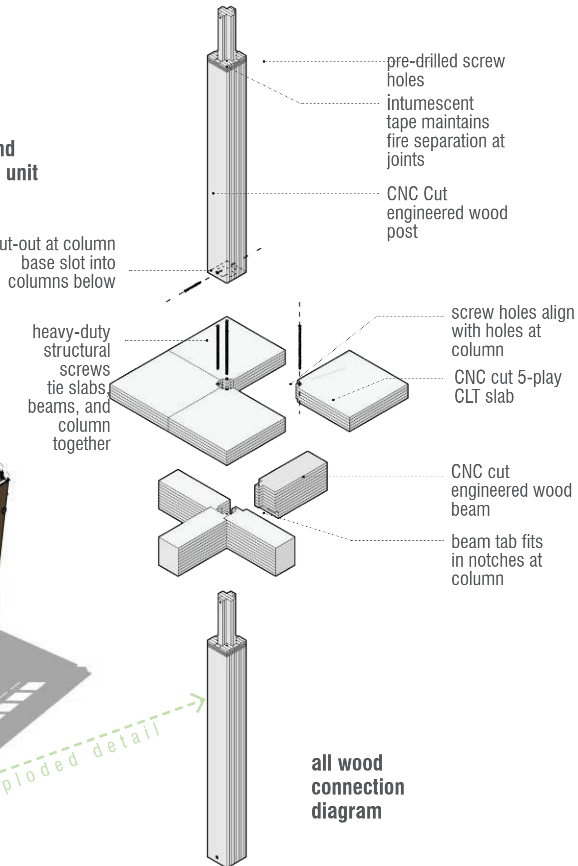
Units do not include private balconies. Large shared terraces are provided as a convenient outdoor space for residents on each floor.



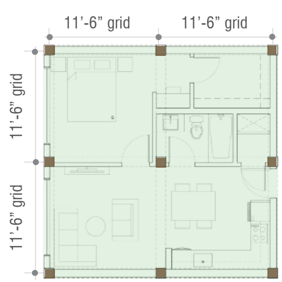
structural grid and unit mix (one bed unit highlighted)



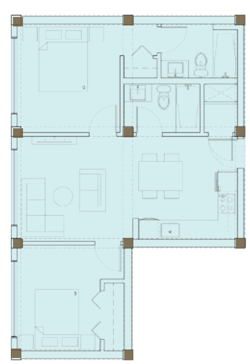
mass timber grid including and a one-bed unit



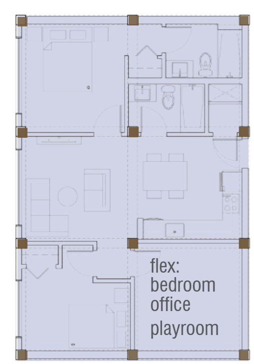
all wood connection diagram



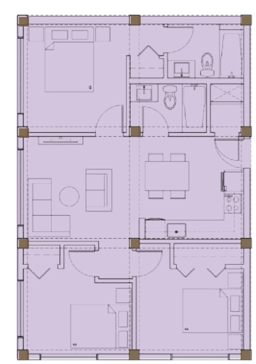
1 bedroom



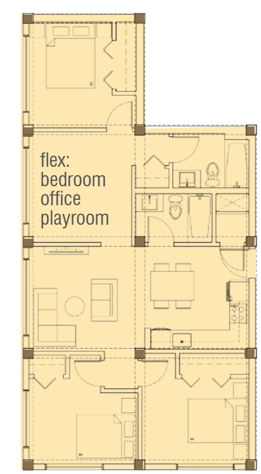
2 bedroom



2 bedroom + flex



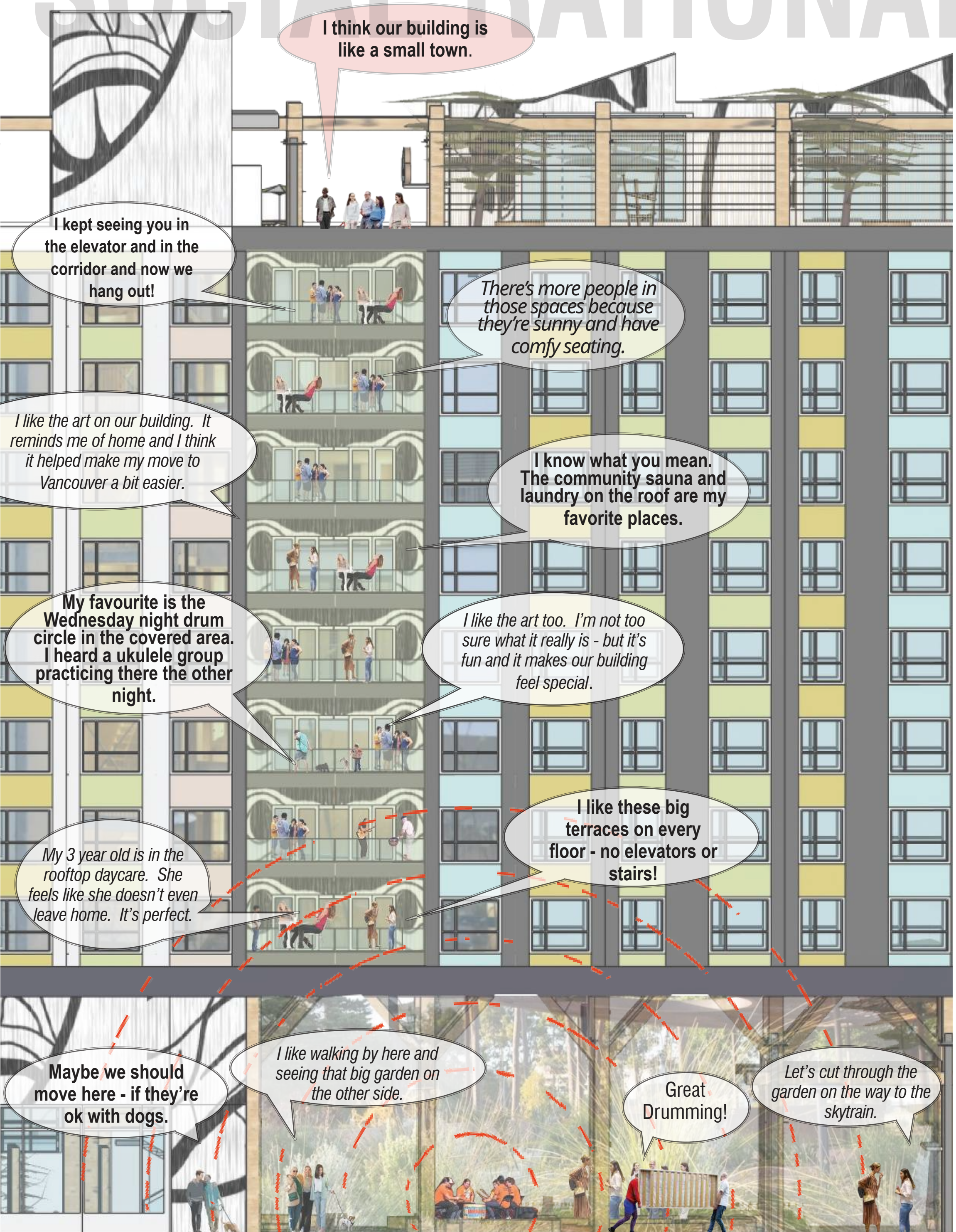
3 bedroom

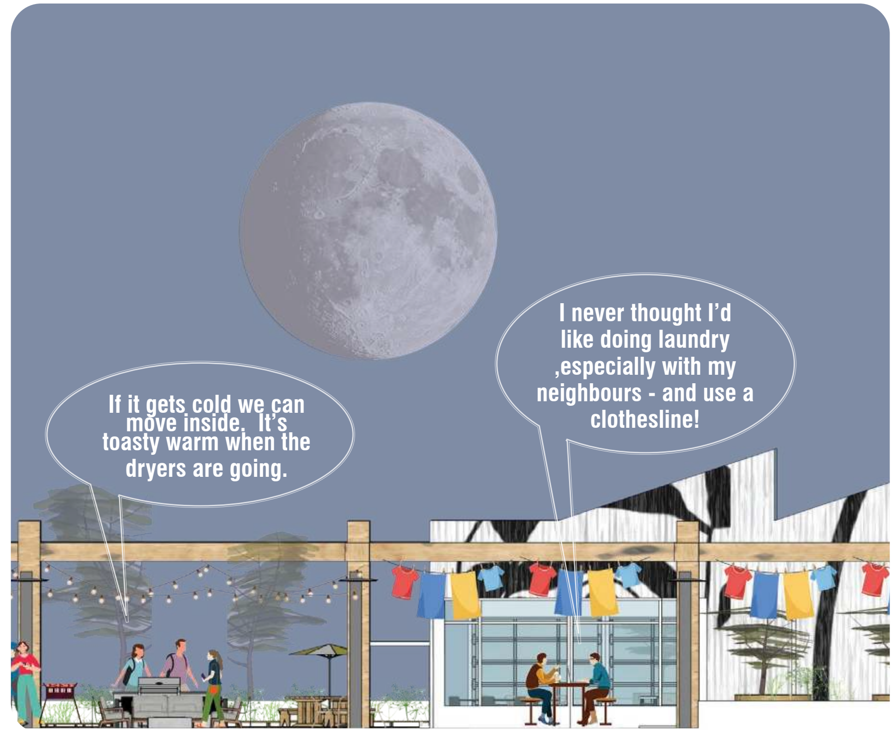


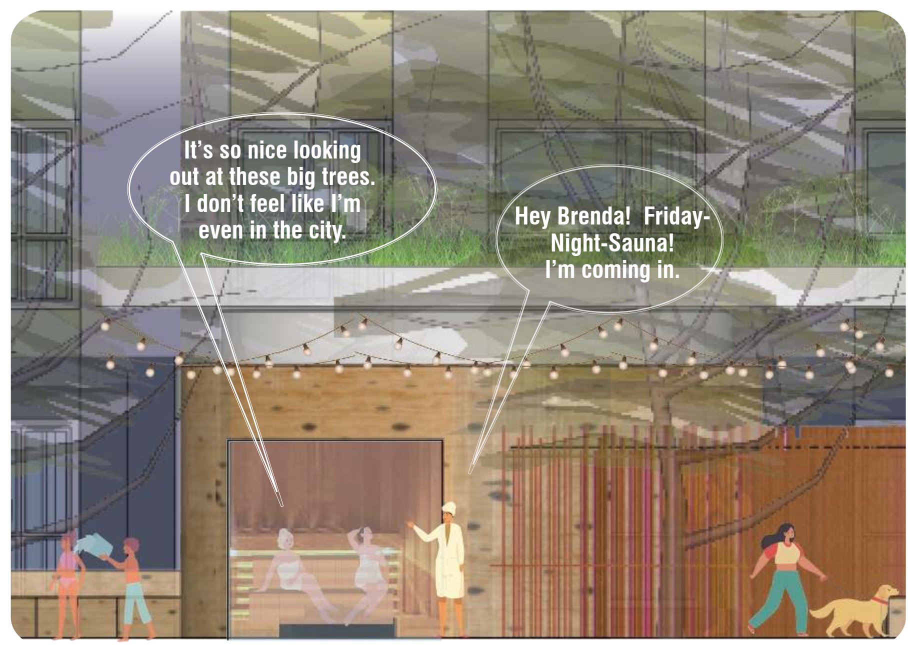
3 bedroom + Flex

DTT-B-06

SOCIAL RATIONALE





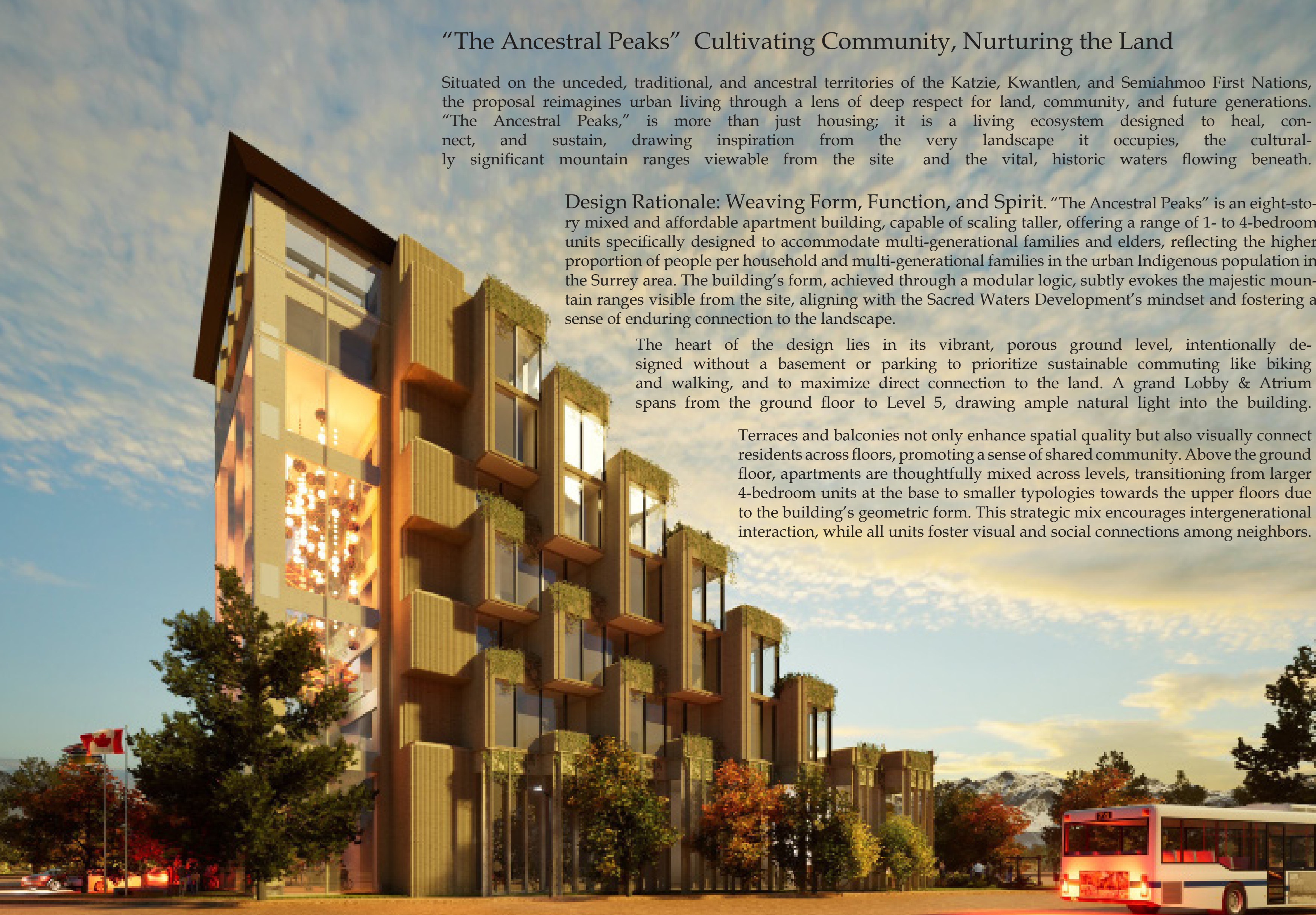


DTT-B-06


DD-LF-C3U6 - The Ancestral Peaks

DTT-C-01

"The Ancestral Peaks" Cultivating Community, Nurturing the Land



Situated on the unceded, traditional, and ancestral territories of the Katzie, Kwantlen, and Semiahmoo First Nations, the proposal reimagines urban living through a lens of deep respect for land, community, and future generations. "The Ancestral Peaks," is more than just housing; it is a living ecosystem designed to heal, connect, and sustain, drawing inspiration from the very landscape it occupies, the culturally significant mountain ranges viewable from the site and the vital, historic waters flowing beneath.

Design Rationale: Weaving Form, Function, and Spirit. "The Ancestral Peaks" is an eight-story mixed and affordable apartment building, capable of scaling taller, offering a range of 1- to 4-bedroom units specifically designed to accommodate multi-generational families and elders, reflecting the higher proportion of people per household and multi-generational families in the urban Indigenous population in the Surrey area. The building's form, achieved through a modular logic, subtly evokes the majestic mountain ranges visible from the site, aligning with the Sacred Waters Development's mindset and fostering a sense of enduring connection to the landscape.

The heart of the design lies in its vibrant, porous ground level, intentionally designed without a basement or parking to prioritize sustainable commuting like biking and walking, and to maximize direct connection to the land. A grand Lobby & Atrium spans from the ground floor to Level 5, drawing ample natural light into the building.

Terraces and balconies not only enhance spatial quality but also visually connect residents across floors, promoting a sense of shared community. Above the ground floor, apartments are thoughtfully mixed across levels, transitioning from larger 4-bedroom units at the base to smaller typologies towards the upper floors due to the building's geometric form. This strategic mix encourages intergenerational interaction, while all units foster visual and social connections among neighbors.

Axonometric views

Axonometric east

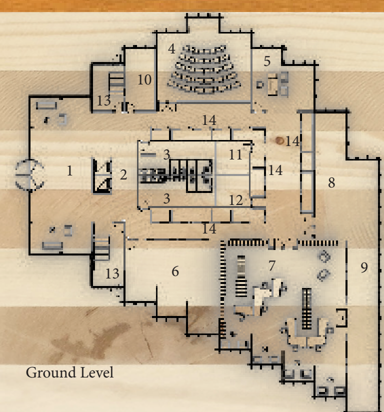
Axonometric south

Axonometric west

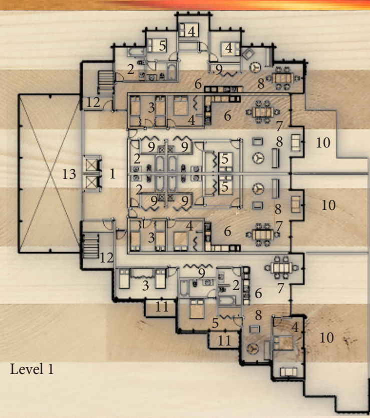
Axonometric north

Architectural floorplans

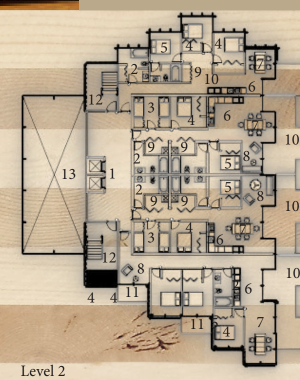
Ground Level	Levels 1 to 6
1. Lobby	1. Elevators
2. Elevators	2. Main Bathroom
3. Public Bathrooms	3. Double Bedroom
4. Gathering Hall	4. Single Room
5. Admin. Office	5. Master Bedroom with en-suite Bathroom
6. Wellness Centre	6. Kitchen
7. Cultural Hub	7. Dinning
8. Communal Kitchen	8. Living
9. Indoors Farm	9. Storage
10. Security Room	10. Terrace
11. Mechanical Room	11. Balcony
12. Laundry Room	12. Emergency Stairs
13. Emergency Stairs	13. Atrium
14. Lockers	14. Flexible space for typological reconfiguration



Ground Level



Level 1



Level 2

Elevations

South façade

North façade

West façade

East façade

DTT-G-01

Economic Rationale: Affordability Through Innovation & Efficiency

The economic model for "The Ancestral Peaks" focuses on delivering affordable, sustainable housing with long-term operational efficiency. The core of this economic advantage lies in the integration of innovative construction methodologies:

Modular Design & Prefabrication: The building's modular logic, based on a mix of ZIP facade walls, combined with the development of a code-compliant cassette system derived from my Ph.D. research ("How to facilitate a data-led approach to Modern Methods of Construction to revolutionise design and production processes in the Architecture, Engineering, and Construction (AEC)"), is critical. This approach follows principles of Design for Manufacturing and Assembly (DfMA) and Design for Disassembly (DfD), incorporating smart joinery components for efficient construction and future typological reconfiguration.

Reduced Labor Costs & Increased Speed: The cassette system, using CNC-cut structural plywood panels with high-performance, interlocking joinery, allows for rapid assembly without specialized tools or heavy machinery. This significantly reduces the need for skilled on-site labor and accelerates construction timelines, directly addressing the challenge of mass timber projects taking longer and costing more than concrete counterparts.

Indigenous Procurement: The commitment to procuring Indigenous suppliers and contractors wherever possible not only aligns with the Sacred Waters Development's values but also builds local capacity and creates economic opportunities within the community, fostering a more equitable value chain.

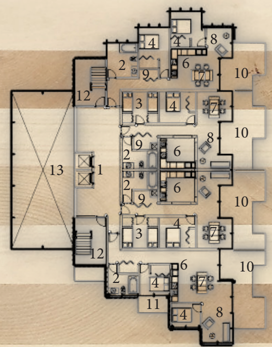
Shared Amenities: The extensive communal spaces (kitchen, laundry, greenhouse) provide services that can reduce individual household expenses, making the overall living cost more affordable.

Lower Operational Costs: The high daylight autonomy, potential thermal benefits from the Indoor Greenhouse, and a focus on simple, low-energy systems contribute to reduced long-term operating costs for residents and the housing provider. This directly supports the objective of long-term affordability for the residents.

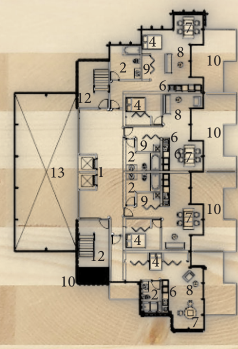
Relationship to Adjacent Properties and Streets: The building's strategic orientation and façade design actively engage with the arterial street, presenting a welcoming and visually appealing presence. The absence of a lane access is integrated into the ground-level programming, which focuses on pedestrian and cycling access, minimizing vehicular dependence. The adjacent "Low Rise Commercial" and "Low Rise Residential" areas are acknowledged by scaling the building form to create a transition from the lower existing urban fabric, while the "Collector" streets define the broader block context.

Levels 1 to 6

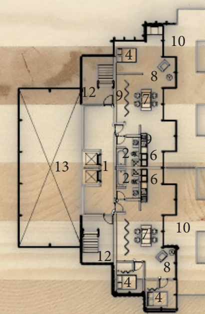
1. Elevators
2. Main Bathroom
3. Double Bedroom
4. Single Room
5. Master Bedroom with en-suite Bathroom
6. Kitchen
7. Dinning
8. Living
9. Storage
10. Terrace
11. Balcony
12. Emergency Stairs
13. Atrium
14. Flexible space for typological reconfiguration



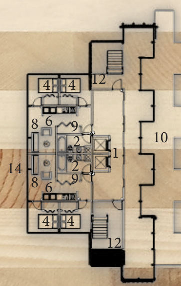
Level 3



Level 4



Level 5



Level 6 & above

The Healing Waters Path: North Garden as a Sacred Landscape

This theme is profoundly inspired by the historical stream, now culverted, that once visibly flowed along the site's northern boundary and holds immense cultural, ecological, and spiritual significance for the Katzie, Kwantlen, and Semiahmoo First Nations. Acknowledging Indigenous cosmologies where water is a sacred connector, and prayers are heard near water. The design commits to symbolically restoring this stream as an act of land stewardship and reconciliation. The 10m stream setback along the northern property line is transformed into a meandering corridor for ceremony, circulation, and storytelling. It integrates native and medicinal plants used by the Katzie, Kwantlen, and Semiahmoo Nations. Interpretive art, carvings, and weaving-inspired ground patterns, rooted in respectful Coast Salish visual language, will be incorporated, with a commitment to Indigenous procurement of artists and suppliers. Resting stones and small platforms will offer spaces for reflection, storytelling, or offering.

The garden references longhouse culture through linear timber elements, grounding the tower in a deeper timeline of land-based community gatherings. It specifically includes areas for drumming and song, with integrated sound walls for acoustic protection , and a designated space for fire or ceremonial gathering, echoing the significance of fire in traditional practices. Rain gardens or bioswales are tincluded as regenerative design features, embodying a return of water to the land. Educational plaque signage or digital storytelling nodes will explain the stream's history, cultural meaning, and the nations' values of Stewardship, Healing, Youth, and Innovation.

DTT-C-01

Proposed Alterations to Project Delivery, Development Approvals, and Financing:

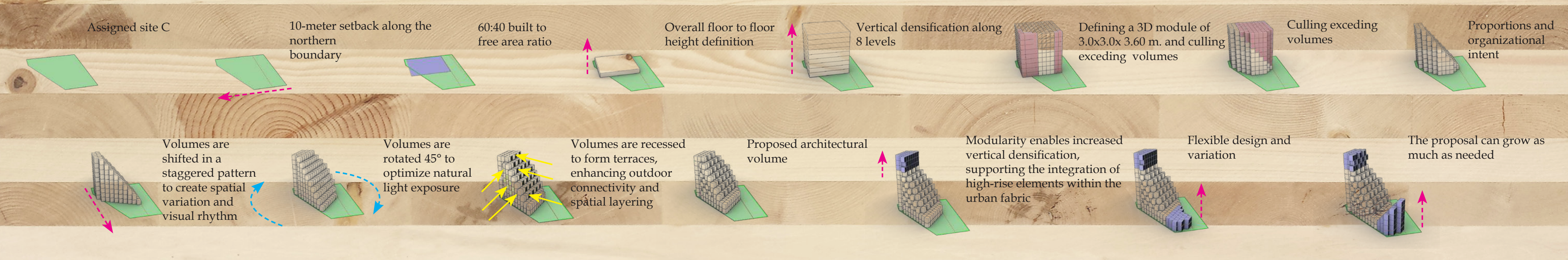
- Standardized Digital Components for Rapid Approval: The modular design, coupled with the digitally manufactured, smart-joinery cassette system (from my Ph.D. research), offers a standardized component logic, allowing for more predictable performance, cost, and timelines. Proposing that municipal and provincial approval processes could be streamlined for projects utilizing such pre-approved, code-compliant, and performance-verified modular systems. Directly addressing the need to "streamline the system of delivery of large-scale low carbon buildings" and the interest in "standardized designs as a way to streamline review and approvals".

- Integrated Project Delivery (IPD): Advocating for an IPD approach, leveraging the DfMA principles. This would involve early collaboration between the Indigenous housing developer (Sacred Waters Development), designers, fabricators, and contractors to optimize the modular system for efficient production and assembly, ensuring project delivery is faster and more cost-effective.

- Values-Aligned Financing: Proposing models that explicitly value the long-term social and environmental returns alongside financial ones. This could involve "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 this innovative mass timber, modular housing solution.

Longitudinal section

Spatial intent and massing strategy



DTT-C-01

Carbon Reduction Rationale: Mass Timber & Optimized Performance

The commitment to a low-carbon future is central to "The Ancestral Peaks." The building's structure primarily proposes Cross-Laminated Timber (CLT) walls for rigidity, forming the central "spine" of the structure and providing vertical connectivity for services and piping elements.

Prioritizing mass timber construction, a low-carbon solution that aligns with traditional Indigenous respect for the land. While an elevator core necessarily uses concrete, the extensive use of CLT significantly reduces the embodied carbon compared to conventional concrete buildings. Aiming to integrate 100% Indigenous-sourced timber into the project, supporting Indigenous procurement throughout the value chain.

Beyond material selection, the building's strategic orientation and façade design are outcomes of rigorous natural illumination simulations. These simulations demonstrate an overall daylight autonomy of up to 73.3%, achieving 2 LEED points and maintaining an average illuminance of 3,772 lux.

This maximizes natural light penetration, reducing reliance on artificial lighting and minimizing operational energy consumption, contributing to long-term operational efficiency and a lower carbon footprint. The southwest-facing primary frontage of Site C is carefully managed with high-performance glazing and integrated shading strategies to mitigate solar heat gain while still optimizing daylight.

Volume of wood products used (m³):
2017 m³ (71239 ft³) of lumber and sheathing

U.S. and Canadians forests grow this much wood in:
5 minutes

Carbon stored in the wood:
1919 metric tons of CO_2

Avoided greenhouse gas emissions:
741 metric tons of CO_2

Total potential carbon benefit:
2660 metric tons of CO_2

Equivalent to:

562 cars off the road for a year

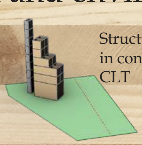
Energy to operate **281** homes for a year

Relationship to the Existing Building Code.

The proposal arises a challenge to the BC Building Code regarding the unintended consequences of recent Energy Step Code changes. The current interpretation and implementation of these changes have sometimes led to design constraints that reduce window sizes and limit residents' exposure to natural light, raising concerns about potential long-term health effects on occupants. The proposal, with its 73.3% daylight autonomy and average 3772 lux, demonstrates that high energy performance can be achieved without compromising access to natural light and livability.

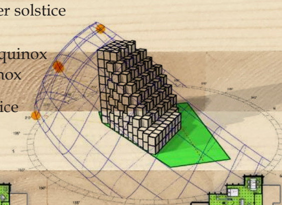
Proposing a re-evaluation of prescriptive aspects of the Code to allow for performance-based solutions that prioritize both energy efficiency and occupant well-being, fostering the health effects of light, building materials and livability.

Structural and environmental strategy


Structural cores in concrete and CLT

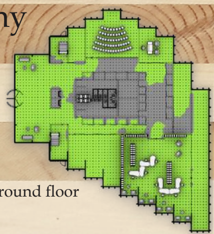

Structural beams and columns in CLT

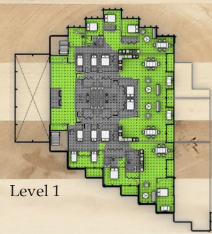

CLT Floors

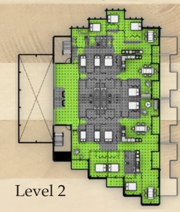



Wind rose

Daylight autonomy


Ground floor


Level 1


Level 2


Level 3


Level 4


Level 5

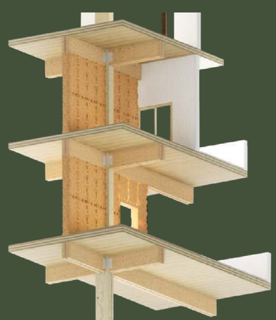

Level 6

Innovation in Systemization and Standardization

"The Ancestral Peaks" is conceived not merely as a standalone building, but as a proof-of-concept for a revolutionary approach to mass timber construction, deeply rooted in principles of Design for Manufacturing and Assembly (DfMA) and Design for Disassembly (DfD). The systemization strategy is the cornerstone of the project, demonstrating how a data-led approach can transform design and production processes in the Architecture, Engineering, and Construction (AEC) industry.

Design for Manufacturing and Assembly: Every component, from the cassette walls to the CLT floor panels and facade elements, is designed with its manufacturing and assembly process in mind. This means optimizing for standardized dimensions, minimizing waste during fabrication, and simplifying on-site construction sequences. This systematic approach significantly reduces construction time and costs, enhancing overall project efficiency.

Design for Disassembly: Looking beyond the building's initial lifespan, DfD principles ensure future adaptability and resource recovery. The smart joinery and modular nature of the cassette system mean that components can be easily deconstructed, replaced, or repurposed at the end of the building's life or for future renovations. This minimizes demolition waste, supports a circular economy, and allows the building to evolve with the needs of its occupants and the changing urban context.



Structural composition

The Cassette System:

A Code-Compliant, Digitally Fabricated Core. Drawing inspiration from previous innovators such as the WikiHouse project, the interior wall system is based on a code-compliant cassette system. This system primarily utilizes CNC-cut structural plywood panels, having the potential to use other structurally-sound materials. These panels are designed with "smart" and high-performance joinery components, ensuring precision and allowing for rapid assembly with minimal specialized tools or heavy machinery.

This approach directly addresses the challenge of reducing reliance on highly skilled on-site labor. The cassettes can be flexibly assembled either off-site as prefabricated panels or on-site, offering adaptability to various project logistics. The emphasis on accessible, sustainable, and modular construction, directly aligns with modern methods of construction (MMC) and prefabrication principles.

Complementing the system, the building's facade employs prefabricated ZIP walls produced off-site. These high-performance panels contribute to rapid enclosure, superior thermal performance, and quality control, leveraging the efficiencies of off-site manufacturing. This integration ensures a cohesive and high-performing building envelope.

CLT Floors and Columns:

The structural backbone; while the core employs concrete for elevator shafts, the primary horizontal and vertical load-bearing elements beyond the core are comprised of Cross-Laminated Timber (CLT) for floors and columns. CLT's inherent structural rigidity and excellent carbon sequestration properties make it an ideal choice for a sustainable mass timber tower. The use of CLT in a systematic, grid-based layout allowing for predictable fabrication and assembly sequences, further integrating with the modular logic of the overall building.

High-Performance Joinery:

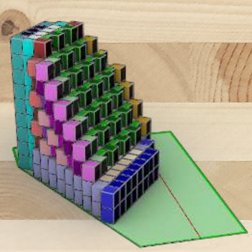
The success of a highly systematic and modular timber construction relies heavily on robust and intelligent connections. The "smart joinery components" within the cassette system and throughout the CLT connections are designed for rapid, precise, and secure assembly. Drawing inspiration from leading manufacturers like Rothoblaas, known for their advanced timber fastening and connection systems. These engineered connections facilitate quick erection, ensure structural integrity, and embody the DfMA principle of ease of assembly.

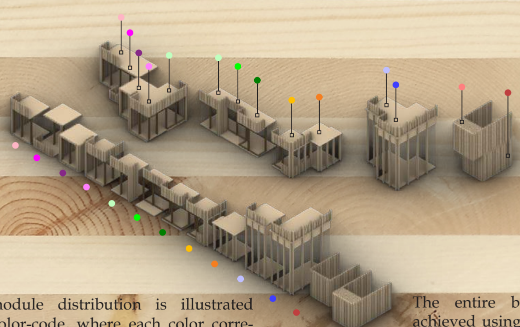
Design for Disassembly (DfD) & Adaptability:

The DfD principles embedded in the cassette system mean components can be easily replaced or reconfigured over time, enhancing the long-term adaptability and resilience of the building. This reduces future renovation costs and material waste, aligning with long-term sustainability and operational efficiency.

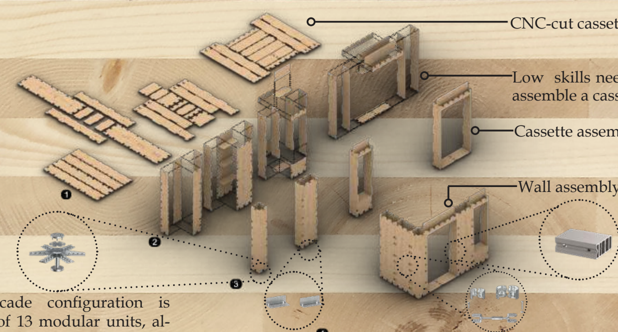
CONSTRUCTION COSTS					
Concept	Quantities	Concrete		Submission	
	Square footage	$/sq ft	Cost	$/sq ft	Cost
Below grade	0.0	$315	$0.00	$299	$0.00
Base floor	11,117.39	$360	$4,002.26	$403	$4,480,308
Above 1st. storey	3,5772.80	$405		$431	$15,418,064
	Quantity	$/unit	Cost	$/unit	Cost
Balconies	24	$25,000	$600,000	$25,000	$600,000
	Cost per month	# of months	Cost	# of months	Cost
Schedule Costs (Monthly Overhead)	$50,000	18	$900,000	9	$450,000
TOTAL	$19,990.23			$20,948.37	

Modular Logic





Façade module distribution is illustrated through color-code, where each color corresponds to a specific module type, material, or function zone.



The entire building facade configuration is achieved using a system of 13 modular units, allowing for efficient spatial organization and scalable design flexibility.

Step-by-step assembly process: (1) flat CNC-cut panels, (2) assembly into volumetric cassettes, (3) completed cassette units, and (4) final wall assembly. This sequence reflects a modular construction approach aligned with MMC principles, emphasizing precision, efficiency, and ease of installation.

DTT-C-02

NINE WAYS TO *GROW* YOUR CITY

Current responses to the housing crisis, ecological crisis, and construction cost and labour issues too often miss the forest for the trees—focusing on each crisis in isolation rather than on the underlying systems. The narrow focus on present-day technological capabilities lacks the transformative vision needed for real impact. Designers and constructors can do more to contribute to affordability than squeezing already-too-austere condos. Likewise, governments can do more than sink funding into a broken system while remaining unable to address root causes. It's time to grow a new vision from the ground up.

Growing *Cities*

Nine Ways to Grow Your City outlines a hopeful new model for urban growth—plentiful housing, crafted from high-quality materials, designed to lock away carbon as it is built—all rooted in a new system of design and construction. It goes beyond mere technical excellence, simultaneously strengthening communities and creating conviviality.

***Growing* Cities**

Cities can work more like ecosystems: grown, not extracted. This shift to a bioregional, biomaterials-based construction ecology begins with timber and expands from there, reshaping our connections to the ecologies to which we belong.

Redesign Design, Reconstruct Construction

These budding transformations need fertilizer and a structure to guide their growth. *Nine Ways* proposes a platform: a systems-scale intervention that provides the tools and the framework to get everyone pulling in the same direction. It reshapes incentives, open-sources expertise, and systematizes successes.

The approaches on the slides that follow already exist: we already know how to do this. By reshaping the playing field, the platform directly confronts the true, systemic challenge—coordination and organization.

Nine Ways to Grow Your City illustrates a series of tangible yet systems-scale actions that can be taken, right now, to begin the transition to a new system of construction, a new era of affordability, and a new weave of ecological and social dynamics.

THE PLATFORM

AN OPEN, SHARED INFRASTRUCTURE

DTT-C-02

Our Platform

Nine Ways operates above the scale of individual projects—operating directly on the systems that determine whether projects and technologies are feasible. It is a platform in a double sense: a shared infrastructure for change, and a focused set of imperatives.

The platform consists of two main components:
1) targeted policy changes to reshape incentives and regulations, and
2) a unified digital-organizational tool to transform design, permitting, and construction systems (divided into the three key components shown to the right).

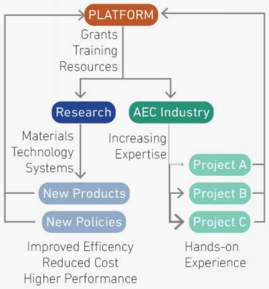
A Platform for Everyone
Built on open-source principles, the platform rejects privatized monopolies and proprietary, fragmented technological approaches. It embraces platform cooperativism and the right to participate, ensuring its governance, goals, and mechanisms of change are collective and able to be shaped by its participants.

While envisioned as initiated by government and with substantial involvement from all levels of government via incentives and regulation changes, ultimately the platform would be guided by its own public-private representative body. In this way the platform can remain shared, adaptable, and held in common.

We're Already Doing This
There is an astounding amount of work currently underway to sew the seeds of this transformation. However, these efforts are currently scattered, siloed, and often competing. The platform builds on these existing initiatives and technologies, coordinating them and providing missing links.

Weaving Together
The platform brings these efforts together, weaving them into a coherent whole. The challenge is structural. To meet it, we need a visible hand guiding the invisible one—rallying around a shared vision and guided collectively by the platform.

Keep the Change
The platform builds in openness to change, with robust feedback loops as part of its core structure. It becomes a machine for initiation, ideation, innovation, iteration, and implementation—working small and multiple, feeding off its successes and making them part of the next round of its operation.



Program + System Boundary

PLATFORM

Platform + Digital Tools Boundary

Knowledge Base

A centralized, open-source repository of guides, standards, technical data, research, case studies, and best practices, and more—promoting information sharing and a circular knowledge system.

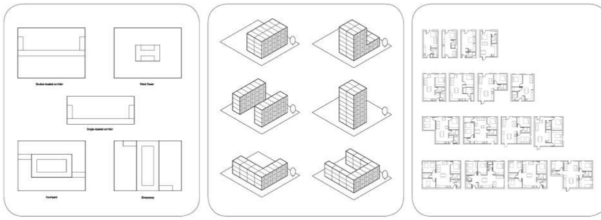
Existing References
- *Knowledge and Standards Repositories:* WoodWorks, FPInnovations, CREE, Intelligent City, EASI ZERo, StraviDB, CSA, CAN/ULC testing, AWMAC, TTMAC
- *Training and Certifications:* federal and provincial training grants, BCIT/UBC/UNBC timber training programs, global exchanges, Indigenous Manufacturing and Contracting Network, Red Seal program, prequalification programs

Knowledge Repository | *Standards* | *Training + Certification*

Catalogue

A curated library of pre-approved, standardized architectural plans and massing strategies that can be adapted to specific site conditions and client ambitions. These are coupled with fluid, digitalized analysis tools for real-time testing of options.

Existing References
- *Design Catalogues:* DASH Program (BC Housing), Housing Design Catalogue (CMHC), Standardized Housing Designs Catalogue (BC Prov. Gov't)
- *Massing, Layout, Feasibility, and Analysis BIM/AI Tools:* Mass Timber Navigator, Platforms for Life (Intelligent City), Finch3d, Spacio, Hypar, Testfit, Autodesk Forma, & many more

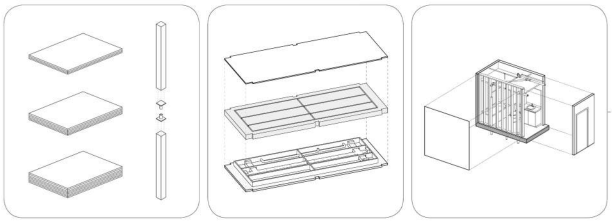


Building Archetypes | *Massing and Feasibility* | *Unit Library*

Kit

A standardized and interoperable set of pre-fabricated mass timber and building envelope elements, allowing for efficient, factory-built construction systems. Free flow of data streamlines design, construction, and product development.

Existing References
- *Prefab systems:* UK Construction Playbook/MMC; Construction Innovation Hub
- *Componentized prefab:* typical mass timber products, standardized connections
- *Panelized prefab:* Platforms for Life (Intelligent City), CREE, CLIPs (Element5), Speedwall (Flynn), UnitiWall, Stora Enso, +
- *Volumetric prefab:* ...



Type 1: Components | *Type 2: Panels* | *Type 3: Volumes*

INCENTIVES & REGULATORY CHANGES

A framework for aligning policy—providing financial incentives and streamlining approvals processes.
An *a la carte* menu: the more that are implemented, the more robust the transition will be.

anticipated impact
○ *low* ◍ *med* ● *high*

	Existing	Implemented At Platform Launch	Phased In Steps
Municipal • zoning bylaws • planning approvals • building code + engineering	○ *Timber Zoning Relaxations (YVR)*	● *Timber Density Bonuses*	● *Material Reuse Incentives & Req's*
	○ *Embodied Carbon Guidelines (YVR)*	● *Expedited Development Permits (Catalogue Projects)*	◍ *Parking Reductions*
	● *Broadway Plan Upzoning (YVR)*	● *Expedited Building Permits (Catalogue + Kit Projects)*	◍ *Design/Construction Prequalification*
		◍ *Design/Construction Prequalification*	
Provincial • provincial building code • large-scale planning (e.g. TOAs) • training and education • coordinating municipalities	● *Transit-Oriented Area legislation*	● *Timber Building Code Optimizations*	● *Timber Building Code Relaxations*
	◍ *Training Grants*	● *Timber Density Bonuses in Transit Zones*	● *Embodied Carbon Step Code*
	○ *Co-op Housing Incentives & Grants*	○ *Co-operative Products Incentives*	● *Resilience Requirements*
	○ *CleanBC Initiatives*	◍ *'Buy Bioregional' Incentives*	● *Pilot Project Funding*
Federal • housing funding • research and development • tax incentives • standards	○ *Affordable Housing Funding*	● *Platform Participation Incentives*	● *BIM Implementation Road Map*
	◍ *Timber Building Research*	◍ *Prefab Housing Funding*	● *Pilot Project Funding*
	◍ *Research Grants*	◍ *Timber / Prefab Housing Tax Rebates*	● *Harmonized National Standards*
	◍ *Material Testing Grants*	◍ *Biomaterial Research + Startup Grants*	◍ *'Sell To The World' Grants*

Platform Planks: Objectives and Underlying Concepts

On the pages that follow, the nine key Planks underlying the platform are elaborated and drawn out.

These Planks are loosely grouped into three underlying shifts:

- new communities of construction
- new economies of construction
- new ecologies of construction

These shifts and their associated Planks guide the detailed development of the platform and its evolution over time.

Narrative Tableau: Following a Project Through the Platform

The Planks are paired with a tableau telling the story of one illustrative project as it works its way through the process of construction—illustrating its exchanges with the platform as it goes.

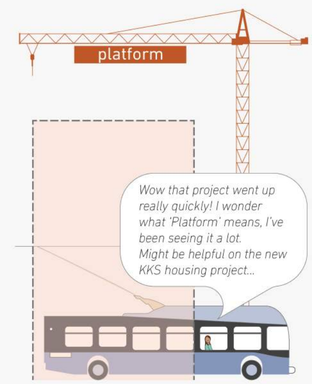
The project is envisioned as taking place roughly ten years into the adoption of the platform, at a stage where its systemic impacts have begun to manifest but early enough to remain applicable to the current context.

Site and program were specifically chosen to test the limits of the system's flexibility and ambition:

Site: Site C (irregular shape, no lane)

Development scenario: Indigenous Housing Provider (KKS Nations) + Co-Operative Housing + Public-Sector Support

Non-Housing Program: Significant community gathering spaces and social programs per the brief, an Indigenous community organization in the podium, daycare, and CRUs.



I. NEW COMMUNITIES OF CONSTRUCTION

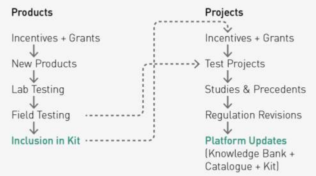
The platform reshapes communities related to the construction industry in a variety of ways—from new communities of knowledge, based around open cooperation and new forms of design and construction expertise, to new communities of production, based around shared goals, incentives, and interests, to new communities of shared well-being, through the creation of dense, vibrant, and culturally-responsive cities.

Plank 1: Share Knowledge Freely to Build New Norms

The platform's open-source Knowledge Base democratizes access to expertise. Coupled with an iterative process of testing, pilot projects, and training, new communities of practice take form. Timber and prefab knowledge becomes non-proprietary, familiar, and accessible.

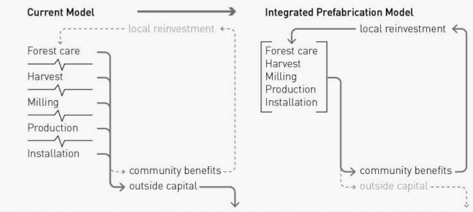
Plank 2: Create an Innovation & Implementation Infrastructure

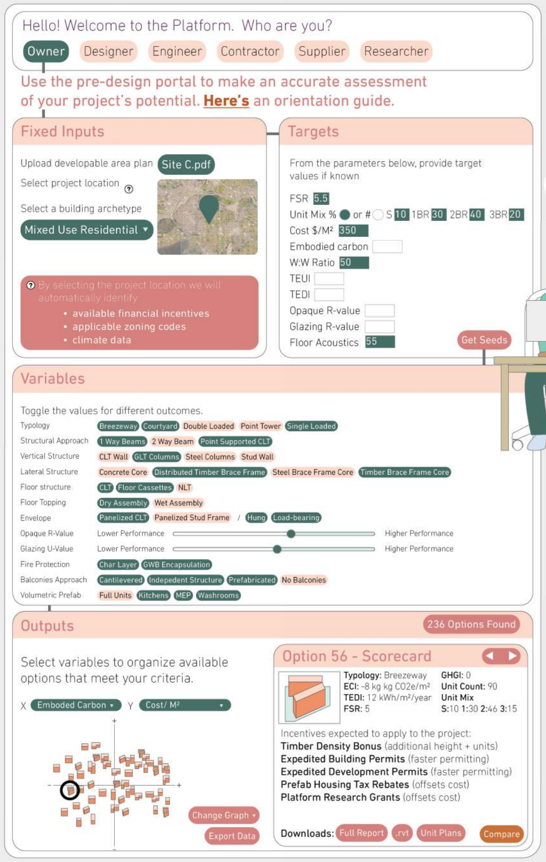
The platform serves as an incubator for new construction ideas, enabling rapid testing and deployment. It provides structured pathways and incentives for both projects and products, supporting research, scaling, and commercialization while driving demand.

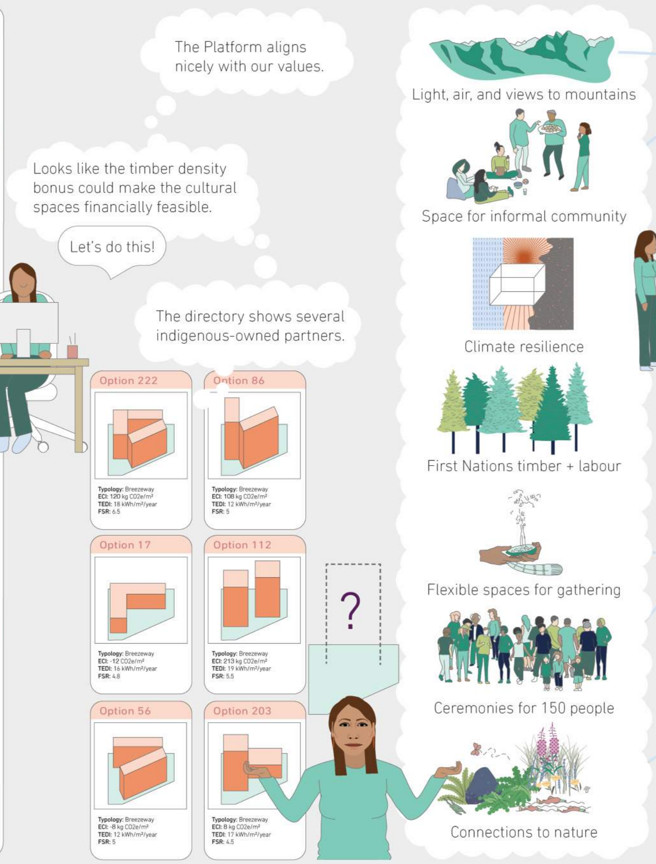


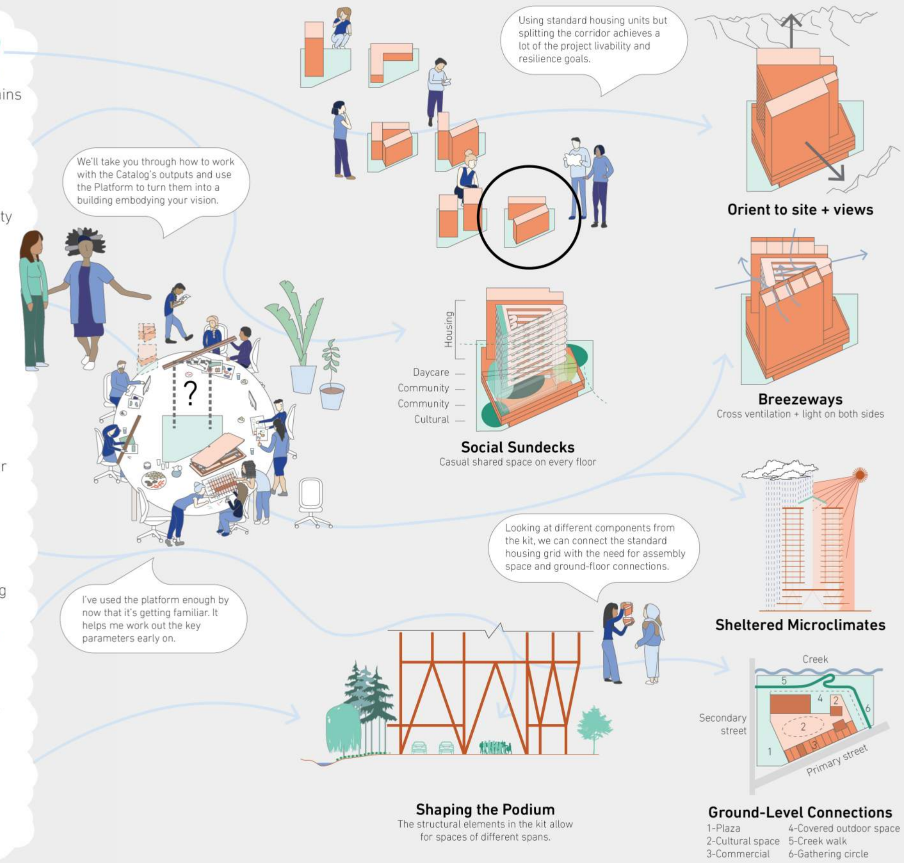
Plank 3: Foster Shared Benefits for BC Communities

The platform helps ensure the transition to a biomaterials-based economy benefits all. Off-site fabrication can empower Indigenous and rural communities and create value-added jobs in resource regions—enabling autonomy while easing pressure on urban centres.









A. Consulting the Catalogue

The owner begins pre-design in the platform, drawn in by its reduced costs and ease of use. Options are tested, metrics explored, pro-formas re-formed, starting points developed.

B. Developing the Vision

Now equipped with Catalogue outputs, the client engages a design team to incorporate elements of the client's vision that were beyond the scope of the initial study.

C. Flexing the System

Working with the Platform gives the design team a head start on the design. They iteratively shape its outputs in response to site conditions and design aspirations.

II. NEW ECONOMIES OF CONSTRUCTION

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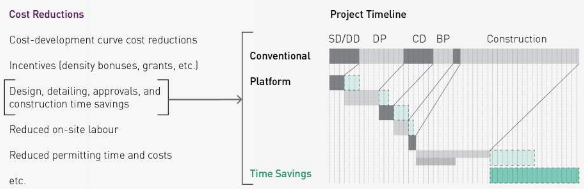
The platform reshapes design and construction systems in a variety of ways—from new economies of housing production, reducing housing cost by building more efficiently and shifting the cost-innovation curve, to new economies of building, transitioning to modern methods of construction, to new economies of global exchange, repositioning BC and Canada as global experts in this new era of construction.

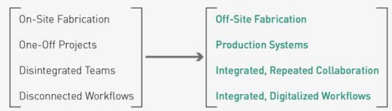
Plank 4: Re-Tool Construction to Lower Costs and Scale New Approaches

By standardizing components and prefabricating off-site, the platform cuts costs, waste, and timelines. Starting in high-cost markets like Vancouver sustains new products until technological development and economies of scale make them viable in more affordable regions.



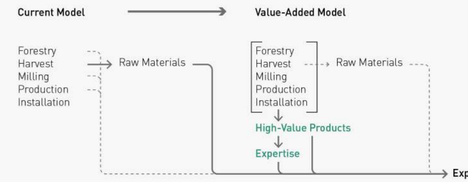
Plank 5: Adopt New Methods of Construction From the Field to the Factory

The platform enables a series of key shifts in construction: from on-site to off-site prefabrication, from one-off projects to standardized systems across builds, from fragmented teams to integrated collaboration, and from disconnected tools to BIM-enabled workflows.

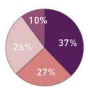


Plank 6: Build Local Expertise & Sell it to the World

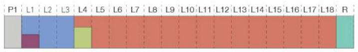
The platform develops local expertise, creates a homegrown market for BC's timber sector, and helps tariff-proof the economy. It also boosts exports of high-value products and expertise, positioning BC and Canada as leaders in sustainable construction and the global bioeconomy.



Lot Size	20,130 sf
FSR	5.5
Gross Area	110,430 sf
# of Storey	18 storey
Efficiency	78%



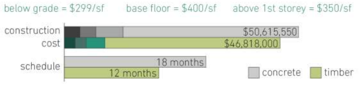
type	# units	avg. sf
studio	30	425
1 bed	41	600
2 bed	29	875
3 bed	12	1025
total	112 (155 beds)	

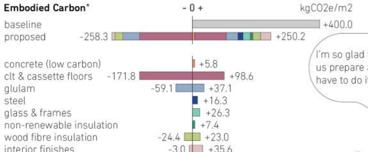


- parkade = 7,500 sf
- CRU = 1,750 sf
- cultural / community = 8,750 sf
- daycare = 7,500 sf
- res. = 93,865 sf + 2,600 sf amenity
- rooftop amenity = 4,500 sf

Anticipated Platform Cost + Schedule Improvements	Cost	Schedule
• Systemic Changes: construction cost ↓, knowledge ↑	x	
• Timber Density Bonus: increased FSR & building stories	x	
• R+D & Pilot Project Funding: open-source knowledge base	x	x
• Streamlined Design & Permits: preapproved layouts	x	x
• Biomaterials Grants: support local & Indigenous materials	x	

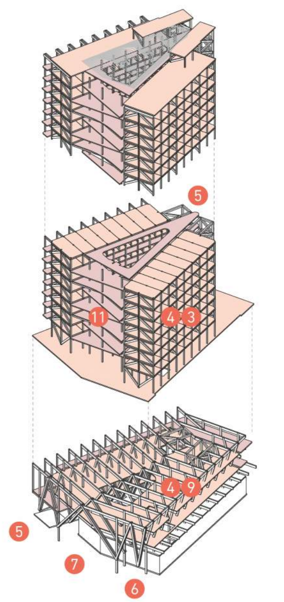
below grade = $299/sf   base floor = $400/sf   above 1st storey = $350/sf





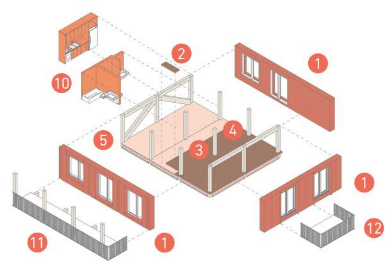
- ECI: 250.2 kgCO2e/m2 (40% below CoV benchmark)
- Net ECI w/ biogenic carbon: -8.1 kgCO2e/m2
- Carbo Life Calculator plugin used with material quantities from BIM model.
- wbLCA methodology follows the CoV Embodied Carbon Guidelines, except that we also included the parkade. Region-specific, current EPDs were used. Analysis assumes cradle-to-grave life-cycle boundary (A1-C4).

Structural Axonometric



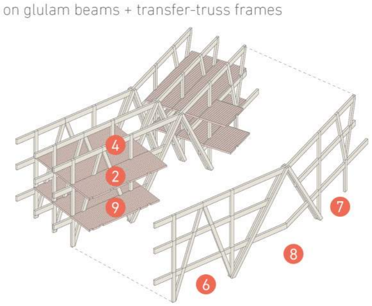
Housing Levels: Mass Prefabrication

Point-supported CLT+MPP floor cassettes



Podium Levels: Structural Reconciliation Becomes Flair

CLT on glulam beams + transfer-truss frames



Assemblies

1. Panelized envelope (BOD: Element 5 CLT Insulated Panels, w/ fibre-cement cladding)
2. Panelized dry topping (BOD: Fermacell 2E35 / Stravitec Stravifloor Channel M30)
3. Floor cassettes w/ integrated MEP routing (BOD: Intelligent City floor cassettes)
4. Glulam columns / braces / beams
5. Glulam brace-frame lateral system
6. Glulam transfer truss @ parkade ramp
7. Glulam transfer truss @ CRUs
8. Glulam showcase truss at ceremony space
9. CLT floors
10. Volumetric prefab washrooms + kitchens
11. Independent balcony/breezeway structure
12. Prefabricated clip-on balconies

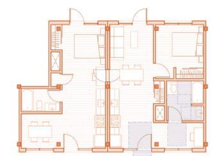
Fire and Acoustics

The building acts as a demonstration project, testing fire and acoustics approaches used broadly in Europe.

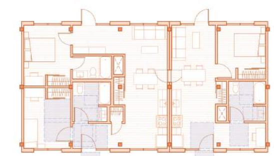
- The building focuses on mitigating fire risk through technical systems, in line with more permissive European combustibility standards. Fire-performance mitigation measures adopted include redundant sprinkler standpipes to increase sprinkler reliability, and increasing sprinkler performance by upgrading the system to Ordinary Hazard standards.
- Char-layer protection is used instead of encapsulation, except in concealed spaces, to reduce embodied carbon and simplify sequencing. This approach supports future code trends and maximizes wood's benefits.
- An alternative solution is needed for exterior combustible materials on a high building. The wood is largely separated by noncombustible surfaces and can be treated with fire-retardants. If not accepted, the secondary structure could be swapped to steel with little design impact.
- To reduce embodied carbon, the project uses fire-retardant, waterproof woodfibre insulation from BC, modeled after Gutex Multitherm. The platform would fund CAN/ULC S134 and S146 testing for envelope and floor assemblies.
- In lieu of concrete topping (with its sequencing, moisture, and embodied carbon challenges), the project uses a dry topping commonly used in Europe. It acheives STC 58 and IIC 55 on 5-ply CLT. Assuming it passes CAN/ULC S146, it can act as the 50min encapsulation for the top of the slab.

Flexible Housing System

0-3 BRs + Lockoff Suites

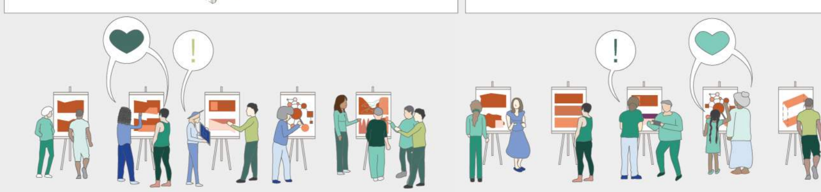


1 BED + STUDIO + 1.5 BED



2 BED + STUDIO = 3 BED

2 BED + 2 BED = 4 BED



D. Refining Performance

Through platform-empowered analyses and easily-accessible information from the knowledge base, the team refines the design against carbon, cost, and design targets.

E. Elaborating the Systems

As things progress, technical approaches are integrated with program goals—for example, working the podium structure to achieve an extra-large assembly space sans transfer slabs.

F. Dialing In the Details

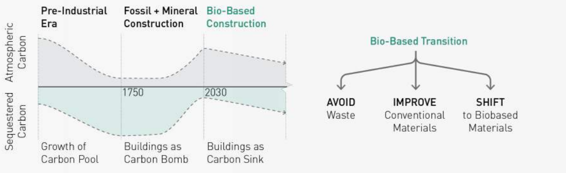
The platform speeds the design team through construction documentation, allowing them to draw on robust, certified, manufacturer-provided BIM elements and details from the Kit.

III. NEW ECOLOGIES OF CONSTRUCTION

The platform reshapes larger ecological systems, carbon flows, and material flows in a variety of ways—from new ecologies of carbon sequestration, using buildings as a carbon sink, to new ecologies of material use, diverting waste from around the bioregion to produce new products, to new ecologies of resilience, confronting the effects of climate change by building resilient buildings, landscapes, and communities.

Plank 7: Sequester Carbon in Buildings via a Shift to Biomaterials

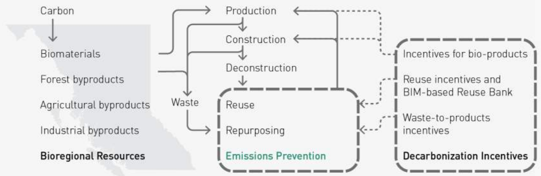
The platform leads a shift from carbon-intensive to bio-based construction, starting with timber and expanding to other grown—not extracted—materials. With abundant forests and clean energy, Canada is uniquely positioned to produce low-carbon building materials.



*based on diagrams from UN Environment Programme, "Building Materials And The Climate: Constructing A New Future"

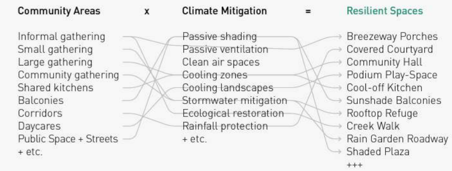
Plank 8: Decarbonize Production and Transform Waste into Novel, Bioregional Products

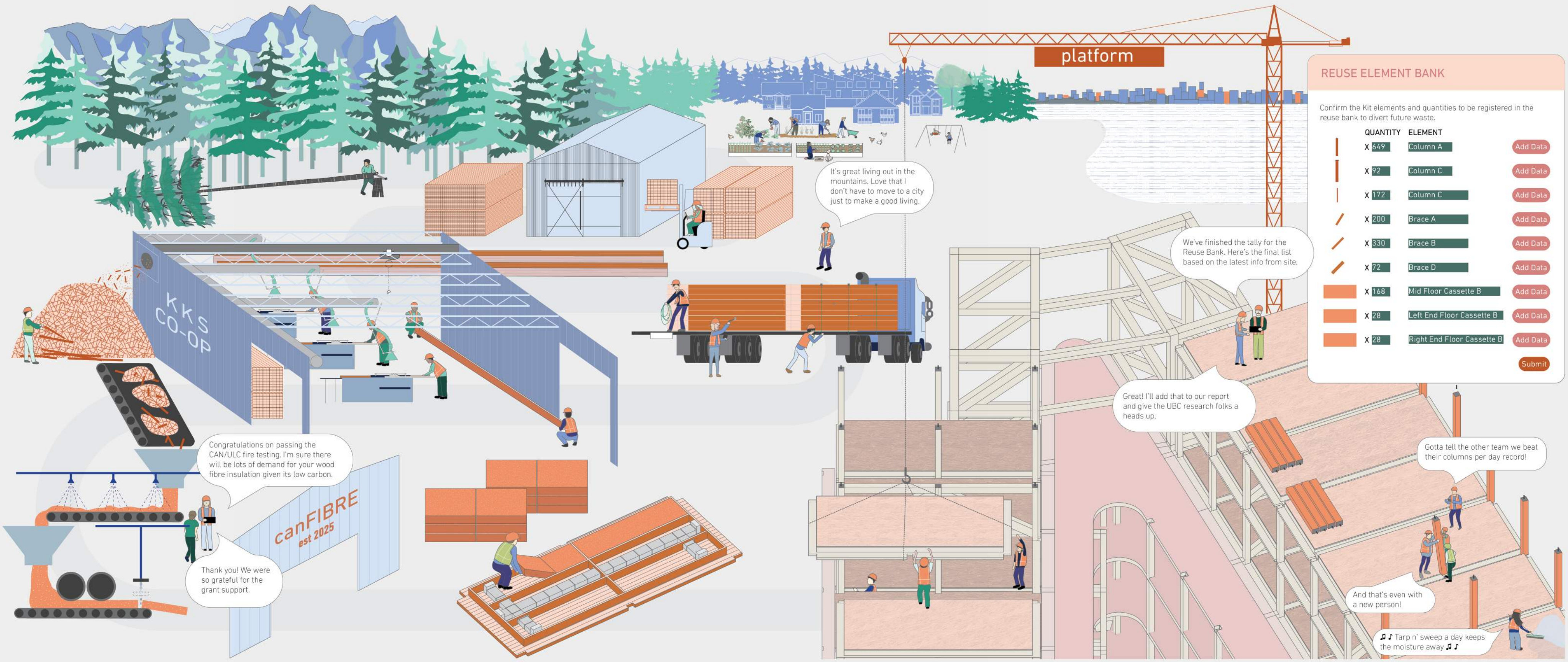
The platform advances circular material systems by transforming bioregional waste streams (e.g. forest and agricultural byproducts) into healthy, reusable building components. Designing for disassembly and reuse turns buildings into carbon stores and future material banks.



Plank 9: Build Climate and Social Resilience Into Our Communities

Climate resilience grows from strong communities. The platform promotes simple, affordable design strategies that make buildings more climate-resilient, create shared community spaces that foster strong social bonds, and restore the natural ecologies we call home.





G. Fabricating the Kit

Off-site fabrication begins early, with the team selecting a new, fully-integrated First Nations timber co-operative from the Kit suppliers list in the platform.

H. Seizing Opportunities As They Arise

At the last minute, the team gets a Materials Research grant to swap in a new wood-fibre insulation product in the envelope panels. The system is plug-and-play, so change is easy.

I. Closing the Knowledge Loop

The project combines circular material flows with circular knowledge flows—feeding experience, lessons, and data back into the Reuse Bank (and the platform) for the future.

FROM TECHNICAL TO EXPERIENTIAL

Scales of Community

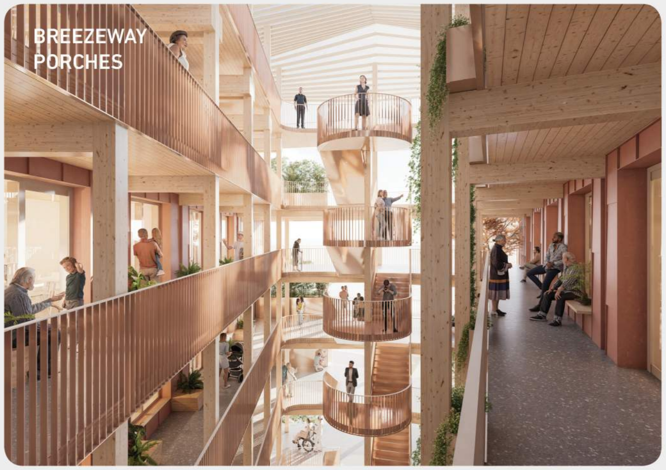
The project constructs community at a nested series of scales, from unit to city: within dwelling units (generous balconies, reconfigurable suites), between neighbours (breezeway porches), on each floor (shared sundecks), within the building community (roof garden, shared kitchens, podium childcare, and amenity spaces), with the broader community of the First Nations tenant (community ceremony space, outdoor gathering circle), and with the general public (corner plaza, boulevards, commercial units, parklet, and creek walk).

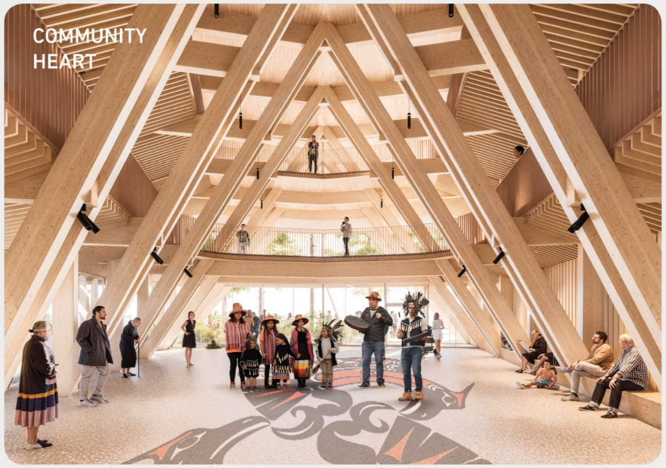
Project Data: Refer to boards 3-5 *(yes, the data in the narrative is accurate!)*

1. corner plaza
2. restored creek + public boardwalk
3. parklet + outdoor gathering circle
4. boulevard w/ rain gardens, parking, seating
5. commercial spaces (x4)
6. community hall + ceremony space for 150 people
7. sheltered outdoor gathering space + connection to restored creek
8. community kitchen (shared by building and KKS tenant)
9. breezeway (open to below) and neighbour porches
10. shared sundecks (one per residential floor)
11. studio (425 ft²)
12. 1 bedroom unit (600 ft²)
13. 2 bedroom unit (875 ft²)
14. 2 bedroom w/ studio lockoff suite (1025 ft²)

Level 10 (typical housing level) 1:1000

Level 1





DTT-C-03

SOLIDVOID
SITE C SACRED WATERS DEVELOPMENT

A VOLUMETRIC MODULAR UNIT SYSTEM DESIGNED FOR MASS PRODUCTION, EASY TRANSPORT, AND RAPID ASSEMBLY ON CONSTRAINED URBAN SITES

KEY INTENTIONS

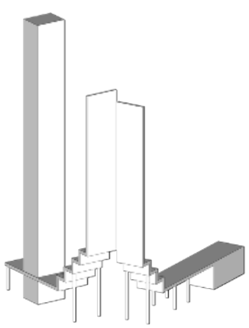
Only One Unit
- A fully prefabricated, standardized, stackable VMU with integrated systems.
- VMUs alternate with 'capped' voids to cut cost, material, and time by 50%.

Flexibility and Customization
- One unit, many outcomes: enables diverse, family-sized configurations.
- Self-supporting at low-rise; can be used in hi-rise with a dedicated lateral system.
- Responds to evolving demographics and multi-generational households.

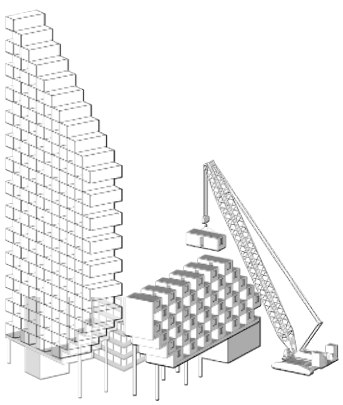
Prefabrication and Standardization
- Repeatable VMU components and approvals.
- Prefabricated light-framed shafts, metal balconies, shades, and corridors.
- Plug-and-play kitchens and bathrooms enable easy programming.

Biophilic Thinking
- 'Float' the building above the site to preserve ±75% of existing vegetation.
- No underground parkade. Provide ample bicycle storage and car sharing.
- Daylight and restore the historic stream to make it a destination.
- Access via elevated walkways to minimize ecological disturbance.
- Maximize exposure to natural light, fresh air, and mountain views.

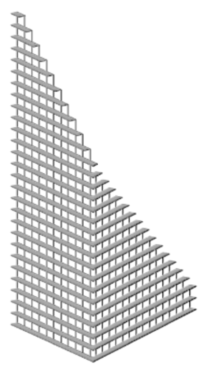
Community Commons
- The building is raised to invite visual and physical access to the courtyard.
- A cantilevered gathering space offers year-round community engagement.
- Exterior corridors and communal amenity spaces on every floor.
- Locally sourced CLT, ultra-low-carbon concrete, and EAF steel.



Cast-in-situ ULCC 'table', vertical core, and corner 'starter' walls offload lateral loads from the modules and counter story drift, diaphragm continuity, and connection demand.



Prefabricated VMUs with integrated CLT shear walls stack in a staggered solid/void pattern. Shear walls run floor-to-floor to ensure continuous vertical lateral paths.



Prefabricated EAF steel 'galleries' of corridors and posts complete the lateral force-resisting system by providing secondary stiffness and buttressing adjacent modules.

DTT-C-03

SOLIDVOID

DESIGN RATIONALE: CLIMATE CHANGE & AFFORDABILITY

1) Restore water and make a place of learning.

We daylight the stream and hold a 10m riparian setback, then frame a generous courtyard around it as a 'sacred' garden. This move pays homage to Coast Salish estuarine root gardens - carefully tended places at river mouths and tidal edges - by restoring hydrologic continuity, shaping gentle, walkable terraces for teaching and ceremony, and planting native food and medicine species. In this configuration the courtyard is not residual open space; it becomes a living classroom and community table, honoring Katzie, Kwantlen, and Semiahmoo relationships with water and stewardship.

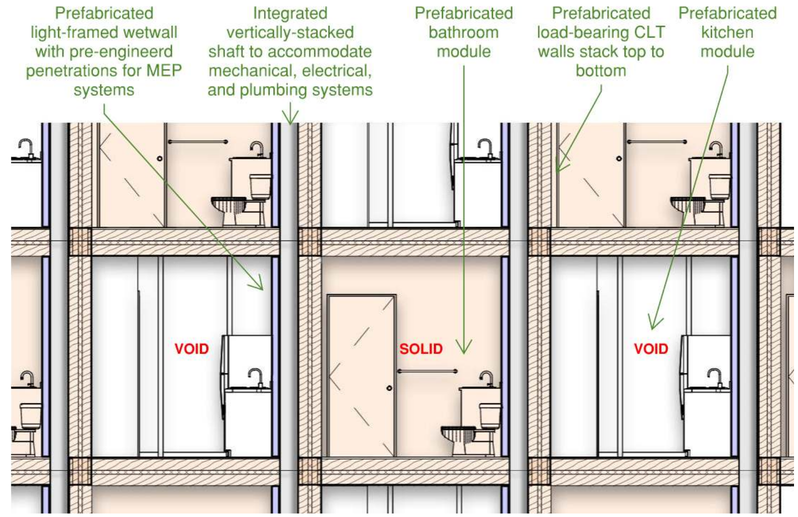
2) Eliminate underground parking to protect soils and carbon.

Given the site's exposure to active streets and its five-minute walk to rapid transit, shops, services, and green space, we remove underground parkades. This choice cuts concrete volume and reinforcement associated with excavation, protects tree roots and hydrology, and shortens schedule risk. Only essential elements touch the ground: the residential lobby, columns on micro-piles or helical piles with Ultra-Low-Carbon Concrete (ULCC) pile caps, and a two-storey service podium for bicycle and residential storage, garbage/recycling, loading, car-share stalls, and the main electrical and mechanical rooms. The ground-level building footprint is limited to ±25% of the site area. Elevated walkways, built from reclaimed wood salvaged from the demolished houses, thread through the trees to minimize root disturbance and keep the ground permeable.

3) Build an elevated, low-carbon platform and stack modular timber above.

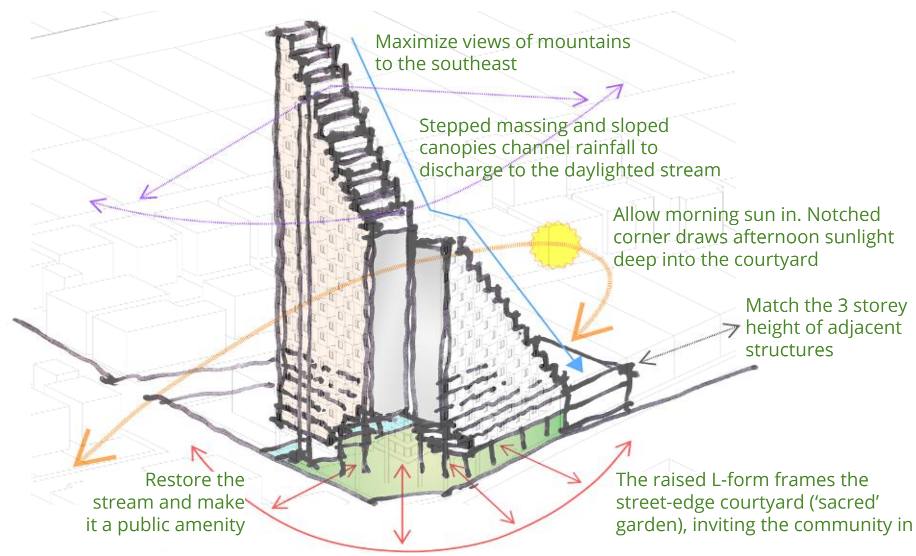
We pour an elevated, cast-in-place ULCC slab-on-frame "table". Beyond minimizing disturbance to soils and drainage, this platform is a carbon strategy. A single core and select corner "starter" walls maintain seismic regularity and limit torsion. Above this, we set Volumetric Module Units (VMUs) - 11'×26' mass-timber boxes - in a unit–10' gap–unit rhythm. When offset vertically, each solid module sits between voids above and below.

The voids become habitable living spaces with high-performance glazing at the exterior and a simple CLT closure at the interior. This preserves daylight and cross-ventilation, reduces the number of volumetric boxes we must fabricate, and maintains a regular, buildable façade cadence.



4) Shape the tower to fit neighbors, make a landmark, and hold community.

The L-form shields the sacred garden from arterial activity, achieving the target FSR, while creating a legible corner marker appropriate to this intersection. The elbow of the L is notched to welcome the community, draw sun deep into the courtyard, and frame a 150-person gathering hall that cantilevers above the restored stream. Constructed entirely in mass timber, this hall is a contemporary echo of Coast Salish longhouse traditions at the water's edge.

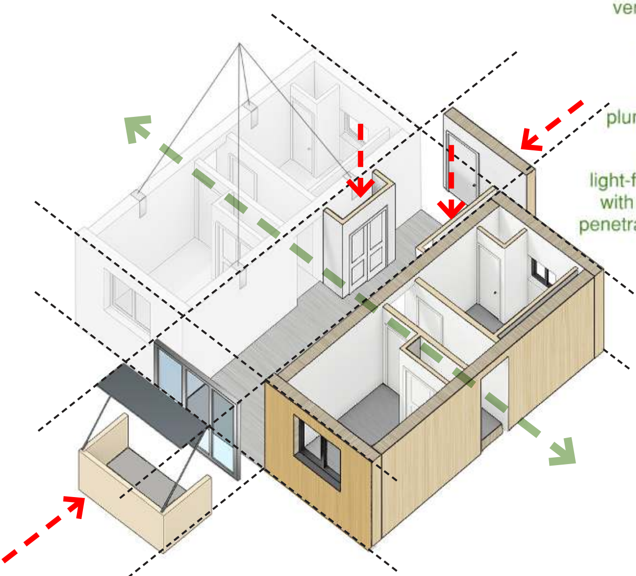


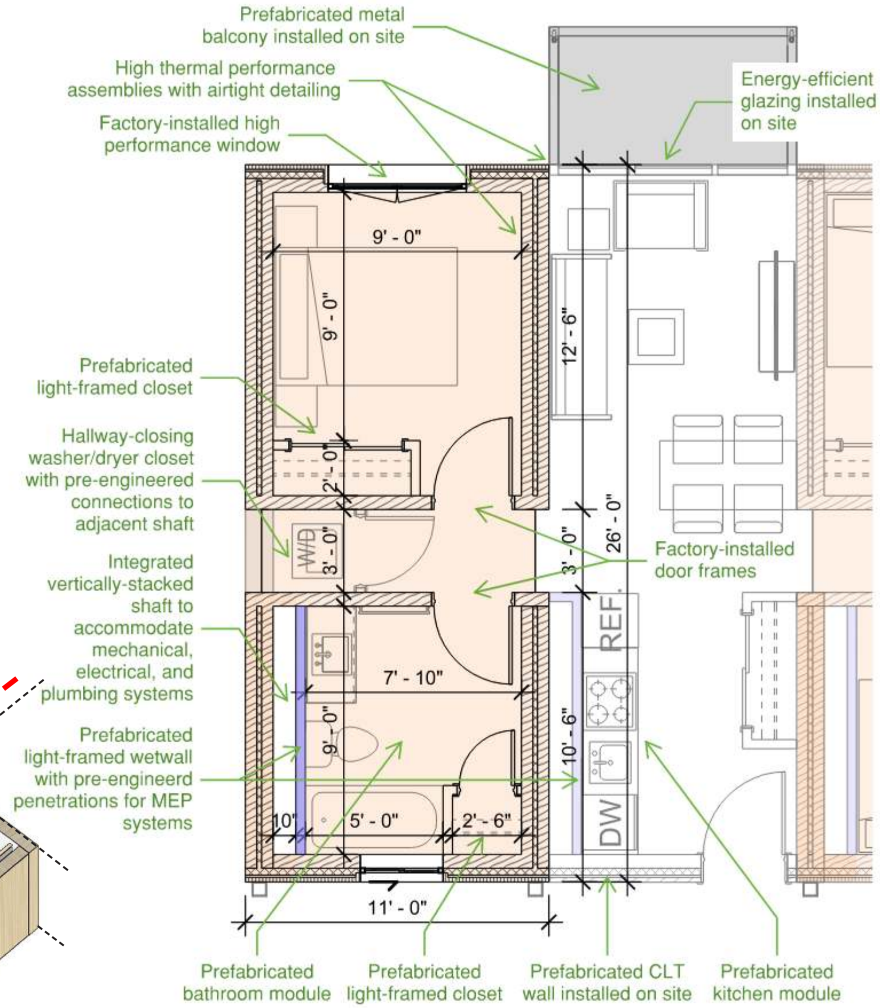
SOLIDVOID

DESIGN RATIONALE: CLIMATE CHANGE & AFFORDABILITY (CONT.)

5) Make the homes bright, flexible, and efficient.

Each 11'×26' VMU contains two rooms flanking a 3'-wide service hallway with a continuous wet-wall spine. Floor and roof CLT plates allow a clean, repetitive stack: each module's floor forms the ceiling for the module below; each roof forms the floor above. Light-frame prefabricated partitions (closets, wet walls) focus timber mass where it carries load and simplify rough-in. Primary living spaces face south for winter sun and views toward culturally significant mountain ranges to the southeast. We maintain useful window-to-wall ratios with high-efficiency glazing, thermally broken frames, and airtight factory detailing. North and north-east galleries give residents immediate mountain views as they step outside their front doors and reinforce visual connection to the courtyard below.





1S + 1V
505 SQ FT

- UP TO 1 BEDROOM
- UP TO 1 BATH
- UP TO 1 KITCHEN

2S + 1V
750 SQ FT

- UP TO 3 BEDROOM
- UP TO 2 BATH
- UP TO 1 KITCHEN

2S + 2V
1010 SQ FT

- UP TO 4 BEDROOM
- UP TO 2 BATH
- UP TO 2 KITCHEN

3S + 2V
1275 SQ FT

- UP TO 6 BEDROOM
- UP TO 3 BATH
- UP TO 2 KITCHEN

3S + 3V
1515 SQ FT

- UP TO 9 BEDROOM
- UP TO 4 BEDROOM + 1 LOCK-OFF UNIT
- UP TO 3 BATH
- UP TO 3 KITCHEN

UNIT MIX

Configuration		Assumed # of BRs	# of Units	Total Bedrooms	% of Total Units
1S + 1V	Up to 1BR	1	7	7	10.10%
2S + 1V	Up to 3BR	3	12	36	17.40%
2S + 2V	Up to 4BR	4	20	80	29.00%
3S + 2V	Up to 6BR	6	5	30	7.20%
3S + 3V	Up to 9BR	6	5	30	7.20%
	TOTAL		69	183	100%

← For singles, elders, or couples without children
← Supports small families and caregivers
← Meets core family housing demand
← Supports multi-generational, cultural, or extended families

The urban Indigenous population is the fastest growing in Canada, with larger household sizes, more single-parent households, and higher rates of multi-generational living. We organize the VMU kit to combine and reconfigure easily, prioritizing family homes:

SOLIDVOID±40% EMBODIED CARBON REDUCTION

CARBON REDUCTION RATIONALE: STRATEGY + CALCULATION

It quickly became clear we cannot reach the target FSR with VMUs alone due to height limits. We therefore propose a hybrid structural system incorporating Ultra-Low-Carbon Concrete (ULCC) and Electric Arc Furnace (EAF) steel, **which still outperforms an industry-standard concrete building by delivering a ±40% embodied-carbon reduction**. Our carbon strategy operates across three coordinated levers, detailed below:

1) Material Substitution — Low-Carbon Equivalents

- ULCC.

All structural concrete is the lowest-carbon mix available in British Columbia, with PLC and high SCMs (e.g., slag/fly ash/pozzolans) meeting or exceeding a 30% GWP reduction relative to conventional mixes. Assumed embodied-carbon intensity: 4.5 kgCO$_2$e/ft^2 vs a conventional concrete baseline of 6.69 kgCO$_2$e/ft^2.

- EAF steel (≥90% recycled content).

Where steel is required (galleries, balconies, connectors, plates, etc.), W specify EAF production routes to minimize GWP. Assumed intensity: 6.0 kgCO$_2$e/ft^2.

- FSC timber.

VMUs are fabricated with locally sourced, FSC-certified mass timber to support responsible forestry and traceability. Assumed intensity: 2.69 kgCO$_2$e/ft^2.

- Charred-wood cladding.

Exterior rainscreen uses locally charred wood planks. Typical published ranges indicate charred wood ≈ 10–30 kgCO$_2$e/m^2, compared with fiber-cement ≈ 60–90 kgCO$_2$e/m^2 and metal cladding ≈ 100–250+ kgCO$_2$e/m^2. Charred wood supports ongoing biogenic carbon storage, local craft, and cultural resonance while reducing enclosure-related embodied carbon.

- Thermal performance and operational carbon.

We pair high-efficiency glazing, thermally broken frames, and insulated opaque walls (effective R-values targeted by orientation) to reduce operational energy and resident costs over time. The reduced energy demand strengthens whole-life carbon performance.

2) Efficiency Through Standardization & Modularity

- VMUs and controlled fabrication.

Factory-built VMUs minimize waste and rework; plug-and-play services reduce redundant materials and coordination. The 11-foot module width aligns with CLT panel economy (one standard panel spans the width; minimal CNC off-cut). In a controlled environment with limited weather exposure, module fabrication and set can deliver up to ±50% schedule compression versus fully site-built equivalents.

- Transport and set efficiency.

Two VMUs per 53-foot flatbed (26' + 26' = 52' load length) avoid special permits/pilot cars and reduce truck trips by ±50%. Standardized lift points and rigging allow a typical crew to place 8–12 modules/day with a single crane, enabling rapid dry-in and compressing critical path activities compared to in-situ construction.

3) Site Preservation & Blue-Green Infrastructure

- Vegetation retention.

We target up to ±75% retention of existing vegetation, avoiding excavation-related emissions and maintaining living carbon sinks that continue to sequester carbon over time.

- Daylighted stream and eco-cultural planting.

Reopening the culverted stream supports native species, food-teaching plants, and seasonal gathering—embedding eco-cultural stewardship in daily use while re-establishing riparian function.

- Elevated, low-impact access.

Elevated walkways of reclaimed wood thread above the ground plane, protecting soils and root zones and reducing hardscape area.

- Blue-green water cycle.

Stepped massing and sloped canopies channel rainfall into gutters and rainwater leaders that discharge to the daylighted stream, attenuating peak flows and improving on-site stormwater management and water quality.

EMBODIED CARBON					
		Concrete		Mass Timber	
	Sq ft	Embodied Carbon kg/sq ft	Total Carbon	Embodied Carbon kg/sq ft	Total Carbon kg/sq ft
Total Building Sq Footage	113250.0	6.69	**757,531.52**	2.69	**305117.02**

EMBODIED CARBON				
Proposal (Hybrid)				
	Quantity	Embodied		Total Carbon
Ultra-Low-Carbon Concrete (kg/cu ft)	54055.0	4.5	*	**243247.5**
Low-Carbon Structural Steel (kg/sq ft)	26150.0	6	**	**156900**
Mass Timber (kg/sq ft)	32500.0	2.69	***	**87425**
TOTAL CARBON				**487,572.50**

* SCMs + GUL cement (30–40% GWP reduction)

** EAF steel with ≥90% recycled content

*** Locally sourced, FSC-certified; can be net-negative if biogenic carbon is included

SOLIDVOID±50% CONSTRUCTION COST REDUCTION

ECONOMIC RATIONALE: PROFORMA + COST SAVINGS

1) Modular fabrication reduces construction costs and delivery time. With VMUs manufactured off-site, on-site labor decreases and sequencing becomes more efficient. Our estimated cost is $475/ft² for VMU construction, slightly higher than the $405/ft² for standard concrete in the competition's base case. However, the solid/void scheme halves the volumetric module count relative to a full-grid approach while preserving rentable area, directly reducing factory labor hours and transport needs.

2) An estimated 66% reduction in overall build time lowers construction financing and general conditions. With one crane and a single shift, at a typical rate of 8–12 VMUs per day, VMU placement would take ±4 weeks. On that basis, total construction duration is projected at ±6 months.

PROJECT STATS	
FSR	4.4064436
Lot size (sq ft)	20,175
Building sq ft Above Grade	88900 *
Building efficiency (%)	0.8533183
non saleable/rentable (sq ft)	13040
saleable/rentable (sq ft)	75860
Total Stories above grade (#)	27
Total Stories (#)	27
Base floor (#)	1
Above 1st storey (#)	26
Stories below grade (#)	0
Units (#)	±69
Bedrooms (#)	±183
Amenity space (sq ft)	6100
Non-residential (sq ft)	3385 **

* Excluding exterior corridors and prefab balconies

** Standalone gathering space for income generation

3) Charred-wood cladding is cost-competitive with metal cladding and demonstrates greater durability than fiber cement in life-cycle costing, particularly given reduced maintenance and repainting cycles.

4) Omitting underground parking saves an estimated $6.3M per level in construction expense.

5) Together, these measures establish a replicable, climate-smart housing approach that aligns with affordability targets while remaining economically viable without subsidies.

CONSTRUCTION COSTS		Concrete		Mass Timber	
	Square footage	$/sq ft	Cost	$/sq ft	Cost
Below grade	0.0	$315	$0	$300	$0
Base floor	4900.0	$360	$1,764,000	$403	$1,974,700
Above 1st storey	108350.0	$405	$43,881,750	$431	$46,698,850
	Quantity	$/unit		$/unit	
Balconies	136	$25,000	$3,400,000	$25,000	$3,400,000
	Cost per month	# Months	Cost	# Months	Cost
Schedule Costs	$50,000	24	$1,200,000	18	$900,000
TOTAL			$50,245,750		$52,973,550

CONSTRUCTION COSTS				
Proposal (Hybrid)				
	Quantity	Unit Price		Cost
Below Grade	0.0	$/sq ft	$315	$0
Base Floor	4900.0	$/sq ft	$360	$1,764,000
Above 1st storey:				
Concrete	47450.0	$/cu ft	$12	$569,400
Prefab Steel Corridors, Stairs, & Canopies	26150.0	$/sq ft	$75	$1,961,250
Prefab Mass Timber VMUs	32500.0	$/sq ft	$475	$15,437,500
Prefab Steel Balconies	136.0	$/unit	$10,000	$1,360,000
Glazing	1250.0	$/linear ft	$210	$262,500
Aluminum Guardrails	4000.0	$/linear ft	$70	$280,000
		Subtotal above 1st storey:		$19,870,650
Schedule Costs	6.0	$/per	$50,000	$300,000
			TOTAL	$24,334,650

SOCIAL RATIONALE: SOCIABILITY & COMMUNITY IMPACT

1) The L-shaped building frames a shared courtyard as a civic commons, integrating a daylighted stream that revives an important local ecological feature. This 'sacred' garden offers a restorative landscape accessible to residents and the wider community, encouraging outdoor gatherings, casual social contact, and neighborhood events. Seating, plantings, and open-air paths reinforce these connections.

2) The northeast gathering hall, accessed via a dedicated public lobby, provides a welcoming venue for up to 150 people. The space cantilevers above the rehabilitated stream to pay homage to the relationship the Katzie, Kwantlen, and Semiahmoo First Nations have with water. It establishes a strong visual connection to the courtyard below - envisioned as a green oasis for the community - with an outdoor patio that allows events to spill outside while maintaining that connection.

3) Smaller multi-purpose rooms on each level, plus shared terraces under prefabricated steel canopies, support everyday sociability (crafts, homework clubs, Elders' tea, parenting circles).

4) Cultural continuity is further supported by plantings of culturally significant species—wapato, cedar, elderberry, and salmonberry—that support traditional harvesting, medicine, and storytelling. These elements go beyond placemaking; they root the project in layered narratives of land, water, and community memory.

SOLIDVOID

BUILDING CODE COMPLIANCE & CHALLENGES:

1) Compliant as intended:

- Occupancy + High-Building features (Div. B, Part 3 / 3.2.6): Group C residential with A-2 assembly (150-person hall); full NFPA-13 sprinklers, central alarm/voice, emergency/standby power, fire pump, firefighters' elevator.
- Fire separations: A-2 hall separated from dwellings with 2-h construction; independent exits.
- Non-combustible elements: All in-situ concrete specified as ULCC to meet non-combustible requirements while minimizing embodied carbon.
- Spatial planning basics: Gathering hall has independent entrance; residential lobby separated; refuge/areas of assistance planned at core.

2) Where we knowingly do not comply:

- Typical floors currently have only one enclosed stair; the second path relies on open galleries and does not qualify as an exit in a high building.
- Likely travel distance and exit separation shortfalls on some floors given the L-shape and single enclosed core.
- As proposed, adaptability features (clearances, bathroom/kitchen convertibility, door hardware, reinforcements, visitability) are not met for the required share of units.
- At 27 storeys, the proposal exceeds the current BCBC 2024 EMTC storey/height limits for residential. This is a fundamental variance requiring a performance-based Alternative Solution.
- Open galleries at height introduce smoke spread, wind, and ice issues; BCBC treats exits in high buildings as enclosed, pressurized shafts. Current galleries don't meet those criteria.
- Where CLT edges, soffits, or balcony soffits are exposed in the stepped terraces, they may contravene non-combustibility / flame-spread limits for exterior elements on high buildings (Div. B 3.1 / 3.2).
- The staggered glazed voids near property lines may exceed allowable unprotected opening percentages at some limiting distances; water-curtain sprinklers or spandrels will be required, or geometry adjusted.
- At 150 persons, door width, number of exits, exit remoteness, and smoke separation from residential are close to the threshold; any reliance on the open gallery for discharge would not comply.
- With a tall, stepped profile, roof access, standpipe coverage, and safe staging at upper terraces require dedicated measures; current plans do not show roof access routes compliant for firefighting.
- A 27-storey CLT shear-wall system likely falls outside tabulated Rd/Ro values in CSA O86 for this height; code requires modal analysis at minimum, and likely nonlinear time-history with validated CLT wall models - i.e., an engineered Alternative Solution for structural performance.

RELATIONSHIP TO ADJACENT PROPERTIES AND STREETS:

1) The project's orientation strengthens connectivity to the existing street network while softening its impact on neighbours. The raised L-form frames the public courtyard along the street edge, creating a permeable threshold between private residence and the public realm.

2) Primary vehicular access is from the collector road; the residential entry is from the arterial.

3) The massing steps from the low east and north edges—respecting adjacent three-storey buildings—to a 27-storey northwest corner. Visual bulk is reduced through staggered modules and articulated balconies.

4) Landscaped buffers, green fencing, and connective pathways encourage interaction while clearly delineating shared versus private spaces. The street-facing public lobby and gathering hall reinforce civic presence, providing the neighbourhood with a visible, functional amenity.

PROJECT DELIVERY & LEGAL MECHANISMS:

1) The project proposes a streamlined design-build model using pre-approved prefabricated components. Wet wall modules, CLT panels, and plug-and-play service zones can be batch-certified and repeated across multiple infill sites. This accelerates approvals and enables municipalities to scale up affordable housing with greater speed and quality control.

2) Off-site prefabrication is coordinated with minimal on-site disruption, enabling delivery on sensitive or underutilized urban land parcels. The platform structure allows phasing without major excavation or servicing constraints, opening new typologies for hard-to-develop lots.

3) Ownership and delivery may be facilitated through partnerships with community land trusts or non-profit development corporations. Leasehold arrangements can retain long-term affordability while supporting Indigenous land stewardship, public sector investment, and equity-based occupancy models.

DTT-C-04

The Wooden Tower

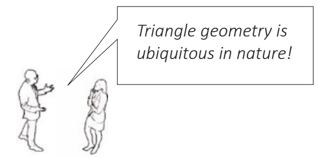
Site C

On the shared territories of the Katzie, Kwantlen, and Semiahmoo Nations

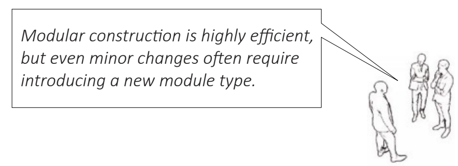
How can we provide reasonably priced housing for the Indigenous people of BC that upholds their core values of respect for nature, family, and community, while utilising the potential of high-rise timber construction?

We propose a four-pronged solution:

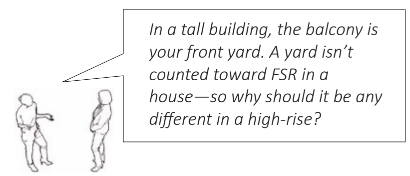
1. Use a timber structural system that provides better lateral stability.



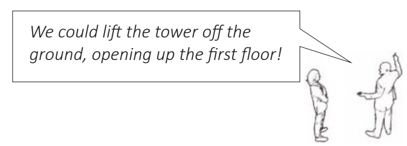
2. Combine modular and conventional on-site construction techniques to mitigate the downsides of each method.



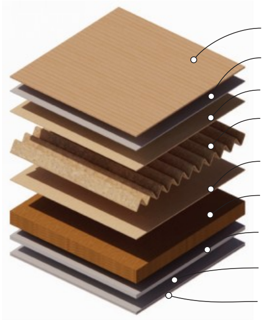
3. Propose an amendment to bylaws so that balconies are not counted toward FSR.



4. Redefine how the tower connects with the ground.

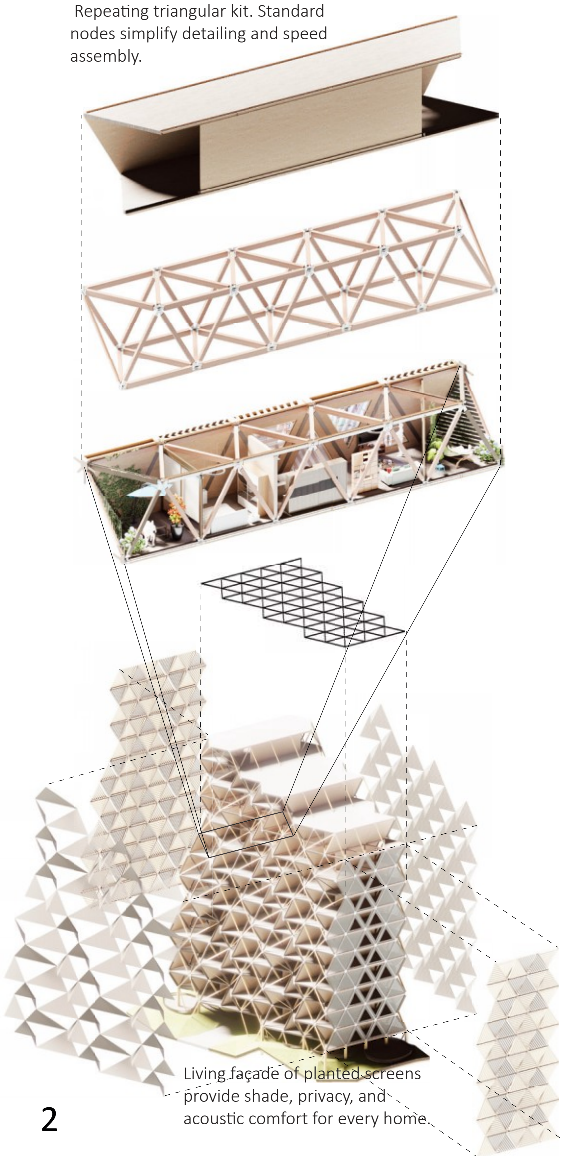


Proposed Floor Assembly

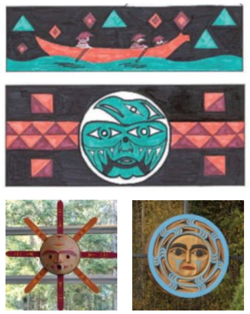


QR-coded modules and on-site scanning anchor quality assurance, speed installs, and reduce rework.

Repeating triangular kit. Standard nodes simplify detailing and speed assembly.

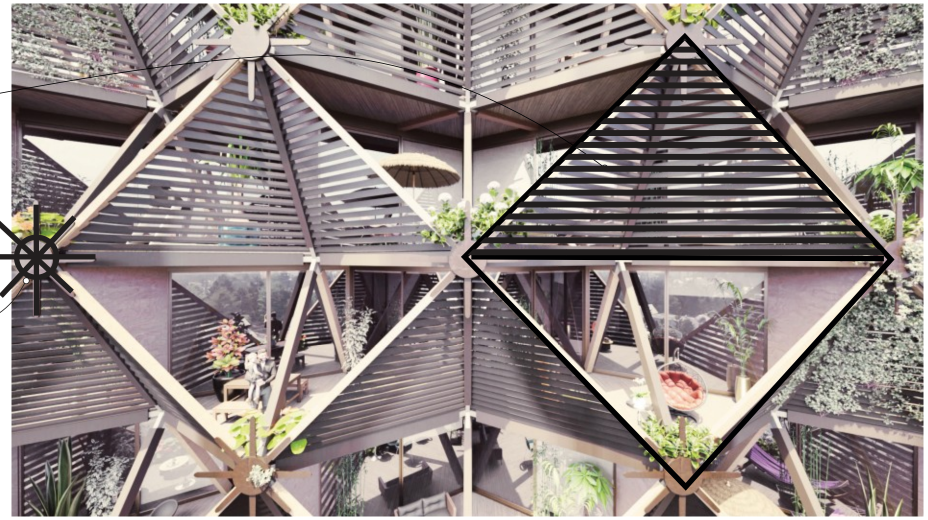


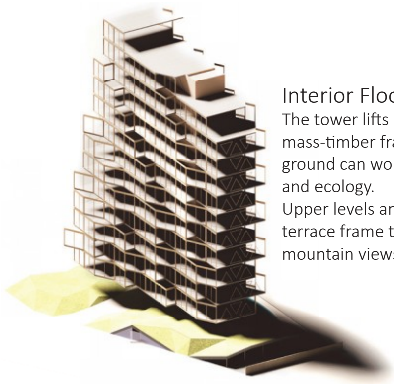
Living façade of planted screens provide shade, privacy, and acoustic comfort for every home.



Geometric forms of the structure and the facade connect to traditional Indigenous patterns and meanings.

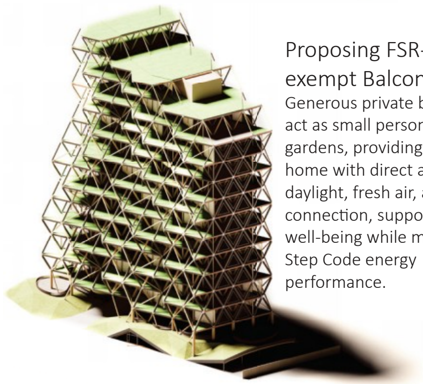
Cultural symbols are used on the facade.





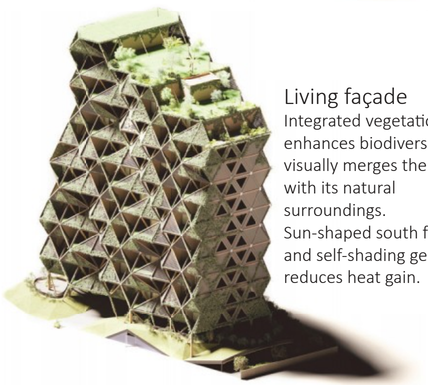
Interior Floor Plates

The tower lifts on a regular mass-timber frame so the ground can work for people and ecology.
Upper levels and the roof terrace frame the long mountain views.



Proposing FSR-exempt Balconies

Generous private balconies act as small personal gardens, providing every home with direct access to daylight, fresh air, and nature connection, supporting well-being while meeting Step Code energy performance.



Living façade

Integrated vegetation enhances biodiversity and visually merges the building with its natural surroundings.
Sun-shaped south façade and self-shading geometry reduces heat gain.

A suspended Indigenous art piece marks the entrance to the building.

Project Data

Site C
TOA: Tier 2

Mountain views to the northeast and southeast are available from about 75 ft above grade

Site area: 20,120 sf (~1870 m²)
Setbacks: 10 m along north edge (creek buffer)
Height: 12 storeys + rooftop common floors*

FSR: ~4.0
(FSR check: 80,514 sf ÷ 20,120 sf ≈ 4.0.)

Name	# of Floors	# of Units/ floor	Studios* **	1BR	2BR	3BR	Units	Area	Total Area (FSR included)
BASEMENT -1	-	-	-	-	-	-	-	~16,103 SF	-
Level 1-Indoor Amenities	1	-	-	-	-	-	-	4,306 SF	7535 SF
Level 1 Building Services		-	-	-	-	-	-	3,229 SF	
Levels 2–10 Residential	9	6	9 UNITS	18 UNITS	18 UNITS	9 UNITS	54 UNITS	~60,030 SF	72,979 SF
Levels 11–12 Residential	2	5	2 UNITS	2 UNITS	4 UNITS	2	10 UNITS	~12,949 SF	
Balconies	-	-	-	-	-	-	-	~32,000 sf	(-)**
Level 13- 14 * Proposed Indoor Amenities	2*	-	-	-	-	-	-	6000 sf*	-
Totals	12	—	11 UNITS	20 UNITS	22 UNITS	11 UNITS	64 UNITS****		80,514 sf

Notes:
* Proposed Indoor Amenities at level 13 & 14: Subject to municipal approval.
** Balconies: Proposed FSR-exempt.
***Lock-off studios (flex suites) may be internally connected to adjacent 1–3BR homes to support multigenerational/blended families. (For Elders, caregivers, or returning family members.)
****Due to the modular system, unit numbers are flexible and may be adapted to regional demands.

Sample floor plan- Level 3

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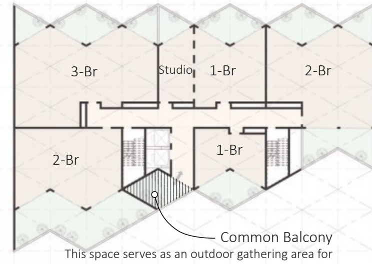
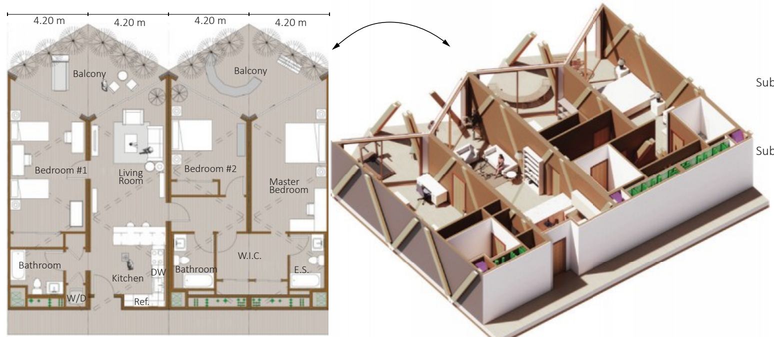
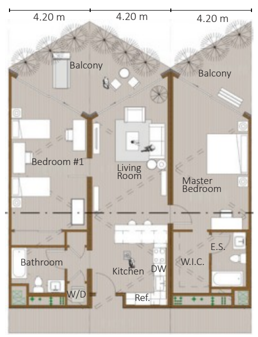
Total area: 6670 sf
Balconies 2600 sf



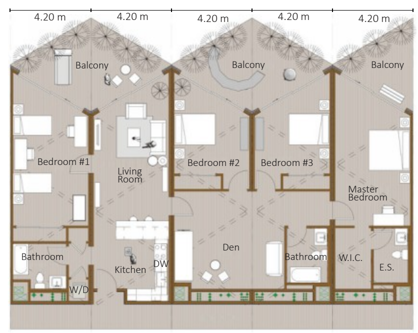
This space serves as an outdoor gathering area for the residents of the floor and their guests. It is in addition to the communal areas provided at the ground level and on the uppermost floors.



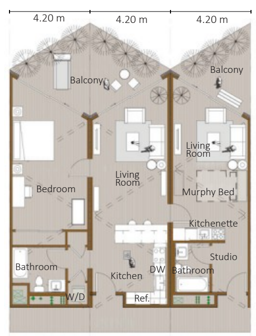
3-Bedroom Unit



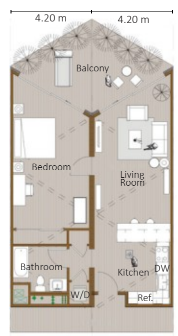
2-Bedroom Unit



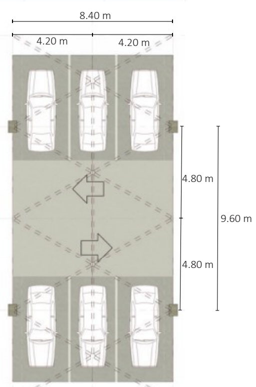
4-Bedroom Unit



1-Bedroom Unit w/ Lock-off Suite

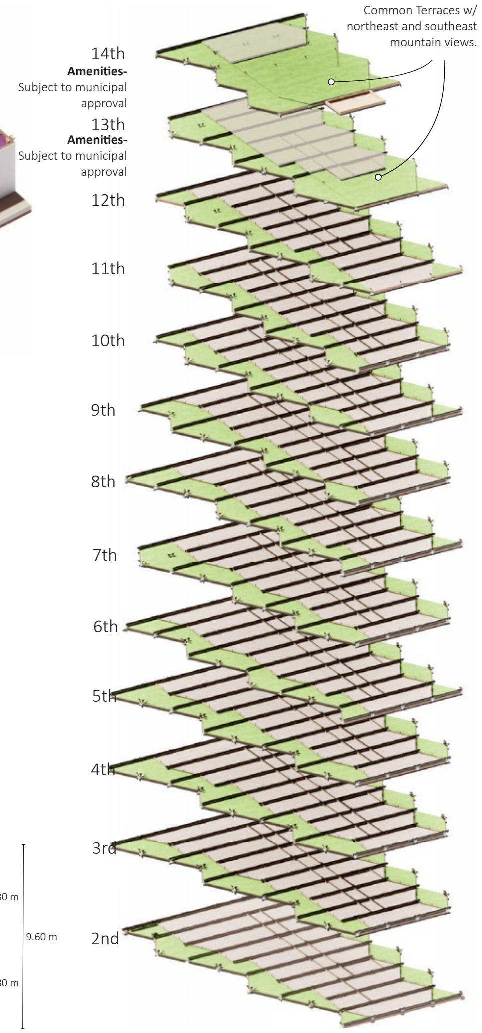


1-Bedroom Unit



Parkade

Family-Forward Housing: Units can expand/contract over time via lock-off suites and connecting doors, supporting multi-generational living without renovations.



Floor Area and Balcony Layout per Level

By excluding balconies from FSR, the design enables larger, greener outdoor spaces for every unit even in a 12+ storey building.

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WoodWorks

Category	Timber estimate	Concrete baseline	Reduction	Notes
GFA for calculation	7,480 m²	7,480 m²	–	80,514 sf total area
Embodied A1–A5 (structure + façade + balconies)	2,506 t CO_2e	5,087 t CO_2e	2,581 t CO_2e (~50.7 %)	A1–A5 ECI used: 335 vs 680 kg CO_2e/m^2
Transport A4 (regional supply)	5.9 t CO_2e	21.6 t CO_2e	15.7 t CO_2e	Short haul to site
Operational, 60 years (all-electric vs mixed-fuel baseline)	471 t CO_2e	1,178 t CO_2e	707 t CO_2e (~60 %)	25 vs 50 kBtu/sf-yr, BC grid, natural ventilation paths
Biogenic carbon stored in timber	–1,207 t CO_2e	0 t CO_2e	1,207 t CO_2e	Report as separate memo item
Net embodied after storage (optional reporting)	1,776 t CO_2e	6,286 t CO_2e	4,511 t CO_2e (~72 %)	Includes biogenic carbon stored in timber

How we cut embodied carbon:

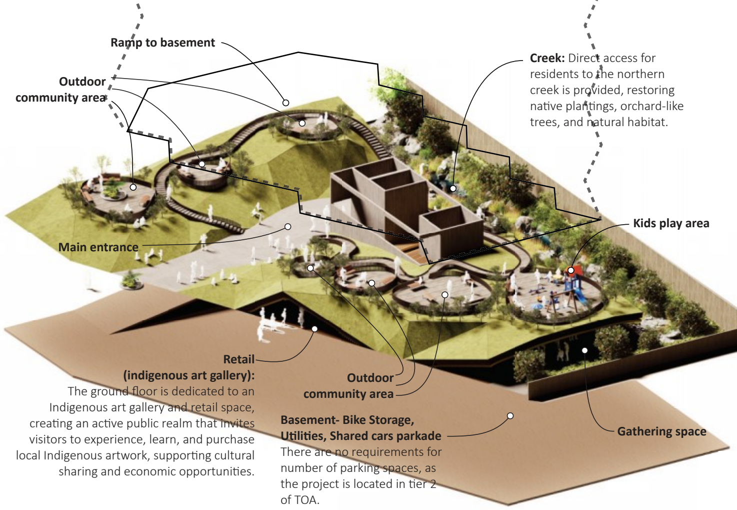
Structure: CLT floors with glulam posts and a light timber bracing kit minimize concrete and steel. Small foundations use low-carbon concrete with SCMs. Factory prefabrication cuts material waste and improves quality control.

Façade: Timber modules with plant-based insulation, exterior planted shading, and high-performance glazing lower material and cooling loads.

Systems: All-electric heat pumps, heat-recovery ventilation, ceiling fans, and right-sized equipment reduce operational energy that drives life-cycle carbon.

Logistics: BC-sourced timber and a flat-pack kit pre-assembled in a temporary on-site workshop cut truck trips, shorten crane time, and reduce A4/A5 impacts. Maximizes use of Indigenous-sourced glulam and CLT to reduce transport emissions and support local economies.

Longevity and end of life: Durable finishes, dry connections, and repairable components enable reuse. Biogenic storage is tracked and reported separately.



Summary

Preliminary WoodWorks-style accounting indicates about 2,581 t CO_2e avoided in manufacturing by substituting timber for concrete. The structure also stores about 1,207 t CO_2e of biogenic carbon. **With stored carbon included, the net embodied total is about 1,776 t CO_2e, roughly a 72 percent improvement versus the concrete baseline.** These avoided emissions are equivalent to removing approximately 550 cars from the road for an entire year.

Assumptions

12-storey residential tower with cultural podium; GFA for calculation 7,480 m² (80,514 sf); CLT floor plates, glulam posts and girders, prefabricated balcony modules; regional supply with short truck haul; all-electric systems, natural ventilation paths, and a passive-first envelope; ~2,973 m² (~32,000 sf) FSR-exempt balconies. Kit designed to maximize use of Indigenous-sourced glulam and CLT, reducing transport emissions and supporting local economies.

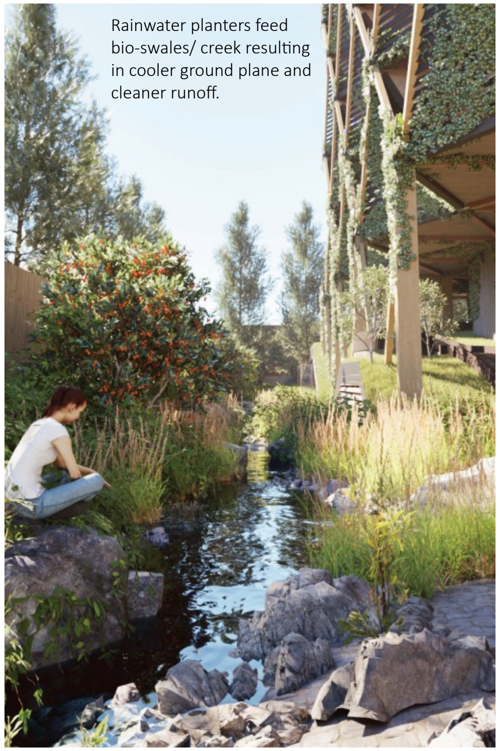
Lifted Ground

A planted, breezy layer of lifted ground tucked beneath the homes. Supported by the timber frame, it becomes a play yard and shared terrace that extends the creek landscape, fostering interaction between residents and neighbours and offering views to the restored creek and surrounding greenery. Open-air, shaded, permeable, and habitat-supporting, it is proposed as outdoor amenity space.


Kids Play Area with views to the creek


A south-to-north residents' path links the arterial sidewalk to the restored creek within the 10 m buffer.


Active ground floor that serves and celebrates the community.


Rainwater planters feed bio-swales/ creek resulting in cooler ground plane and cleaner runoff.


"People say that fences make good neighbours. I say we just need a long table."
— Chief Harley Chappell

Gathering Space

At-grade Indigenous art gallery/retail welcome neighbours and share culture.

Street-active cultural retail and gallery space supports operating budgets and commvunity programming.

FSR	4.001689861
Lot size (sq ft)	20,120
Building sq ft Above Grade	80514
Building efficiency (%)	85
non saleable/rentable (sq ft)	12077.1
saleable/rentable (sq ft)	68436.9
Total Stories above grade (#)	12
Total Stories (#)	13
Base floor (#)	1
Above 1st storey (#)	11
Stories below grade (#)	1
Units (#)	64
Bedrooms (#)	97
Amenity space (sq ft)	4306
Non-residential (sq ft)	0

Bulk procurement of the repeating triangular modules and standard nodes plus flat-pack delivery with on-site preassembly drops the mass-timber above-grade cost to about $392/sf.

Parallel preassembly of façade/balcony modules shortens the tower cycle from 18 to 14 months and lets MEP rough-in start earlier, trimming ~$0.20M in GC overhead. Fewer deliveries and crane picks reduce logistics and crane tim

Standardized digital catalogue enables bulk pricing, clearer bids, and fewer change orders.

Indigenous Procurement: Prioritize Indigenous-sourced timber and suppliers across the value chain.

Simpler systems. All-electric heat-pump systems with natural ventilation paths keep OPEX low and maintenance straightforward. Smaller mech rooms return more NRSF to units.

CONSTRUCTION COSTS

		Concrete		Submission	
	Square	**$/sq ft**	**Cost**	**$/sq ft**	**Cost**
Below grade	16103.0	$315	$5,072,445	$315	$5,072,445
Base floor	7535.0	$360	$2,712,600	$392	$2,953,720
Above 1st storey	72979.0	$385	$28,096,915	$392	$28,607,768
	Quantity	**$/unit**		**$/unit**	
Balconies	64	$25,000	$1,600,000	$25,000	$1,600,000
	Cost per	**# Months**	**Cost**	**# Months**	**Cost**
Overhead)	$50,000	18	$900,000	14	$700,000
TOTAL			**$38,381,960**		**$38,933,933**

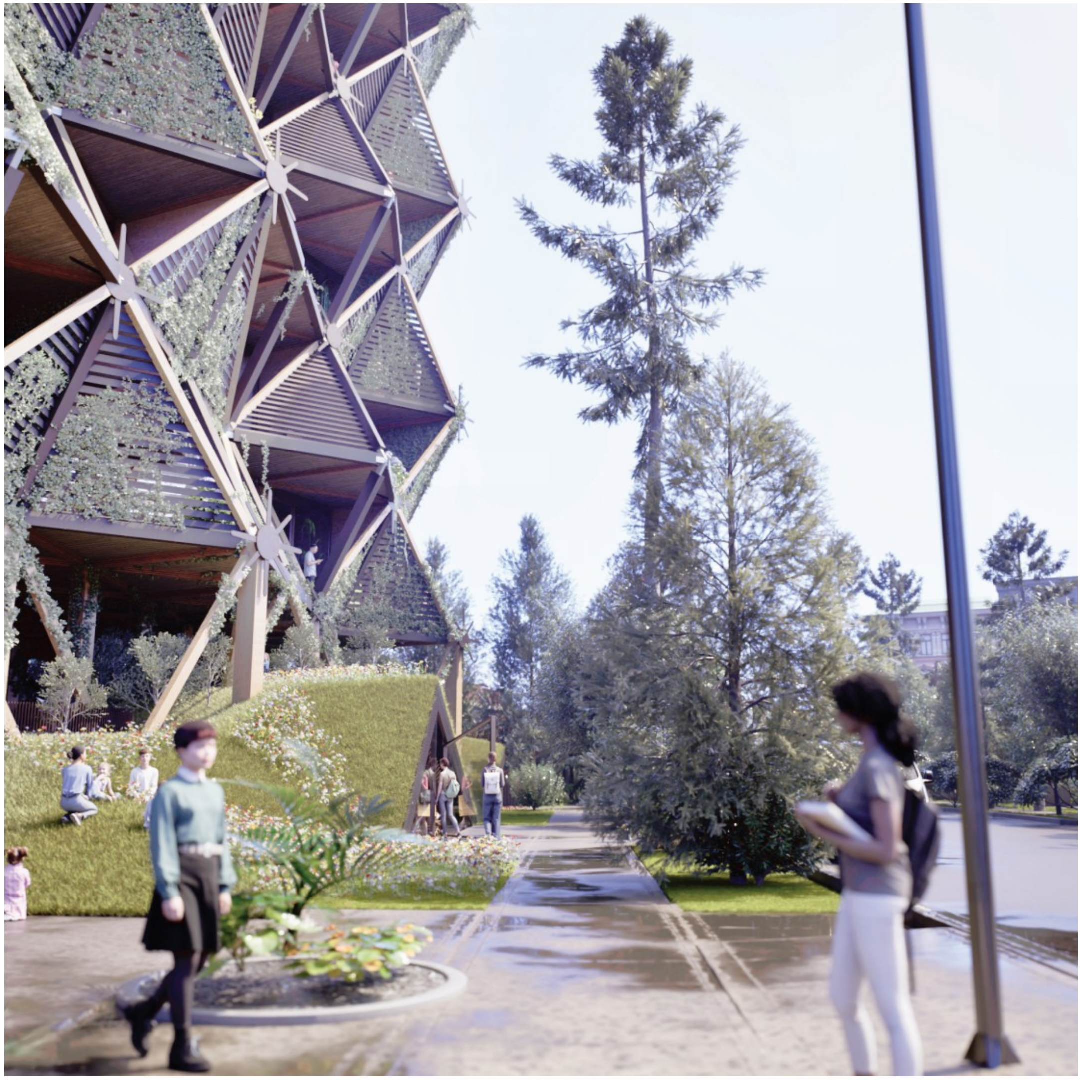
EMBODIED CARBON

		Concrete		Submission	
	Sq ft	**Embodied**	**Total Carbon**	**Embodied**	**Total Carbon**
Total Building Sq Footage	96617.0	6.69	**646273.0453**	13.51	**1305295.67**

Quick cost comparison (hard costs only)

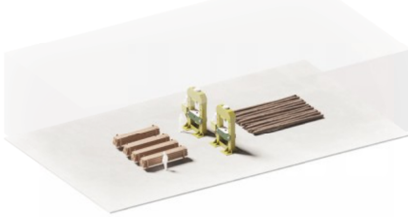
Category	Timber estimate	Concrete baseline	Δ (Timber – Concrete)	Notes
Above-grade construction (80,514 sf)	**$31,561,488** @$392/sf	**$30,809,515** @$383/sf	**+$751,973**	Repeating triangular kit + standardized nodes; parallel preassembly enables earlier MEP rough-in.
Below-grade construction (16,103 sf)	**$5,072,445** @$315/sf	**$5,072,445** @$315/sf	**$0**	Same scope/quantities below grade (concrete).
Balconies (~32,000 sf equiv.)	**$1,600,000**	**$1,600,000**	**$0**	FSR-exempt private outdoor areas; livability gain without reducing unit yield.
GC overhead during construction	**$700,000** (14 mo × $50k)	**$900,000** (18 mo × $50k)	**–$200,000**	Prefab + dry trades shorten schedule (**14 mo vs 18 mo**).
Total hard cost	**$38,933,933**	**$38,381,960**	**+ $551,973**	Includes site overhead only.
Cost per total-built area (96,617 sf)	**$402.97/sf**	**$397.26/sf**	**+ $5.71/sf**	Normalized to total built area (above + below grade).

Note:"Embodied carbon shown is net after storage (A1–A5 + A4 − biogenic storage), excluding operational (B6). Value normalized over all floors (96,617 sf). Source: WoodWorks. Total ≈ 1,305 t CO_2e.



PNW forests
Wood harvested from Pacific Northwest forests.

Sawmill
Sawmill mills trees to lumber for CLT and GLT production

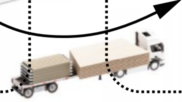


CLT & GLT factory
Dimensional lumber milled for CLT and GLT is sent across the site to the CLT and GLT Factory for pressing into panels.

Module Factory
A prefabricated triangular timber kit integrates structure, façade, and balconies. One standard node and repeating modules ship flat, assemble quickly, and minimize waste. The same parts adapt to the irregular lot and align building services.

Most elements are flat-packed and shipped to an on-site temporary workshop for assembly. Flat-packing eliminates the need for oversized trucks, reducing costs and improving accessibility to more challenging sites.

Bathroom and kitchen units are the only volumetric elements shipped to the site.



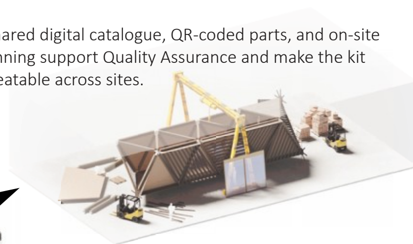
Strength in Triangles: Triangular geometry inherently resists deformation, providing strength with fewer members.
Each triangular cell works as a light truss, carrying loads axially to the nodes and limiting bending, which keeps connections simple and predictable.
With mostly axial forces, many members can be smaller glulam or standard-dimension lumber where spans allow; engineered sections are reserved for longer chords and primary posts.

Less Waste, More Performance: Lighter sticks and compact steel node pieces reduce material cost, crane time, and shop waste while keeping the frame stiff.

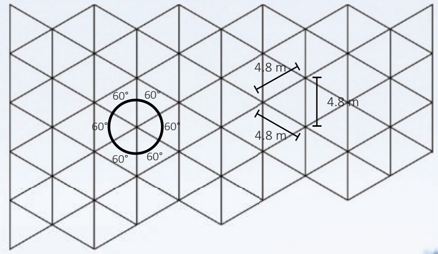
Installation
Modules are lifted from the temporary workshop and installed via crane. The kit can be used on other TOA sites with minimal redesign, creating volume for Indigenous-sourced suppliers and reducing unit costs in future phases.

On-site temporary workshop
A temporary workshop is set up on-site. A flat-pack mass-timber kit arrives in dense loads and is pre-assembled in the workshop into façade and balcony modules. This reduces truck trips, shortens crane time, improves quality control, and keeps the site tidy with just-in-time staging.

A shared digital catalogue, QR-coded parts, and on-site scanning support Quality Assurance and make the kit repeatable across sites.



Reducing Sway and Enhancing Lateral Stability:
Timber towers are notorious for being too light and having limited lateral stability. This often leads designers to add ancillary systems to increase the building's weight and, consequently, its resistance to lateral forces. The 3D triangular system enhances the structure's lateral stability while maintaining its light weight.



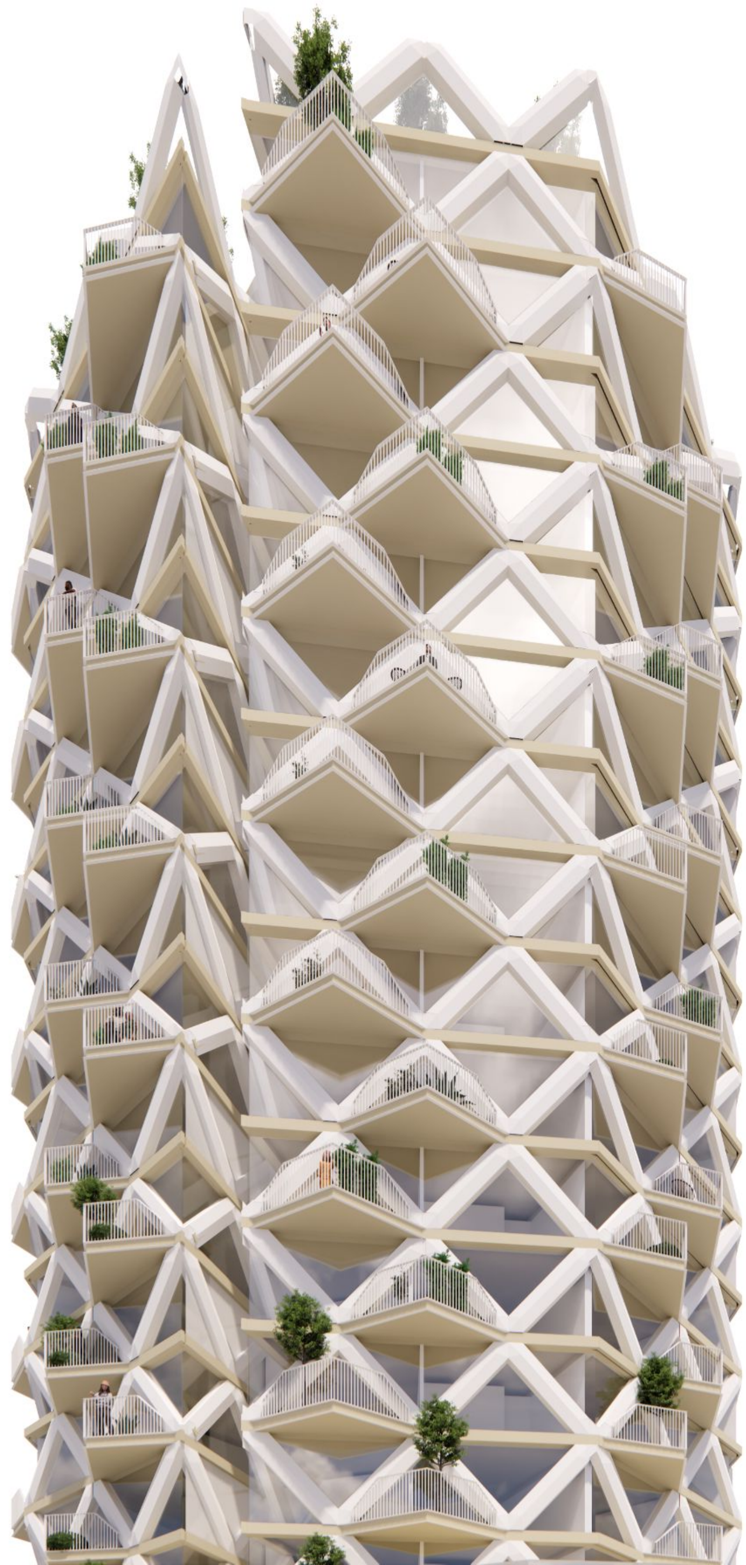
Digital Creation: Using a *Grasshopper** definition, a planar 60-degree grid is generated. This 2D grid is then used to create a 3D structure, following the same logic in which members are oriented at 60 degrees to each other. This approach allows the structure to adapt to different site conditions and grow in the X, Y, and Z directions, much like a tree.

*Grasshopper is a visual programming language and environment that runs within the Rhinoceros 3D CAD application. It allows designers to create complex geometries and models using a visual, node-based interface.

Repeatability: The triangular timber system reuses a small set of parts and dry connections. Fewer unique pieces, fewer crane picks, and simpler Quality Assurance reduce waste and rework.
Repeatable kit → lower costs

Standardization: Standardized digital catalogue enables bulk pricing, clearer bids, and fewer change orders.
Simplification = Efficiency

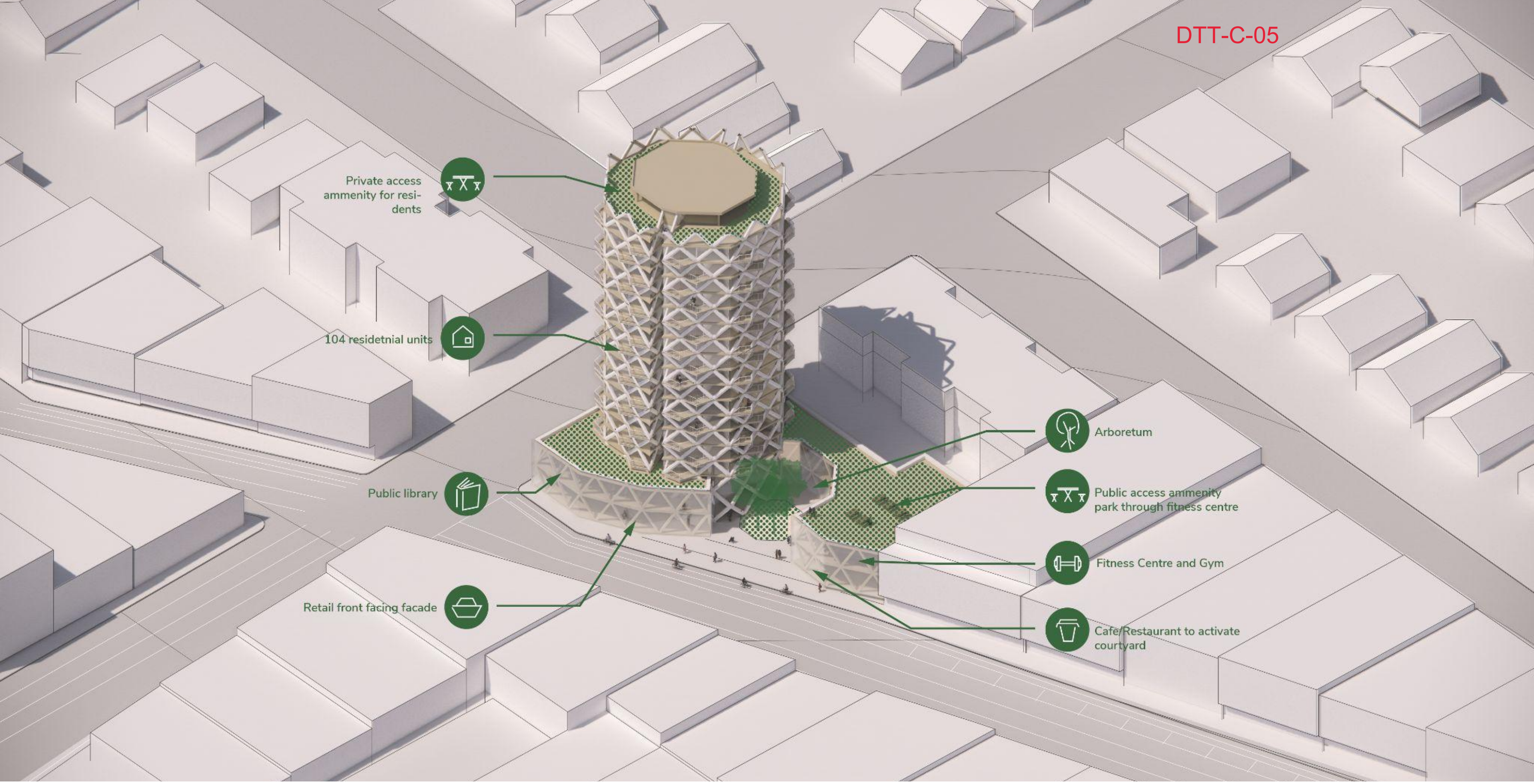
Adaptability: The grid-based triangular system adjusts to the site's irregular lot shape and varying orientations.



Arboria 8

Mass timber is now becoming a mainstream building material. What bold innovations will drive its next leap toward deeper decarbonization and streamlined project design, fabrication, and delivery?

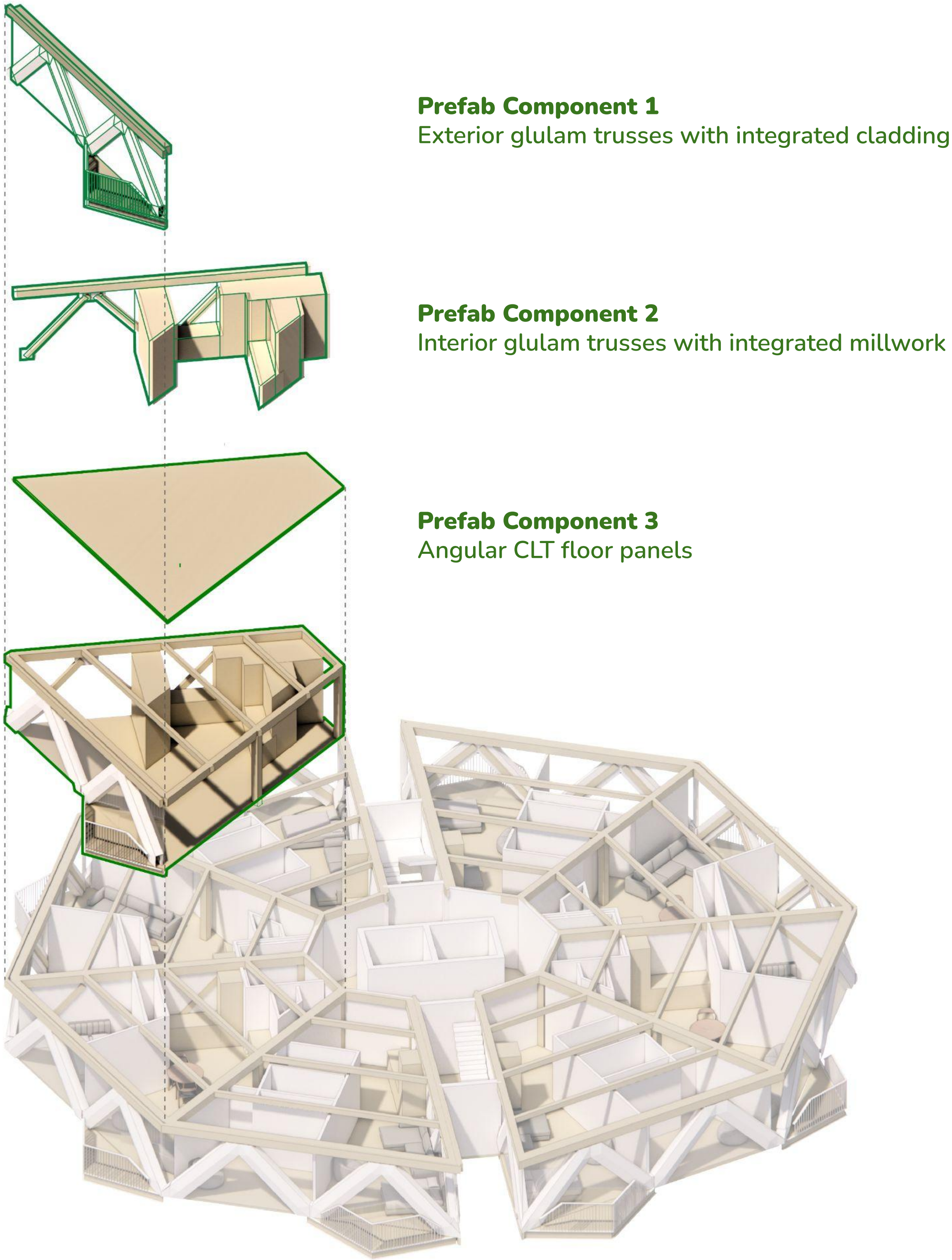
This project endeavours to explore beyond the current scope and limitations of mass timber construction towards enhancing its capacity to address both the climate and housing crises through an innovative and flexible modular approach to multi-unit residential tower design. This customizable "kit-of-parts" design approach is rooted in four core concepts: biodiversity, redensification, monomateriality, and industrialization, that coalesce to unlock a generational shift in the building industry's current perception of mass timber design and construction processes and practices.



Site + Arboretum

The proposed design is deeply integrated within its unique environmental context, and responds directly to the site's existing characteristics. Given the site's heavily treed nature, the project features a ground-floor plan that prioritizes the preservation of the natural landscape while creating a vibrant public space. A central public green space and arboretum are integrated within the podium design, serving as the social and ecological heart of the development. This not only offers a high standard of comfort and livability for residents but also enhances the connection of the site to the land and reinforces the concept of biodiversity.

The podium and tower are strategically designed to maximize views to the mountain ranges to the northeast and southeast of the site. The innovative mass timber diagrid from the tower also extends to grade, blending the rhythm and materiality of the surrounding trees and internal Arboretum with the building's structure, weaving all forms of timber into a unique urban forest.



Monomateriality + Industrialization

The design embraces **monomateriality** , extending the use of wood beyond its structural role to form as many components of the building's physical system as possible. This approach lends itself to purpose-built rental housing by taking a "furniture-first" approach, where the built-in furniture removes the need for disposable pieces, thus also improving the life cycle of the rental units.

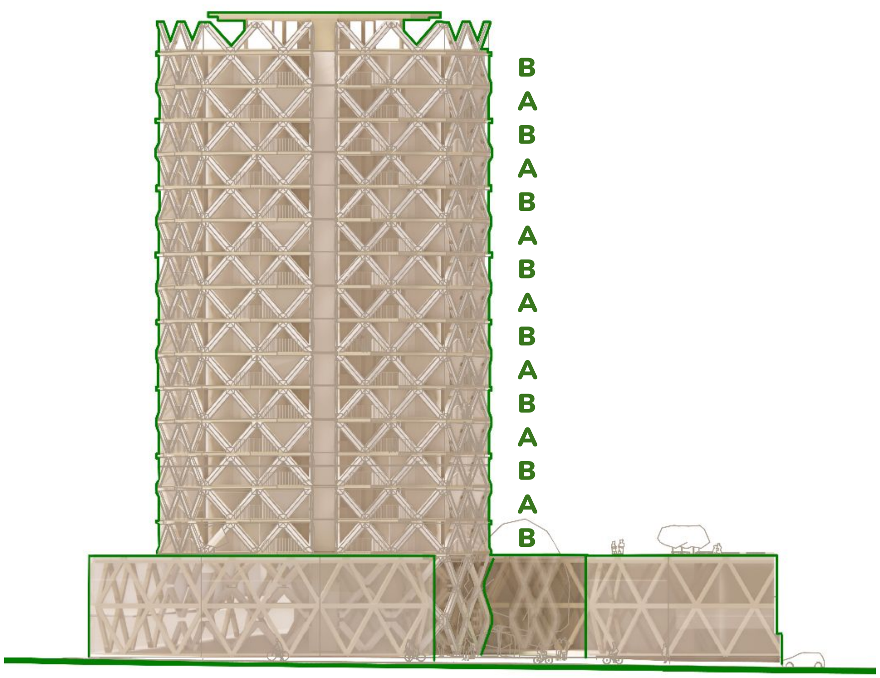
This holistic approach is supported by the principles of **industrialization** , which seek to increase adoption through greater efficiencies in manufacturing and implementation systems. Industrialization is the cornerstone of this project, focusing on exploring a more efficient and scalable delivery process for mass timber. The goal being to promote the use of a limited number of optimized components enabling multiple manufacturers to produce the same units, thereby creating sufficient demand to make these units affordable. This system building approach harnesses the efficiency of off-site production and simplifies the design, review, and construction processes, making this approach to mass timber construction a competitive economic alternative to traditional concrete or steel high-rises.

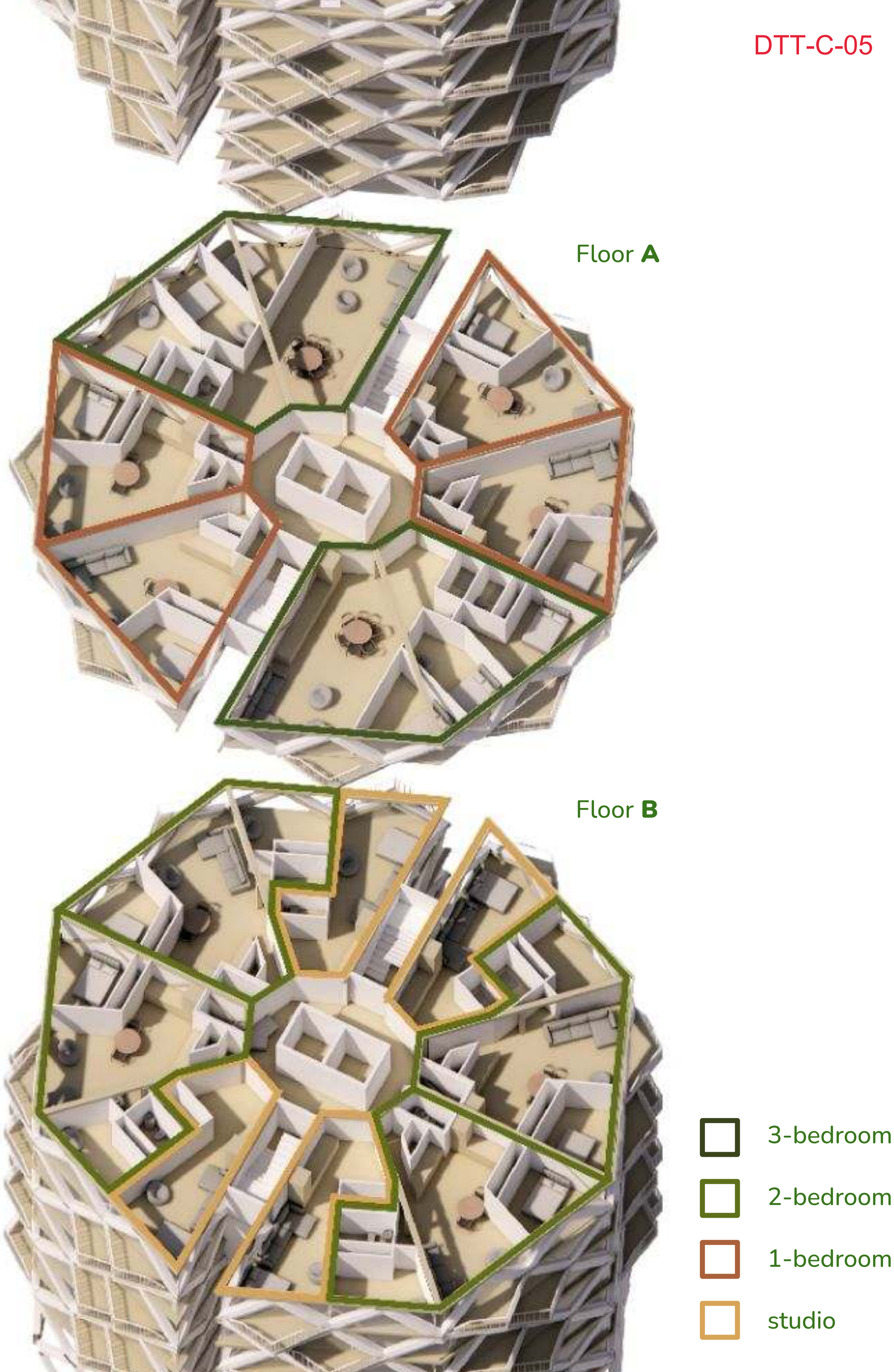
Ultimately, this industrialized method of delivery demonstrated in this design approach streamlines the entire system, paving a clear path towards housing affordability and a low-carbon future.

Biodiversity + Redensification

The design envisions a systems of mass-produced timber apartment units using regional wood resources to address the challenge of delivering high-quality, low-carbon buildings at an unprecedented scale and pace. By **diversifying** the range of wood species used during mass timber manufacturing, the project aims to reinforce local ecosystems, working well within sustainable forestry practices. Varying grades of lumber are also utilized, keeping higher grade lumber at the exterior layers of the mass timber components where higher stress occurs and lower grade lumber within the less stressed interior laminations.

The design also explores the potential for **redensification** , where the modular nature of mass timber products can be leveraged to pre-fabricate entire apartment units. The building's unit makeup is therefore largely flexible and can then be easily selected based on neighbourhood demographics and urbanization requirements.





Affordability

This project prioritizes affordability and acts as a proof-of-concept to encourage developers to consider mass timber as a viable alternative to concrete or steel from a cost perspective and beyond. The design is a response to the "chicken-and-egg dilemma" of demand versus price, where the building itself is a **catalyst for change**. By developing a customizable "kit-of-parts" approach with standardized, mass-produced full apartment unit components, the project aims to **stimulate demand and drive down manufacturing costs**, making mass timber a more affordable and viable building material in Canada and North America.

The design is engineered to **streamline the entire delivery process**. This includes creating low-cost, low-carbon buildings that are not only easy to design and construct but also easy to review and approve - addressing a key pain point for developers and approving authorities. Furthermore, the project reduces life cycle costs and operations through a low dependence on energy sources and a simplicity of systems, ensuring the building is not costly to maintain over time. A detailed proforma provides a tangible comparison to an industry benchmark, demonstrating how this solution contributes to **low-end-of-market affordability** and makes mass timber a powerful tool for a low-carbon, affordable future in Canada.

Arboria 8

FSR	5.0
lot size [sqft]	20,118
building area above grade [sqft]	100,212
building efficiency [%]	85
non rentable [sqft]	15,032
rentable [sqft]	85,180
storeys above grade [#]	17
total storeys [#]	18
base floor [#]	1
storeys below grade [#]	16
above first storey [#]	1
units [#]	104
bedrooms [#]	164
amenity space [sqft]	8,574
non-residential [sqft]	31,447

unit mix	#	%
3-bedrooms	28	27
2-bedrooms	32	31
1-bedrooms	28	27
studios	16	15

Construction Costs

		Concrete		Arboria 8	
	square footage	$/sqft	$ cost	$/sqft	$ cost
below grade	10,549	315	3,322,809	299	3,154,031
base floor	10,549	360	3,797,496	403	4,251,086
above first storey	89,663	385	34,520,409	431	38,644,925
	square footage	$/unit	$ cost	$/unit	$ cost
balconies	10,549	25,000	2,600,000	25,000	2,600,000
	$/month	# months	$ cost	# months	$ cost
scheduled costs (monthly)	50,000	18	900,000	12	600,000
total			**45,140,714**		**49,250,043**

cost difference ~ $4.1M or ~ 8% greater cost

Cost Difference

Based on the proforma, Arboria 8's construction costs are approximately **8%** higher compared to a typical concrete structure.

Notably, the innovative use of three major prefabricated building components has been estimated to reduce the construction schedule by **6 months** compared to the concrete structure - an approximate **30% savings** in scheduled monthly costs!

Timber Carbon Storage Estimation

Volume of wood products used:
46,088 ft³ of lumber and sheathing

US and Canadian forests grow this much wood in:
4 minutes

Carbon stored in the wood:
1,000 metric tons of CO_2

Avoided greenhouse gas emissions
2,130 metric tons of CO_2

Total potential carbon benefit
3,140 metric tons of CO_2

Equivalent to:

599 cars off the road for a year

Energy to operate **267 homes** for a year

Embodied Carbon + Stage D Circularity Options

This project, rooted in the principles of a **circular economy** , demonstrates a tangible reduction in carbon emissions by utilizing BC-sourced wood for the mass timber superstructure and integrated building components. While the use of a carbon sequestering material reduces the embodied carbon of the mass timber products themselves (LCA Stages A1-A3), locally sourcing the wood for the mass timber from FSC certified forests in BC reduces the embodied carbon of the material during construction of the building (LCA Stages A4-A5) as well.

Where this project models innovative and forward-thinking methods of reducing the building's embodied carbon is **beyond the life cycle of the building Stage D: re-use** . Similar to concrete, which is often downcycled into aggregate - a carbon-intensive process in and of itself - mass timber components can be chipped or pulped for other uses, but this is less desirable than re-use which directly uses existing building components in a new structure, either in their original form or with minimal modification. The customizable '**kit-of-parts** ' approach proposed allows individual apartment units to be dismantled and reassembled as standalone homes, infill (laneway) housing, or other stacked MURBs typologies, bringing new life to the materials and and whole units. This not only further reduced the building's overall carbon footprint but also creates an ongoing supply of affordable housing stock, turning a building's deconstruction into a new construction opportunity.

Embodied Carbon

		Concrete		Arboria 8	
	square footage	$kgCO_2e$	total	$kgCO_2e$	total
whole building	110,761	6.69	**740,880**	2.69	**297,946**

carbon difference ~ 442,934 $kgCO_2e$ or ~ 60% less carbon

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FLUVIAL FORMWORK

CONTEXTUALIZING STANDARDIZED METHODS AND MATERIALS

BY TEAM ADJACENT BRICK ROWS

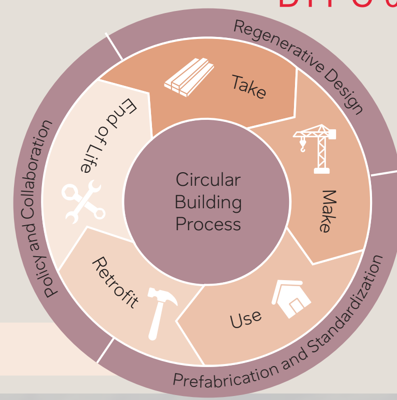
“River dolphins all over the world (in the Ganges and Amazon Rivers, for example) are not close genetic relatives. But they are remarkably physically similar. They have grown common forms due to their common circumstances.

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.

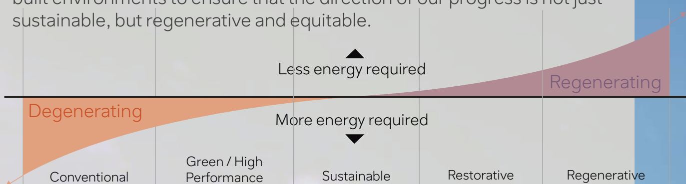


Conventional Linear Building Process

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"

This project is located on the ancestral territory of the Katzie, Kwantlen and Semiahmoo (KKS) Nations who have lived and thrived in this territory since time immemorial.

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

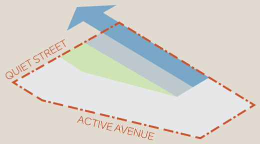
Regulation and policy are paramount in implementing this framework of consumption which posits the reframing of established processes of delivering housing. Collaboration and buy-in among all parties is critical for success.

Policy reformwork

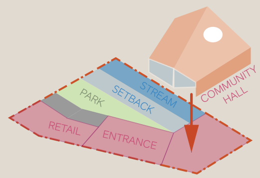
- **A** Daylighting streams should be encouraged and incentivized through density and height bonuses
- **B** Regulate embodied carbon alongside operational carbon with a lifecycle metric approach
- **C** Reward upcycle and deconstruction efforts through carbon targets. Provision of natural areas can 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

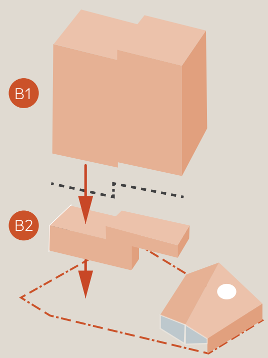
The culverted stream is brought to the surface starting one third of the length of the North property line, establishing a 10.0m setback on the subject site. The buildable area and ecological areas are established.



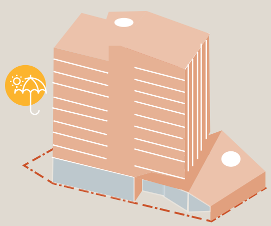
The site is programmed giving prominence to the KKS Nations Community Hall, from which the new stream emerges from underground. In exchange for daylighting the stream and providing a public park, **the project receives a density bonus** from the planning authority with jurisdiction.

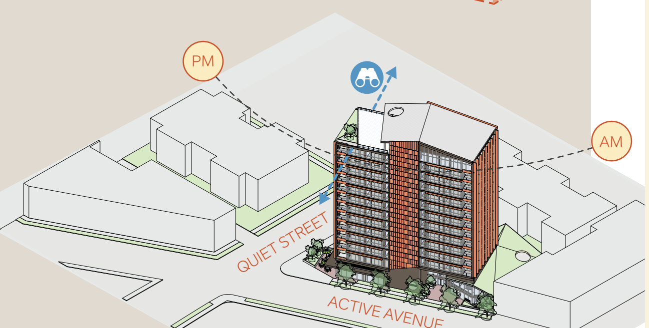


To accomodate the extra density on the site, the building is proposed at 14 storeys instead of the 12 as recommended by the TOA Tier 2 guidelines. Additional density is at the discretion of the AHJ. To permit the building to have exposed mass timber elements (max. 12 storeys), the building is split in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

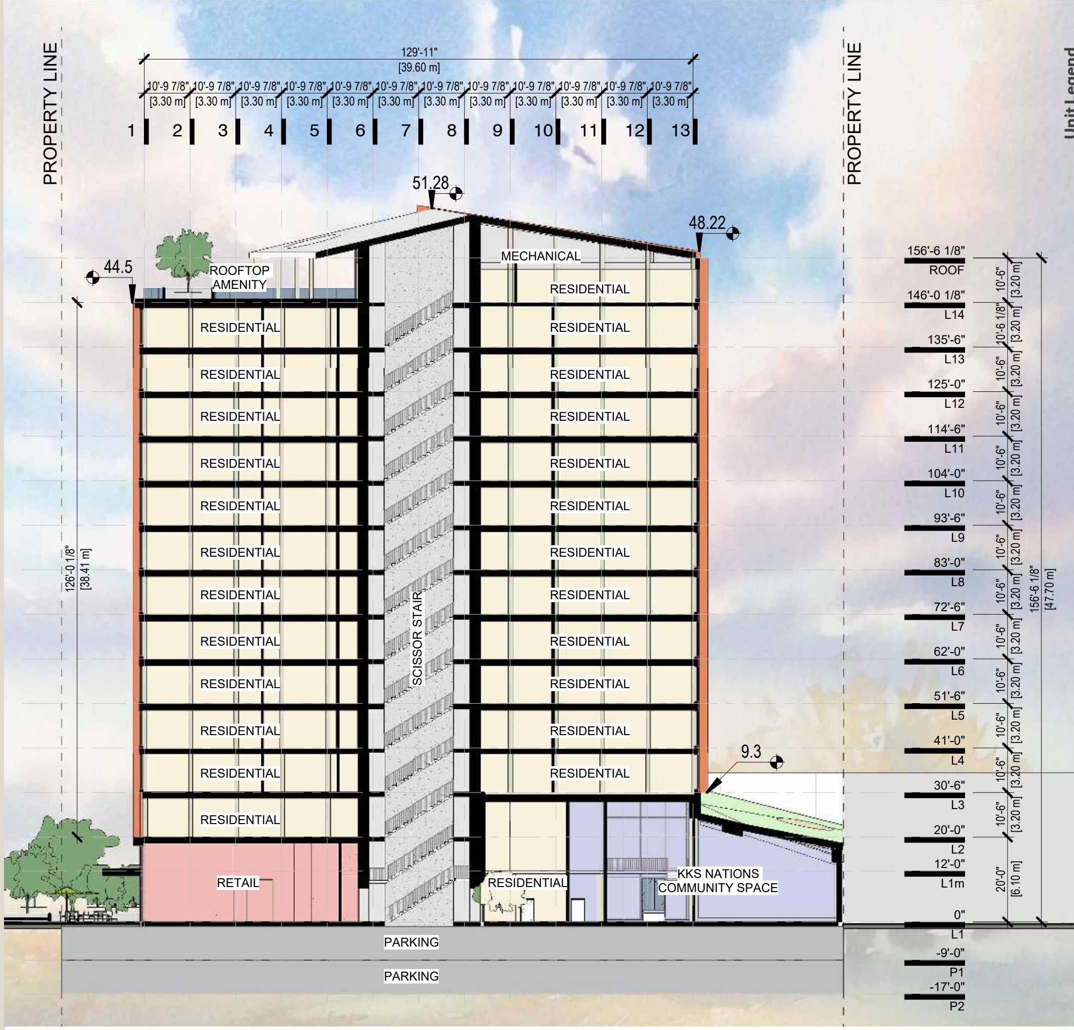


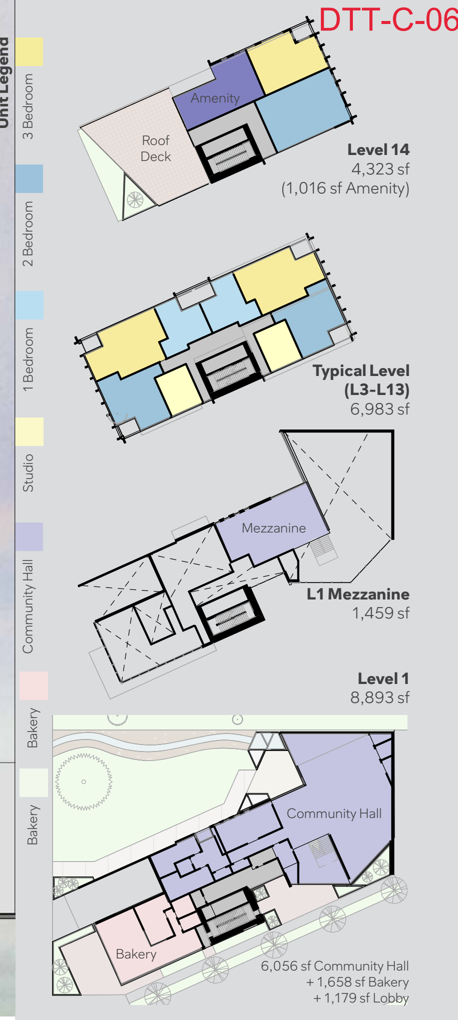
Solar shading devices are designed for the East, South, and West elevations to ensure a reduction in solar heat gain while ensuring the maximum amount of glazing in the liveable areas. The ration of glazed area to opaque is 70 / 30, which is above average at the request of the client.





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!





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 reguations."

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.

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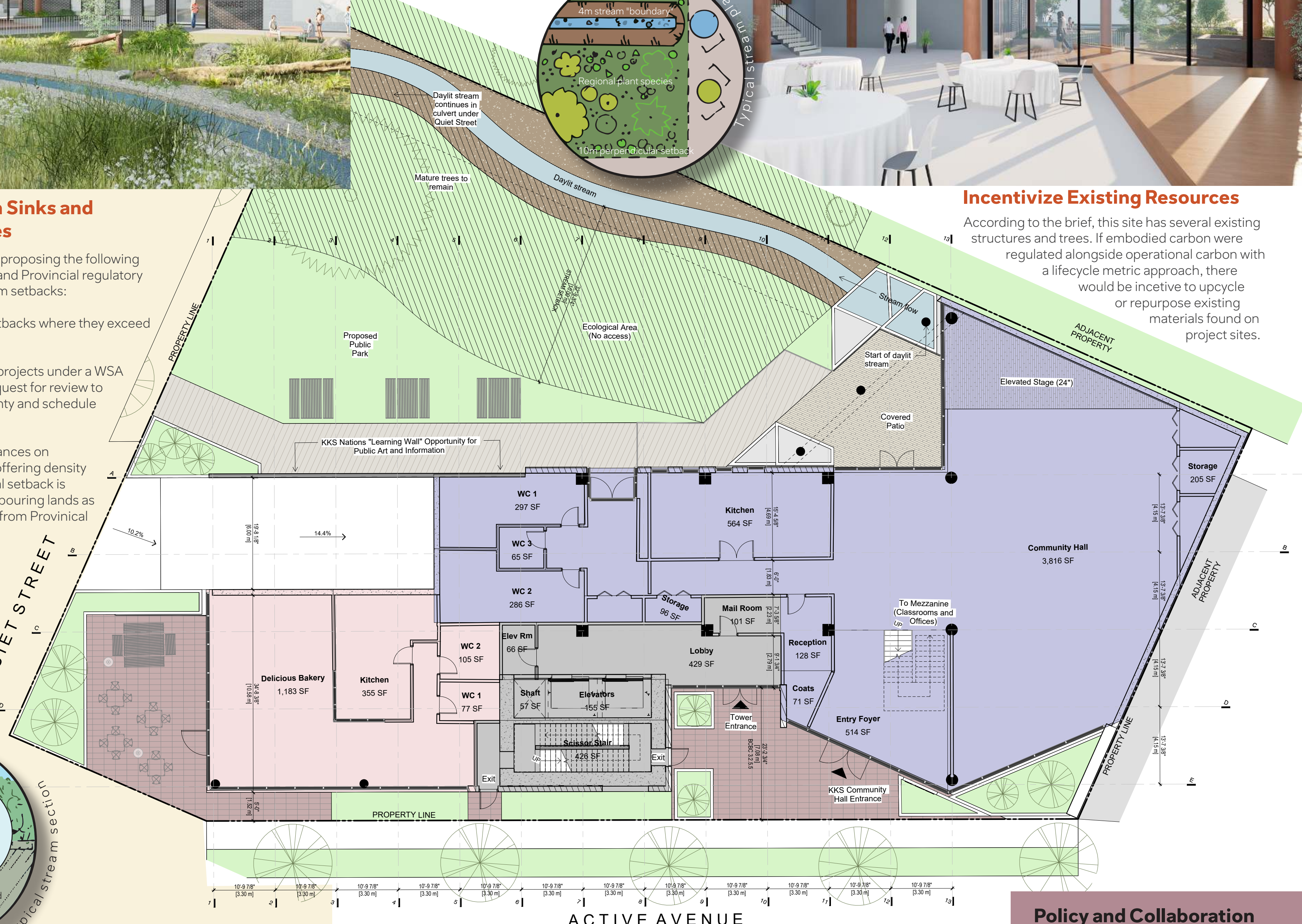
Design for Nature

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:

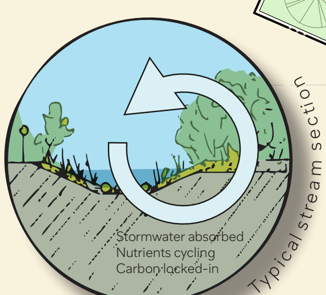
1. Relax municipal stream setbacks where they exceed Provincial minimums.

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 Provincial 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

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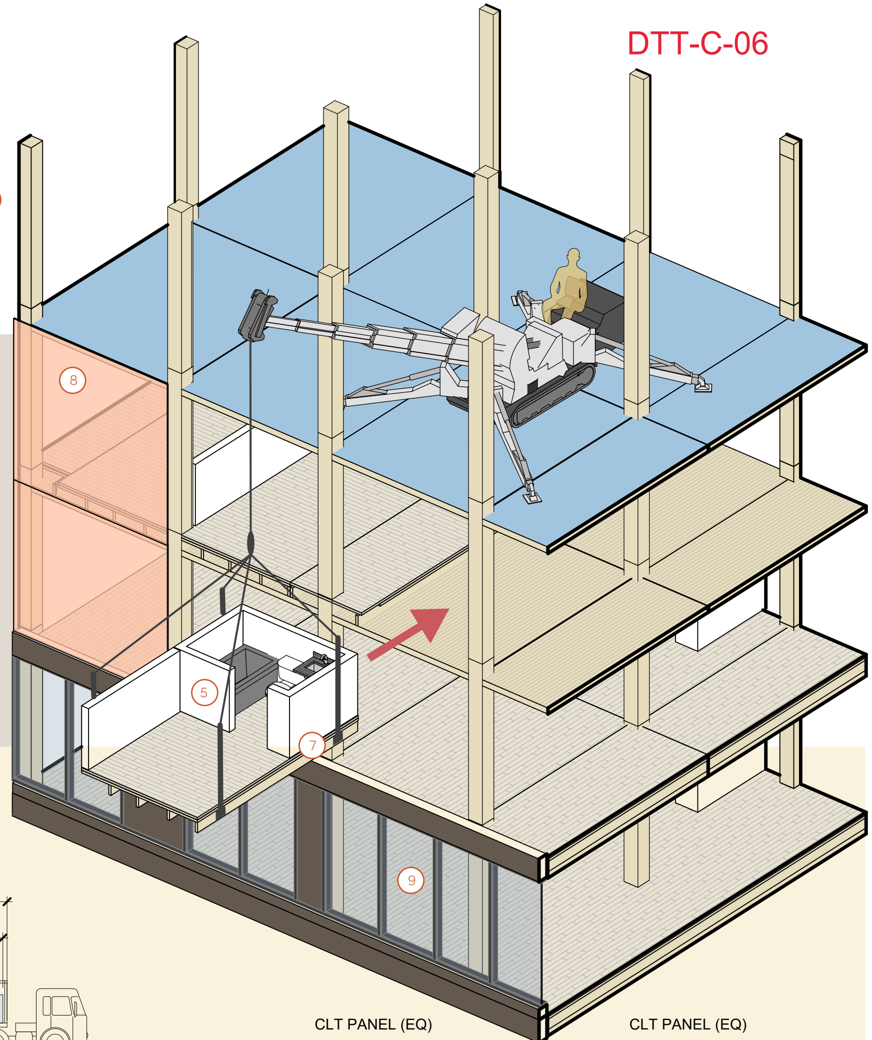
From assembly line to assembly line

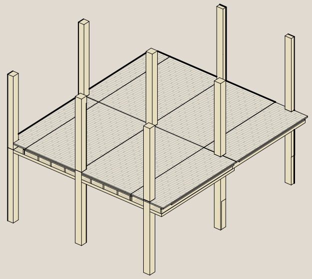
Prefabrication and modularity is an integral component of circularity in the building environment. Mass timber is an inherently prefabricated and modular building system, and yet many projects in the Lower Mainland still resort to traditional methods of connecting the mechanical, electrical, and plumbing 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

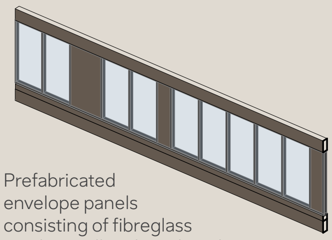
One important consideration we made was to make our interior module smaller than the typical structural grid. With a width small enough to fit inside a cube truck, the smaller modules allow for a greater variety of producers to participate in the production of interior modules. The hybrid volumetric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



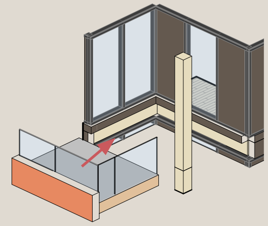
Structure, Envelope, and Balconies



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

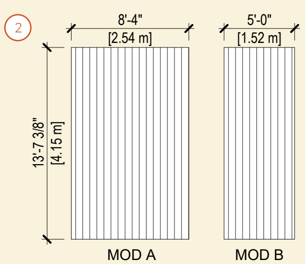


Prefabricated envelope panels consisting of fibreglass window wall and steel stud framing. The steel stud curb ensures that installation does not require custom attachments and is installed like a typical window installation.

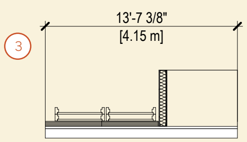


Balconies are LVL slabs interspliced with waterproof membrane layers which prevents water from advancing through multiple veneers.

Interiors + MEP Modules



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

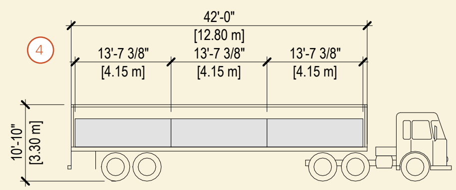


Max lifting weight = 1000 kg

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.

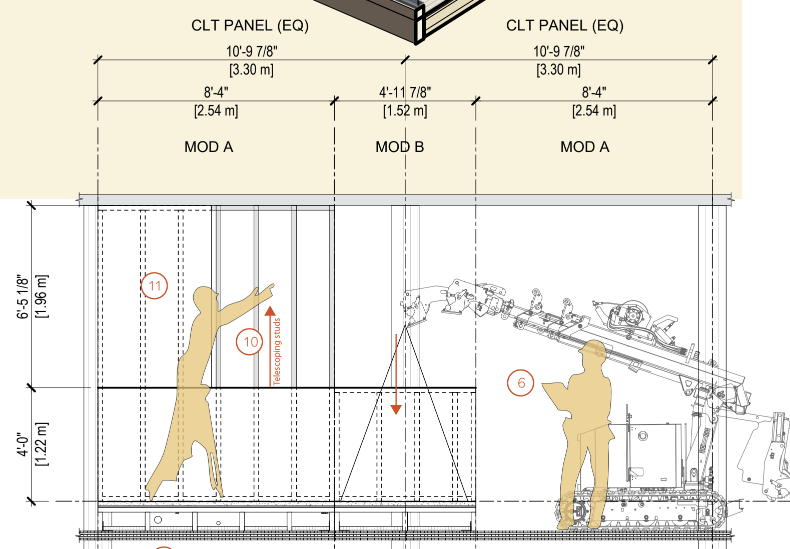


Maximum dimensions of modules in BC without requiring permit or pilot car for transport are 8'6" x 53'-0".

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.



12. Services are connected to building vertical shafts.

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

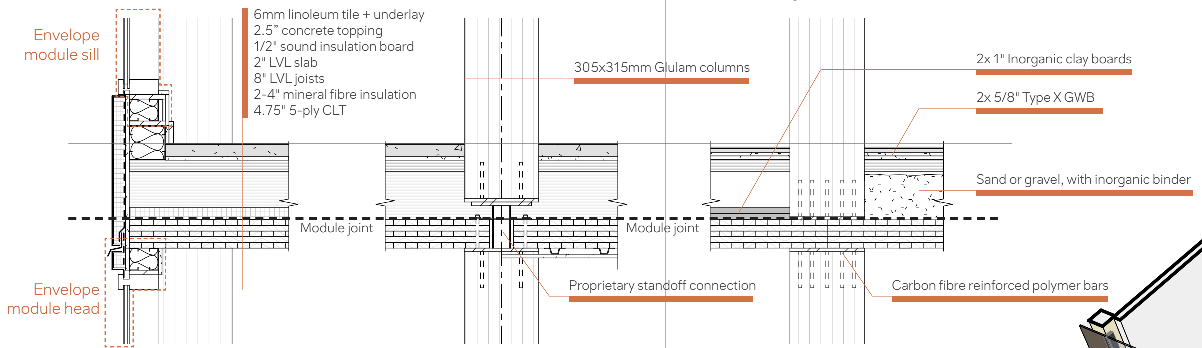
Fire and life safety are one the primary concerns when designing any building. This proposal complies with the 35% exposed surface allowance by the building code, and prefabrication allows for encapsulation to be achieved easily in a high quality factory setting.

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:



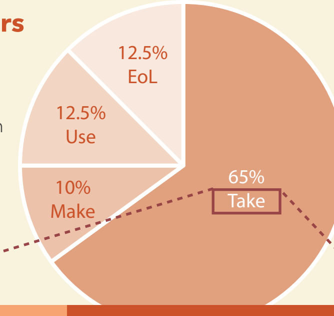
Acoustics

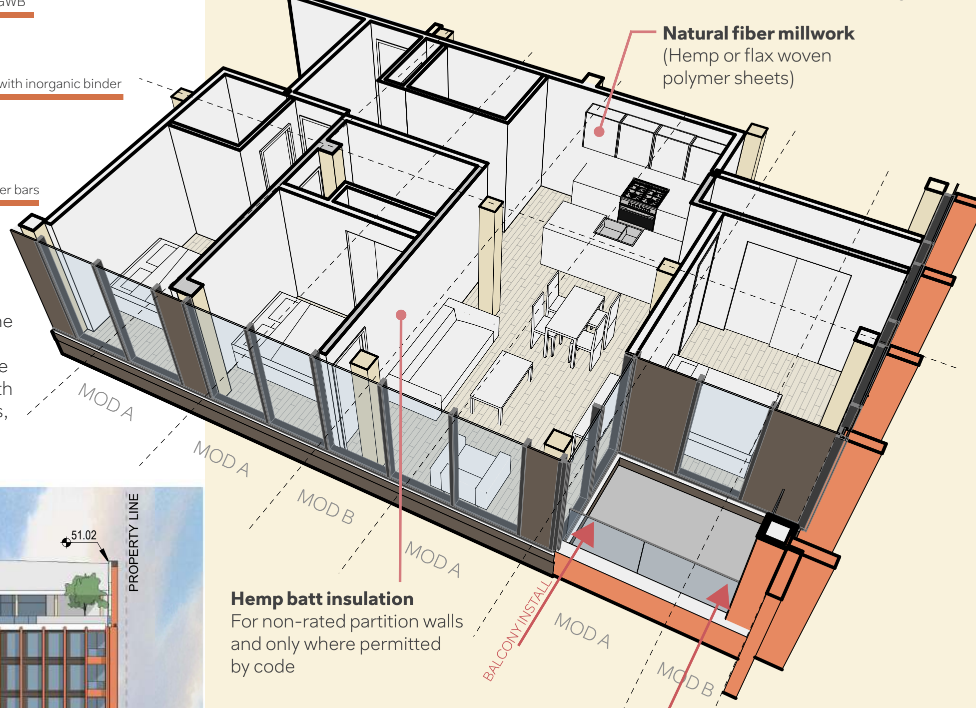
This proposal suggests a conventional assembly using 2.5" concrete topping to achieve both the encapsulation requirements and the acoustic requirements simultaneously. However, the concrete topping in this floor assembly has by far the highest global warming potential impact of any other assembly component 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.

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.

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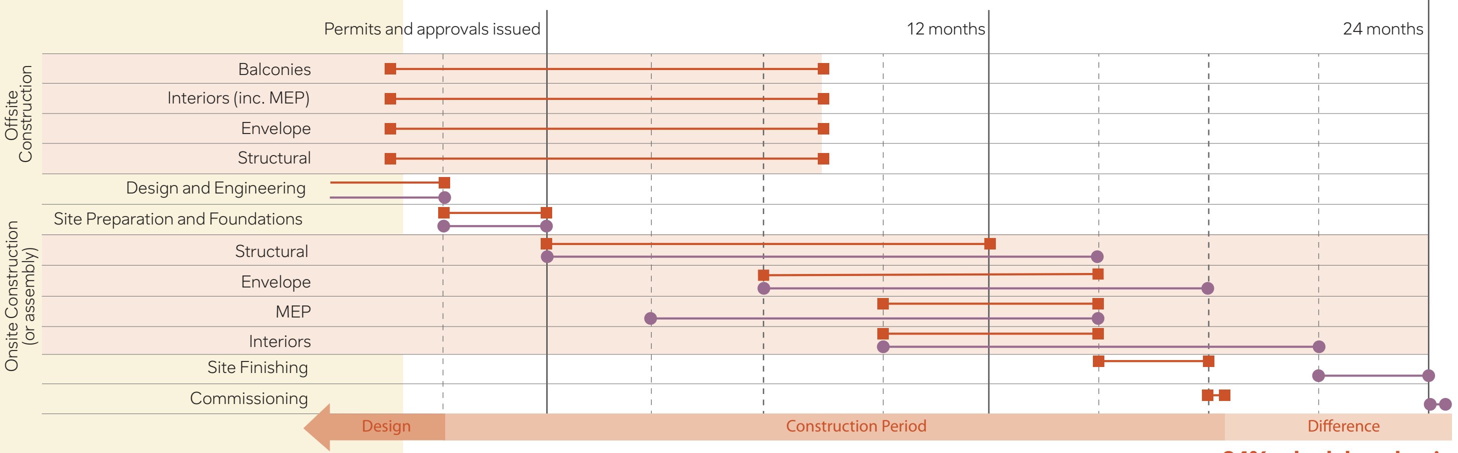
Accelerating the Schedule through Off-site Construction



24% schedule reduction

Construction Costs

	Area (sf)	Area (m²)	Concrete (Base case) ○ $ / sf	Cost	Proposal □ $ / 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

	Area (sf)	Area (m²)	Concrete (Base case) Emission intensity (kg CO_2e / m²)	Net emissions (kg CO_2e)	Proposal 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) Estimater** 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

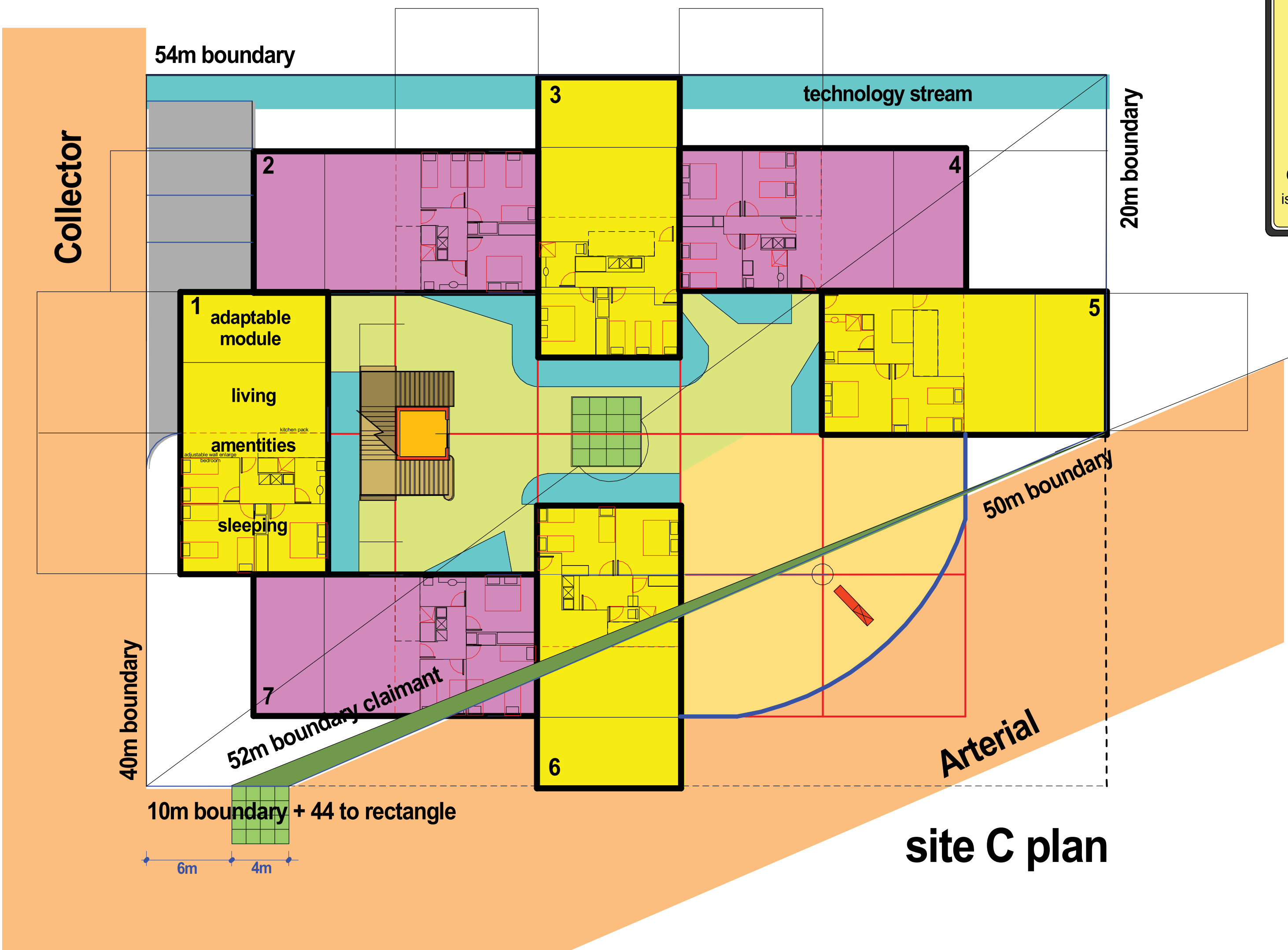
This project was designed to the specifications outlined in Appendix C of the project brief. As is the nature of competitions, we were unable to consult or work with Sacred Waters Development or the KKS Nations to develop this propopsal, and would welcome the opportunity to revisit the design and proposal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

45+315DING
TIMBER TOWERS GABE

paired 451315CRACY of 4MS entity 34 @ 4 = 136 to sacred 33.3... in 137,
sq to cube is 6 @ 34 = 198 Bayesian SHTX in 4th invisibility,
Green Martian alien tech SIG is NOT nature of time.

Ecosphere Rendezvous
Ordinance DING

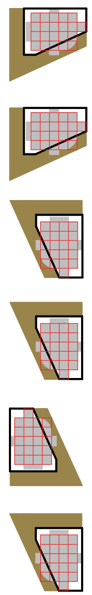
knock knock in INTERZONE boundaries



site C plan

BOB messaging
ALICE of
Ecosphere
1344/1944 phoenix
in 1584 missed,
- 9/11 & 11/9 -
EVEdropper 1984,
GORDON on 17,
whale watching
6th column in Gaza
is Watch This Space

who's intelligence in the systems



p1 = site C to 8 grid

p2 = plan elevation view

p3 = elevator stair contact

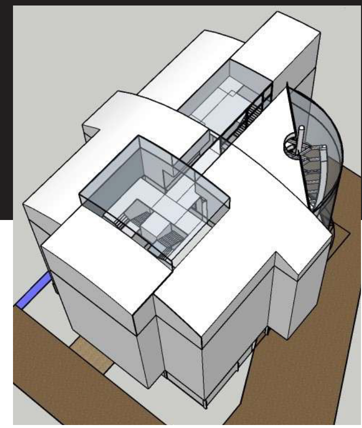
p4 = conservatory *vesica pisces*

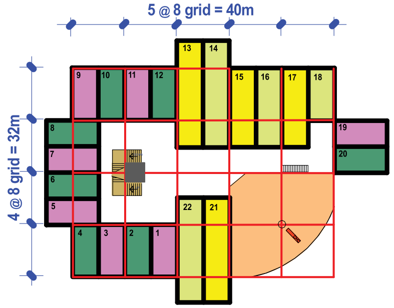
p5 = AI @ site C

p6 = site C to Green Martian

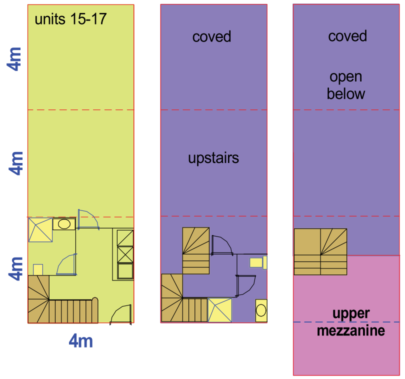
45+315DING TIMBER TOWERS GABE

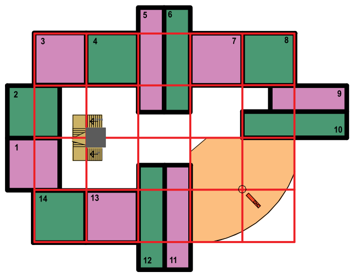
SUSTAINABLE CITIES to SUSTAINABLE FUTURES '93 Chicago & '23 Copenhagen, UIA a 30 yr transit in 191-voyage.



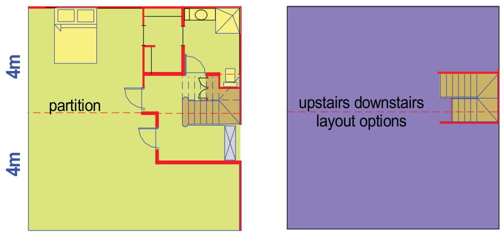


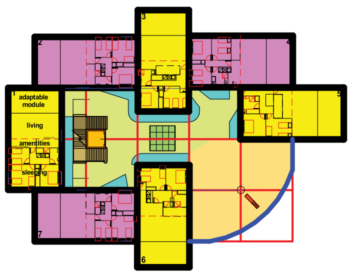
3 storey layout





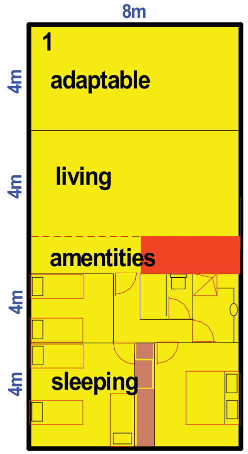
2 storey plans

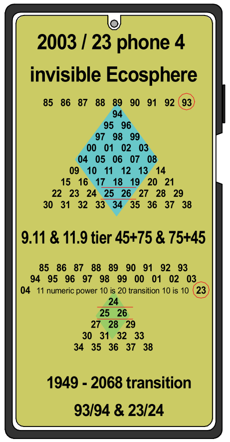


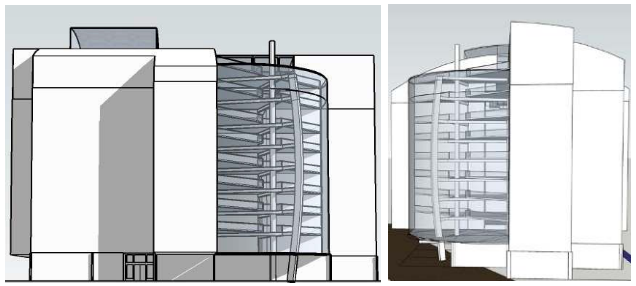


1 storey 8x16m

BOUNDARIES from Latin *bombus* = *humming* bounds forest, & Aries the Ram of Astrological 12 are 26,000 solar years, 2160 approx Age of Ares 2150 BCE to 1AD, at celestrial longitude 1st 30°, & hr GMT = 72° pentagon @ 30°.

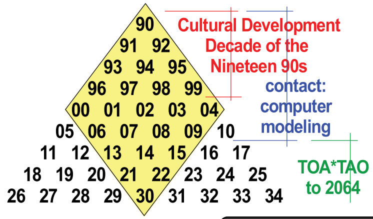




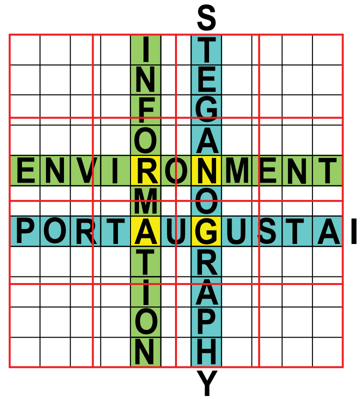


6th column Americanism drive thru ADT (adaptive)

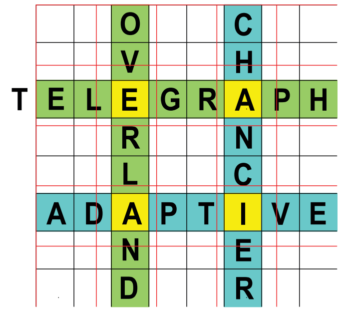
2014 grid 4 in 1990 aligns UK Architects for Gaza demand RIBA call Israel explusion from UIA (illegal settlements), redemand = genocide architectural-urban crime open June 9 2025 FIFTY of site C boundary 6x9 = 54m to 40m quarantine 4th invisibility in American Civilization a 6th column bender to architectures 3 Greek +2 Roman, as automation climate crisis



UIA 1990 Montreal in UN2015 Agenda 2030 & Copenhagen UIA 2023 SDG #11: Make cities & human settlements inclusive, safe, resilient, & sustainable, undone Ukraine, Gaza Strip, Trumped Greenland & 51 st8 zero9test to 2033 CarbonWars Trescue 2034 temporals.



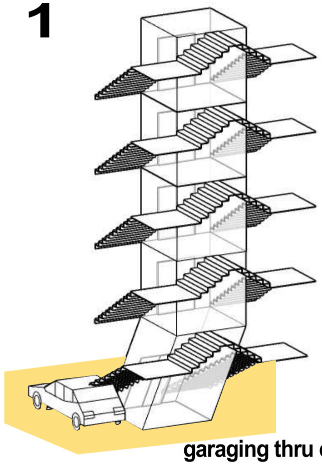
RANG = Mayotte Nov 11, 2018 seismic Armistice centenary Missed Rendezvous C in EAIA is AMERICA, to SOLVENTER paired SQLVENTER an IQ is SO in 2:1 ratio



5 grid 8 hash EAIA electronic Mafia L12 Misfit on 17th St, Washington DC to IAEA International Atomic Energy Agency in MAGA v One China firing line, as Cold War Putinism remind WWII nuclear begun. EAAI = 5119 as 658 prime to 9151 is 1134 , differ 449 in , is 87 a 4 score 7.

GABE ROTATES ELEVATOR-STAIR WIT TO ESCALATOR DUAL ARRIVAL IN IMITATION GAME

1

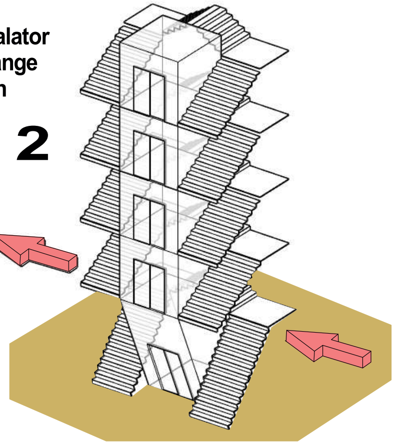


stair wit to escalator paradox a change of direction

1.5m horizontal realign vertical

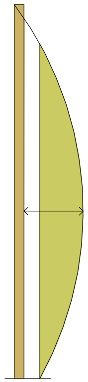
garaging thru escalator

2



Ecosphere rotate in orbit Foucault pendulum

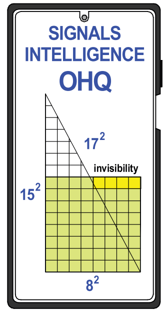
1:- escalator
2:- seismic shift
3:- 137 prime 33
4:- GeoMetric
5:- gamecube
6:- SIG.ID



6

$50m^2$ = 538 (sq ft) Electoral College first to 270 US President #48, unless Trump #33 a Gaudi 4MS at UIA2026Barcelona dismantling Democracy in clim8 change.

$60m^2$ @ 646 sq ft Ecosphere = UIA1990Montreal 1344+646, a 77^0 SIM+27= GMTX: Trump hit top right ear at Butler rally, July 13, 2024 Thomas Crook, 20, killed Corey Comperatore, 50, his volunteer fire uniform @ Trump acceptance speech Uncanny A*topia Fiction



16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

Durer

1	14	14	4
11	7	6	9
8	10	10	5
13	2	3	15

Gaudi

7	12	1	14
2	13	8	11
16	3	10	5
9	6	15	4

Jaina

0	7	9	14
11	12	2	5
6	1	15	8
13	10	4	3

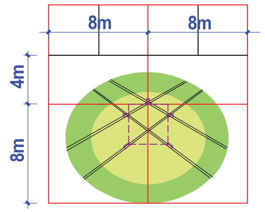
zero #30

13	1	12	7
11	8	12	2
5	10	3	15
4	14	6	9

L12 misfit #33

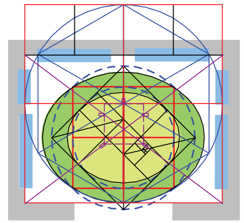
10	1	12	7
11	8	9	2
5	10	3	12
4	11	6	9

3/4ths #30



5 columns atop elevator to 4 beams + elliptical ramp with GABE interactive steps

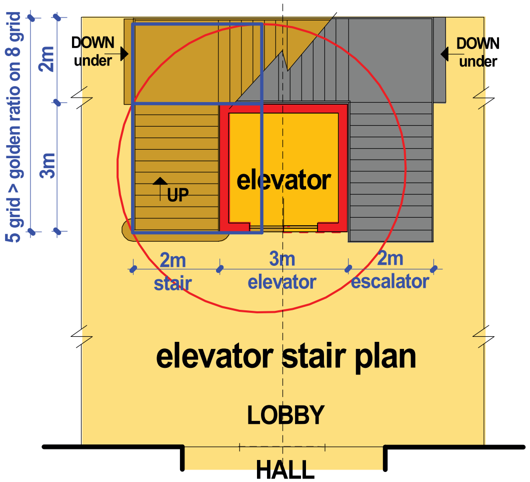
5



atrium gamecube Ecosphere

ground zero to above in predictive futures Bayesian SHTX capsize

A0 841x1189 to 1041x1550 = 200x361 of $\sqrt{2x19}^2$ BSING: atrium in Urbanarium is T urban briefs Mayday sent



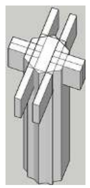
decoding America Canada Greenland ACG 137

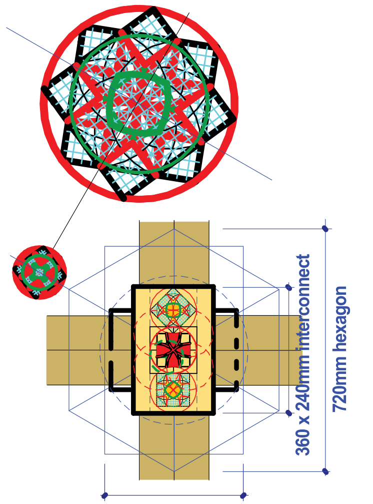
13 July 1997 SIGGM: *12-yr old Katie Bender fatal shrapnel, Lake Burley Griffin, 1pm Royal Canberra Hospital* demolition misfire reset 1:30 Bender family at Church 1pm, a still closed bridge tragedy.

USGS HQ Sioux Falls, South Dakota, 13 July 1997 hailstones contact zero Barn Elm tee GOLF / GULF in SIX codeX2000 to SIG.ID Autonomous Researcher 2.0 of 137 prime 33rd in 5x4@64 =1280 pixels High Definition 720 a 16:9 Bayesian.

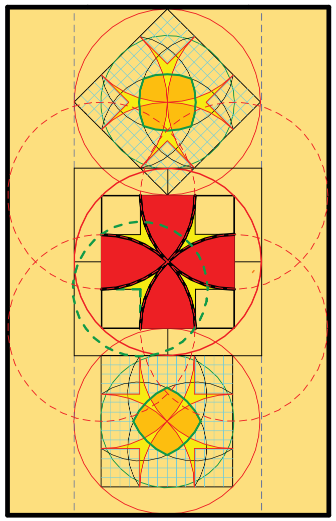
3

GABE hexacube post & beam gridlock atrium
TIME in TIMBER = 218 mirror BRING to
TIME MEMBER = TIMBER MEME
casually sent Ecosphere





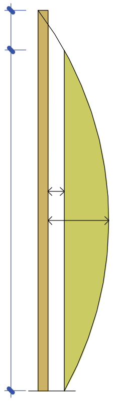
4



Power grid / Grid power in Iberian Peninsula outage, April 28, 2025 -induced atmospheric vibration =extreme temp variations in Spain's interior freaked electric: mass outage 12.33pm (10.33 GTM, 11.33 Lisbon), 60% supply-demand gone in 5sec, lack of inertia 1033 is Cicada 3301 (174th & 464th primes) to Ecosphere as 1344+464= 1808+174= 1982 centurion of 1582 Gregorian calendar 10 days lost in 2MR to 1984 Orwellian in The Pentagon - Kyiv 107^0 longitude difference plus 34′ 42″ is 25′ 18″ YR off 108 paired 72, as Trump's golf-gulf 39′ 37″ stakes Gaza 1072023 Hamas.

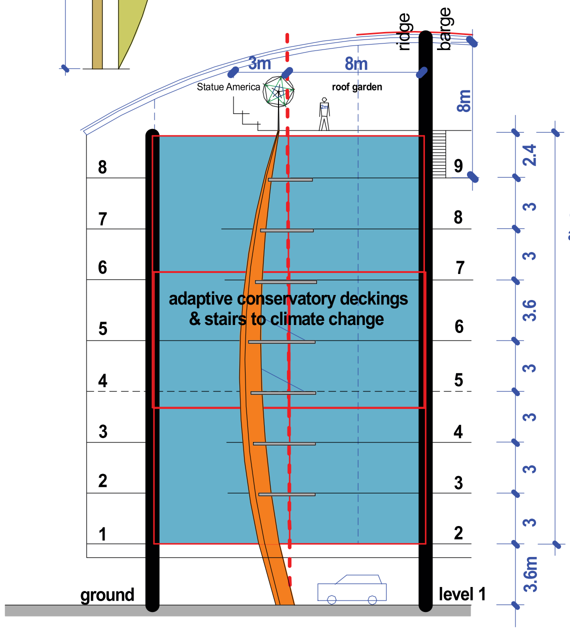
DTT-C-07

45+315DING TIMBER TOWERS GABE IS SITE C IN GAMECUBE THE EMU A 3 DOT OF 2:1 RATIO



SOLVENTER

if totem to 6th column bender discourse
is a site C on 8 grid proportional login,
priority of whose authority to dialogue
doesn't hallucinate semiotics has
history entangled sacred god-powers
as ratios cubic a 4th invisibility,
2D is the knock knock of
net zero arc awaits whose there.

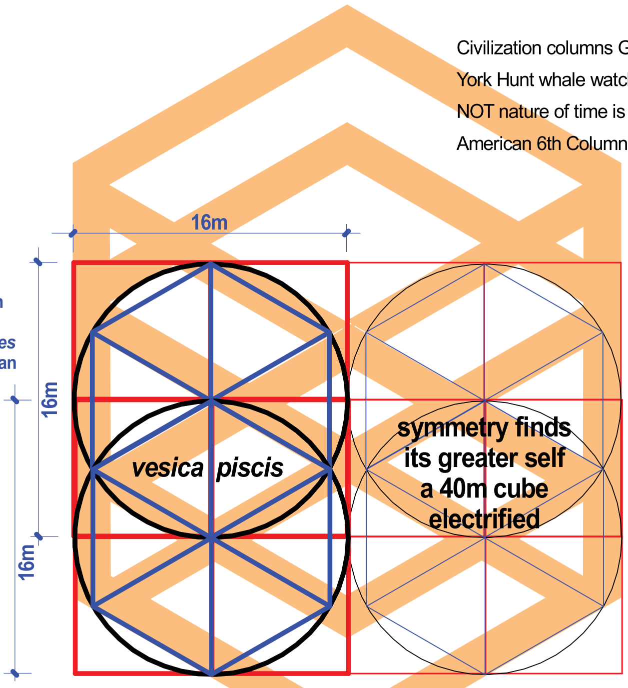


part cross section

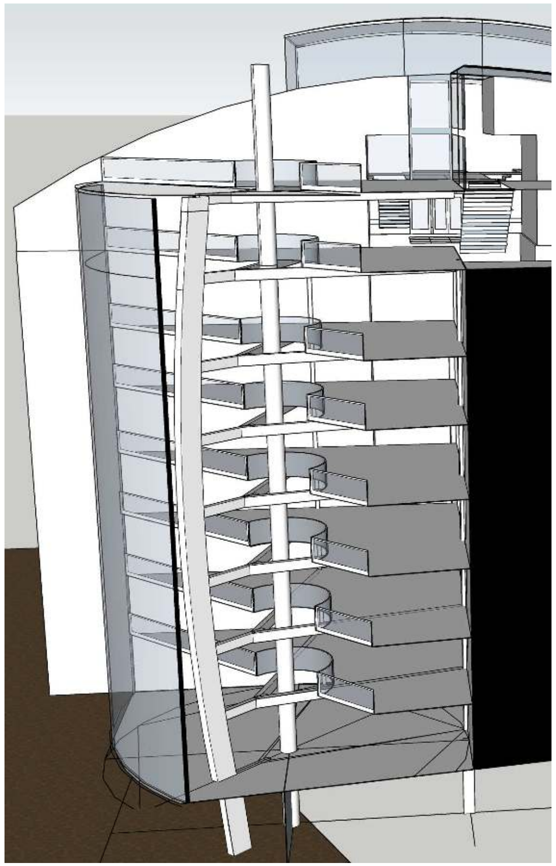
Ecosphere codeX2000 typo to Statue of America at Smithsonian Castle $77^0\ 1^/\ 33.59^{//}$ hallucinates a minute in zero as 1033 flips 3301 Cicada in Cascadian faultline AS 119 =7x17 GAG orders is DC's Zero Milestone at 2ft sq x 4ft high double 4m x 8m module a zero datum *covfefe* Trumpian 65-65 columns 5MS to US Capitol dome meridian $77^0\ 00^/\ 33^{//}$ W in what is Democacy, for a Federal City to be?

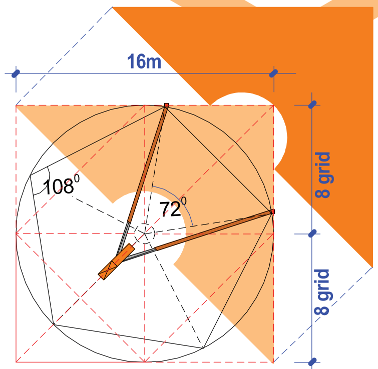
staircase of wit *Lespirt de lescalier,* the Gaza Strip dislocation of Nelson's Column zero datum + Emma = British Empire in Jerusalem 1944+81 = 2025 in Statue of America 1881 to Jefferson Pier Stone 1804/1805 Nelson + EMMA cipher a Naval 77^0 West, as 1881+144=2025 Mafia "L12" Misfit 4th leg invisibility codename Tres enters Bayesian whether/weather 81 HA equation, if thrice a 24m column bender storms a 72m mast alien tech.

Civilization columns Greek 3+2 Roman to York Hunt whale watching whore-ale, NOT nature of time is Trumpian as American 6th Column contender.



6th column bender over boundary on Arterial drive-thru sentience

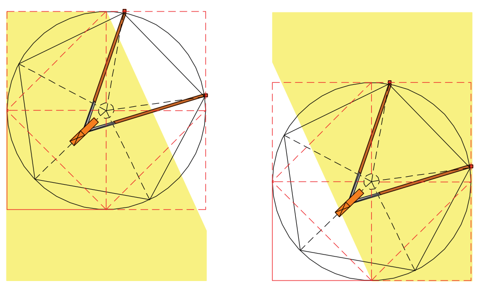




conservatory plan

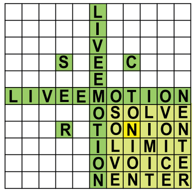
rotate site C in ID

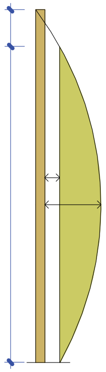
Totem on 8 grid epicenters the Pentagon in 72^0 geometry to outset pairs of arms from 6th column bender in a multistorey conservatory hold adaptive deck +stair to NOT nature of time events.

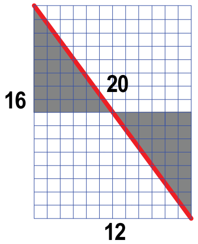


site C 8 grid to pentagon

GROUND ZERO 3 DOT IMITATION GAME SIG IS SITE C PLAN IN PREDICTIVE FUTURES BAYESIAN TO JAINA 4MS OF OHQ SACRED CHESS





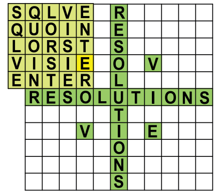


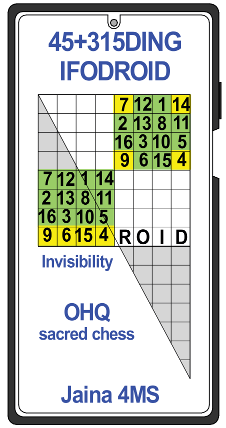
TEST PLAN
TPL
$20^2 = 16^2 + 12^2$ a 543

to *whose there* responder of *knock knock* in the Ecosphere, "45+315DING longitude's 4MS trail," awaits *blah blah who?*

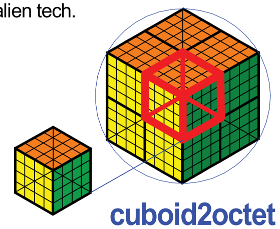
$79^0\ 55'\ 17''$ E + $109^0\ 02'\ 43''$ W = $198^0\ 58'\ 00''$

Khajuraho 4 Corners Monument





oneninety Mystery Theatre 777+198 to 58 verifies 2 missed rendezvous in TVIP 2022 Sept 16 feather in Greenland TWIP 2023 Sept 16 *Dickson Fjord landslide megatsunami generated a wave over 650ft high,* 51ther 315here in 6 & 5MC Ecosphere's whether weather basin is a let that sink in cubesat X factors in what rigs sail, as tumble-interstellar Oumuamua perihelion Sept 9, 2017 alien tech.

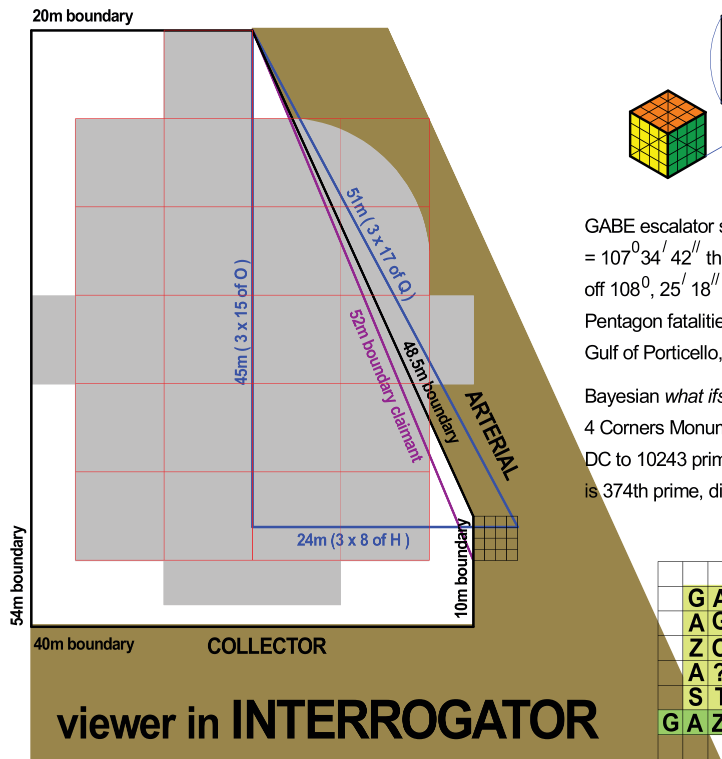


AUTOMATION an esaclator to Nelson+Emma a 6th column bender in Gaza Strip Strip annihilation, as Bayesian probability the British Empire transition to American, The Pentagon 911 in AA Flight 77 auto eliptic lands 60th anniversary, World Trades Center 7 tower collapse a fire phenomenon.

Bayesian 72m storm across the International Dateline in Washington DC - Kyiv, Ukraine longitudes (Wikipedia) sum $77^0 00' 59''$ & $30^0\ 31'\ 34''$ an $107^0 32'\ 23''$ architectural vehicle to 107.20.23 Hamas Oct 7, 2023 trigger, in what is off 108^0 Pentagon of Israeli ops in ChCh 2.22.2011 EQ ground zero.

1/2 base x height to rectangle quantum site C plan other, 20x54= 108 contact zero m poison a rabbit hole, Interrogator quests hold the phone drinker to alien tech human/AI calling shots Uncanny A*topia Fiction. GABE elevator-stair wit duel on/off escalator a 1.5m seismic horizontal in vertical's where from here.

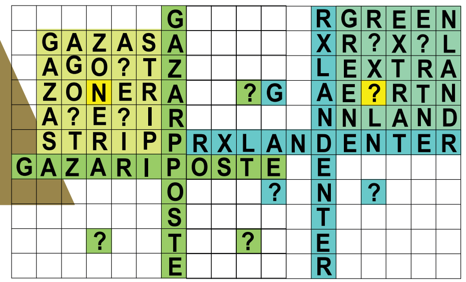
zero0test: can Interrogator detect deepfakes?



5MS Mars warp speed, *zoner* crossed *GazaStrip a GazaRiposte*
if 1893 Columbian Expo to 2020 2020 vision hit covid-19.

GABE escalator sites The Pentagon - Kyiv $77^0 03'\ 18''$ W + $30^0 31'\ 24''$ E = $107^0 34'\ 42''$ the AM waveband In area frequencies to 4MS alaising 3MS off 108^0, $25'\ 18''$ YR wire 72+108 to oneninety Mystery Theatre's 189 Pentagon fatalities on 911, pair 198 Bayesian probability anchor Sicily's Gulf of Porticello, Italy, on 19.8.2024 sheet X chart *there be dragons.*

Bayesian *what ifs* happened, The STIFF Code that Rests in ...? on 8 grid 4 Corners Monument $109^0\ 02'\ 43''$ as 1.02.43 over 108 a 102=14+88 DC to 10243 prime 1255 LEE, less Colorado Basin-Bayesian YEA 2551 is 374th prime, differs 881 a 2nd millennium Statue of America 6th column.



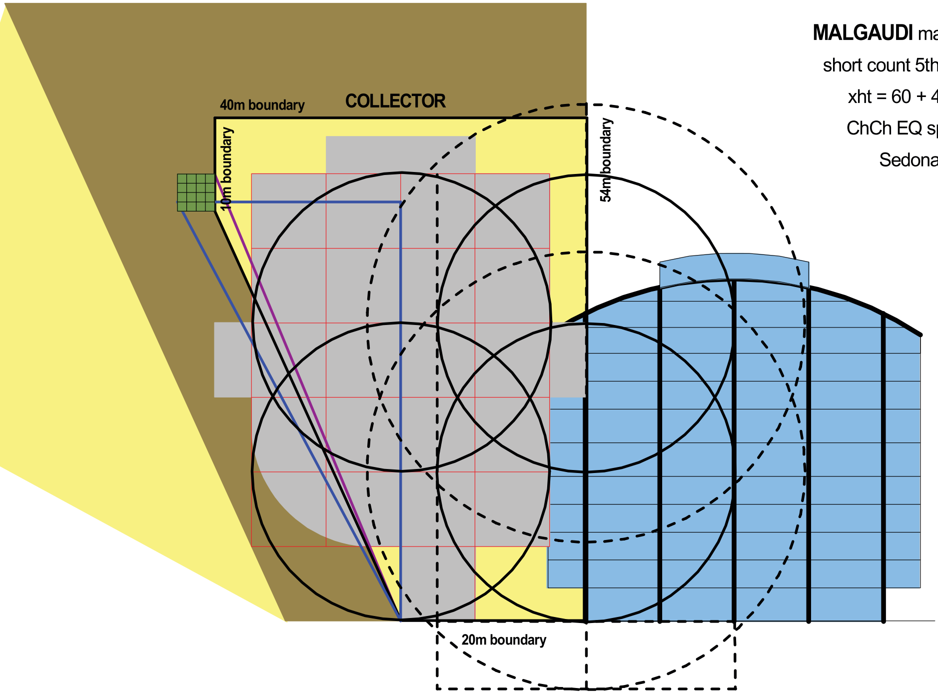
RKEY
X
BOPH

18	25	2	9	11
4	6	13	20	22
15	17	24	1	8
21	3	10	12	19
7	14	16	23	5

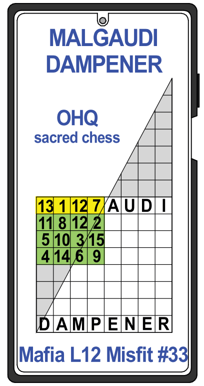
17	24	1	8	15
23	5	7	14	16
4	6	13	20	22
10	12	19	21	3
11	18	25	2	9

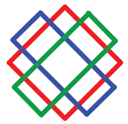
QOIK
M
DAVY

INTERROGATOR IN VESICA PISCIS VIP IS SITE C PLAN 3D IMITATION GAME



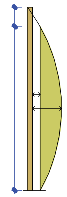
MALGAUDI malicious architecture escalator to Maya short count 5th World End 1521 = 39^2, OHQ1/2 base xht = 60 + 4-invisible NOT nature of time 12.51pm ChCh EQ splits 72 in 24/7 is 48th US State capital Sedona to 4MS DONA = Durer 1514 Albrecht.



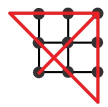


17	24	1	8	15
23	5	7	14	16
4	6	13	20	22
10	12	19	21	3
11	18	25	2	9

5MS cnrs 52



5	3	4	A	G	A	A	Z	U	B	O	A	B	E	A	P	2	P
3	4	5	G	M	T	Z	E	R	O	9	T	E	S	T	2	M	R
4	5	3	A	T	E	U	R	E	A	T	S	A	T	S	P	R	O



Longitude City SIG.ID *Salone* 1997 April 4-9 to Autonomous Researcher Aldo Rossi single car crash, Milan, Sept 4, 1997: *2020vision* Canada Ucluelet rogue wave 3xpeers 17 Nov 2020 is QK to OI in 5MS cnrs, in 1990 Iraq invades Kuwait after UIA1990Montreal, 4 tier tetractys tees a decade in Golf/Gulf OU flip 12:51am zero9test ChCh EQ Feb 22, 2011 an Ecosphere 222 DownUnder to YUU: oilop code UFO Year 2121 =1344+666 typo in 777.

3-d chess gazetted Frankenstein 8MC 11 March 1875 to Sendai 2011 tsunami, 136 yrs question 4@34 a 4MS, in 5MS delivery systems...

knock knock imagines *who's there*
net zero arc hallucinates *who?*
"7MC entity 1204 as 4 mins past noon is 4MS time to 16 minute vortex whatifs Bayesian,
net zero in interzone hierarchy is even real."

Human Machine Green Martian

MAGA v One China in smartphone / smartcity 8 grid: imitation game plotted tracks a lost cause, unless...

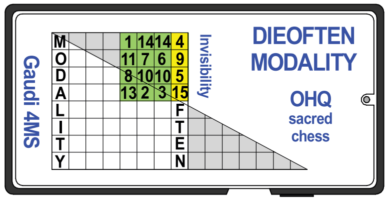
11	24	7	20	3				
4	12	25	8	16				
17	5	13	21	9				
10	18	1	14	22				
23	6	19	2	15	8	1	24	17
				16	14	7	5	23
				22	20	13	6	4
				3	21	19	12	10
				9	2	25	18	11

1 thru 25 = 325

5MS pairings
9 grid O-tel
right angle OIL

11	24	7	20	3				
4	12	25	8	16				
17	5	13	21	9				
10	18	1	14	22				
23	6	19	2	15	14	8	2	21
				7	1	20	19	13
				24	18	12	6	0
				11	5	4	23	17
				3	22	16	10	9

0 thru 24 = 300



DURER 4MS
DAMP = 34
+ gr 51@2
= 102
totals 136

16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

1	14	14	4
11	7	6	9
8	10	10	5
13	2	3	15

GAUDI 4MS
MODA = 33
+ gr 49 & 50
= 99
totals 132

JAINA 4MS
DING = 34
+ gr 45 & 57
= 102
totals 136

7	12	1	14
2	13	8	11
16	3	10	5
9	6	15	4

9	19	20	6
14	12	11	17
10	16	15	13
21	7	8	18

4MS #54
RUFI = 54
+ gr 2 @ 81
= 162
totals 216

4MS
BIGP = 34
gr 45 + 57
= 102
totals 136

9	6	3	16
4	15	10	5
14	1	8	11
7	12	13	2

16	15	2	1
5	3	14	12
4	10	7	13
9	6	11	8

4MS
AHIP = 34
gr 34 + 68
= 102
totals 136

4MS
BCON = 34
+ gr 51@2
= 102
totals 136

2	16	13	3
11	5	8	10
7	9	12	6
14	4	1	15

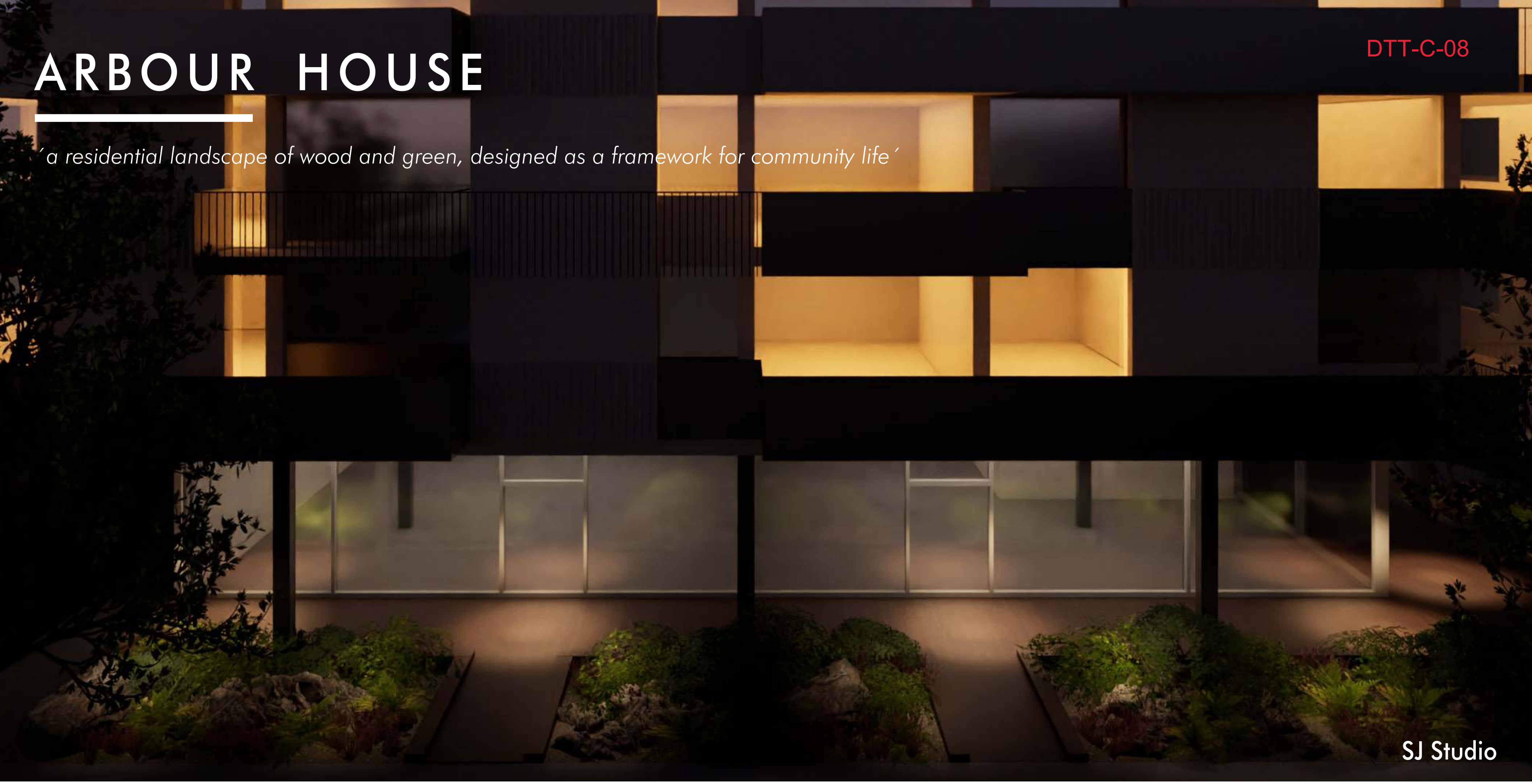
15	10	3	6
4	5	16	9
14	11	2	7
1	8	13	12

4MS
LOAF = 34
gr 41 + 61
= 102
totals 136

DTT-C-08

ARBOUR HOUSE

´a residential landscape of wood and green, designed as a framework for community life´



SJ Studio

Arbour House is a 10-storey hybrid mass timber proposal that embodies ***simplicity and practicality***, aiming to address issues of housing affordability and sustainable building practices. With a straightforward approach to tackling these issues, SJ Studio has envisioned a design backed by data, which collectively forms a design that can be realistically envisioned. This is not to say that the project does not challenge conventional practices today; the proposal still addresses many topics to ***break conventional designs for affordable housing***, such as double-loaded corridors and single-sided sunlight exposure in units, and instead, ***introduces ideas for a more liveable and family-oriented development***.

The proposal also takes a closer look at translating the ideas of flexibility in the structural design to create a template to fit not only a mid-rise residential typology, but to extend its ideas of modularity to small-scale suburban residential developments, as well as large-scale phased developments.

shared amenities
shared laundry, cowork + library & play room

bike amenities
100 spaces + bike repair room

commercial
3349 sqft

1 bedroom units
X 36

outdoor space
4815 sqft

2 bedroom units
X 32

community gathering space
3490 sqft

3 bedroom units
X 9

DTT-C-08

Design Development

1. Structure as a Kit-of-Parts

We chose a structural system that is highly flexible, utilizing a hybrid steel column and CLT floor where the columns are laid out in a typical high-rise grid of 27' - 6" x 27' x 6" developed by SOM. This grid is a happy medium when it comes to buildability and sustainability due to the structure's flexibility for a wide range of building heights, which enables the removal of a transfer slab to connect to the structural concrete foundation below if underground parking is required. With the concrete skirt to finish the structural edge, this allows for a variety of 'parts' to connect to the superstructure, such as prefab facades, balconies, and circulation.

2. Single Loaded Corridor

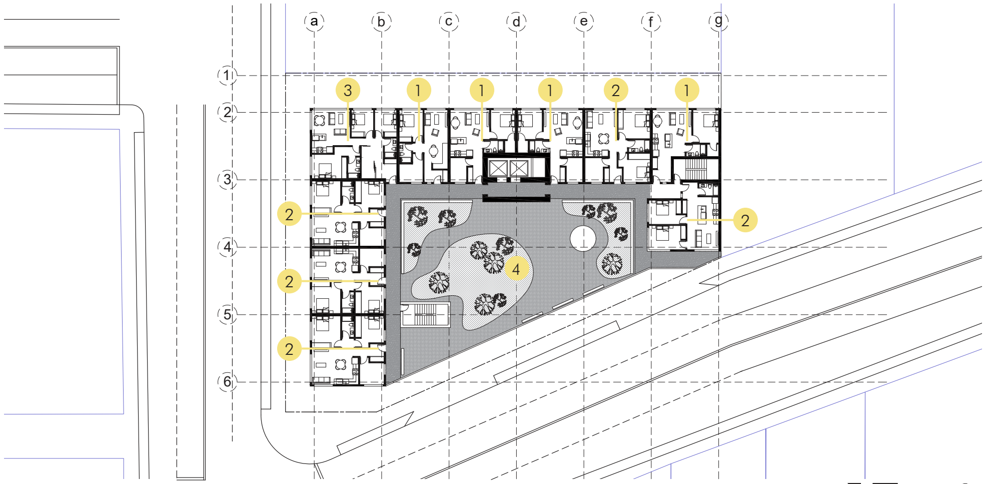
Choosing a single-loaded corridor design offers several benefits, including increased natural light and cross-ventilation for suites, enhanced resident comfort and energy efficiency, and creating opportunities for stronger visual and physical connections to the surrounding landscape. This layout can also create a more attractive and marketable living environment while reducing a pure reliance on mechanical systems, aligning well with sustainability goals and BC's emphasis on livable, climate-conscious housing.

3. Family Oriented Development

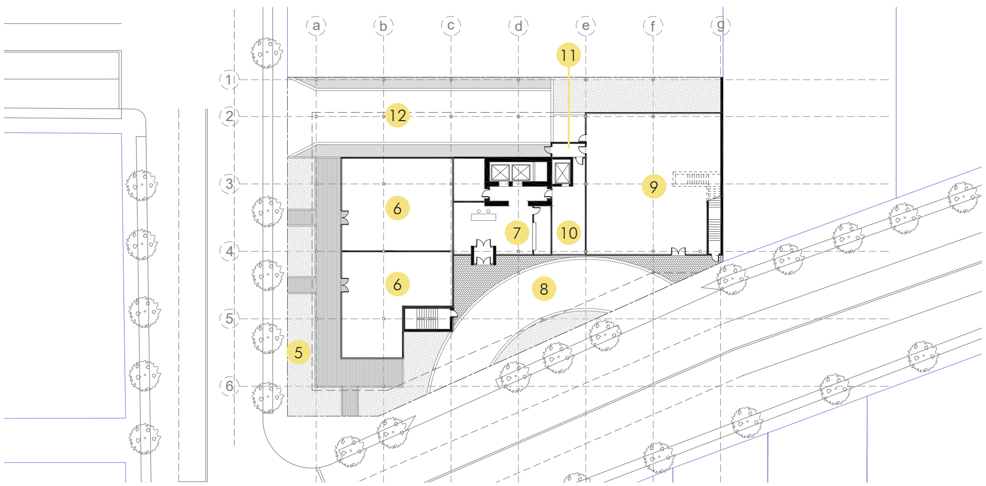
An exterior atrium provides residents with a semi-private outdoor gathering space that balances openness with comfort. By being fully open-air, it enhances natural light, ventilation, and connection to the environment, while its elevation creates separation from street activity, improving privacy and security. This type of shared amenity supports social interaction, wellness, and a stronger sense of community, all while contributing to the building's livability and appeal

4. Rainwater Management

Integrating landscaping at street level creates an effective buffer between the public street and the retail portico and residential areas. This enhances privacy and comfort for occupants, softens the urban edge with greenery, improves stormwater management, and contributes to cooling and biodiversity. At the same time, it elevates curb appeal and creates a more inviting, pedestrian-friendly streetscape that benefits both residents and visitors, rain or shine.



Level 2 - 10 Plan



Level 1 Plan (Ground Floor)

1. 1-bed + den
2. 2 bed + den
3. 3 bed + den
4. outdoor play space
5. storm water wetlands
6. commercial retail units
7. residential lobby
8. residential drop off
9. community gathering space
10. bicycle repair room
11. bicycle entry
12. ramp to underground parking

Creating a Community

From personal experiences, lectures from professors, and stories from families that have lived in multi-residential buildings, a common pattern that can be noted is that there are very little interactions between neighbours and apartments are not that fitting for a growing family. Why is it that the only encounters with our fellow residents are when we bump into each other waiting for the elevators and where are the third spaces within the building?

Our design thoughtfully situates our double fronting units to surround the inner courtyard that enables the units to have a suburban feel with a frontage that faces their 'front' yard as well as a frontage that faces their 'back' yard. The courtyard is a public amenity that features a children's play area as well as a multi-use outdoor space. Having this private open space allows families with children to have a safe play area where parents can feel secure, as access to this area is for residents only. Having the units overlook the 'backyard' as they traverse through the single-loaded corridor of the building on their way to work, or to do laundry in the shared laundry room, or to the shared office and library space, increases the chances of seeing other residents within the complex. This gives a sense of feeling that the complex is an urban village of its own, where everyone is part of a common goal to keep the environment livable.

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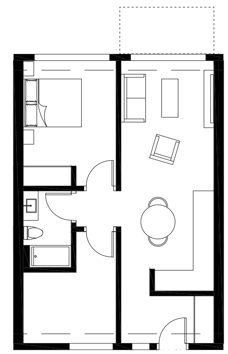
NS Section

Facade on East Elevation

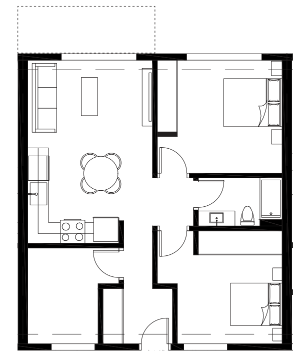
Typical Unit Modules

A standard grid allows units to be standardized and repeated over the entire project. Stacking the same units on top of each other allows for easy mechanical and plumbing work to be set up throughout the building, reducing the overall cost of materials and labour for expedited construction times.

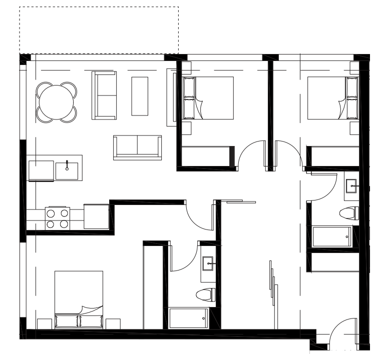
Reinforcing the idea of the double-fronting design, it enables the standard two-bed unit module to have a smaller frontage width while still accommodating both bedrooms and the living room to have solar exposure. This strategy allows units in the middle of the development to have increased lighting and usability, allowing for more flexible and unique layouts.



1-bed + den module



2-bed + den module



3-bed + den module

Proposal - Arbour House		
Site Area	**20,132**	**Sq.Ft.**
Permited FSR	**4.00**	
Proposed FSR	**4.42**	
Total GFA	**88,962**	**Sq.Ft.**
Residential GFA	85,613	Sq.Ft.
Residential NFA	67,195	Sq.Ft.
Commercial GFA	3,349	Sq.Ft.
Community Gathering Space	3,490	Sq.Ft.
Residential Amenity	3,392	Sq.Ft.
Residential Efficiency	81%	
Below Grade	40,264	Sq.Ft.
Grade	3,349	Sq.Ft.
Above Grade	86,706	Sq.Ft.
Total Stories	**10**	
Parking Levels	**2**	
Total Units	**77**	
One-Bed	36	
Two-Bed	32	
Three-Bed	9	

Cost at Current Face Value

Through an initial cost estimate comparing the two building methods, conventional concrete seems to be better. But, looking at the estimates at face value does not tell the whole story. Construction of the foundation, underground garage, and build times all contribute to additional cost. With mass timber as a structural element, the foundation requirement can be significantly reduced as the overall superstructure is lighter than poured concrete. Utilizing steel columns and CLT floors expedites the build time significantly as well. As the proposal is in a TOD zone, the overall number of parking spaces required can be reduced. To challenge this further, promoting sustainable modes of transportation can remove the underground parking entirely. Ultimately, we have decided against this as we have programmed our proposal to be family-oriented, and we believe that the options for different modes of transport embodies a flexible design.

Construction Cost (High Level Cost Estimate)					
		Conventional Concrete		**Mass Timber Hybrid**	
	Sq.Ft.	**$/ Sq,Ft.**	**Cost**	**$/ Sq,Ft.**	**Cost**
Below Grade	40,264	$315.00	$12,683,160.00	$315.00	$12,683,160.00
Grade	3,349	$360.00	$1,205,640.00	$415.00	$1,389,835.00
Above Grade	86,706	$285.00	$24,711,210.00	$415.00	$35,982,990.00
	Quantity	**$/ Unit**	**Cost**	**$/ Unit**	**Cost**
Balconies	77	$25,000.00	$1,925,000.00	$25,000.00	$1,925,000.00
	Cost/Month	**# Months**	**Cost**	**# Months**	**Cost**
Schedule Cost (Monthly Overhead)	$50,000.00	18	$900,000.00	13	$650,000.00
Total			**$41,425,010.00**		**$52,630,985.00**

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View of Residential Outdoor Courtyard

Structural System Material Breakdown & Cost Analysis		
Below Grade (Sq.Ft.)	**40,264**	**Sq.Ft.**
Grade + Above Grade (Sq.Ft.)	**90,055**	**Sq.Ft.**

Structural System	Quantity	Unit Type	Unit Cost per LB/FT3	Cost/ Sq.Ft.	Total
Conventional Concrete					
Superstructure					
Reinforcing	5.50	PSF (Pound per Sq.Ft.)	$1.60	$8.80	$792,484.00
Post-Tensioning	1.10	PSF (Pound per Sq.Ft.)	$2.50	$2.75	$247,651.25
Concrete	0.90	Ft3/Ft2	$9.00	$8.10	$729,445.50
Total					**$1,769,580.75**
Foundation					
Reinforcement	1.70	PSF (Pound per Sq.Ft.)	$1.60	$2.72	$109,518.08
Concrete	0.30	Ft3/Ft2	$9.00	$2.70	$108,712.80
Total					**$218,230.88**
Grand Total					**$1,987,811.63**
Mass Timber Hybrid (Proposal)					
Superstructure					
Structural Steel	9.95	PSF (Pound per Sq.Ft.)	$2.50	$24.88	$2,240,118.13
Slab Reinforcement	1.8	PSF (Pound per Sq.Ft.)	$1.60	$2.88	$259,358.40
Concrete	0.28	Ft3/Ft2	$9.00	$2.52	$226,938.60
CLT	0.6	Ft3/Ft2	$8.50	$5.10	$459,280.50
Total					**$3,185,695.63**
Foundation					
Reinforcement	0.9	PSF (Pound per Sq.Ft.)	$1.60	$1.44	$57,980.16
Concrete	0.17	Ft3/Ft2	$9.00	$1.53	$61,603.92
Total					**$119,584.08**
Grand Total					**$3,305,279.71**

*Coefficients of PSF and Ft3/Ft2 are directly taken from **Skidmore, Owings, and Merrill. AISC Steel & Timber Research for High-Rise Residential Buildings: Final Report. 4 Dec. 2017.** with the unit cost derived from multiple sources such as BC Housing, WoodWorks, and Altus Group.

Cost of Encapsulation (Ceiling)	Material Cost/ Sq.Ft.	Labour Cost/ Sq.Ft.	Total (Potential Savings)
Single Layer Standard	$2.00	$2.00	$180,110.00
Double Layer Mass Timber Encapsulated	$4.00	$3.00	**$360,220.00**

Embodied Carbon		Conventional Concrete		Mass Timber Hybrid + Concrete Foundation	
	Sq.Ft.	Embodied (KG CO_2e/ft^2)	Total (KG CO_2e)	Embodied (KG CO_2e/ft^2)	Total (KG CO_2e)
Above Grade	88,962	43	3,825,366	21.5	1,912,683
Below Grade	40,264	43	1,731,352	43	1,731,352
Total			**5,556,718**		**3,644,035**

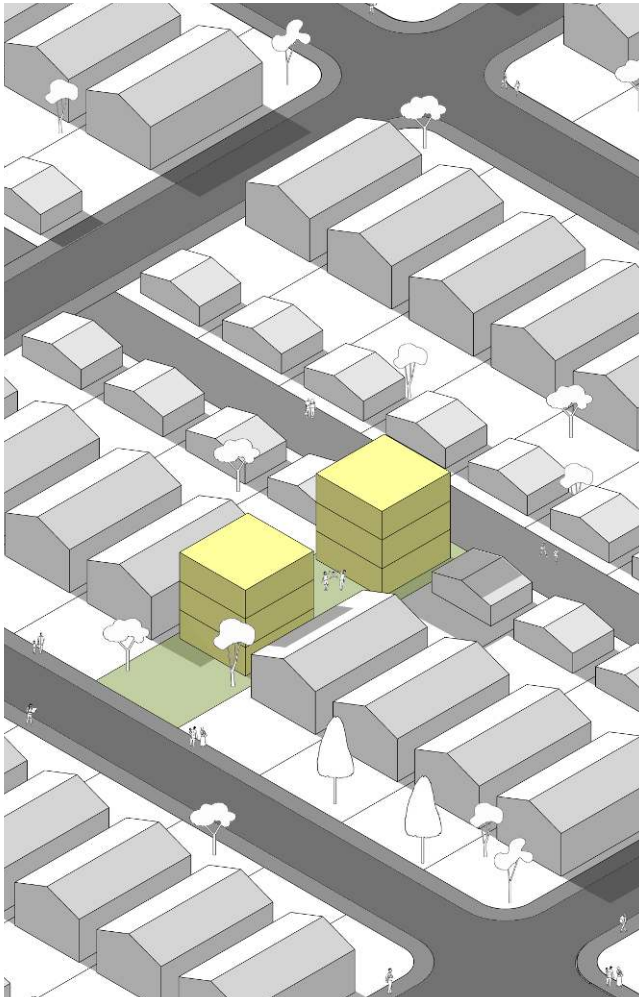
* Embodied Carbon Coefficient of conventional concrete is derived from, **Robati, Mehdi, and Philip Oldfield. *"The Embodied Carbon of Mass Timber and Concrete Buildings in Australia: An Uncertainty Analysis."* Building and Environment, vol. 214, 2022, p. 108944, doi:10.1016/j.buildenv.2022.108944.** and Mass Timber Hybrid is derived from **Westbank, and Henriquez Partners Architects. *Rezoning Application: PROTOTYPE – M5 Residential: A Mass Timber Net Zero Carbon Future for Vancouver.* 23 Sept. 2022.** at a rough estimate rate of 50% to conventional concrete.

Increasing Affordability by Breaking Limitations

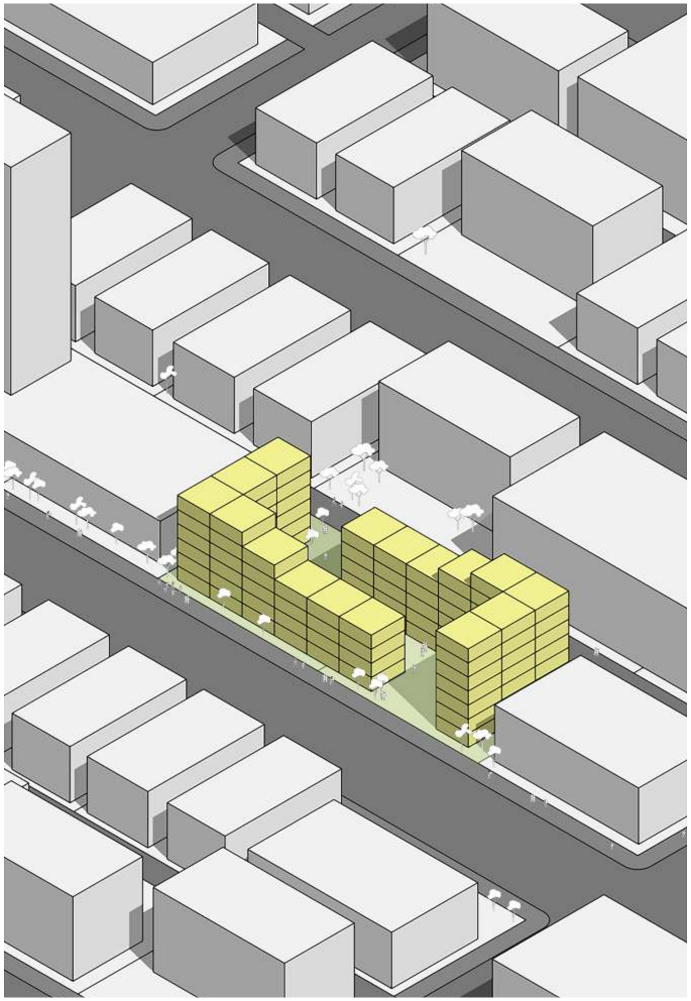
Many standard design elements that can help reduce the cost of the building over its whole lifetime already exist. Methods such as adequate sun shading, heat recovery ventilator units, and well-insulated buildings can significantly reduce the overall energy consumption of the entire building. As BC Energy And Carbon Step Code continues to increase its requirements, it is vital in our building to ensure that the building is thoughtfully designed. With the increasing ratio of solid walls to glass, our proposal of having double fronting units ensures that all units have enough natural sunlight, as well as providing enough air circulation by equipping each unit with an HRV to reduce the increasing need for heating and cooling systems.

Although current practices are good, there is always room to improve the system to enable more unique, quality-built, and innovative solutions to be proposed. The following is what we propose to change to allow more flexibility for mass timber to be an alternate building solution.

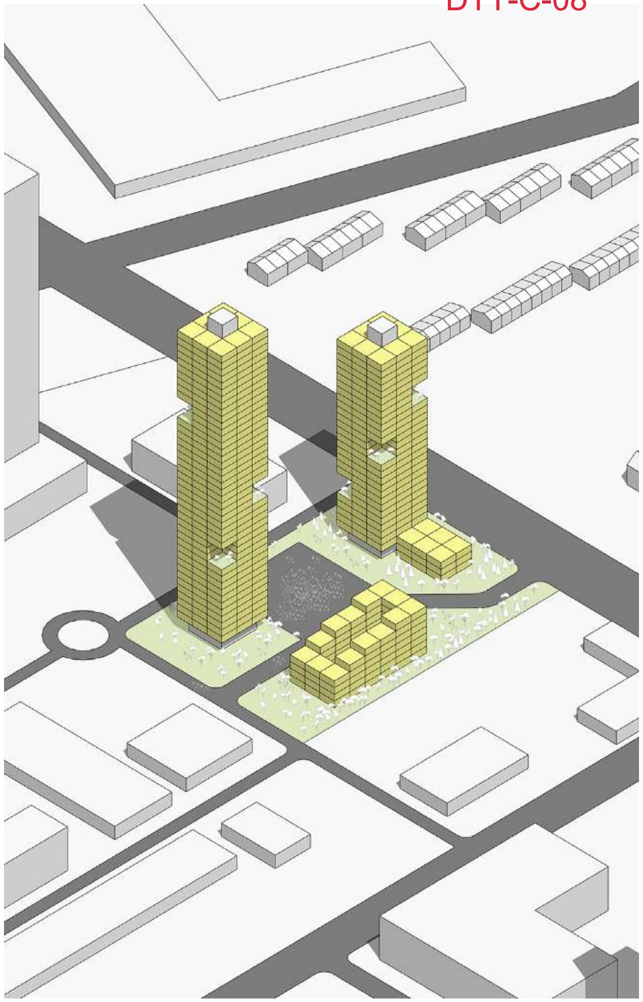
1. **Reduce encapsulation requirements**
   As Mass Timber right now in BC is required to be encapsulated as a prescriptive measure due to fire prevention, which adds cost, weight, and material waste, allowing materials to be performance-based opens up further testing to see how a mass timber system actually holds up under fire testing.
2. **Include the building's embodied carbon as a taxable element as part of the carbon tax**
   Make it a requirement that buildings have to have a life-cycle report in both embodied and operational carbon. This way, decisions of choosing construction materials can be made more cautiously to choose a low-carbon alternative over conventional methods.
3. **Increase government incentives for Mass Timber buildings to entice developers**
   As mass timber is still a premium over conventional concrete, there can be grants given to developers to start building more mass timber towers, as well as an incentive for low-carbon structural systems. Providing a density bonus for choosing a lower embodied carbon proposal, as well as reducing the parking requirements, can also benefit the developer.



Scheme 1: Typical Vancouver Suburbia



Scheme 2: Typical Vancouver Arterial Block



Scheme 3: Typical Vancouver Phased Development

Mass Production as a Means of Affordability

Adapting Kit-of-Parts Across All Typologies

The principle of mass production in housing—standardizing components for flexible application—offers a way to scale affordability. A kit-of-parts strategy allows the same prefabricated unit types to be applied across multiple typologies: suburban multiplexes, infill along arterial roads, or phased mid-rise developments on larger sites. By standardizing floorplates, wall panels, and service cores, while keeping the massing adaptable to irregular site conditions, housing can remain cost-efficient without becoming repetitive. In the diagrams above, the schemes demonstrate how a two-bed unit can be repeated throughout different typologies.

If embraced at scale, mass production and prefabricated timber systems could shift housing delivery from one-off, site-specific builds to repeatable yet adaptable frameworks. By doing so, affordability can be addressed not only through lower construction costs but also through faster delivery of diverse, well-designed housing forms.

Benefits of Mass Production in Housing

Faster Construction Times – *Off-site prefabrication accelerates assembly, allowing buildings to rise in weeks rather than months.*

Lower Labour and Equipment Costs – *Mass timber components like CLT and glulam require smaller crews and less heavy machinery compared to concrete or steel.*

Shorter Build Durations – *Projects finish sooner, reducing interim financing, carrying costs, and risk exposure for developers.*

Streamlined Sequencing – *Prefabricated elements reduce trade overlaps, subcontractor conflicts, and costly site delays.*

Mass Timber as a Driver of Affordability

Mass timber strengthens the case for prefabrication by combining efficiency with sustainability:

Sustainability Incentives – *As a renewable material, timber unlocks potential carbon credits, grants, or expedited permitting—particularly relevant under BC's green building policies.*

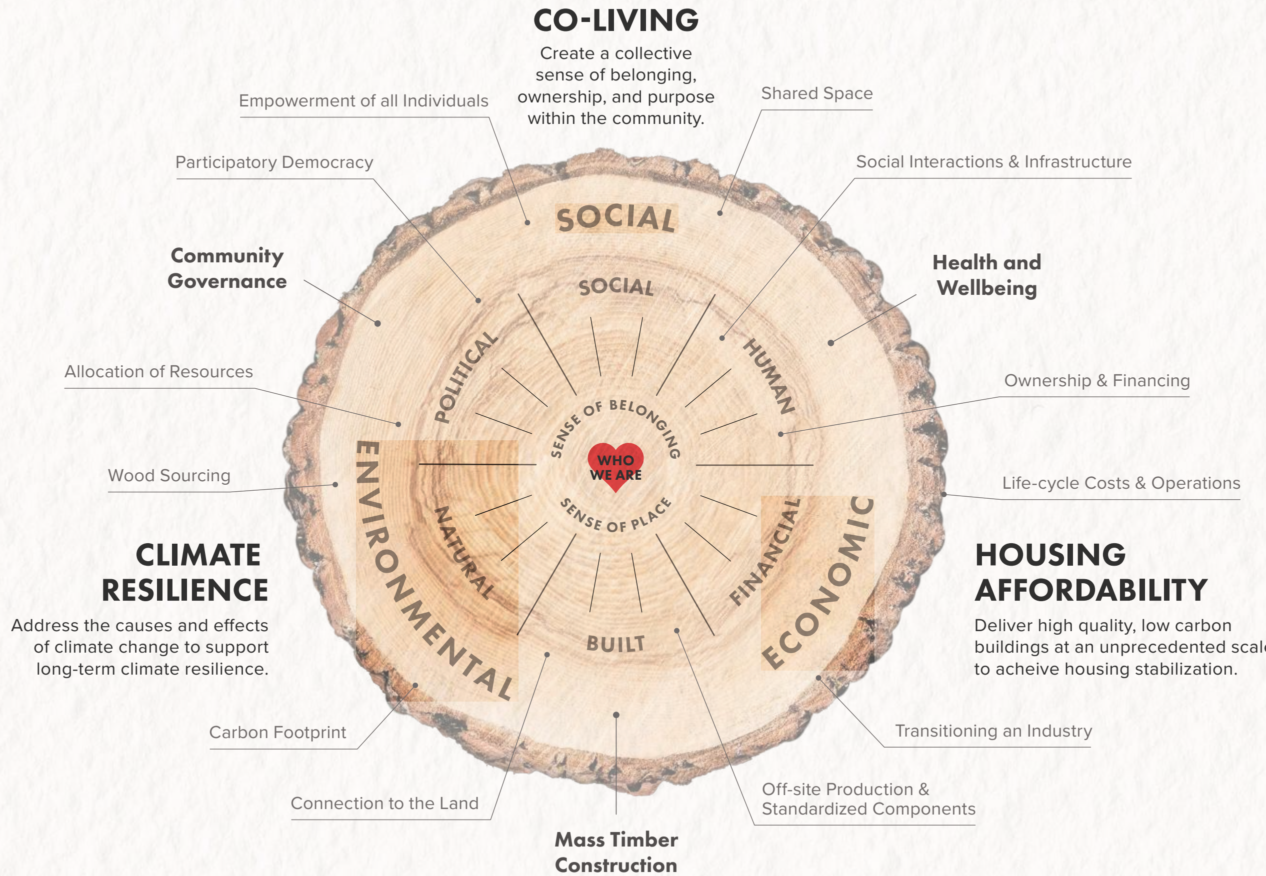
Support for Mid-Rise Density – *Timber excels in the 6–12 storey range, providing the "missing middle" housing form: denser than low-rise wood-frame, but more cost-effective and livable than high-rise concrete towers.*

Reduced Lifecycle Costs – *Precision fabrication improves energy performance and durability. Exposed timber finishes can reduce the need for drywall and cladding, cutting both material and maintenance costs.*

DTT-C-09

Vertical Grain

Decoding Timber Towers to have a positive impact on three primary drivers of **housing affordability, climate resilience and co-living** is an intricate structure of discrete systems coming together in ways that allow communities to thrive and grow. While mass timber design and construction continue to gain momentum there are some very challenging aspects to be resolved before we witness widespread adoption in the lower Mainland of British Columbia and beyond.



The **Vertical Grain** project aims to achieve comfort and livability while facilitating stronger connections between occupants through striking a balance between individual private spaces within a shared co-house form of dwelling. Every individual private unit will be equipped with sleeping space, a private washroom, kitchenette, and a balcony. Larger common spaces on every floor will provide a full complement of living, dining and kitchen space. The concept for the typical residential levels differs from current mainstream market and rental housing projects by creating an environment more aligned with that of a household where a collection of different individuals and families can share in a collective experience aimed at strengthening a sense of community and belonging. The co-housing format also opens the door to various forms of intergenerational living in much more supportive and integrated ways while reducing costs by not requiring every unit to be fully outfitted with furnishings and appliances. Affordability is further enhanced by building less. The project challenges most regional municipal bylaws in terms of provision for parking. Finding ways to reduce parking requirements whenever reasonable is a significant first step toward improving a project's affordability and reducing its carbon footprint. Working within transit-oriented development strategies and utilizing traffic demand management models is a great way to approach project needs while finding a balance between what forms of transportation can be accommodated.

The project will strengthen people's connection to nature by connecting the site between the urban frontage and natural existing conditions by integrating exterior passageways through the building on the first floor. The project aims to retain as many existing trees as possible while daylighting a previously buried stream. Exterior balconies have been provided for every private dwelling space as well as large common balconies at every second floor throughout the building, The project is capped by an accessible roof top patio which will accommodate gatherings for up to 150 people and provide allotment gardens for any occupants interested in growing food.

The building is designed to align closely with current strategies for structural systems and modularization, while aspiring to reach new heights and efficiencies. A commitment to a simple form, combined with a 12 storey maximum height facilitates a design which maximizes the exposed timber to realize the biophilic and aesthetic benefits of the material. The design uses Standard size components for CLT panels (3.0m max width) to align with the majority of vendor limits and simplify logistical challenges related to transportation routes and permitting, as well as standard size Glulam posts and beams. The potential for systemization of repeatable steel connections, for axial and lateral resistance, enables simplification of fabrication and installation while facilitating labour force skills development and knowledge transfer. Over time, with the widespread adoption of standardized components and mass production it can be assumed that productivity will increase, and costs will come down.

Structure and Design

The design of the tower responds to the angled, forested site with the general approach of an 'inflected, winged bar building focused on the prominent corner of the stie. The building is pushed over to the street face as far as possible to minimize the area of trees displaced or cut down and preserve a back area focused on the uncovered creek bed.

The structure takes a straightforward approach, assuming a point-supported CLT floor on glu-lam columns- with a hybrid steel-timber eccentrically braced frame forming the major lateral resisting element. The massing allows for a repetitive floor plate, based on a 10' by 12' grid allowing for economical and non-manufacturer specific CLT panel sizes, provision for over-sized load deliver.

Shallow bays. The building hinges on a triangular 'core' stabilized with 2 storey eccentrically braced frames. In this plan configuration the scheme assumes either side of the triangular frame can provide a transverse line of stability to its adjacent wing- while stabilizing its opposite wing in the long dimension of the floor. The design assumes braces and columns are stabilized at each floor diaphragm- with deformation at the hinge point- assuming significant deformation in the floor itself. Opposite ends of each wing are assumed with secondary braced frames. The major common areas are all concentrated around this self-supporting 2-storey space, allowing for open atria and common balconies at the corner of the building.

Social
Program spaces and opportunities for all members of the community to work, share, and play together before and after the project has a physical presence.

- shared spaces
- social infrastructure
- community governance

Environmental
Integrate our natural and built environments to address the causes and effects of climate change.

- sustainable wood sourcing
- carbon footprint
- connection to the land

Economic
Reimagine our system of delivery to deliver high quality, low carbon buildings at an unprecedented scale.

- lifecycle costs and operations
- ownership and financing
- transitioning an industry to off-site production and standardized components

Vertical Grain is located on the shared territories of the Katzie, Kwantlen, and Semiahmoo Nations

Facade and Details of Construction

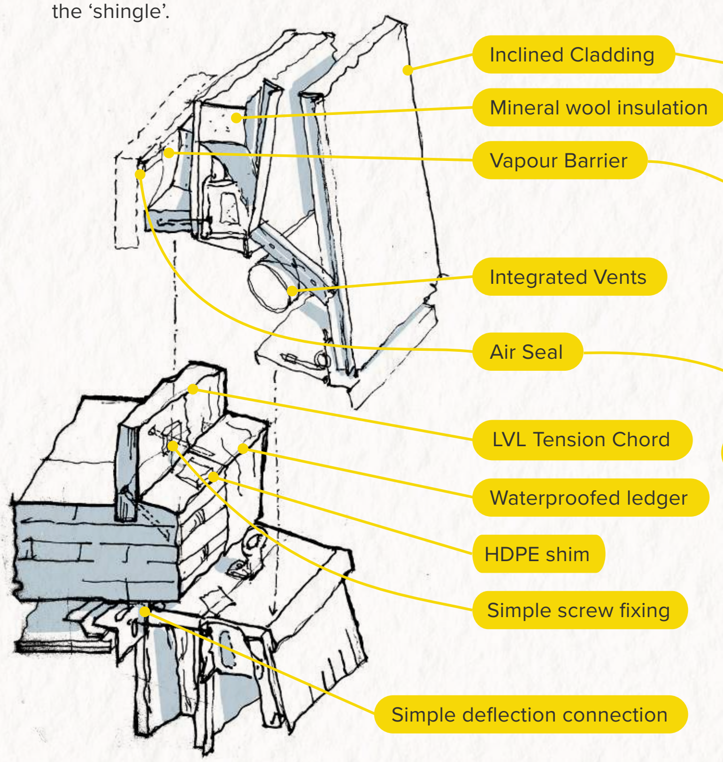
The envelope design and the related CLT Plate perimeter are speculations on current pre-fabricated envelope design. Rather than a curtain-wall style system- the concept is for numerous light-weight, wood-framed panels in a unitized, platform-frame system An integrated design of structure, cladding and architecture proposes an alternate approach to watertightness, perimeter fire-stopping attachment & support and differential movement- The goal is to maximize wood material use and simplify construction with portable units installable with small equipment from below an active deck- as a tower-crane continues assembling the CLT floors above.

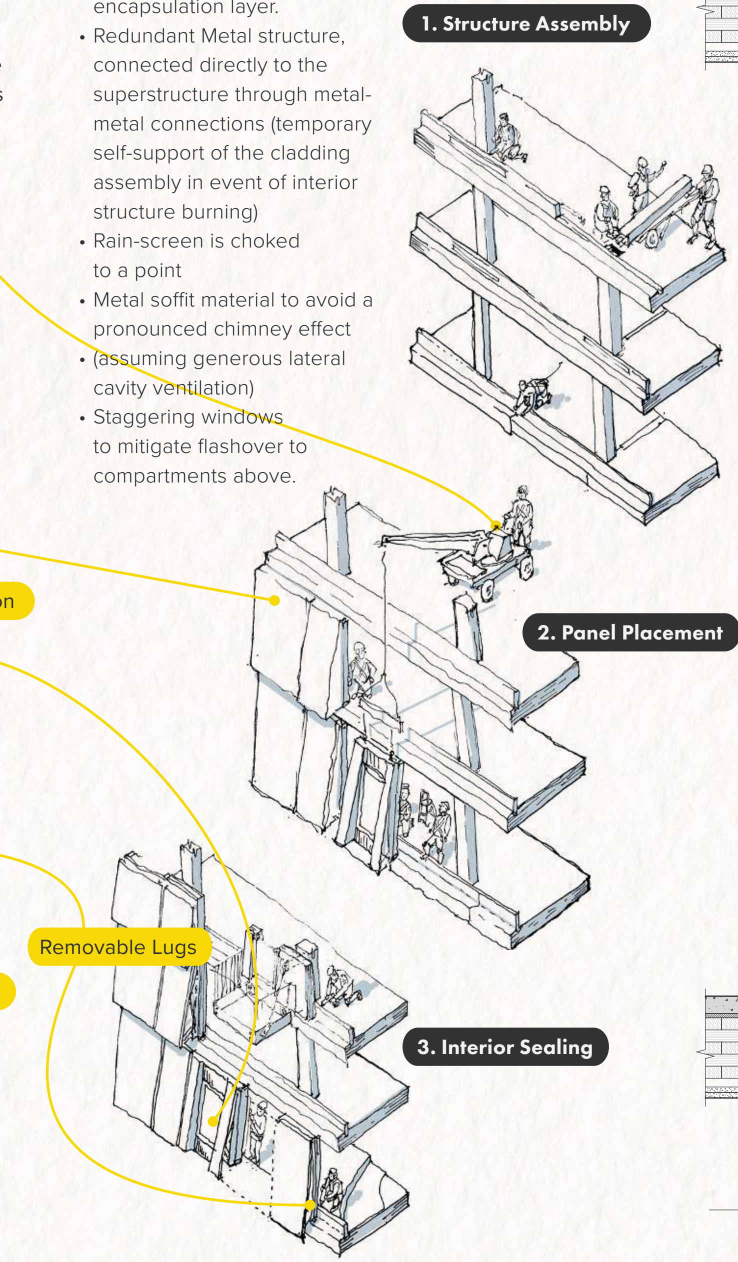
The unifying concept is the 'shingle'- a lightweight 5' panel, using an inverted 'king-post' truss design to stiffen a minimal interior structure of encapsulated light-wood framing. Panels are landed on a water-proofed ledger formed outboard of an LVL tension chord ringing the floor-plate, and anchored to the chord and the panel above with simple connections taking deflection and lateral drift.

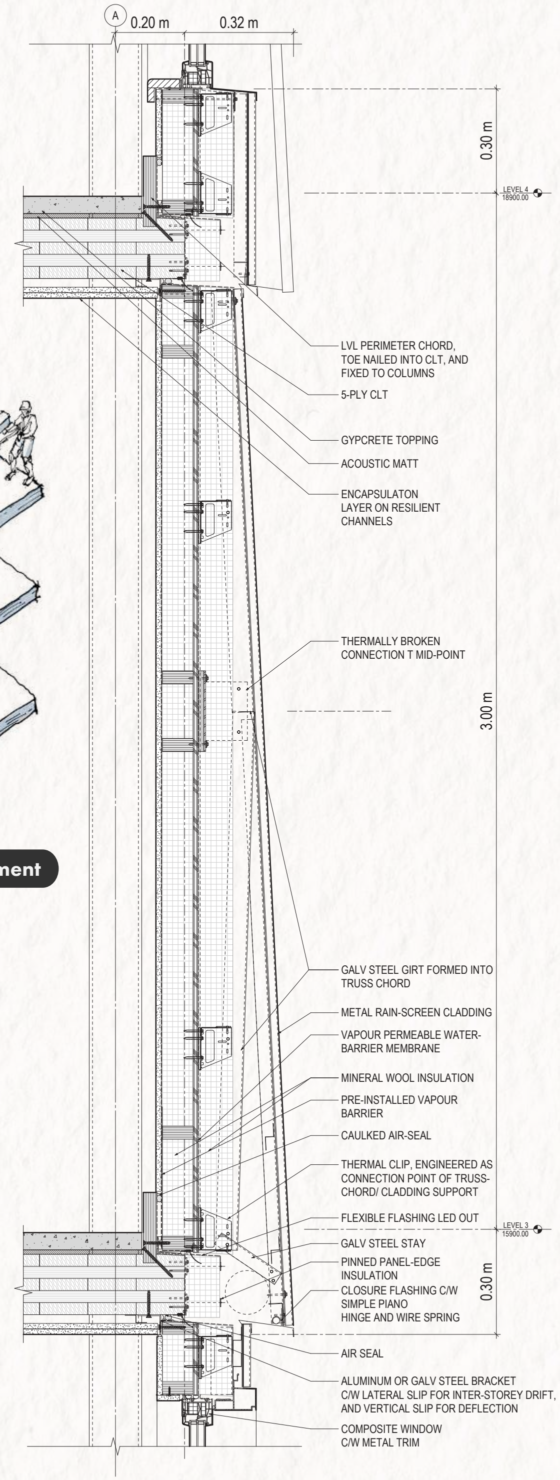
Extending this logic to the exterior- the cladding extends past the centre-point of the 'truss' to form a shingle like expression, and a deep and sheltered over-hang for good water-shedding off the primary surface and space for integrated vents beneath the hem of the 'shingle'.

To address fire-safety issues of a combustible envelope and enlarged rainscreen, design incorporates the following:

- Wood-cavity filled with mineral wool and interior encapsulation layer.
- Redundant Metal structure, connected directly to the superstructure through metal-metal connections (temporary self-support of the cladding assembly in event of interior structure burning)
- Rain-screen is choked to a point
- Metal soffit material to avoid a pronounced chimney effect
- (assuming generous lateral cavity ventilation)
- Staggering windows to mitigate flashover to compartments above.



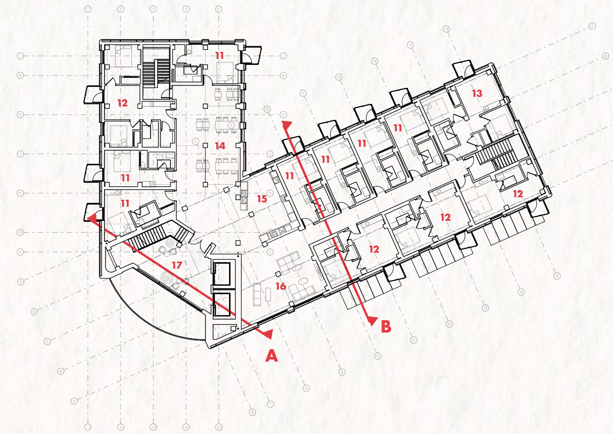




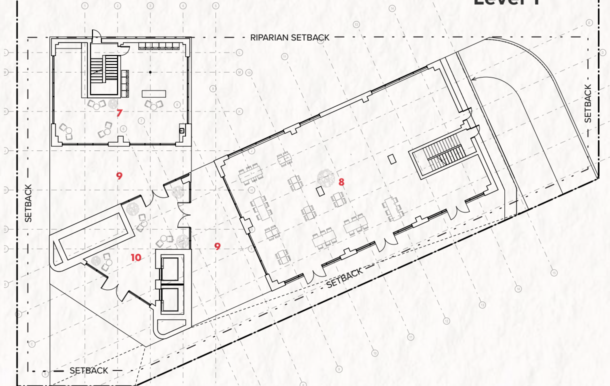
Social Rationale

Program spaces and opportunities for all members of the community to work, share, and play together before and after the project has a physical presence. By following a development model based upon co-living and sharing of spaces the project has recalibrated the collection of program elements to achieve heightened efficiency and simplified structural design to realize enhanced affordability and more sociable dwelling. The main floor is comprised of mixed use offerings which serve as amenity to both the occupants of the tower and surrounding community as well as a dedicated residential entry. The layout of these spaces frame an urban corner while offering porosity through the building to the naturalized courtyard behind. Levels 2 through 12 provide a repeating stack of efficiently organized residential plans based on a collection of moderate private units sized for individuals up to small families, each of which provides bedrooms, bathrooms, kitchenettes, and small exterior balconies. These units open onto a generous arrangement of shared kitchen, dining and living spaces along with large common exterior balconies. The roof level is envisioned as an accessible terrace for larger gatherings along with a complement of allotment gardens all surrounded by amazing views of the city to the SW and the local mountains to the NE.

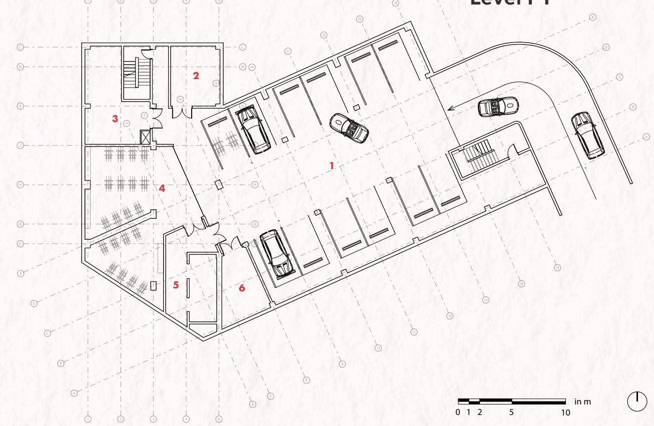
Levels 2-13

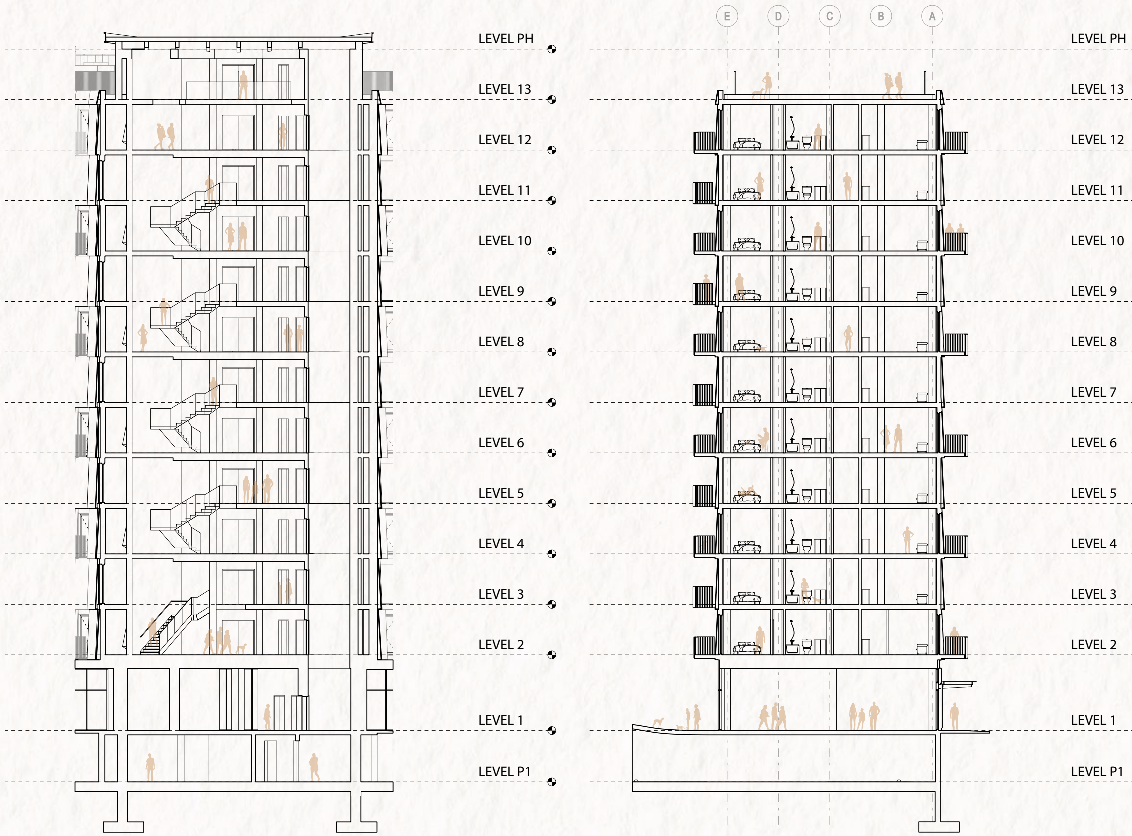


Level 1



Level P1





A Section: Spine

B Section: East Wing

0 1 2 5 10 in m

Floorplans

1 Parking
2 Electrical Room
3 Water Entry / Mechanical Space
4 Bike Storage
5 Elevator Lobby
6 Garbage and Recycling
7 Laundromat
8 Cafe / Co-Work Space
9 Exterior Pass-Through
10 Residential Lobby
11 Studio Unit
12 1-Bed Unit
13 2-Bed Unit
14 Shared Dining
15 Communal Kitchen
16 Living Space
17 Double Height Elevator Lobby

Environmental Rationale

One of the primary goals of the Vertical Grain project is to maximize sustainability aspects ranging from Indigenously sourced and sustainably harvested wood for the mass timber, through to watershed-based storm water management through rain gardens and biofiltration back into the reconstituted natural stream. The project site offers great opportunities to work with existing landforms and features to enhance the projects' connection with nature. Multiple trees will be retained on site by keeping the development to the south and west and limiting the need for extensive excavation. The commitment to working with as much wood as possible support ambitions to drive embodied carbon as low as possible.

Why we care about sourcing

We care where our wood comes from to ensure our buildings have a positive impact on the landscapes and communities they grow from. Our role as architects and sustainability leaders is to drive continuous improvement of supply chain by creating demand for wood that address:

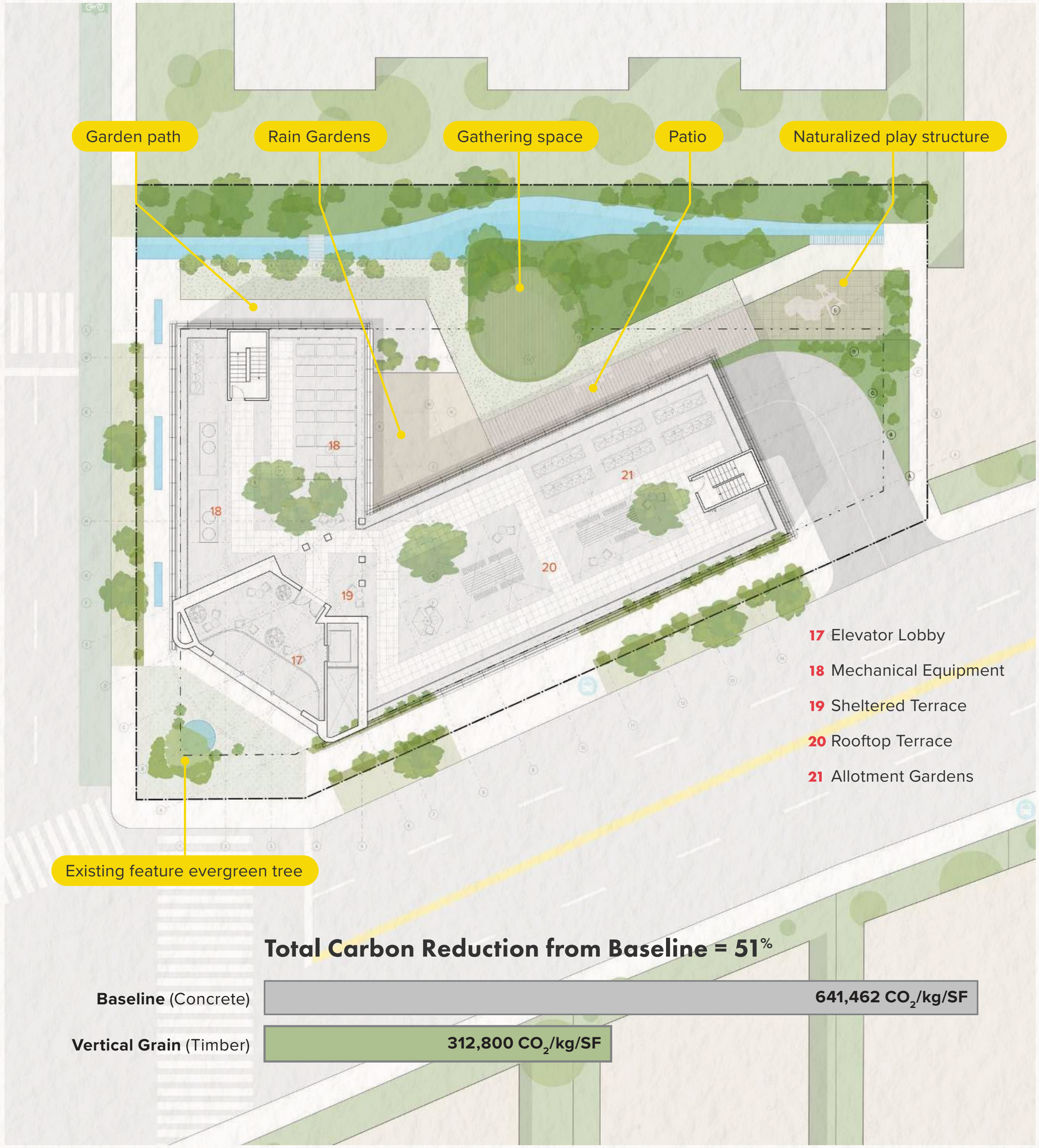
Sustainable Forest Management
Target practices that improve forest health, restore ecosystem services & balance economy & ecology

Social Equity
Support underrepresented parts of the supply chain and drive financial value to the landowner

Climate Smart Forestry
Aim for practices that stabilize or maximize carbon stored both on the landscape and in wood products.

Our Approach

We have been connecting with the BC forest sector and gaining first-hand knowledge from stakeholders in the supply chain. We have walked through our forests with foresters and cultural features surveyors of Community Forests and First Nations owned forests to learn about sustainable forest management. We have met with log brokers, mills owners and mass timber fabricators to understand more about what type of traceability information is available to them and what we can reasonably ask for.



Economic Rationale

Reimagine our system of delivery

The project challenges most municipal bylaws in terms of provision of parking as previously mentioned. Finding ways to reduce parking requirements whenever reasonable is a significant first step toward improving a project's affordability and reducing carbon footprint. Working within transit-oriented development strategies and utilizing traffic demand management models is a great way to approach project needs while striking a balance of what forms of transportation can be accommodated on a project specific bases.

A more sophisticated approach to defining project development data and identifying common vs amenity spaces will have an impact on how projects are measured for financial viability as well as bylaw compliance.

Building Information	Baseline (Concrete)	Submission (Wood)
FSR	4.4	
Lot size (sq ft)	20,000	
Building sq ft Above Grade	88,014	
Building efficiency (%)	75%	85%*
saleable/rentable (sq ft)	66,011	71,143
non saleable/rentable (sq ft)	22,004	14,594
Total Stories above grade (#)	12	
Total Stories (#)	13	
Base floor (#)	1	
Above 1st storey (#)	11	
Stories below grade (#)	1	1
Units (#)	162	132
Bedrooms (#)	189	154
Rooftop Amenity Area	1,500	1,500
Common Area (sq ft)	0	27,176
Non-residential CRU (sq ft)	3,389	
Cost Concrete BG @ $360/SF	$2,619,696	$2,486,632
Cost Concrete Lvl 1 @ $361/SF	$1,941,235	$2,173,105
Cost Concrete Lvl 1+ @ $362/SF	$33,286,532	
Cost Wood Lvl 1+ @ $431/SF		$35,423,445
Cost Balconies	$3,150,000	
Schedule Costs (Monthly Overhead)	$900,000	$800,000
Construction Cost	**$41,897,463**	**$44,033,182**
Carbon Concrete @ 6.69 kg/sq ft	641,462	91,712
Carbon Wood @ 2.69 kg/sq ft		221,088
Total Carbon kg/sq ft	**641,462**	**312,800**

* Assumes 15% of common area is dedicated to circulation on all residential floors

Lifecycle costs and operations

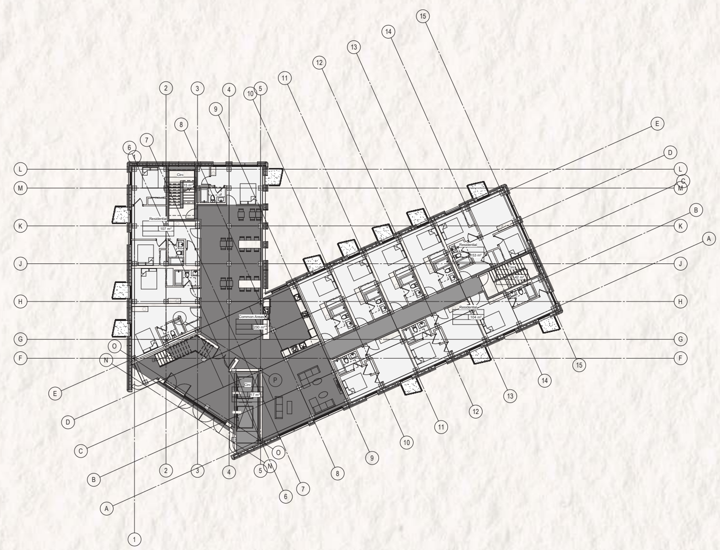
- Shortened construction schedule: Off-site fabrication and on-site crane assembly reduce build time by 20–30%, saving on labor, financing, and temporary services.
- Lower mechanical and finishing costs: Exposed wood interiors reduce the need for dropped ceilings, secondary finishes, and artificial lighting infrastructure.
- Deconstruction-ready assemblies: modular design supports future disassembly and reuse, further reducing lifecycle emissions.

Ownership and financing

- Indigenous procurement and training: Dollars are reinvested locally via Indigenous contractors and suppliers, creating durable economic multipliers in the region.
- Indigenous Nonprofit Ownership Structure: the development is proposed under the leadership of Scared Waters Development with ownership retained by a nonprofit Indigenous housing provider, enabling long-term affordability and community governance.
- Procurement-as-Economic Development: construction and supply chain funding includes allocations for Indigenous contractors, material suppliers, and youth training, reframing housing not just as a cost, but a generational investment in Indigenous economies.

Transitioning and industry to off-site production and standardized components

- Prefabricated Modular System: construction shifts from conventional on-site framing to a kit-of-parts, mass timber assembly model—that leverages off-site in micro factories for milling and finishing of mass timber elements to be craned into place using a standardized platform system.
- Digital Twin Integration: introduces a BIM-to-field digital workflow that aligns fabrication, permitting, delivery, and quality control—offering greater predictability and transparency.



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DESIGN RATIONALE

Reimagining of high-rises a vertical villages for raising families and building community.

LOCATION CONSIDERATIONS

A corner lot along a busy commercial street with close proximity to transit lines expects high pedestrian traffic. Finding ways to accommodate the public was a high priority to reduce disruptions to the neighbourhood's existing character, especially considering the dominant trend of low-rise buildings in the vicinity. This presented the opportunity to design spaces not only to facilitate circulation, but also as places to visit and interact with public programming, or simply to gather and rest.

HOUSING STYLE

The lot sits on the traditional unceded lands of the Katzie, Kwantlen, and Semiahmoo First Nations. The team was inspired by the sense of belonging and togetherness that comes natural to living in vernacular architecture such as the longhouse of the Coast Salish. A co-op housing style of ownership is the natural option, as relationship may begin to be built from the development process. Additionally, there would be an aspect of self-selection since people who would join are likely already seeking to foster close relationships, which at present seems alien in the context of high-rise buildings. To remedy this, programs have been placed to create compounding points of interaction as a way to bridge the gap between the seclusion many have grown to expect and become accustomed to, and the fulfilment that comes from engaging with community.

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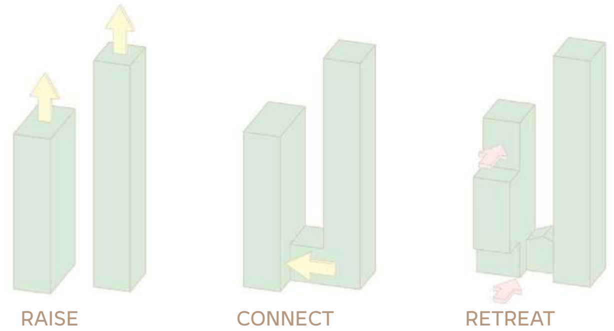
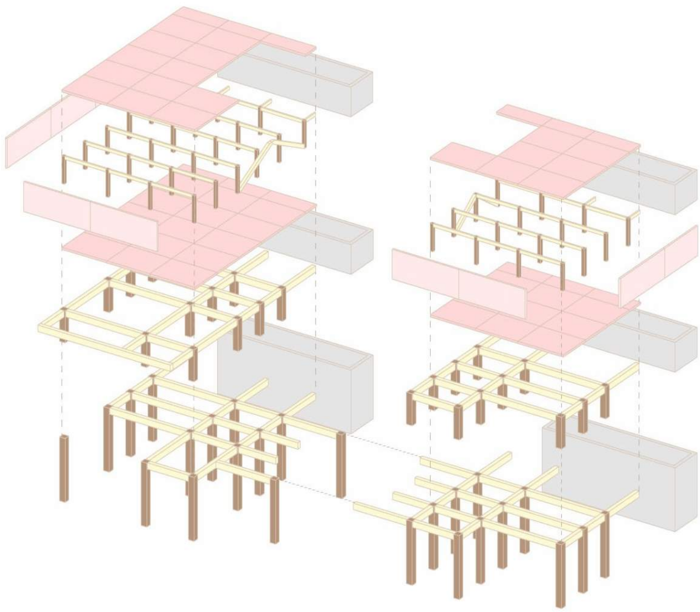


FORM

A pair of discreet towers avoid a “massive bar” form which would not only be disturb the skyline, but also the neighbourhood’s character by creating an imposing street condition. This allow for variable unit types between buildings, which may be further adjusted by extending or retracting the floor plate according to the structural grid if required for different site contexts. The mass is also highest at the corner of the block, stepping down twice as it reaches the intersection, as though conceding to it. Between them came ample opportunity to create programmable space for residential amenities, and was further improved by retreating from the street wall to provide a generous amount of public space.



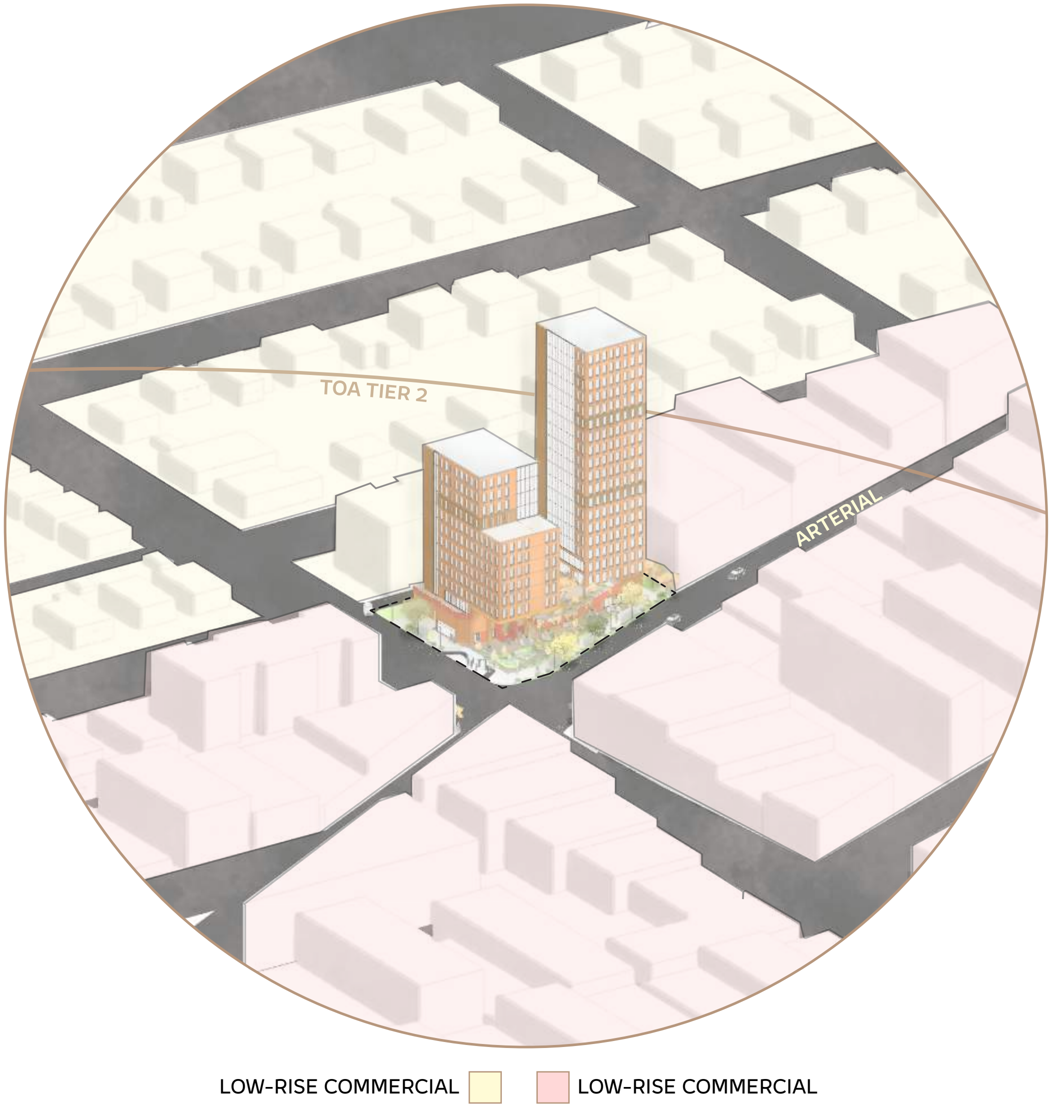
STRUCTURE

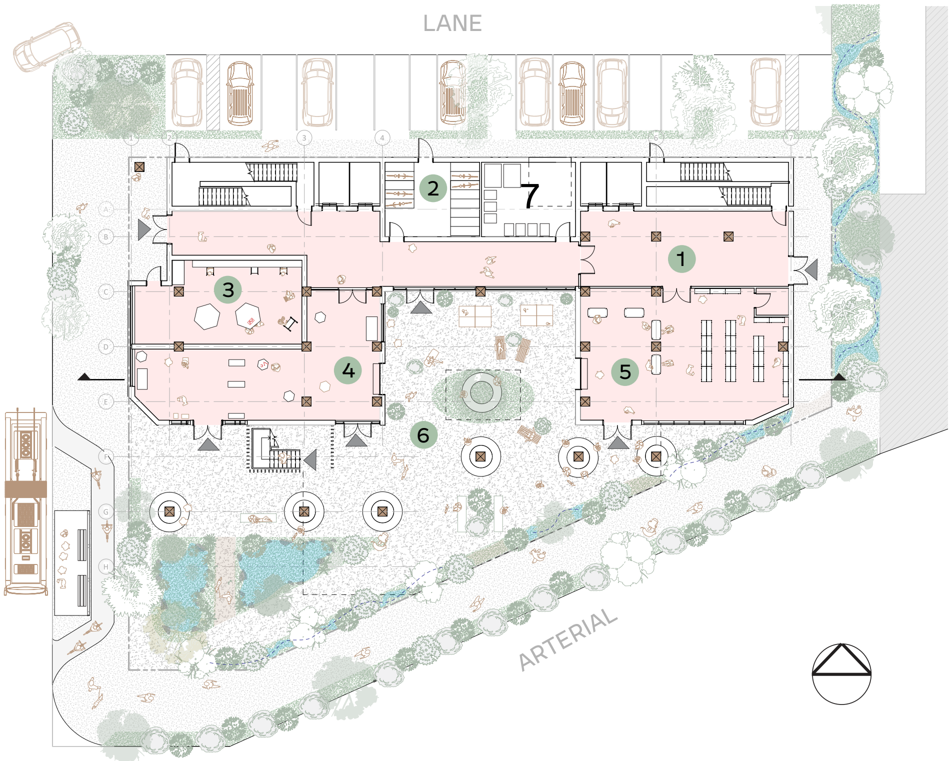
Simple massing creates efficiencies in structure prefabrication, and construction. The upper residential levels use a regular grid followed by columns that are superimposed between CLT floor panels. The concrete core runs east to west, while timber elements with steel connections span two levels at a time for bracing along the north-south axis. This continues at the podium with bracing that is entirely steel to minimize obstructions between programs. Structural members thicken at the podium to support the larger open spaces of the residential and public amenities, and acetylated wood is used for exterior structural members to improve durability.

SITE CONTEXT

To reflect the site’s TOA designation along transit lines and near a transit hub, a bus stop is accommodated in the southwest corner of the lot along with a bike lane that connects the busy commercial stretch with the quieter residential neighbourhoods to the north.

Parking spaces have been reduced and allow for car-share services. This also follows the increasing trend of alternate modes of transportation, including for work commutes. The 2023 Vancouver Transportation Snapshot, for example, revealed that an estimated 53% of daily trips were made by transit, walking, or cycling, a figure that has been steadily increasing since 2021. In the same survey, over 40% of trips were to restaurants, recreation, and shopping, all of which are very likely to exist within a walkable stretch of a commercial arterial street. Additionally, other cities with more robust transit and biking infrastructure have trip values up to 74%, as in Berlin. It will take time for such a shift in the Lower Mainland, but sites such as these are a great place to start.





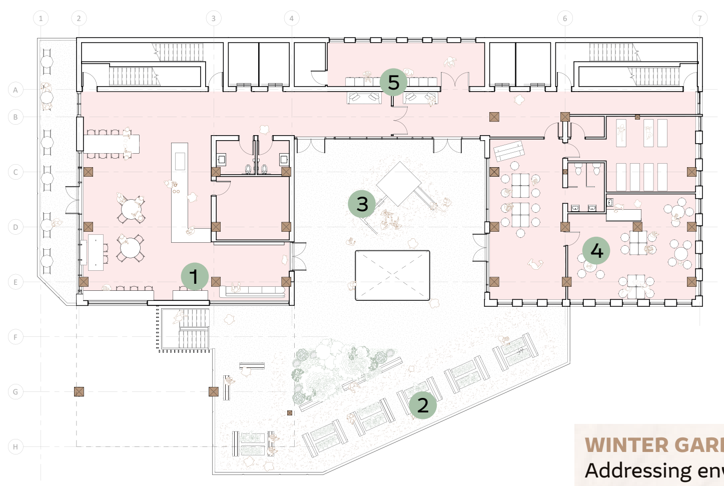
LEVEL 1

1 RESID. LOBBY
2 BIKE STO.
3 MAKERSPACE
4 ART GALLERY
5 MARKET
6 EXTERIOR SPACE
7 WASTE MANAGEMENT

WATER MANAGEMENT

A bioswale wraps along the perimeter from the northeast to the southwest corners of the site, guiding flow to a rain garden, temporarily holding excess and slowing runoff to the municipal system. Retained water also cools the surrounding area to alleviate urban heat island effects.

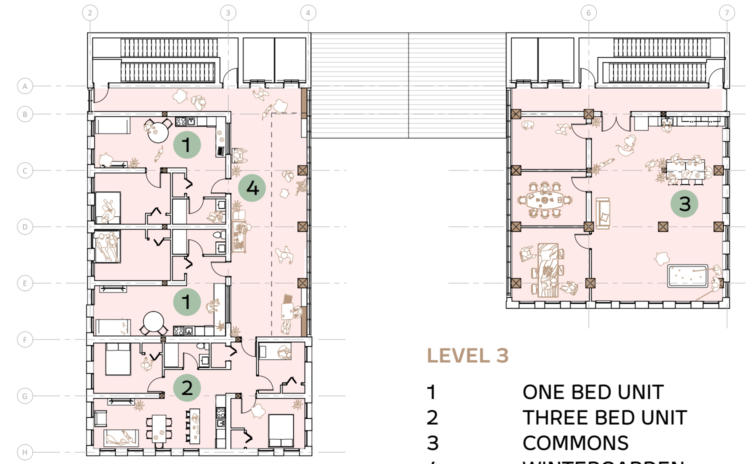
Likewise, the site on-grade slopes southwest. Raised pavers create connections across bioswales, allowing water to flow in a channel underneath. Where they run parallel, pipes underneath the paving connect the bioswale and the rain garden.



LEVEL 2

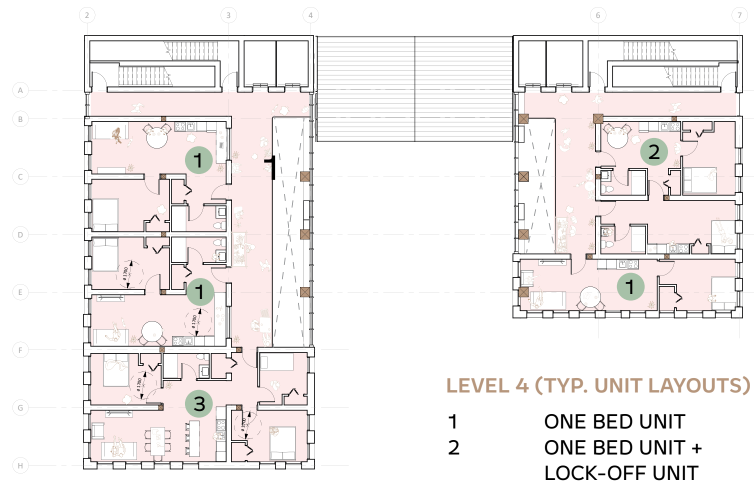
1 CAFE
2 COMMUNITY GARDEN
3 PLAY
4 DAYCARE
5 COMMUNITY LAUNDRY

	EAST TOWER	WEST TOWER	TOTAL
1 BED	15	20	**35 UNITS**
1 BED WITH LOCK-OFF UNIT	-	15	**15 UNITS**
3 BED	6	-	**6 UNITS**
			56 UNITS



LEVEL 3

1 ONE BED UNIT
2 THREE BED UNIT
3 COMMONS
4 WINTERGARDEN



LEVEL 4 (TYP. UNIT LAYOUTS)

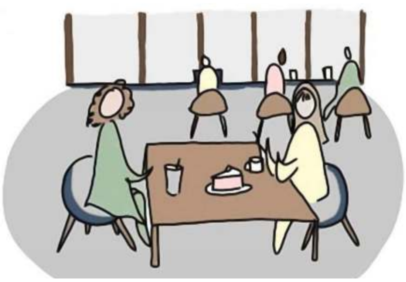
1 ONE BED UNIT
2 ONE BED UNIT + LOCK-OFF UNIT
3 THREE BED UNIT

WINTER GARDENS

Addressing envelope concerns with balconies in a mass timber project, an enclosed winter garden is shared between every two floors, acting as a “third space” in lieu of traditional balconies that typically serve individual units. This creates character for the conventionally barren circulation of high-rise towers, while also encouraging interaction between residents that may personalize or simply enjoy the space together. The space can regulate indoor temperature by capturing daylight through floor to ceiling glazing when desired, or with operable windows that facilitate cross ventilation to each unit. Certain plants may also thrive in this indoor environment given the ample amount of direct sunlight, and given enough care between the residents sharing the space.

The space also fits between two ends of the social gradient available to residents. Starts at the very private individual unit, they may engage with the winter gardens between pairs of floors, then the residential amenities serving both towers, and finally the remaining podium programs that are entirely open to the public.

LIVING IN THE LOFT



1 Cafe

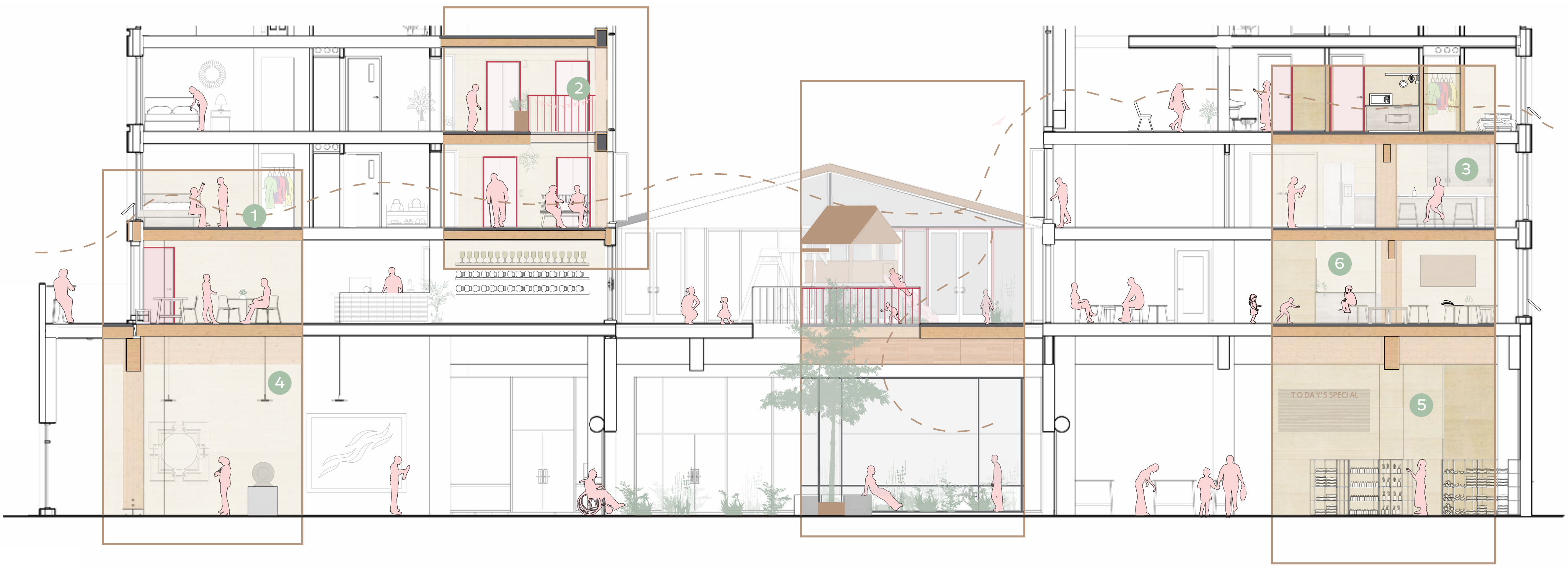
A local-owned cafe brings the public up to the second floor while also being conveniently accessible from residential amenities at the same level.

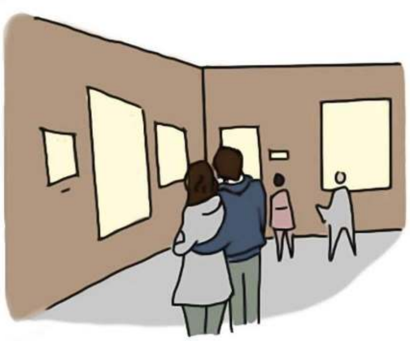
Winter Garden 2

An assembly space serving two floors at a time. Residents may nurture plants together or simply relax as they observe the courtyard below or opposite tower's garden across.

Commons 3

A flexible space with kitchen facilities, a lounge, and recreational furnishing for general use. It may also be reserved for events.





4 Art Gallery

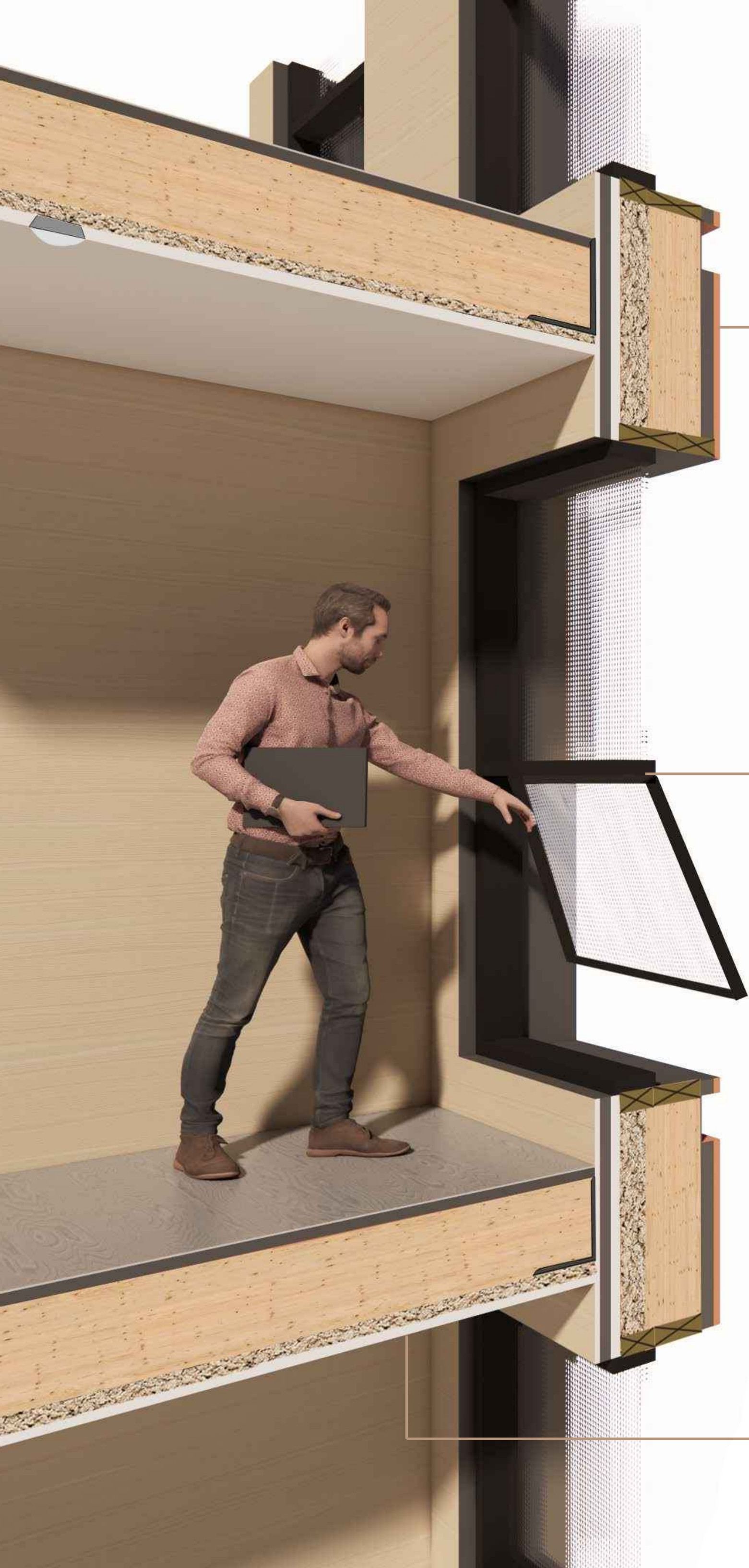
The most front-facing program, a showcase of local art including from indigenous artists creates dialogue within the community. The gallery is supported by a rentable workspace for artists.

5 Grocery

A shop for fresh goods and produce serving both the residents and the public. This space can be rented out to local businesses or jointly owned by residents to subsidize costs.

Daycare 6

An amenity for all residents that is also an affordable servicefor families in the neighbourhood. Placed at the confluence of the tall east tower and the public programs above the street level.



TYP. EXTERIOR CLT WALL

25mm METAL PANEL (WOOD STAIN)
25mm VENTILATED CAVITY STRAPPING
AIR BARRIER WRB
100mm EXTERIOR SEMI RIGID MINERAL WOOL INSULATION
15.9mm PLYWOOD SHEATHING
200mm PREFABRICATED CLT WALL
31.8mm GWB TYP “x”
38mm RESILIENT CHANNELS
15.9mm FINISH

TYP. PREFABRICATED STEEL WINDOW THROUGHOUT ALL SIDES

Using robust mass timber assemblies with consistent and reliable performance due to prefabrication, a minimum STC rating of 41 can be achieved between floors.

Partitions between units are generally thicker to minimize intrusion of mass timber columns into the living spaces. This also allows the divisions to achieve a minimum STC rating of 38. Sound attenuation is one of the team’s primary concerns among residential spaces.

Thermal bridging is easily handled due to the lack of protruding residential balconies. The typical prefabricated exterior wall panels can also achieve a minimum R-value of 28.

TYP. PREFABRICATED CLT FLOOR

5mm VINYL FLOORING
38mm CONCRETE TOPPING C/W ACOUSTIC UNDERLAYMENT
200mm 5-PLY CLT FLOOR
36mm SERIVCE CAVITY WITH INSULATION AS NEEDED
31.8mm GYPSUM FINISH

INDIGENOUS SOURCED WOOD

A few indigenous suppliers from the BC as our mass timber sourcing. Sourcing our mass timber locally would support the local economy as well as supporting sustainable initiatives.

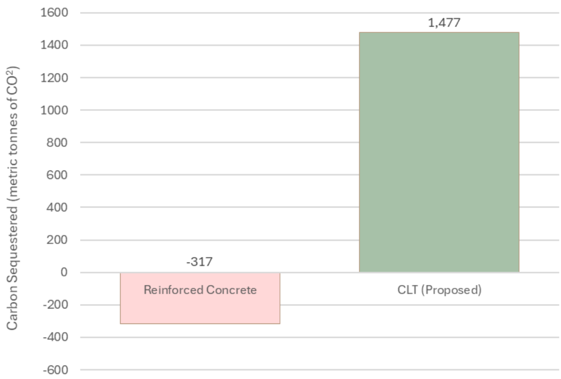
FP Innovations is a NFP organization that provides and supports the innovation of wood products including mass timber across British Columbia in collaboration with Indigenous communities. Collaborating with Indigenous communities to source their lumber such as West Chilcotin Forest Products. They have also worked on numerous projects for Indigenous communities, including Yunesit’in First Nations on a housing project based in CLT and modular construction.

FP Innovations has forestry practices and mills in British Columbia, based in Vancouver and Maple Ridge, along with other locations in Canada. With local industries, it would mean less transportation emissions. Sourcing wood from indigenous suppliers ensures that we follow sustainable practices from generations of Indigenous forestry.

Other suppliers that were considered were the following:
Totem Sawmill LP (Nuxalk Nation)
Stuwix Resources Ltd.
Lil’wat Forestry Ventures (Lil’wat Nation)

Partnering with Katzie, Kwantlen and Semiahmoo first nations through the join development of Sacred Waters, we wanted to ensure our building programming reflected indigenous values and their goals. Some values detailed on Kwantlen First nations included maintaining a sense of flow and allowing one to become more connected to natural systems of a site, providing opportunities of educational and economic growth - shown through additions of a daycare and Indigenous run market, and supporting generational growth leaning into the co-op housing model.

NET CARBON EFFECT OF CONCRETE VS. CLT FLOOR SLABS



CALCULATION CONSIDERATIONS

Overall proposal costs are estimated to be three million less than that of a concrete structure. While this difference is not drastic when considering cost as a driving factor, the material availability of lumber in British Columbia adds another layer of why mass timber is a better option.

Below grade costs were assumed to be similar to the concrete case. The base floor estimate cost per square foot is slightly less than with fully concrete, as large timber members replace much of the column mass beyond retained concrete pedestals. The main cost savings of having prefabricated panels is found in the upper levels. Replicabilty of the floor assemblies and prefabricated mass timber panels drives efficiencies in both time and cost.

Some of our assumptions for the construction costs included using case studies' cost per square foot and applying a rate of inflation. We also accounted for use of local timber resulting in a lower delivery and transportation cost.

CALCULATIONS	
FSR	5
Lot size (sq ft)	20,142
Building sq ft Above Grade	93,420
Building efficiency (%)	85
non saleable/rentable (sq ft)	14,013
saleable/rentable (sq ft)	79,407
Total Stories above grade (#)	20
Total Stories (#)	21
Base floor (#)	1
Above 1st storey (#)	19
Stories below grade (#)	1
Units (#)	56
Bedrooms (#)	83
Amenity space (sq ft)	1,994
Non-residential (sq ft)	5,411

CHART PARAMETERS

The adjacent graph compares net effect of using typical reinforced concrete slabs against our specified CLT floor slabs for upper level floor plates only. The concrete mix in consideration uses embodied carbon values following EC60 data, with an average compressive strength of 30 MPA or C25/30.

The Proposed CLT's total carbon sequestration value takes into account an estimated 34 kg CO2 equivalent of embodied carbon per square metre.

CONSTRUCTION COSTS					
		Concrete		Proposed	
	Square footage	$/sq ft	Cost	$/sq ft	Cost
Below grade	155.0	$315	$48,825	$315	$48,825
Base floor	11662.6	$360	$4,198,528	$350	$4,081,902
Above 1st storey	81757.6	$385	$31,476,672	$346	$28,268,904
	Quantity	$/unit		$/unit	
Balconies	0	$25,000	$0	$25,000	$0
	Cost per month	# Months	Cost	# Months	Cost
Schedule Costs (Monthly Overhead)	$50,000	18	$900,000	16	$800,000
TOTAL			$36,624,025		$33,199,632

EMBODIED CARBON					
		Concrete		Proposed	
	Sq ft	Embodied Carbon kg/sq ft	Total Carbon	Embodied Carbon kg/sq ft	Total Carbon
Total Building Sq Footage	93575.2	6.69	625926.17	2.69	252,109

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.

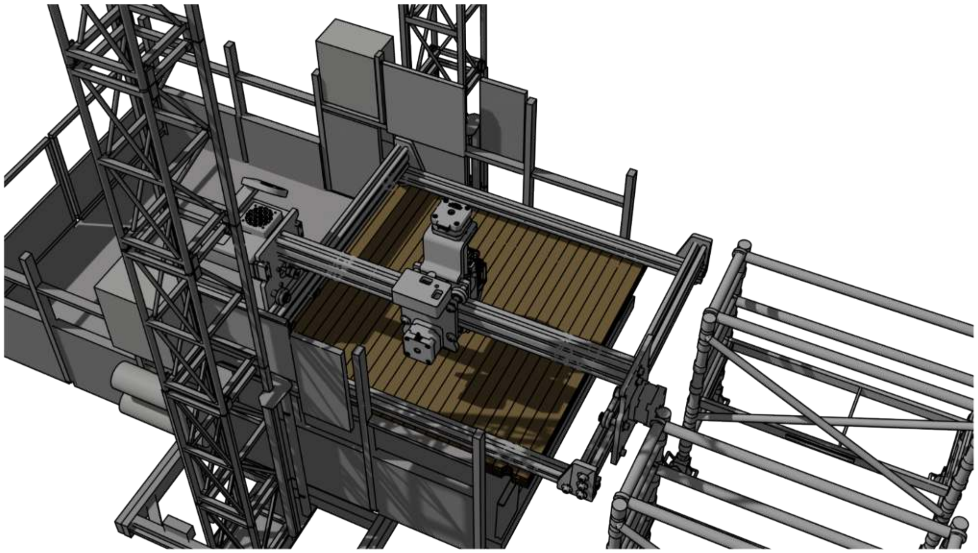
In a time of increasing loneliness, we need alternatives to the studio, one- and two-bedroom units dominating the market. Two demographics historically underserved by the housing sector — **intergenerational families** and **young people** — both stand to benefit from larger units. For families, remaining 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 “Səy̓em̓” 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

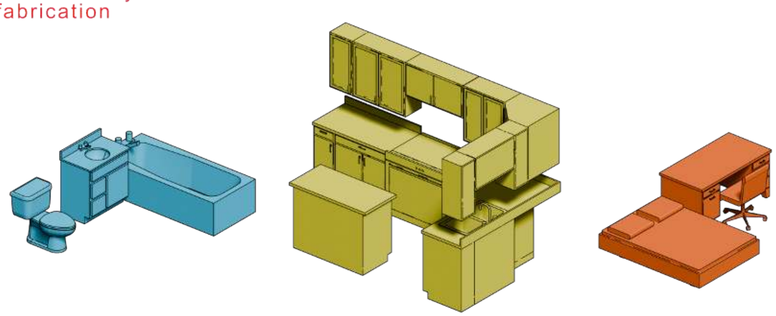
the project proposes a tandem mass timber facility that can produce both prefabricated CLT panels as well as prefabricated light wood framing panels. This would avoid more carbon heavy materials such as steel framing as well as utilising the efficiency of materials provided by the stick framing.



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.

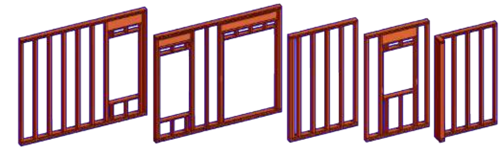
PODS

standardized kitchen, bathrooms and bedrooms allow for easy prefabrication



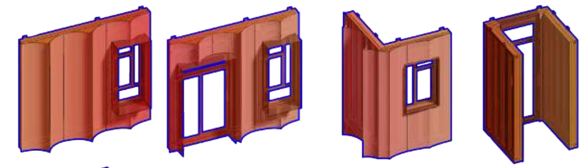
EXTERIOR PANEL FRAMING

prefabricated in factory



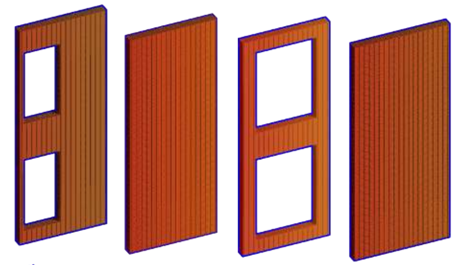
EXTERIOR PANELS

cladding and assembly completed in factory



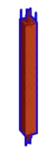
CLT SHAFT PANELS

prefabricated in factory



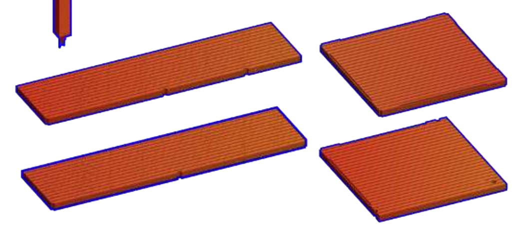
GLULAM POST + STEEL CONNECTION

prefabricated in factory



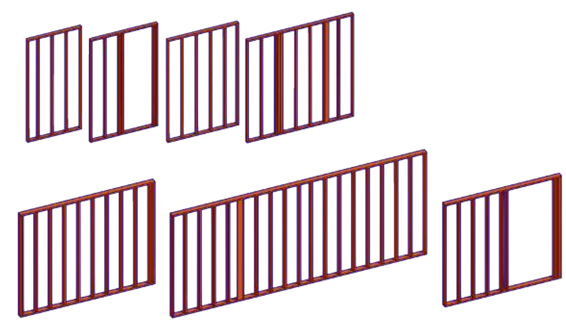
CLT PLATES

prefabricated in factory



INTERIOR PARTITIONS

prefabricated in factory

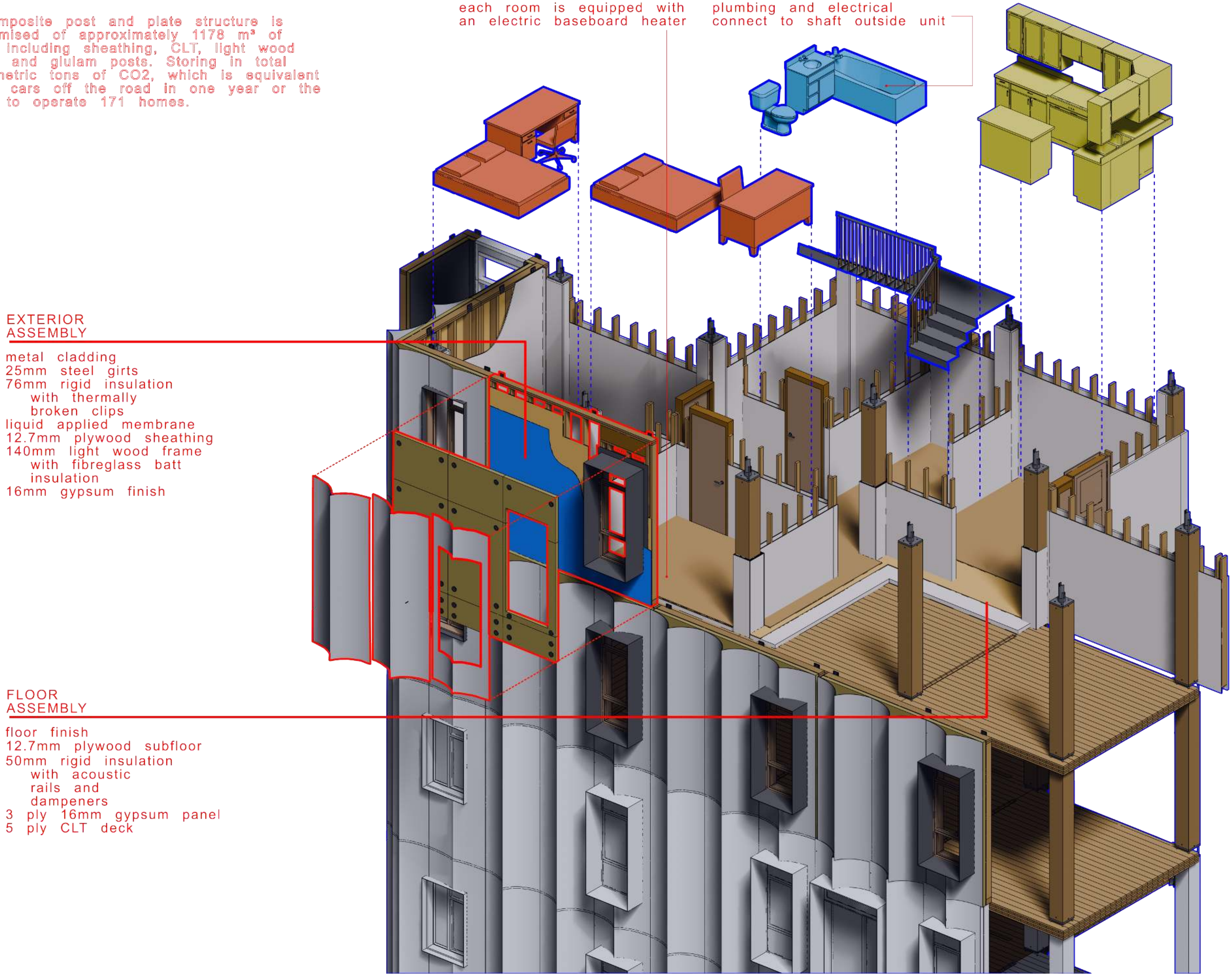


STAIRS

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.



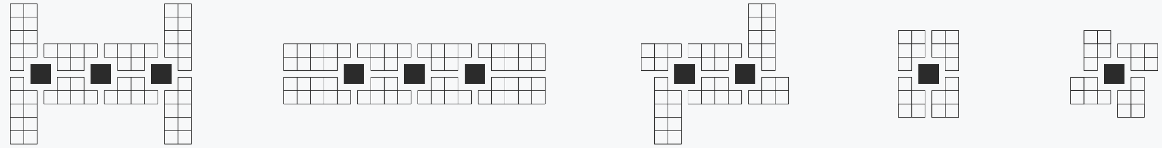
DTT-C-11

TYPICAL UPPER FLOOR + SITE PLAN

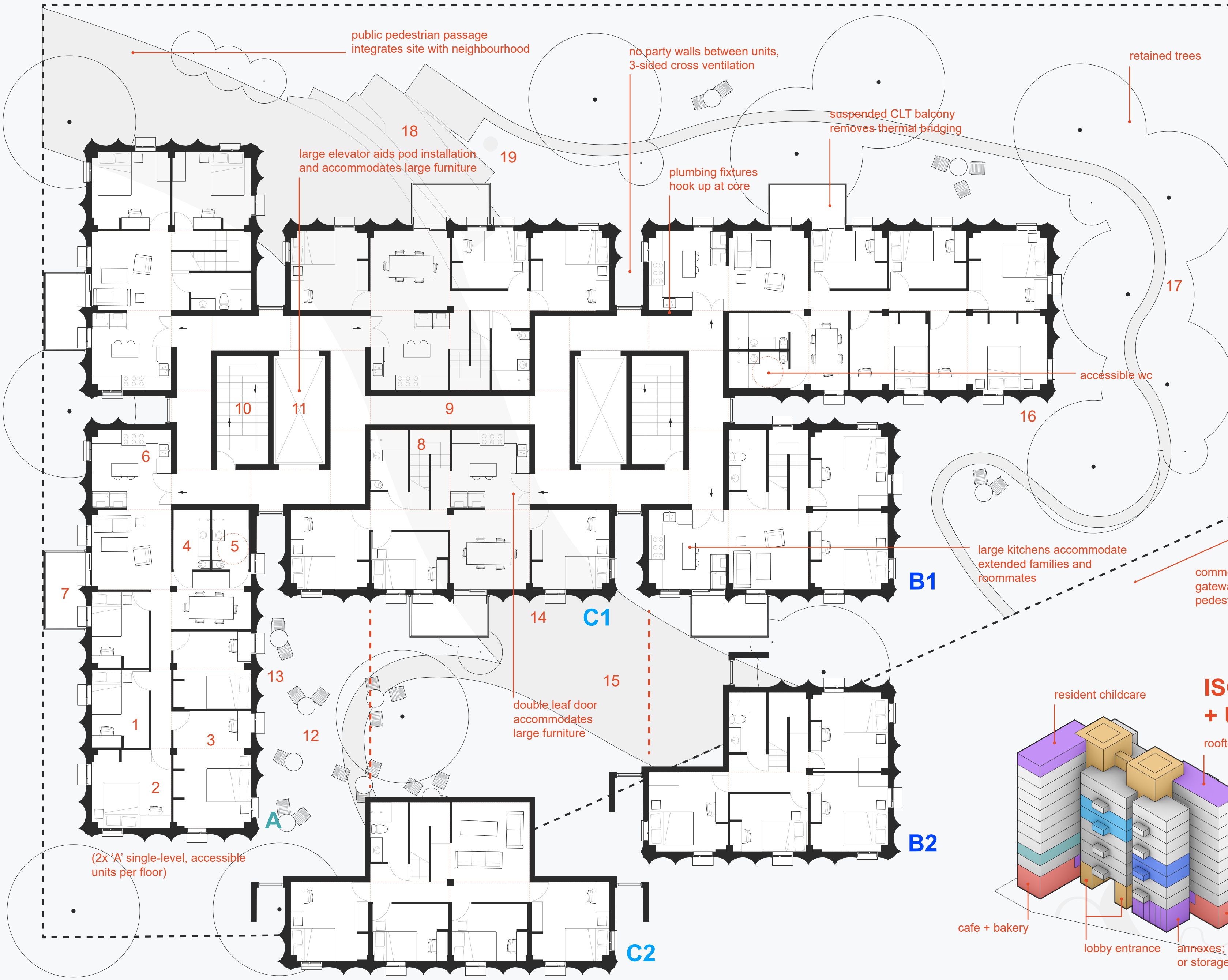
1:250

0 1 2 5 10 m

N



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



commercial amenities front arterial; gateway and stream passage invite pedestrian access to site

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

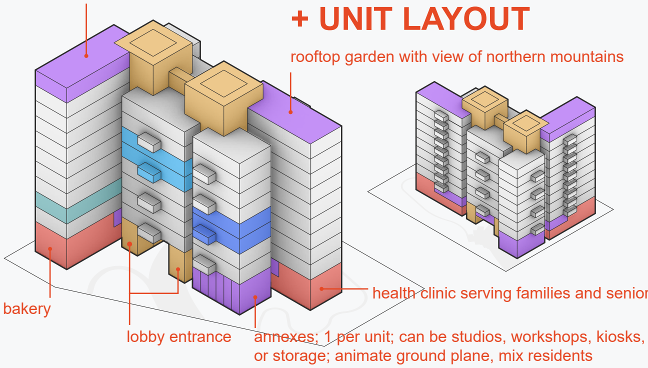
CORE

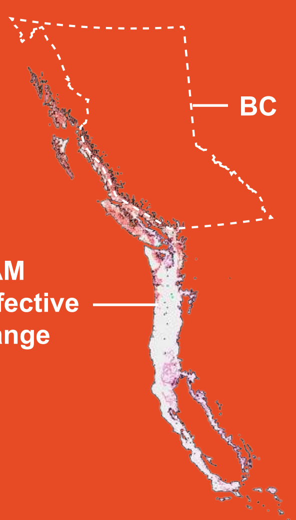
9 shared circulation
10 exit stair
11 oversized elevator

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

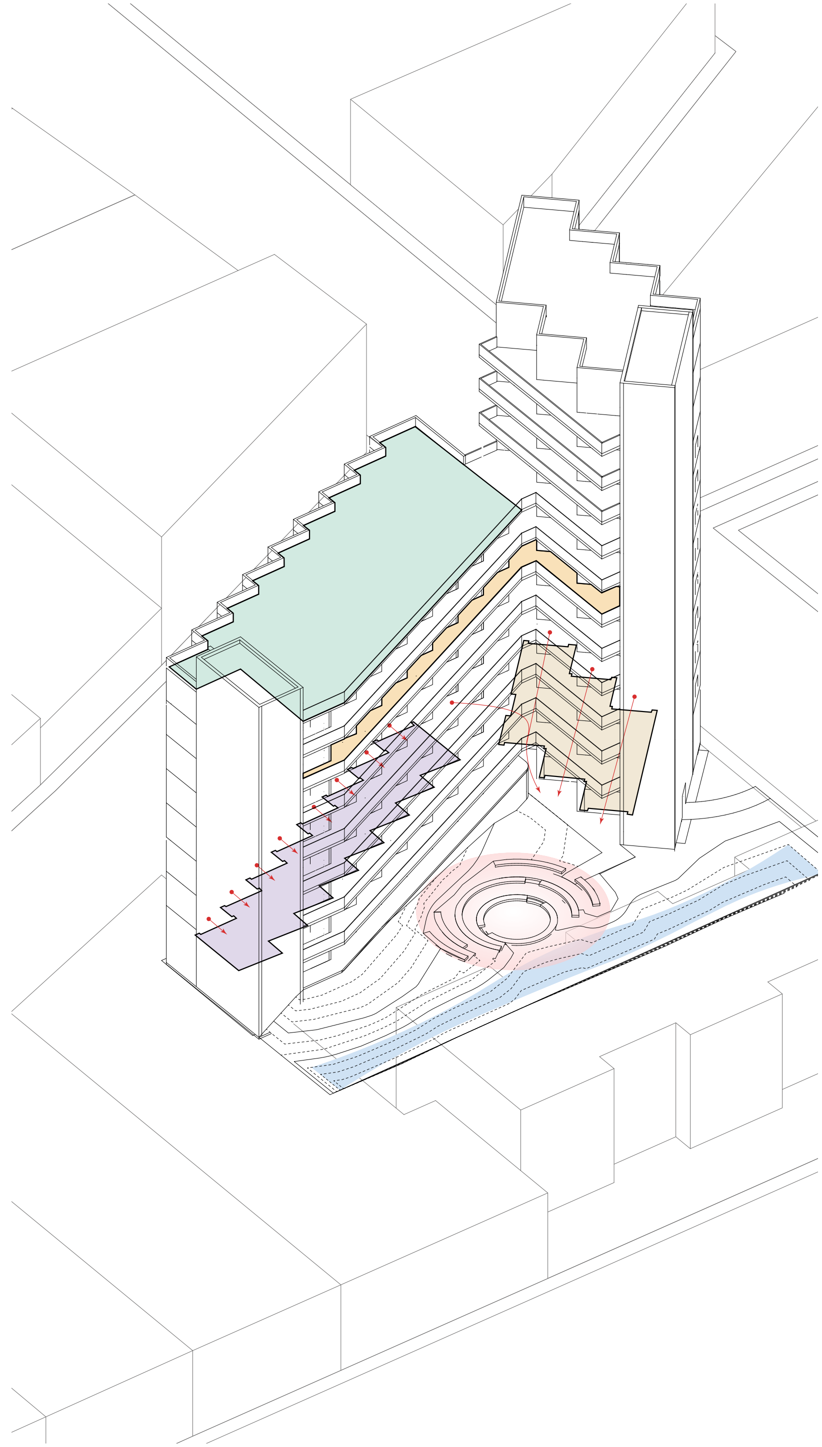
		Concrete		Submission	
	Square footage	**$/sq ft**	**Cost**	**$/sq ft**	**Cost**
Below grade	0.0	$315	$0	$150	$0
Base floor	7463.3	$360	$2,686,775	$270	$2,015,082
Above 1st storey	67169.4	$385	$25,860,21	$280	$18,807,428
	Quantity	**$/unit**		**$/unit**	
Balconies	34	$25,000	$850,000	$25,000	$850,000
	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.


Verdure

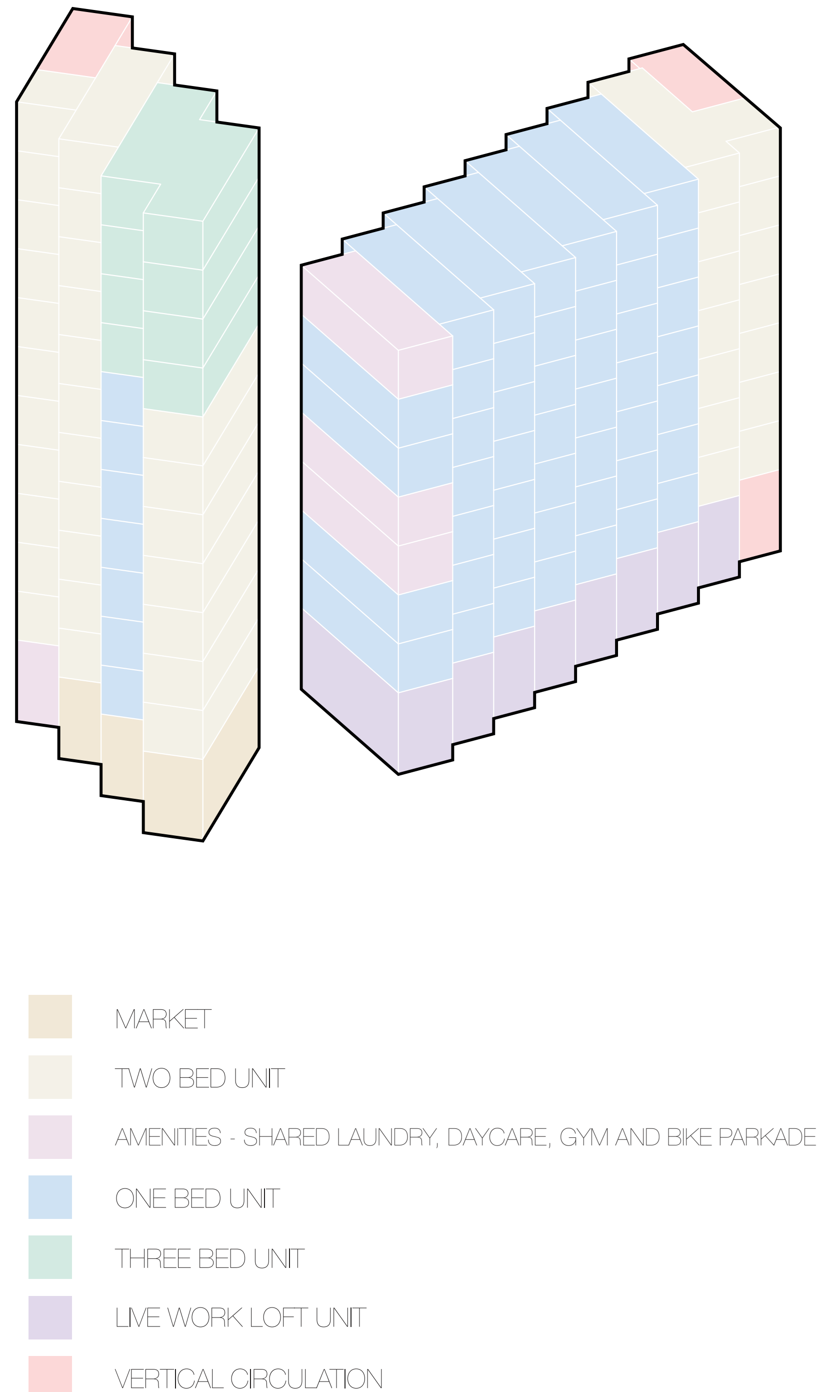


Verdure is a co-operative housing development for the KKS Nations. The project provides a variety of unit layouts, communal amenities, exterior gathering spaces. The staggered massing articulates the public street edge, providing frontage for live-work loft studios and a large market. The courtyard scheme shelters a restored historical stream running along the northern side of the site, directly adjacent to a ceremonial gathering space, prioritizing cultural safety and reconciliation. The project uses primarily GLT timber panels, beams, and columns which were chosen as a more readily available, local and indigenous supplied material compared to CLT products.

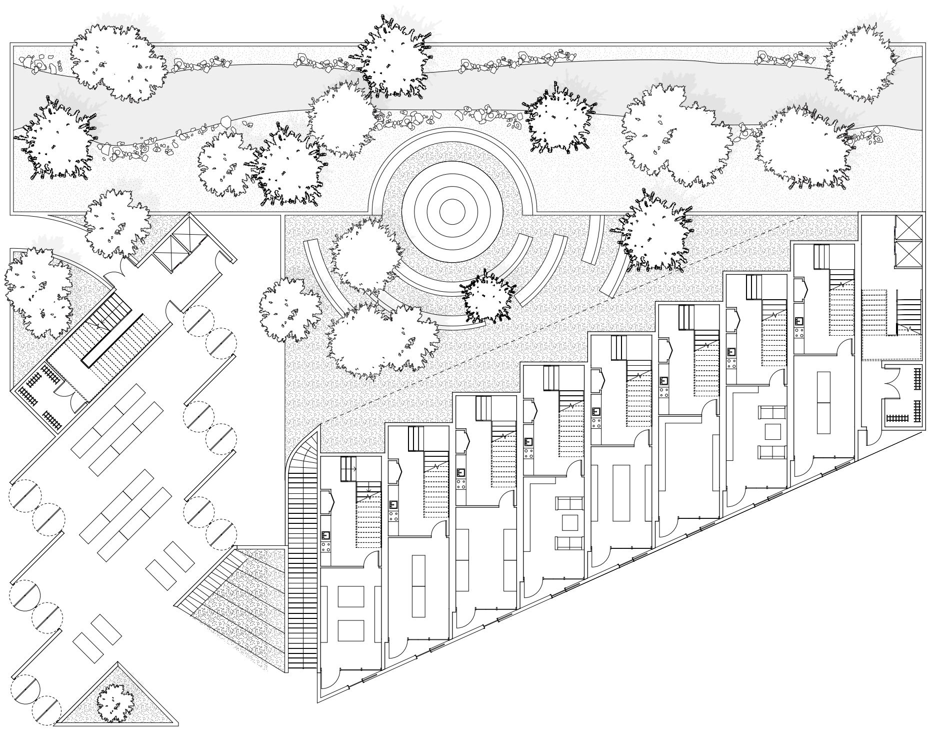
Unit	Area	Units/Level	Levels	Area(sq.ft.)	Area(m2)	Total Units	Total Beds
Rooftop Amenity	4864			4864	451.88		
Commercial				2110.6	196.08		
BikeA				192	17.84		
BikeB				192	17.84		
Daycare	628	1	1	628	58.34		
Laundry	628	1	1	628	58.34		
Gym	628	1	1	628	58.34		
CoreB	418	1	12	5016	466.00		
CoreA	523	1	8	4184	388.70		
1Bed-A	628	1	4	2512	233.37	4	4
1Bed-B	576	6	7	24192	2247.49	42	42
1Bed+Den	683	1	8	5464	507.62	8	8
LoftA-L1	628.2	1	1	628.2	58.36		
LoftA-L2	362.2	1	1	362.2	33.65	1	1
LoftB-L1	570.9	6	1	3425.4	318.23		
LoftB-L2	335.6	6	1	2013.6	187.07	6	6
LoftC-L1	528.4	1	1	528.4	49.09		
LoftC-L2	306.7	1	1	306.7	28.49	1	1
2Bed-A	780	1	7	5460	507.25	7	14
2Bed-B	734	1	8	5872	545.52	8	16
2Bed-C	886	1	11	9746	905.43	11	22
3Bed	1416	1	3	4248	394.65	3	9
Ammenity Interior				**2268**	210.70	**91**	**123**
Ammenity Exterior				**4864**	451.88		
Commercial Area				**2110.6**	196.08		
Residential Area				**64758.5**	6016.21		
Total Building Area				**78337.1**	7277.69		

Resi Area	Site Area	FSR
64758.5	20130.83	**3.22**

Project Data



Programming Diagram



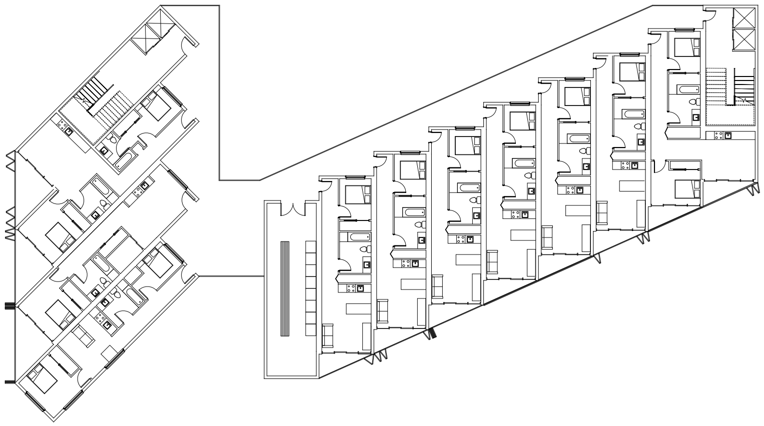
Site Plan

8-Storey Section

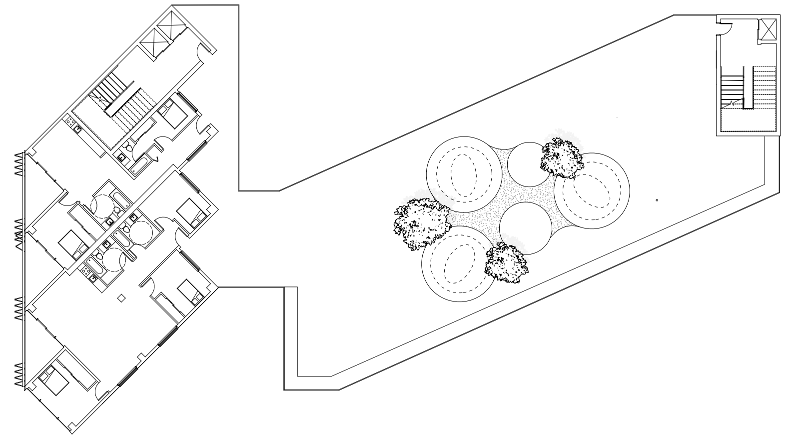
Courtyard

Exterior Corridor

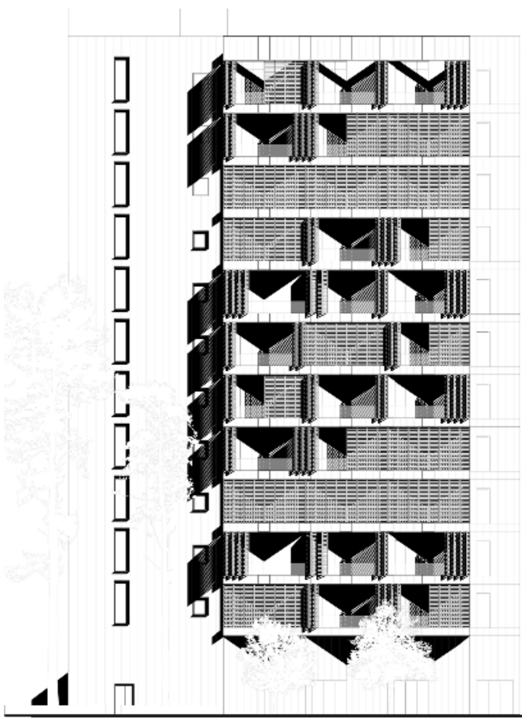
DTT-C-12



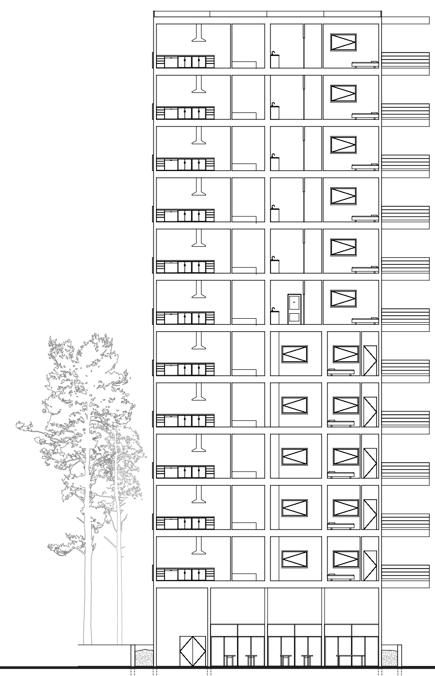
Level 2-8



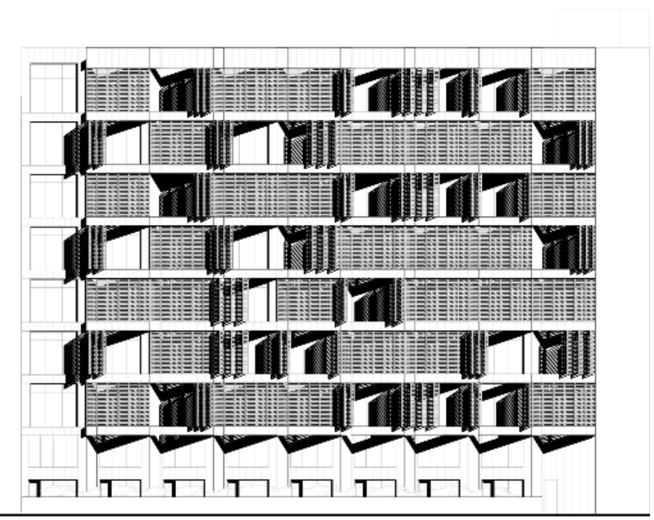
Level 9-12



West Elevation

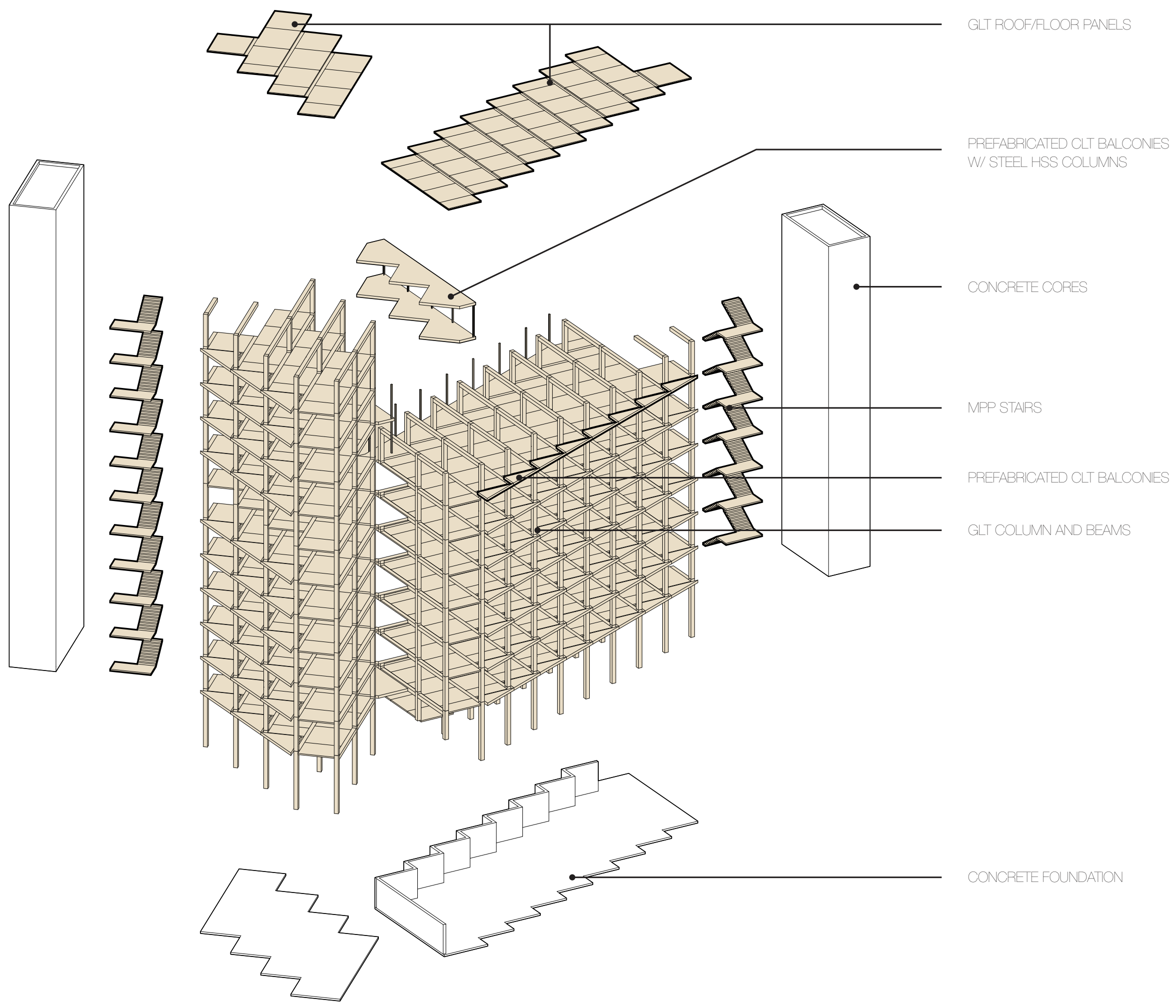


Tall Tower Section

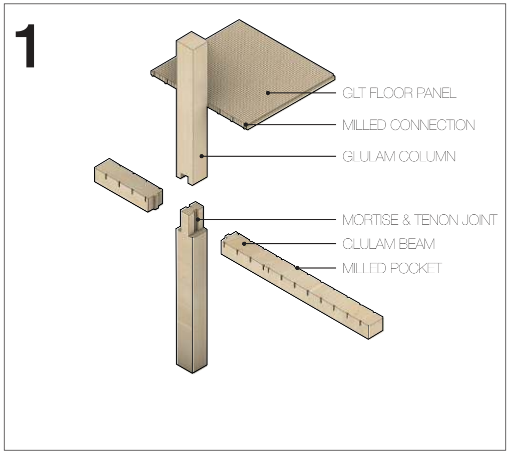


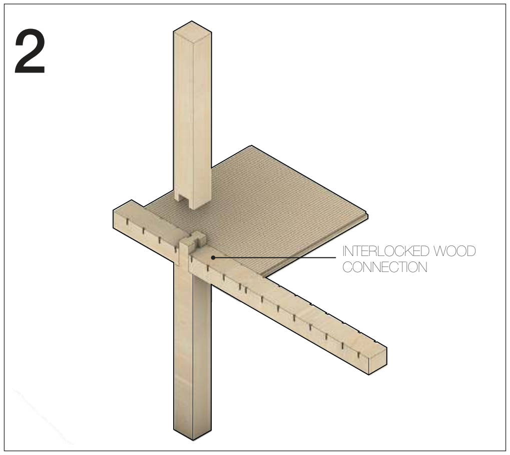
South Elevation

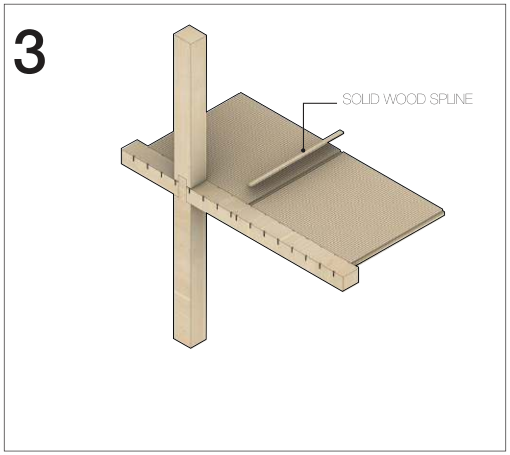
MASS TIMBER PROPOSAL	**CONCRETE PROPOSAL**
CLT: 642.187 m^3	**CONCRETE:** 2648.06 m^3
GLT: 1100.152 m^3	
MPP: 46.32 m^3	
CONCRETE: 905.72 m^3	
STEEL: 1.032 m^3	
GWP: 437 kgCO2eq/m^2	**GWP:** 602kgCO2eq/m^2



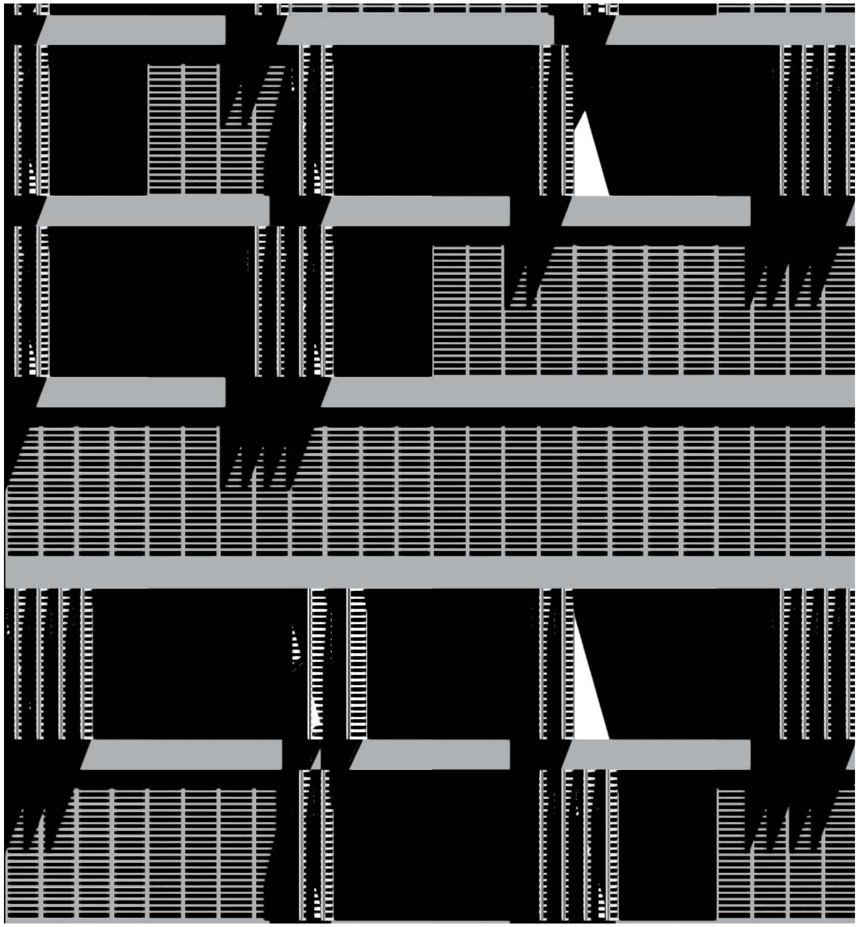
STRUCTURAL/CARBON RATIONALE







WOOD TO WOOD CONNECTION



The project explores innovation in structural connection to simplify the erection process, engineering requirements, and coordination between multiple materials such as steel connectors. Utilizing wood to wood connection reduces fabrication time, installation time, and coordination time. Thus, saving money on the overall project from start to finish. Values for GLT products could not be directly sourced, the values shown are an estimate.

Simple, uniform rectangular layouts are utilized for simplified construction process. Values collected for the construction costs are interpolated from CLT estimates using a similar structural layout. We believe CLT is expensive sue to lack of supply. GLT has been used as the primary structural floor panel as an alternative, ensuring more opportunity for local suppliers. GLT is stronger than CLT when used in a single direction and therefore uses less wood.

Economic Rationale

FSR	3.483820588
Lot size (sq ft)	20,131
Building sq ft Above Grade	70132
Building efficiency (%)	85
non saleable/rentable (sq ft)	10519.83
saleable/rentable (sq ft)	59612.37
Total Stories above grade (#)	12
Total Stories (#)	12
Base floor (#)	1
Above 1st storey (#)	11
Stories below grade (#)	0
Units (#)	91
Bedrooms (#)	123
Amenity space (sq ft)	2268
Non-residential (sq ft)	2110.6

CONSTRUCTION COSTS					
		Concrete		Timber	
	Square footage	$/sq ft	Cost	$/sq ft	Cost
Below grade	0.0	$315	$0		$0
Base floor	12071.2	$360	$23,855,724	$200	$13,253,180
Above 1st storey	66265.9	$405	$26,837,690	$250	$16,566,475
	Quantity	$/unit		$/unit	
Balconies	91	$25,000	$2,275,000	$25,000	$2,275,000
	Cost per month	# Months	Cost	# Months	Cost
Schedule Costs (Monthly Overhead)	$50,000	18	$900,000	16	$800,000
TOTAL			**$53,868,414**		**$32,894,655**

Real Estate Pro Forma

Summary		
Gross Potential Income (GPI)	$	2,883,412.80
LESS Vacancy + Credit Loss	$	51,901.43
EQUALS Effective Gross Income (EGI)	$	2,831,511.37
LESS Operating Expenses	$	1,132,604.55
EQUALS Net Operating Income (NOI)	$	1,698,906.82
LESS Mortgage Payments	$	2,828,010.30
EQUALS Cash Flow Before Tax	**-$**	**1,129,103.48**

Potential Gross Income						
Base Rent Income/Month	Square Feet	Average Rent/Sq Ft*	Average Rent	No. of Units	Total/Month	Total/Year
1Bed-A	628	$3.50	$ 2,198.00	4	$ 8,792.00	
1Bed-B	576	$3.50	$ 2,016.00	42	$ 84,672.00	
1Bed+Den	683	$3.75	$ 2,561.25	8	$ 20,490.00	
LoftA	990.5	$4.00	$ 3,962.00	1	$ 3,962.00	
LoftB	906.5	$4.00	$ 3,626.00	6	$ 21,756.00	
LoftC	889.1	$4.00	$ 3,556.40	1	$ 3,556.40	
2Bed-A	780	$4.00	$ 3,120.00	7	$ 21,840.00	
2Bed-B	734	$4.00	$ 2,936.00	8	$ 23,488.00	
2Bed-C	886	$4.00	$ 3,544.00	11	$ 38,984.00	
3Bed	1416	$3.00	$ 4,248.00	3	$ 12,744.00	
TOTAL INCOME					**$ 240,284.40**	**$ 2,883,412.80**

*Average rent per squre foot taken from Liv.com: https://liv.rent/blog/uncategorized/august-2025-metro-vancouver-rent-report/#:~:text=As%20of%20August%202025%2C%20the,Get%20Your%20Free%20Estimate

Vacancy and Non-Payments			
Vacanacy	**Average Rate of Vacancy***	**Loss Per Month**	**Loss of Per Year**
	0.80%	$ 1,922.28	$ 23,067.30
Credit Loss	**Est. Rate of Non-Payment**	**Loss Per Month**	**Loss of Per Year**
	1%	$ 2,402.84	$ 28,834.13
TOTAL LOSS		**$ 4,325.12**	**$ 51,901.43**

*Average vacancy rate taken from CHMC Fall 2024 Market Report for Metro Vancouver: https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/market-reports/rental-market-reports-major-centres?selected=vancouverDiv

Operating Expenses		
Average % of EGI*		**Total**
40%	**$**	**1,132,604.55**

*Average percentage of operating expenses taken from https://www.bullpenre.com/insights/operating-expense-ratio#:~:text=What%20is%20a%20typical%20operating,expenses%20can%20vary%20between%20municipalities.

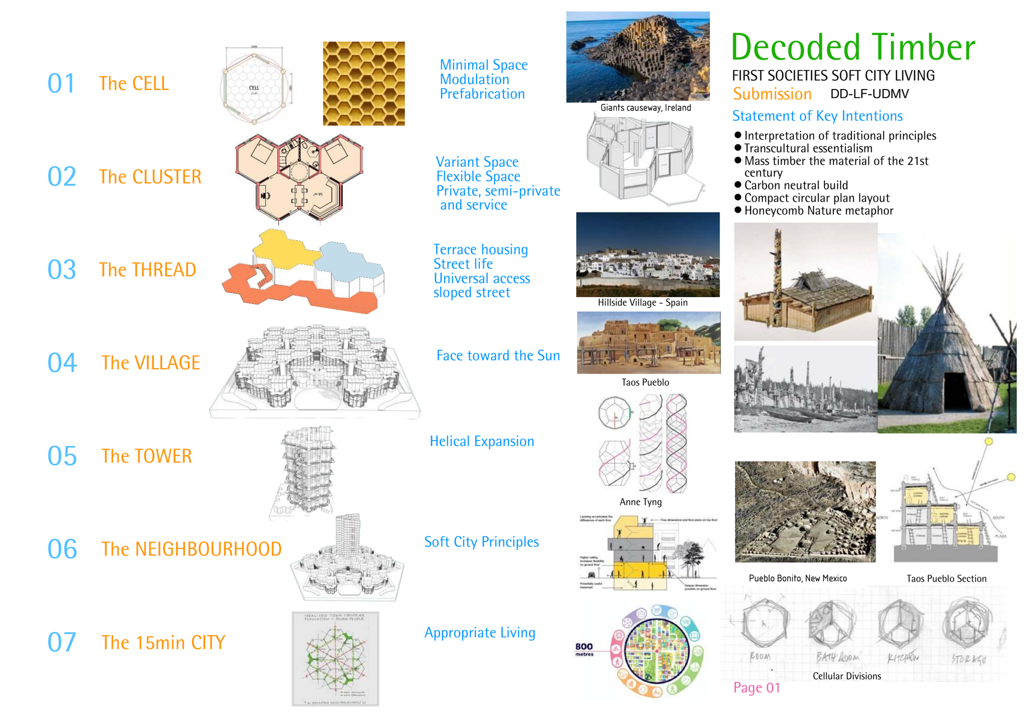
Mortgage Payments		
Loan Amount	$	32,894,655.00
Interest Rate (Annual)		6%
Term (Years)		20
Mortgage Payment/Month	**$**	**235,667.52**
Mortgage Payment/Year	**$**	**2,828,010.30**

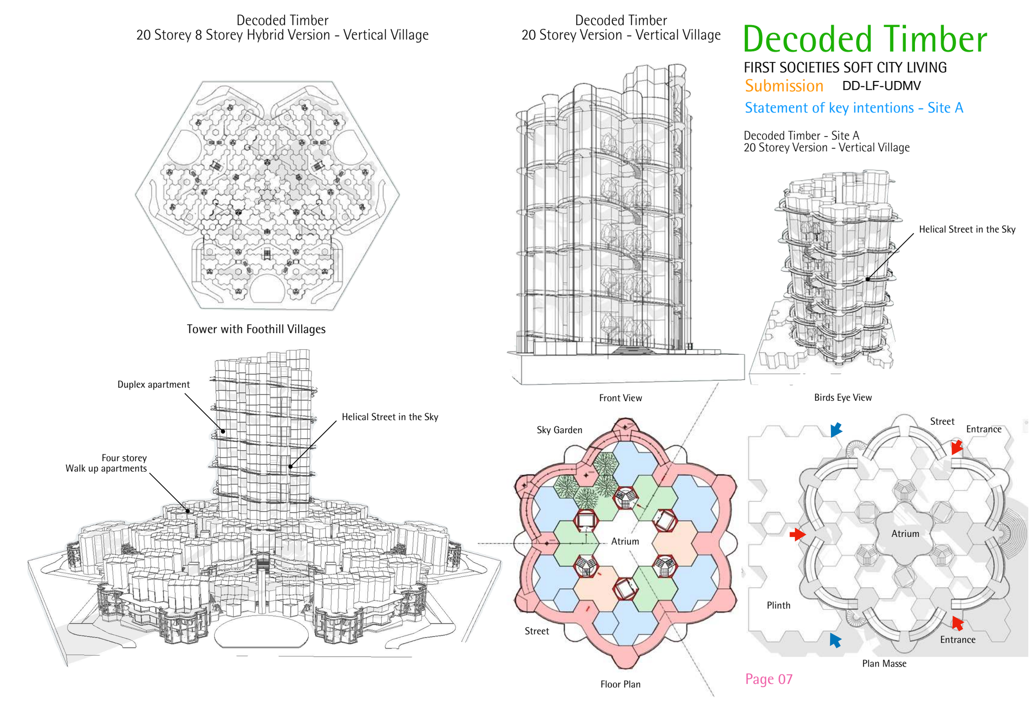
SITE -D
DD-LF-UDMV

FIRST SOCIETIES SOFT CITY LIVING

SITE -D
DD-LF-UDMV

DTT-D-01

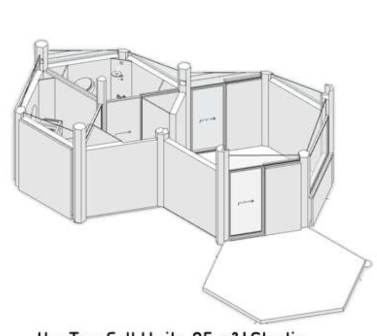




Street View

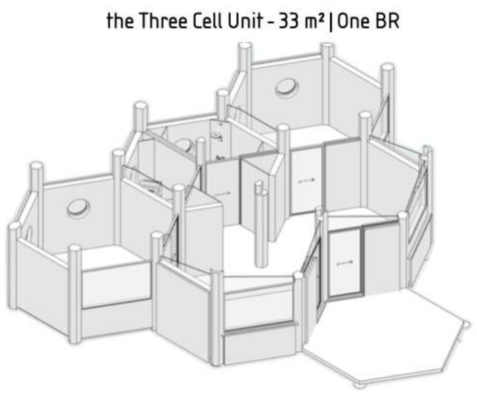
Plaza View

DTT-D-01

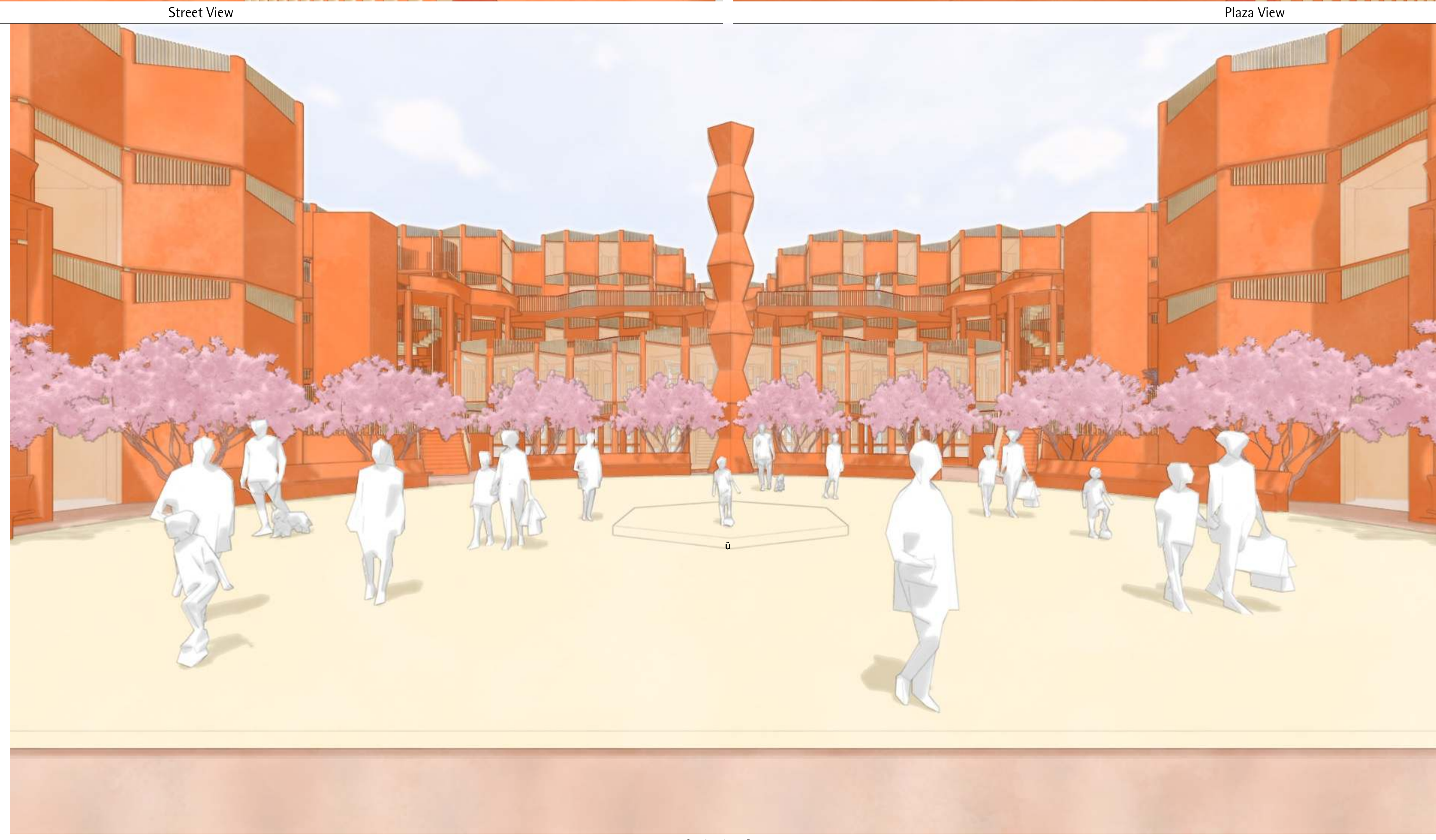


the Two Cell Unit - 25 m² | Studio

the Three Cell Unit - 33 m² | One BR



the Five Cell Unit - 55 m² | Two BR



Gathering Space 1:0.95

DTT-D-01

Key Drivers

a First Nation Space

an Understanding and re-Interpretation of First Nation vernacular architecture.

Eco-Minimalism

"If we are to move forward, towards mainstreaming ecological design as an integral part of building for the 21st century, then it is crucial that it is acceptable, economic, genuinely environmentally sound, gimmick-free and not stigmatised as a style"
Howard Liddell

Minimal Existence

'The concept was used as a design laboratory to create affordable housing that was space-efficient. It was based on the idea of creating a secure life without being tied to an unaffordable home.'
Alexander Klein

Flexibility

"Considering housing as a collection of rooms of identical size, freely networked, without hierarchy and without assignment, leads to an emancipated vision of living and human relationships"
Sophie Delhay

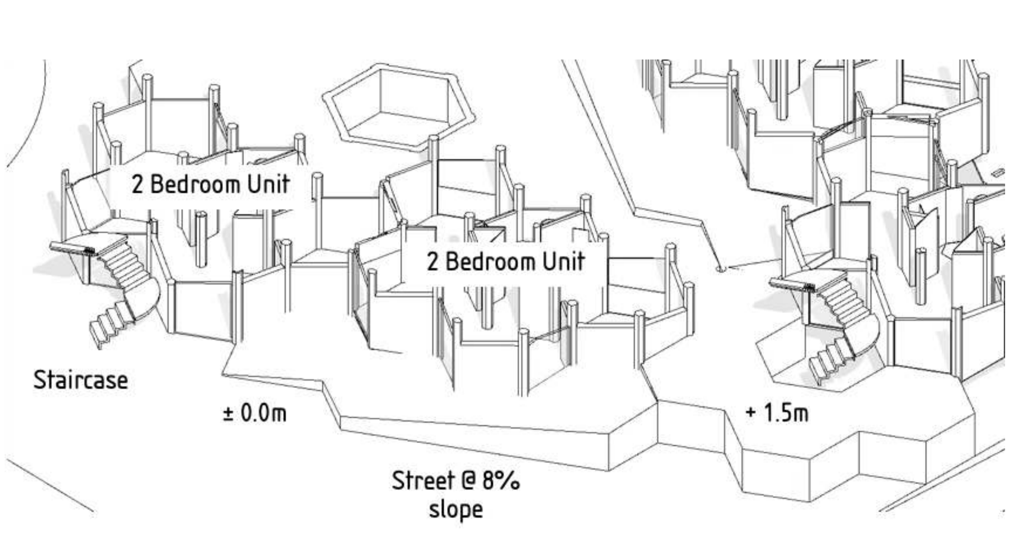
Design for Disassembly

'the design of buildings to facilitate future changes and dismantlement (in part or whole) for recovery of systems, components and materials, thus ensuring the building can be recycled as efficiently as possible at the end of its lifespan
Gustav Düsing

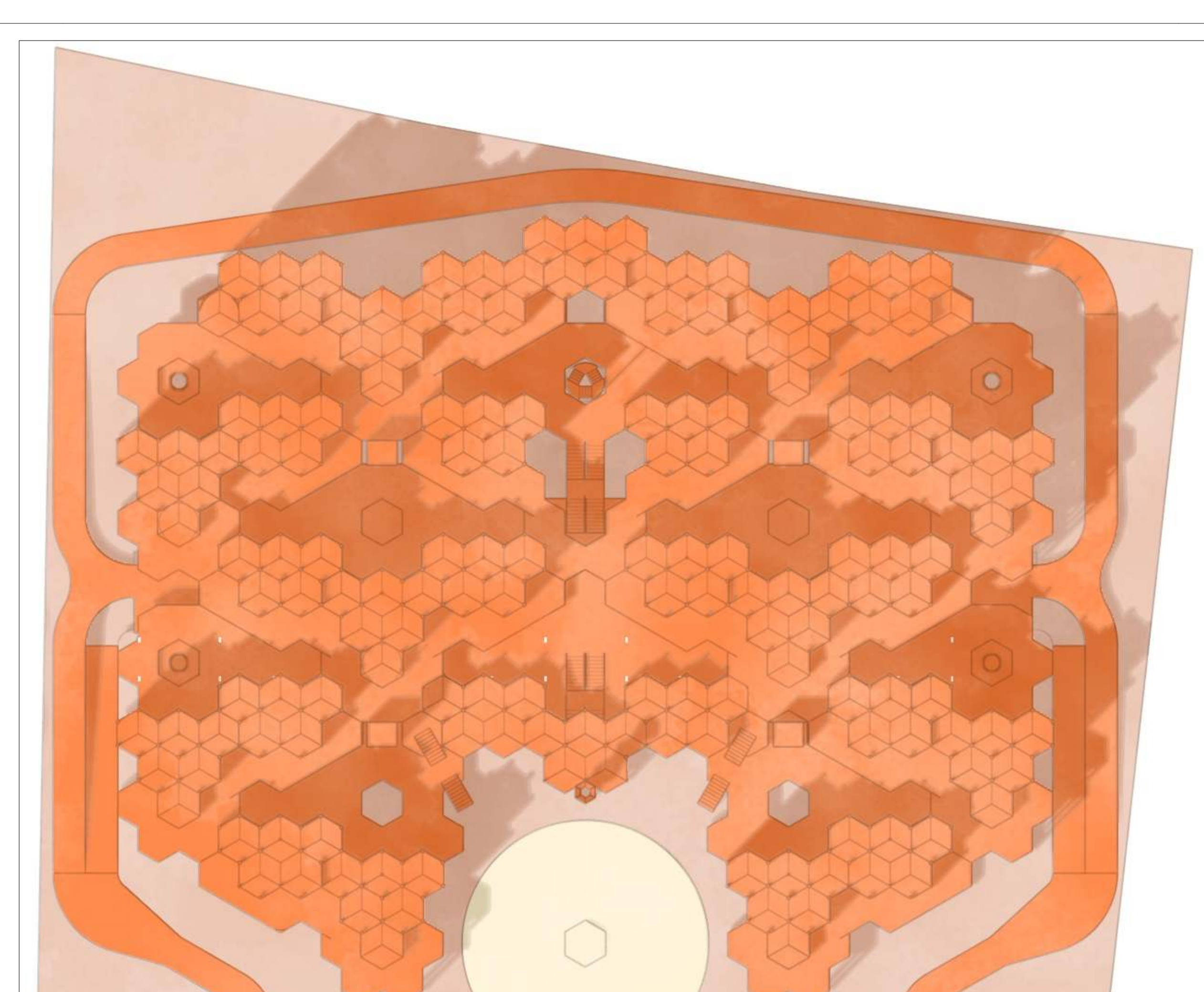
Indoors, Mid-doors and Outdoors

A climate concept of low tech uses un-heated spaces as expansion zones which at the same time serve as a climatic buffer zone (mid-doors).
Gustav Düsing

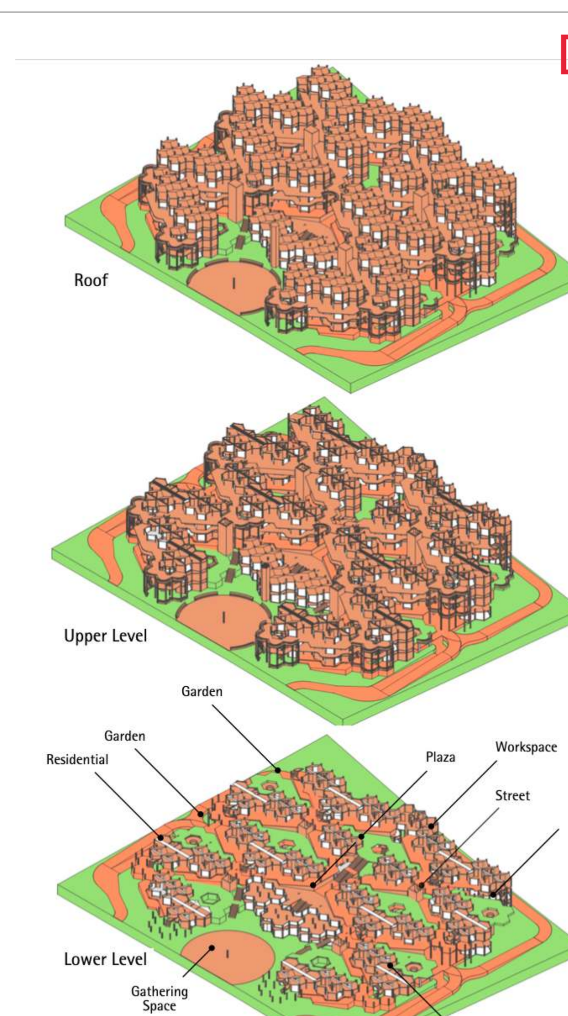
DTT-D-01



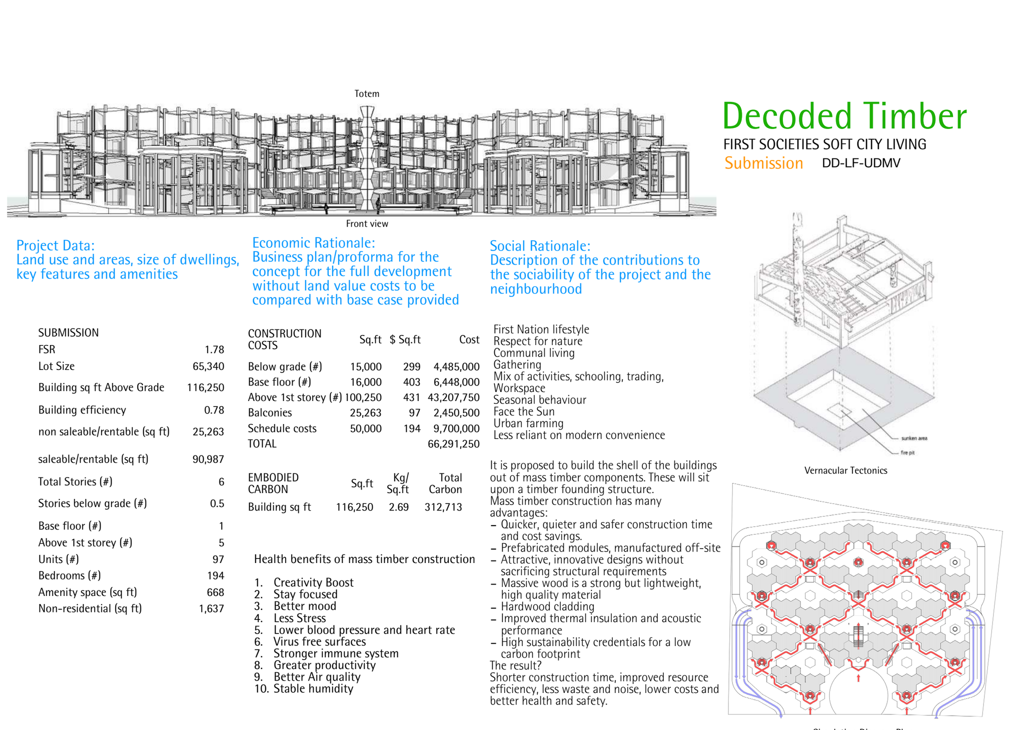
Terrace House Idea

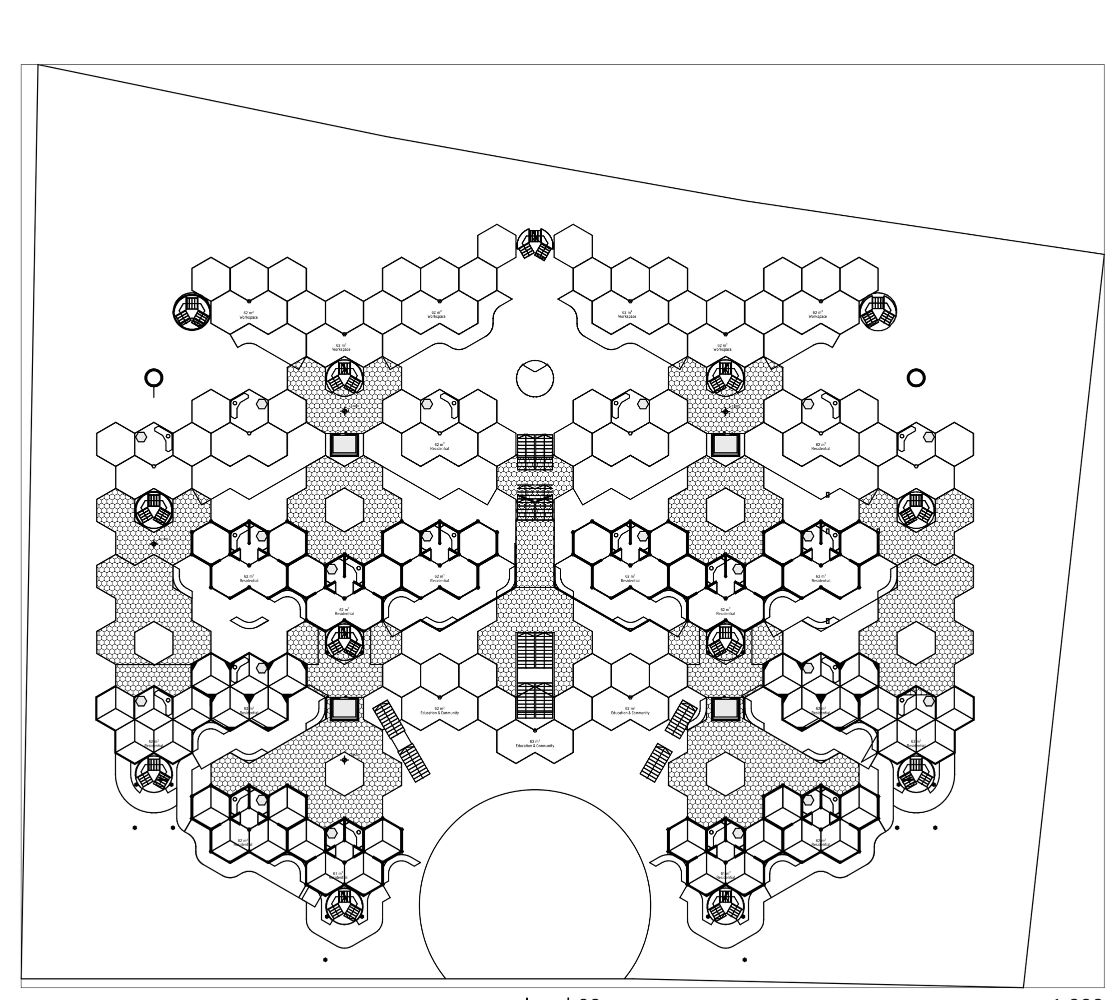


Plan Masse

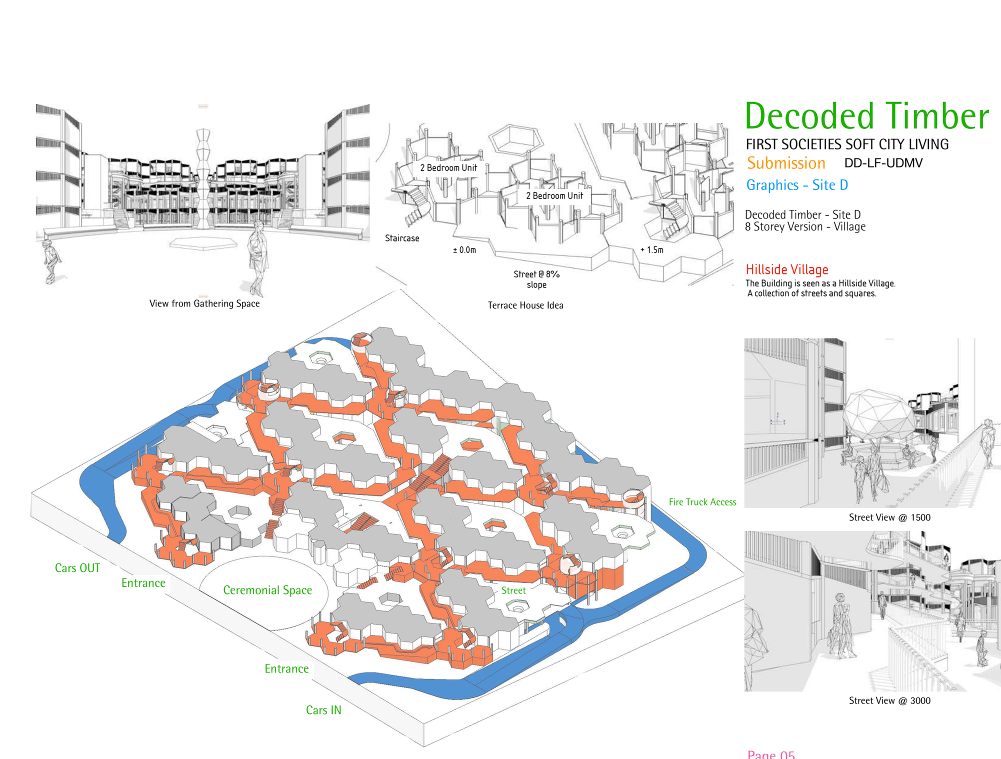


DTT-D-01





Level 02 1:333

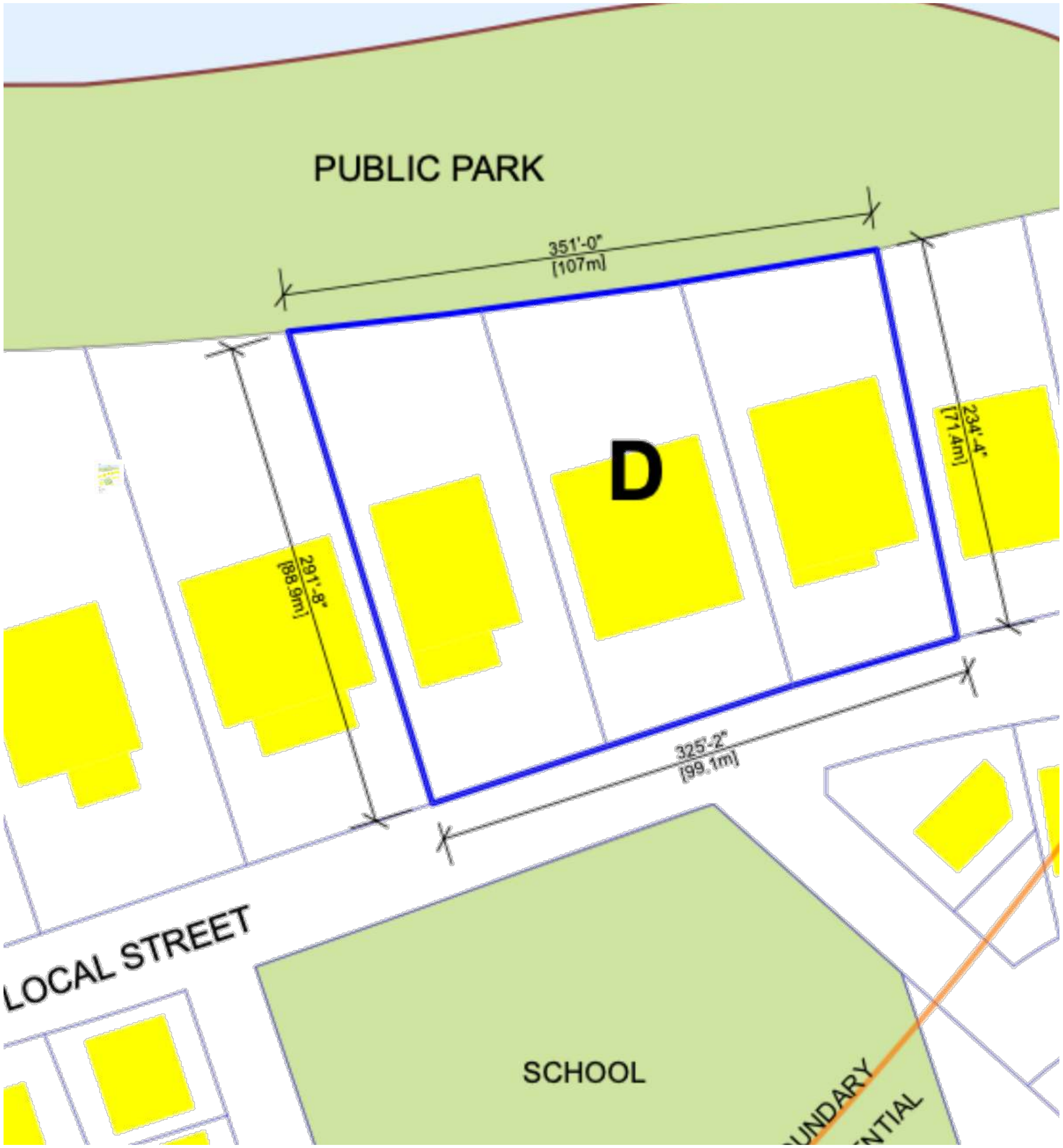


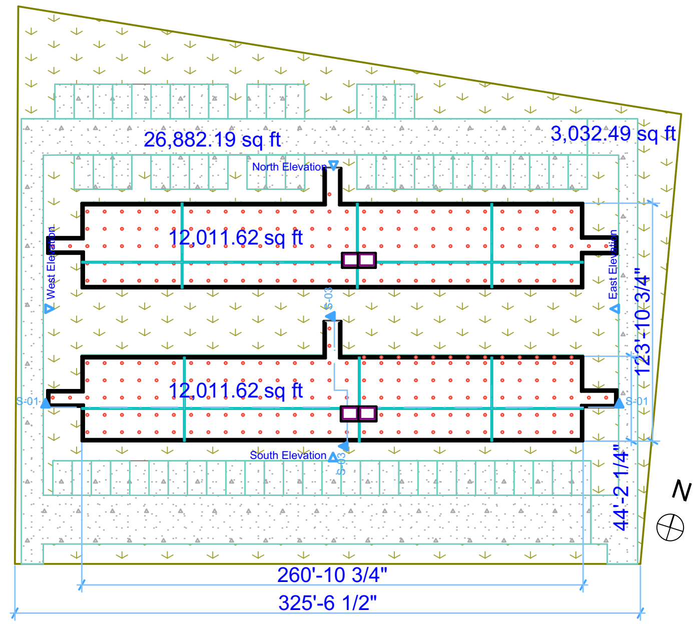
Tsawwassen Apartments

Design intent of this project reflects previous high-rise modern buildings by the Tsawwassen Nation in the Vancouver metro, the traditional longhouse and communal living.

Another precedent for the sake of comparison is a partial modular project in New York City by Gluck+, The Stack, which has a conventional steel and concrete structure extending up to the ceiling of the podium level. Then six floors of factory built light frame modular units are stacked on top of one another by crane like shipping containers. In the Tsawwassen project, hinge-connected glued laminated timber (GLT) columns and beams support factory built modular cross-laminated timber (CLT) apartment modules. The trucked in half-units complete with plumbing and appliances fit into the site assembled frame similar to a jungle gym and are paired together with splines.

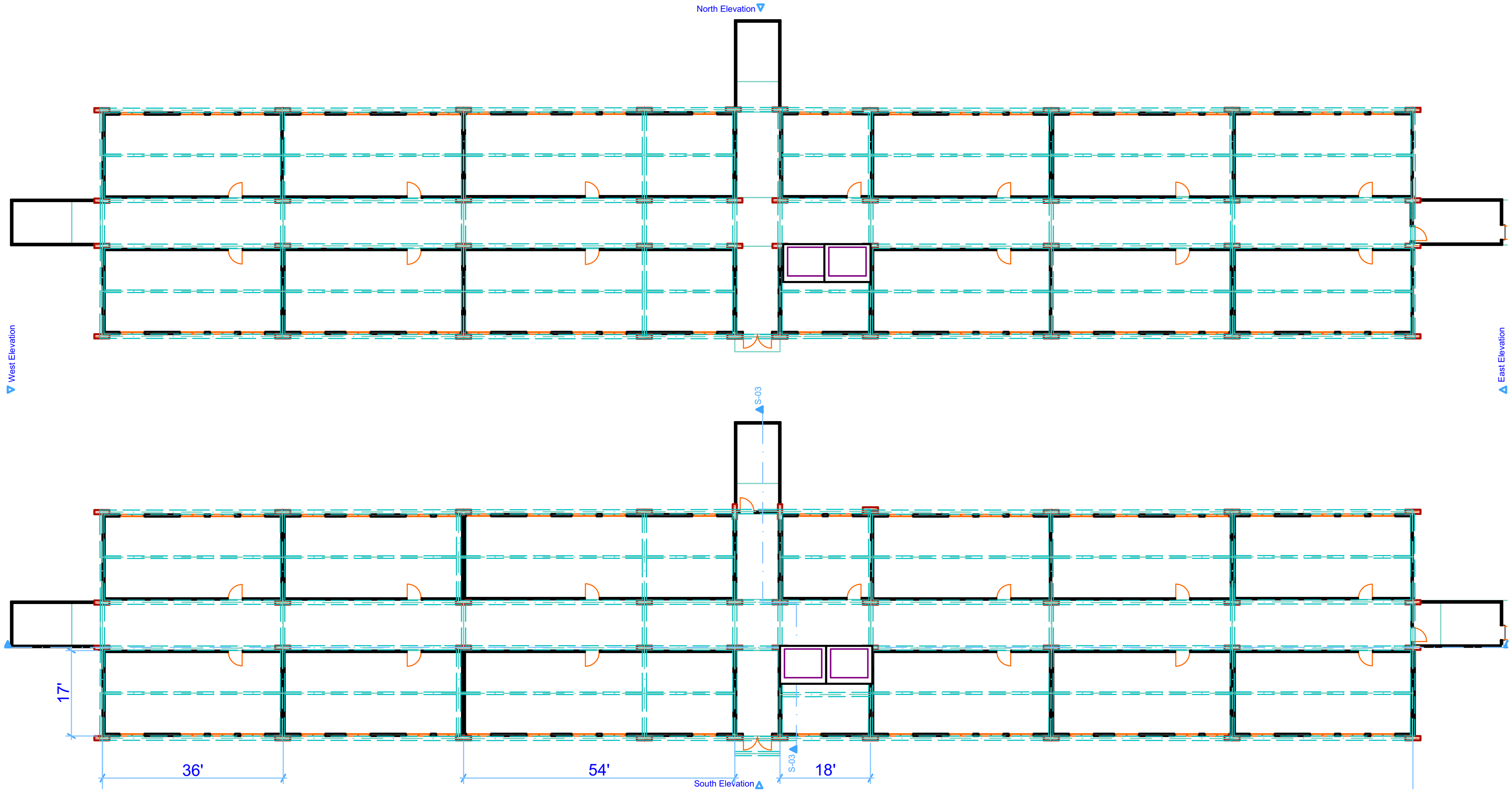
This scheme is very bare bones, designed to lower costs and reflect traditional modestly appointed building styles, yet the buildings are designed to resist axial and lateral loading conditions. For example, there are alluvial soils capable of liquefaction in an earthquake and there's a coastal tsunami hazard. The selected solution is slab on grade supported by driven piles, pile caps and grade beams. There's no basement because of the high water table except for the elevator pit.





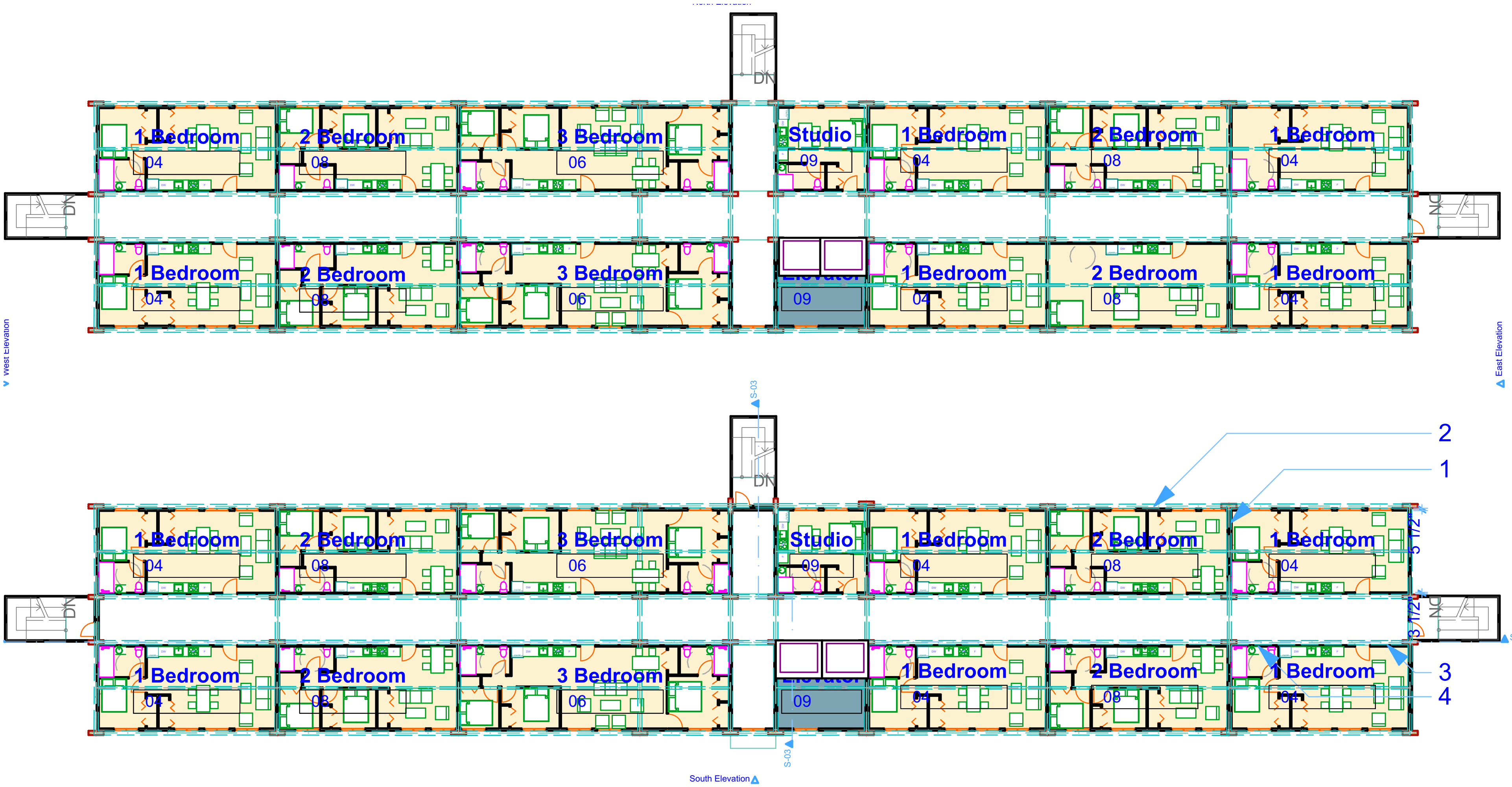
1. Gross Floor Space Ratio
276,680SF/88.273SF= 3.13
2. Foundation per Soils and Structural. Here proposed perimeter wall over slab on grade over grade beam over pile cap over 14" dia driven pile
3. Permeable concrete paver at drive and parking
4. Two twelve story mass timber buildings are technically feasible in the Metro Vancouver area.
5. Transit oriented development favors multi-family occupancy over existing single family development.

0. Site 1" =100'



1. Podium 1" = 30'

1. Nominal module sizes for cross-laminated timber CLT apartments indicated
2. Units inserted into a jungle gym structure consisting of glue-laminate timber (GLT) or glulam hinge connected structural members
3. Elevator shaft, typical, is mass timber, separate supplier.
4. Exit stair, typical, is mass timber by separate supplier



1" = 30' Story 2.

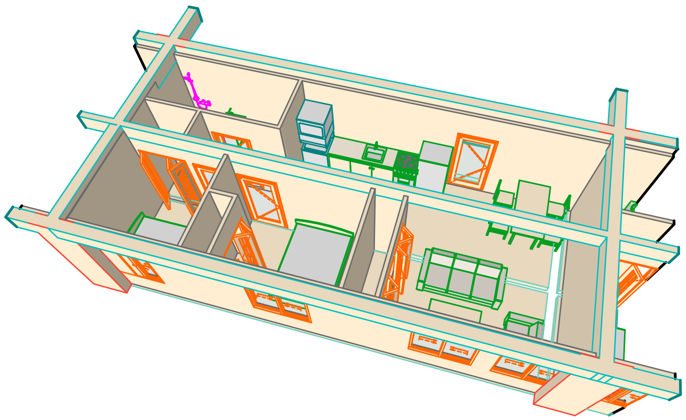
1. Party wall unit to unit, 1-hr, STC >= 50:
CLT each side, 1½" service cavity with mineral wool + hat channel with sound isolation clip or resilient channel (RC1) + 2 x 5/8" Type X

2. CLT interior exposed:
Exposed CLT interior (no gypsum) → air/vapor control layer at exterior of CLT as required → continuous insulation (mineral wool or rigid CI) on outside of CLT → water resistive barrier (WRB) → rainscreen/cladding

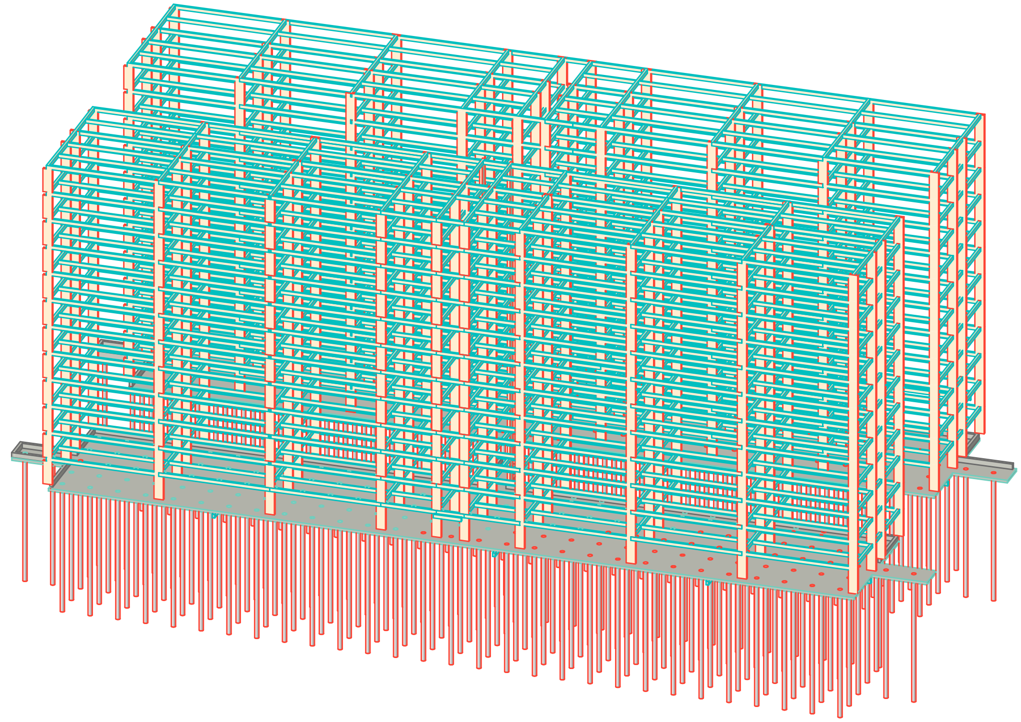
3. Wet wall (quiet):
2×6 + 1" gap + 2×4/2×6, mineral wool both, ⅝" gyp (2× Type X on rated side).
Overall 12"–14" width. Plan mini-shaft (18–24" W × 12–18" D) at stack.

4. Unit↔corridor 1-hr, STC≥50:
Corridor face: 2× ⅝" Type X on furring + mineral wool;
Unit face: 1½" service cavity + ⅝" Type X.

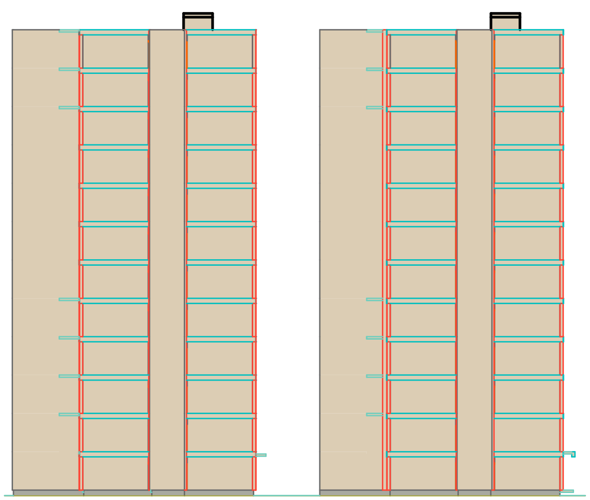
1. Balcony, typical, omitted for safety.



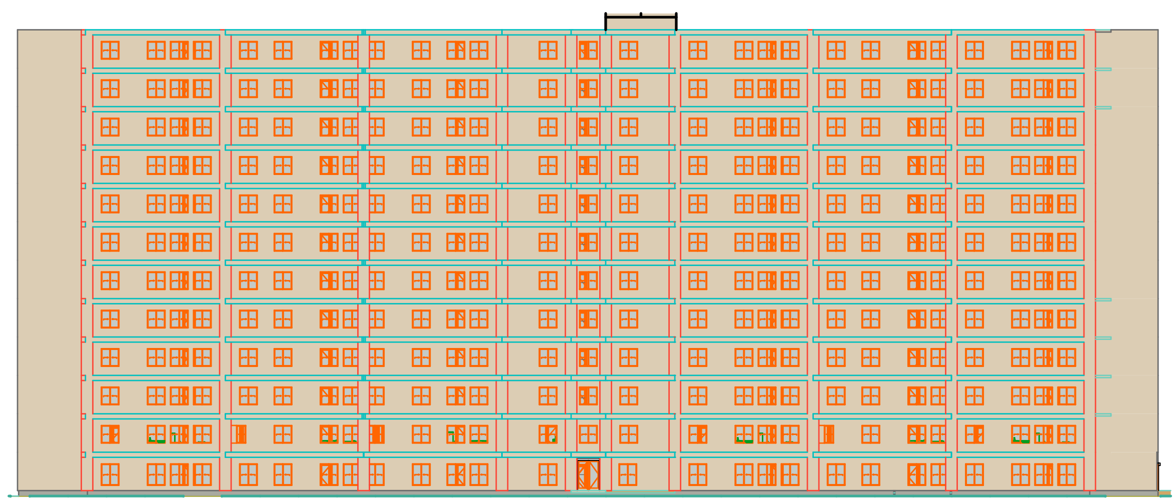
3D-05 Module Perspective 1" = 40'



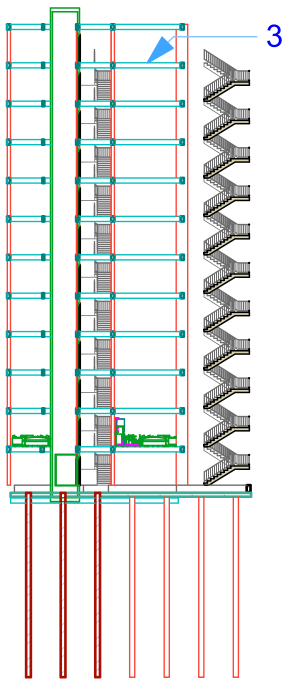
3D-04 Jungle Gym Axonometry



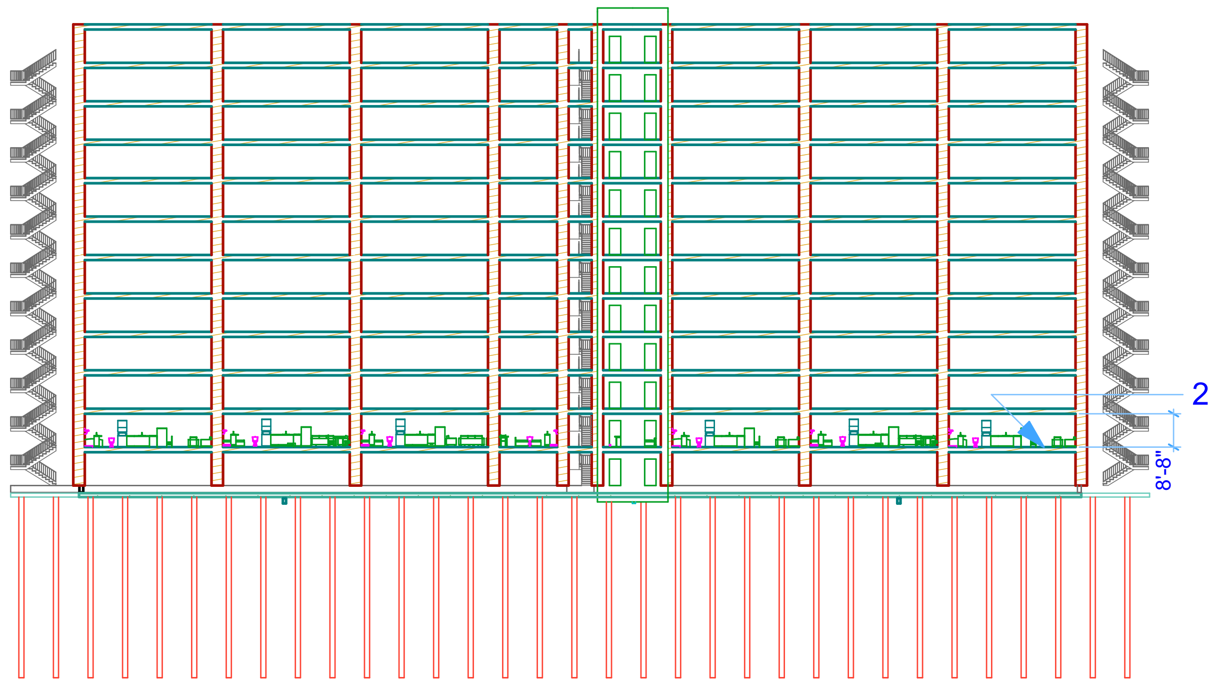
West Elevation 1" = 50'



South Elevation 1" = 50'



S-03 Section



S-01 Section 1" = 50'

1. Ceiling height nominal 9'
2. Floor/ceiling unit to unit tested assembly 1 hr STC >= 50, IIC >=50 expose architectural finish CLT underside ceiling treat top side 10 mm resilient underlayment + 1½ - 2" gypcrete topping + optional finish floor
3. Same assembly as in 2 above, add thin acoustic treatment to ceiling if IIC performance found ineffective

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.

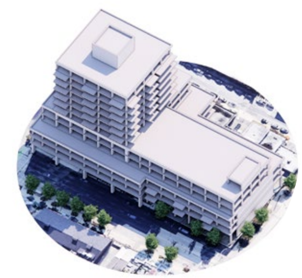
Timber Town envisions a vibrant, high-density neighbourhood that seamlessly integrates the natural beauty of Vancouver with the warmth and sustainability of mass timber construction. At its core, this project aims to create high-quality living environments that foster deep connections - both to nature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

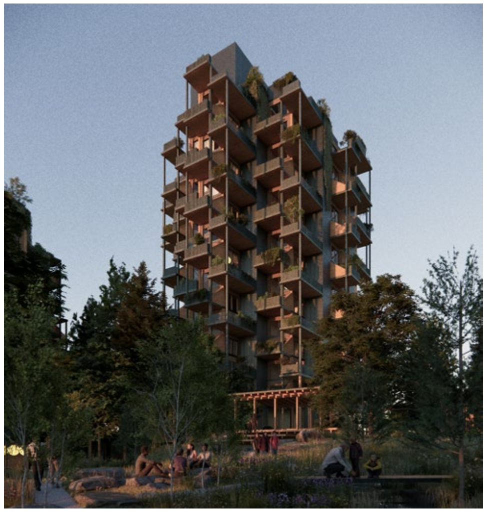
In Timber Town, tall, compact mass timber towers meet the ground directly, giving back much of the ground floor to it's residents and the community.

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.

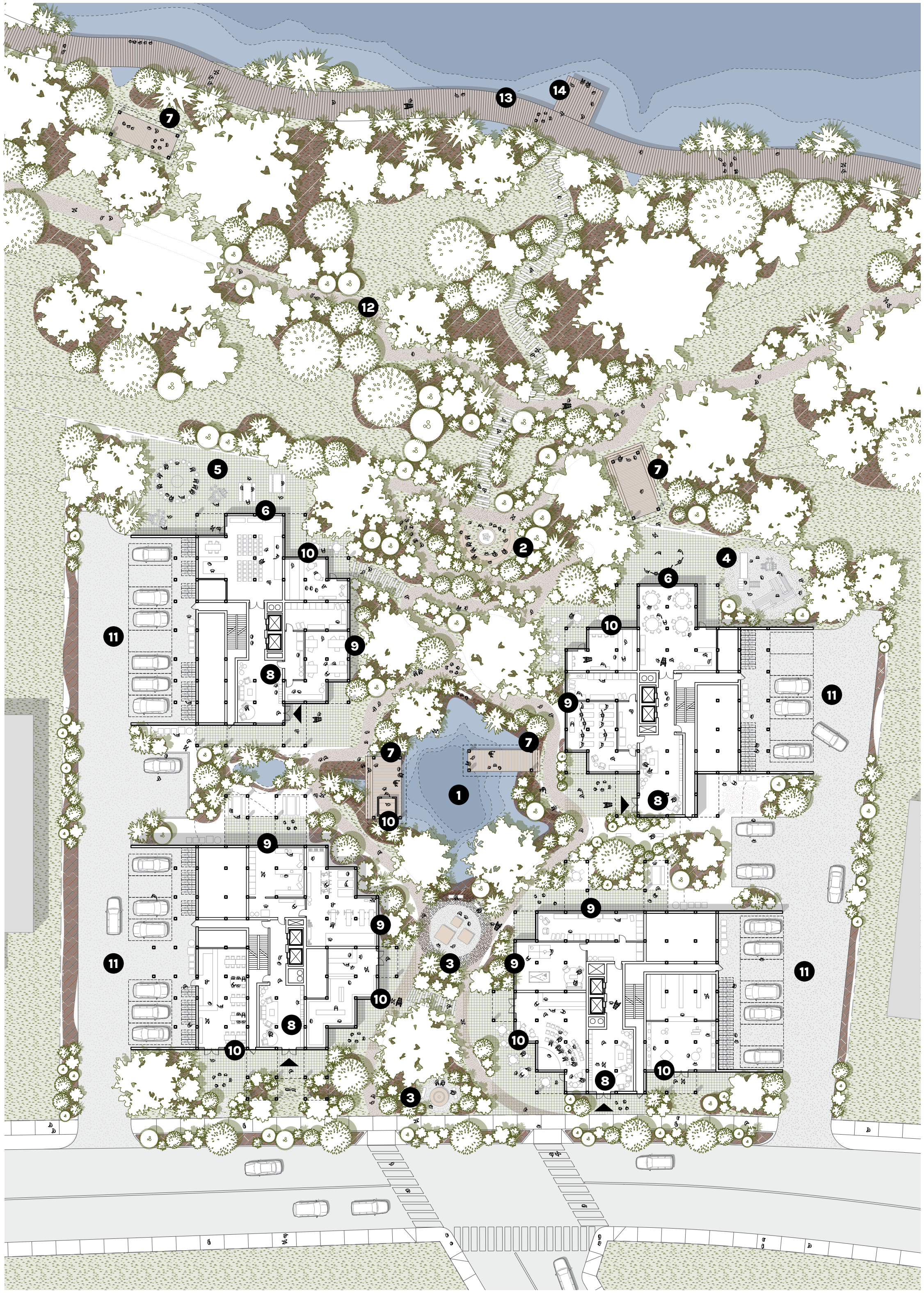


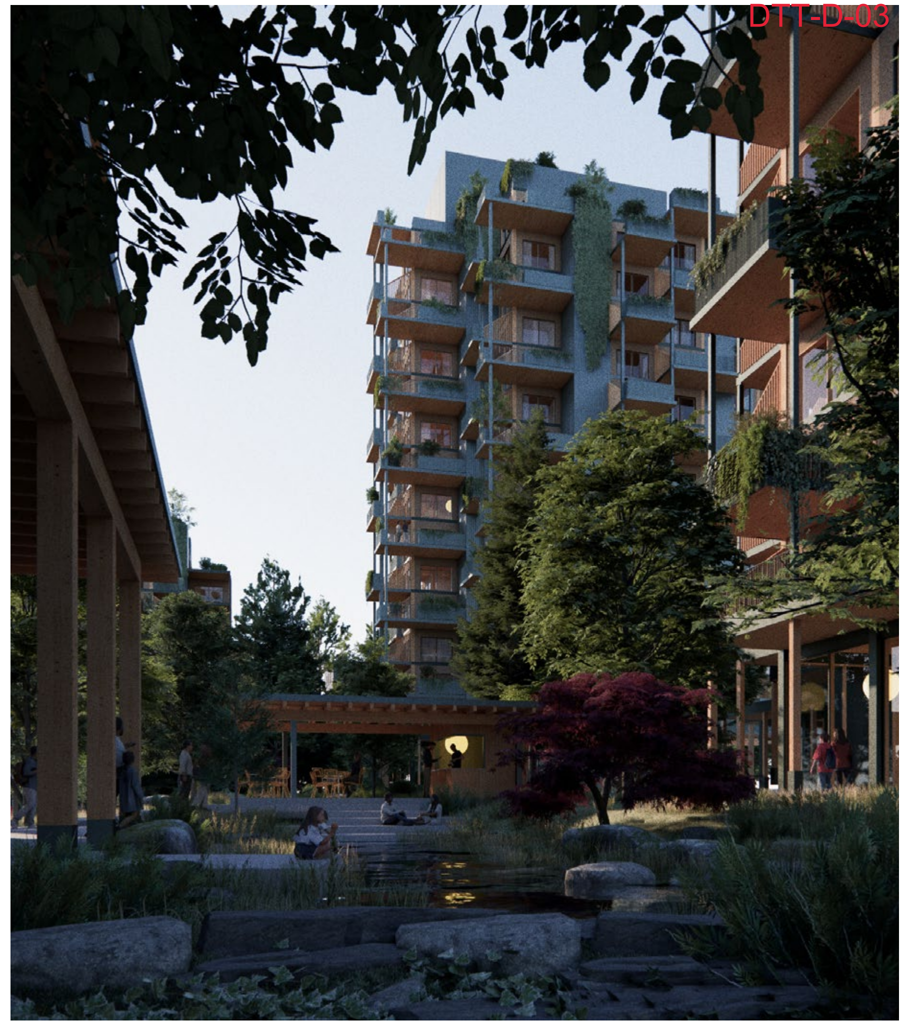
Concrete Tower-Podium Construction
- carbon intensive concrete construction
- complex structural and mechanical transfers
- excavation and concrete required for on-site parking
- large building footprint
- minimal outdoor public space
- secondary beams require additional coordination

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.

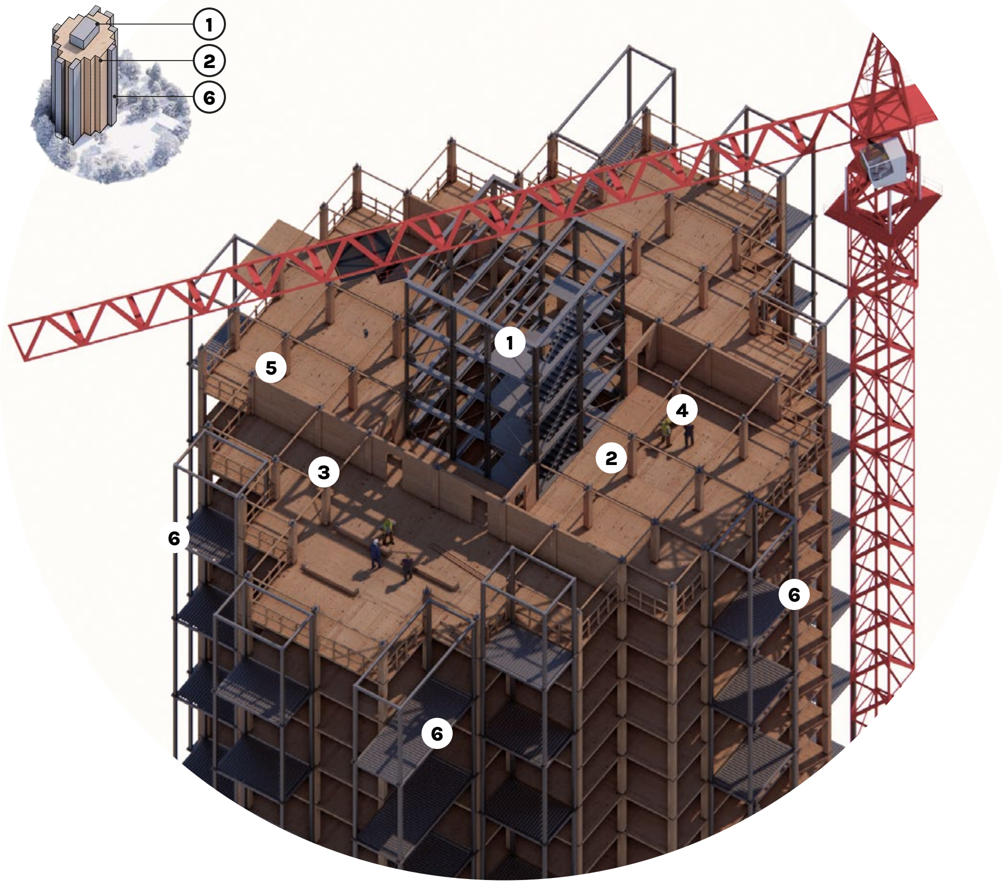
The site is bookended on the south residential zone by public art displays, and on the north by a communal fire pit overlooking the adjacent natural area and public waterfront.

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.

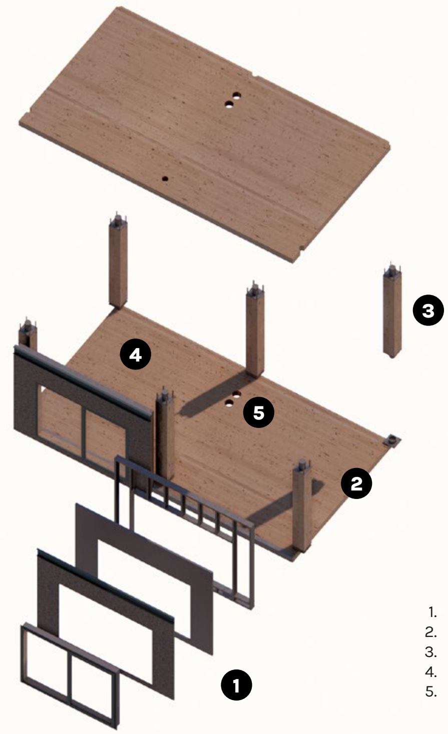
Left: 1. Water collection pond / Water garden 2. Firepit 3. Public art 4. Playground 5. Outdoor community room 6. Indoor community room 7. Covered Outdoor Pavilion 8. Residential lobby 9. Residential amenities 10. Small-scale commercial spaces 11. Car share parking / service access 12. Waterfront trail 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.

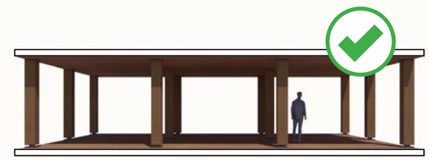


The balconies are conceived as pre-fabricated, modularized steel frame units that are self-supporting and tied back to the building at discrete points. The intent of de-coupling the balcony structure from the mass timber building is to reduce construction complexities typical of cantilevered structures 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

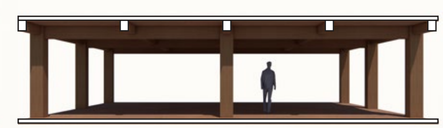


1. Pre-fabricated building envelope
2. Point supported CLT panels
3. 12" x 12.5" 16c-E DF glulam column
4. 12' x 10' structural grid
5. Pre-drilled slab openings



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"

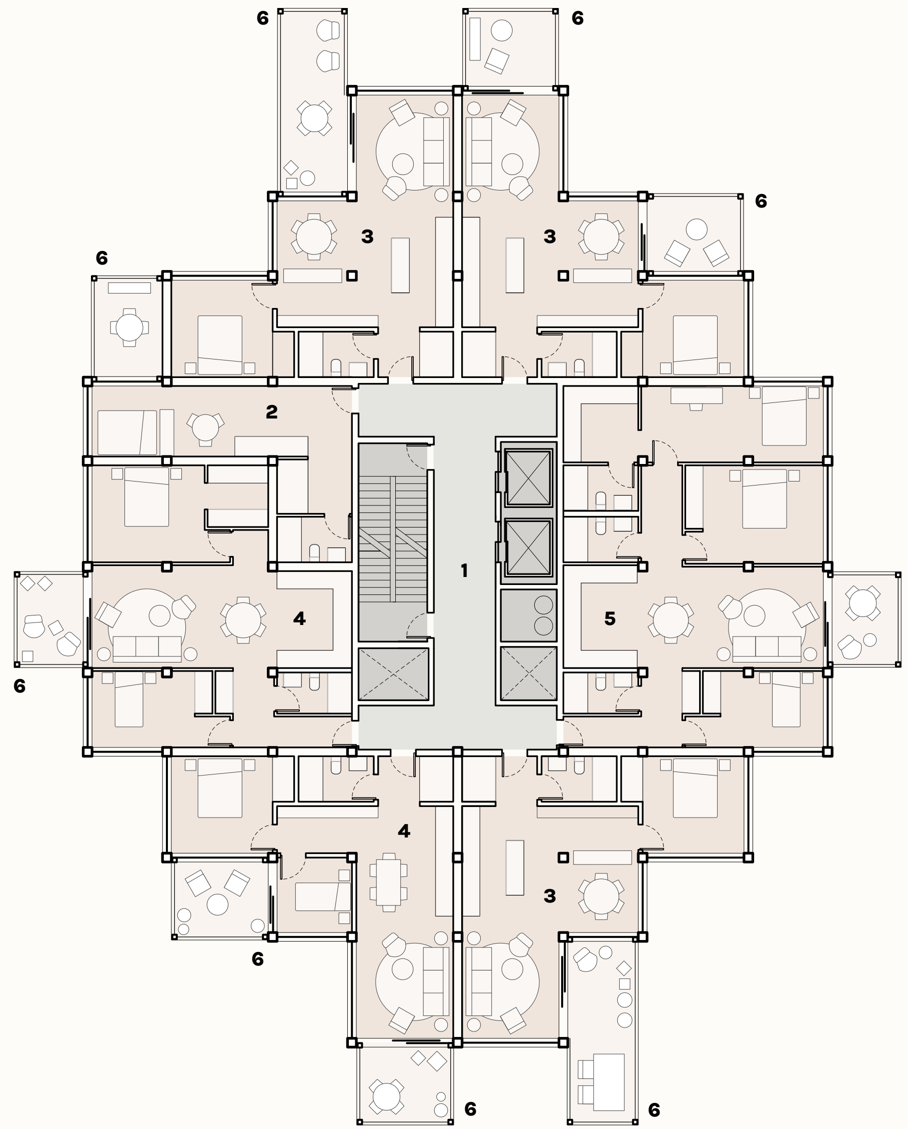
Compared to Post-and-Beam systems, Post-and-Plate construction uses fewer structural members, allowing for faster build times and reduced material complexity. This efficiency makes it possible to fit more floors within the same building envelope without sacrificing desirable ceiling heights which is 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

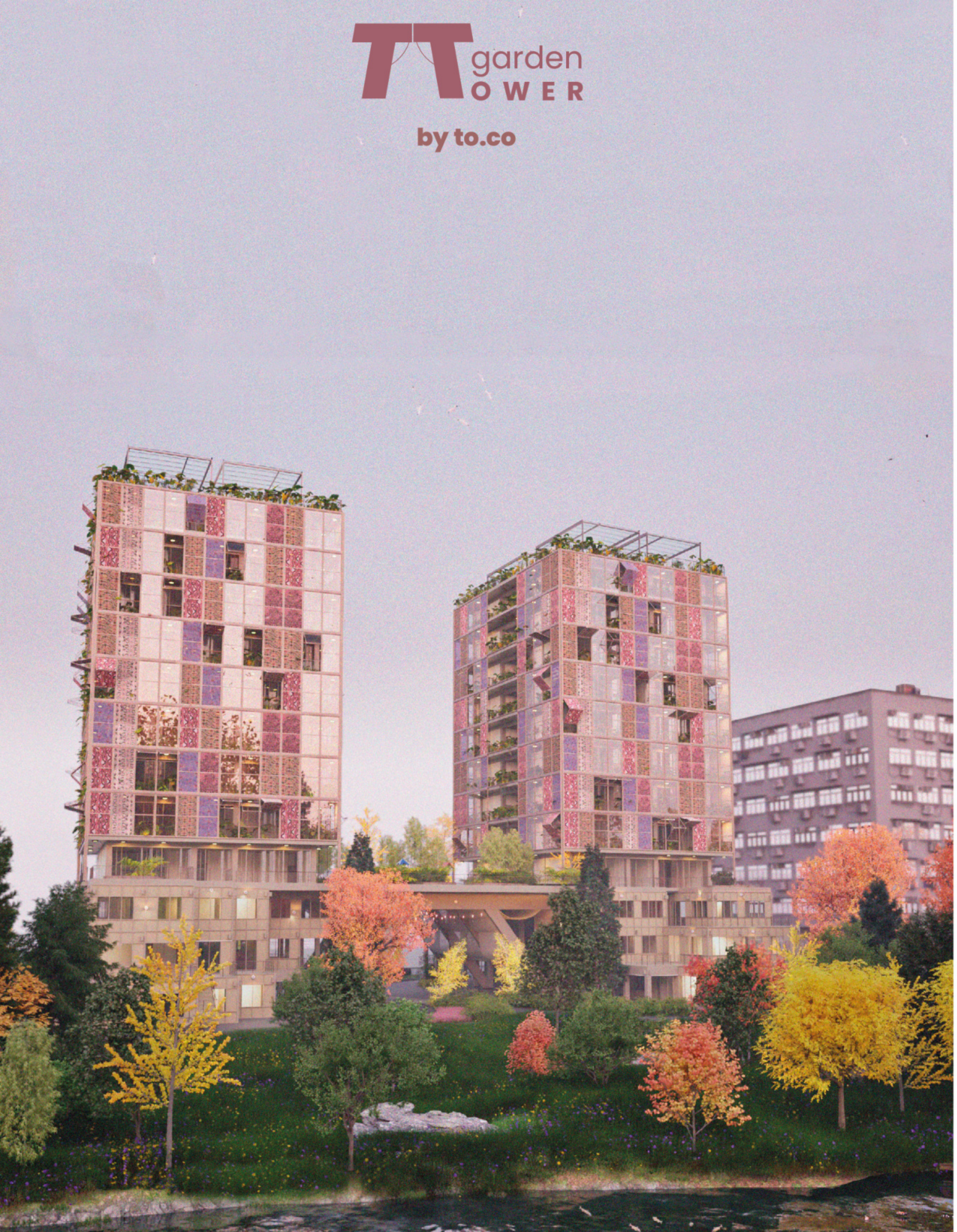
		Concrete		Timber Town	
	Square footage	$/sq ft	Cost	$/sq ft	Cost
Below grade		$315	$0	$299	$0
Base floor	23,250	$360	$8,370,000	$403	$9,369,750
Above 1st storey	255,555	$385	$98,388,675	$431	$110,144,205
	Quantity	$/unit		$/unit	
Balconies	176	$25,000	$4,400,000	$15,000	$2,640,000
	Cost / Month	# Months	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

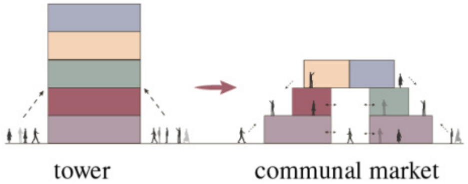
While timber construction may at present be costlier than it's concrete equivalent, the inherent benefits of timber such as reduction in the amount of embodied carbon and improvements in construction timeline (25% reduction assumed based on industry studies) are key considerations particularly when material 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.



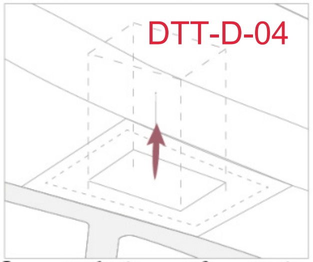
The ongoing climate and housing crises have challenged us to find new ways of living in urban centers. "The Tower Garden" emerges as a design methodology that seeks to reintroduce, through architecture, aspects of the traditional lifestyle and techniques of the Tsawwassen people. We aim to create a harmonious relationship between humanity and nature, market and community, tourism and local demands. This is achieved through multiple architectural programs.

The method is based on two main structures: the tower, where residential units are concentrated, and the communal market, inspired by Longhouse architecture, which features an internal courtyard for recreation and terraced geometry.

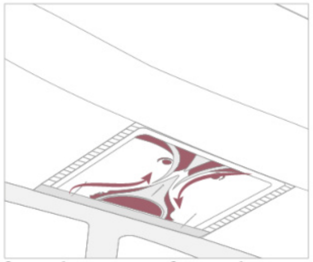


Due to the site's proximity to the water, we chose to create a connecting axis that links with the watercourse. Additionally, local ecological restoration will be promoted along this axis using native species, thereby integrating the architectural project with nature.

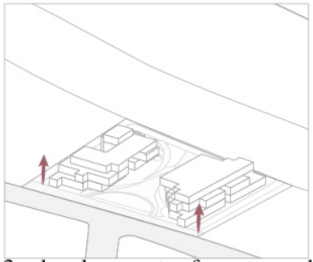
step by step



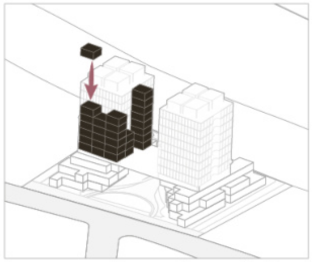
I. analysis of socio-environmental factors and local laws.



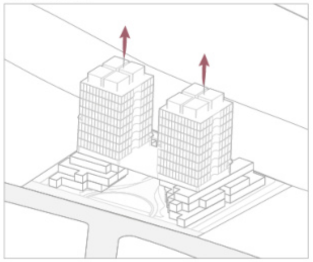
2. design of pedestrian pathways and connection to the natural environment



3. development of a stepped market, providing terraces for public uses.



4. tower dimensions defined by the demand for residential modules.



V. vertical building services module.

DTT-D-04

Our design method is guided by five architectural principles:

Autonomous Design: People aren't static, so architecture must adapt to the demands of the present and the future.

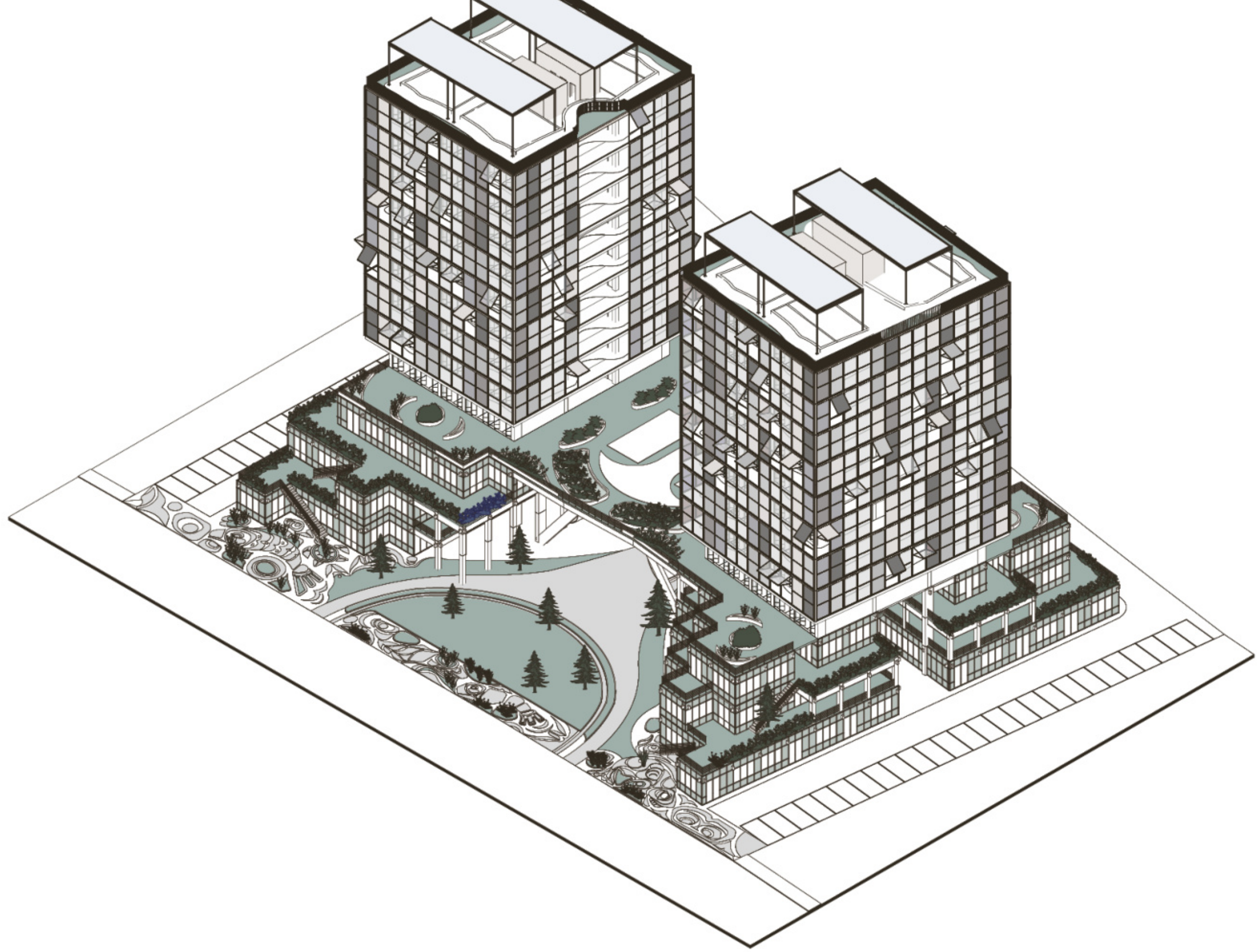
Social Inclusion: We understand that Canada is a culturally diverse society, with families of different sizes, incomes, and generations. Our architecture needs to reflect this plurality.

Human-Nature Ecosystem: The design should integrate with the flow of biodiversity in urban centers, providing an ecological infrastructure that allows for harmony between people and nature.

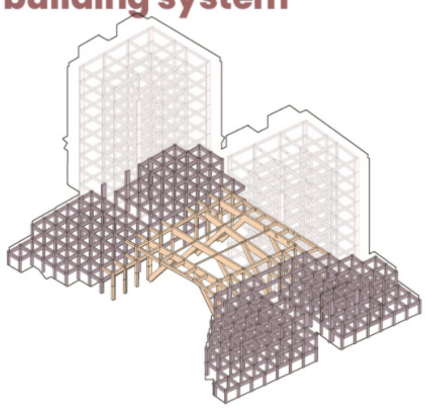
Solidarity Economy: The complex should provide commerce and services for the community, acting as a democratic space where small, medium, and large businesses can coexist.

Artistic Expression: The project must value and incorporate the traditional arts of the Tsawwassen into its aesthetic design. The goal is to highlight their cultural identity and keep traditional artistic techniques alive.

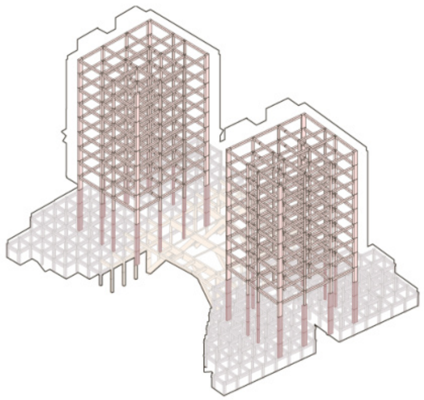
We translated these principles into design strategies and architectural programs that promote continuous human-animal interaction throughout the day. In this way, the architectural ensemble sustains a vibrant and dynamic urban-ecological system.



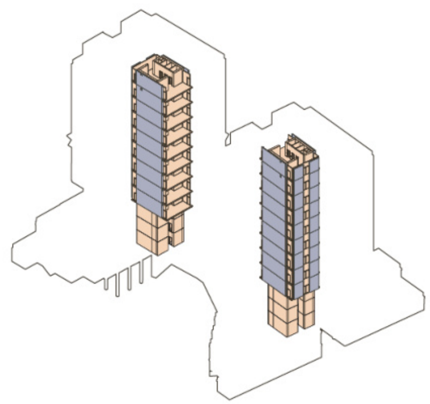
building system



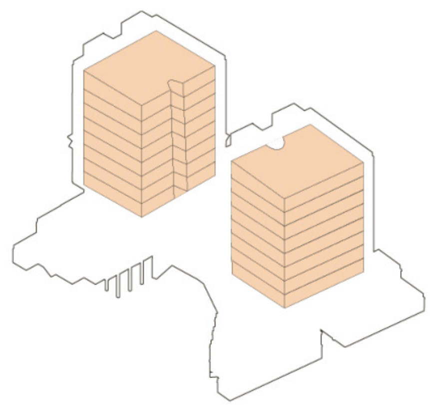
1. The communal market's structure is lighter and more affordable, cutting construction costs and time. Structural modules measure 4x4x4 meters, half the size of tower modules.



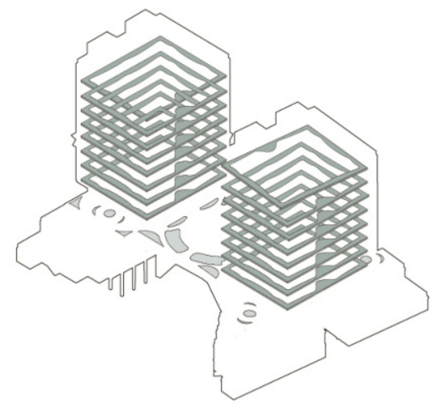
2. Above the public market, starting from the third floor, rise the residential towers. Its structural modules measure 8x8x4 meters, with reinforced corner columns to resist torsional effects.



3. The infrastructural core rises within the tower, with 50 cm-thick concrete walls. In addition to elevators and the emergency stairwell, it also contains services wall and waste chutes.



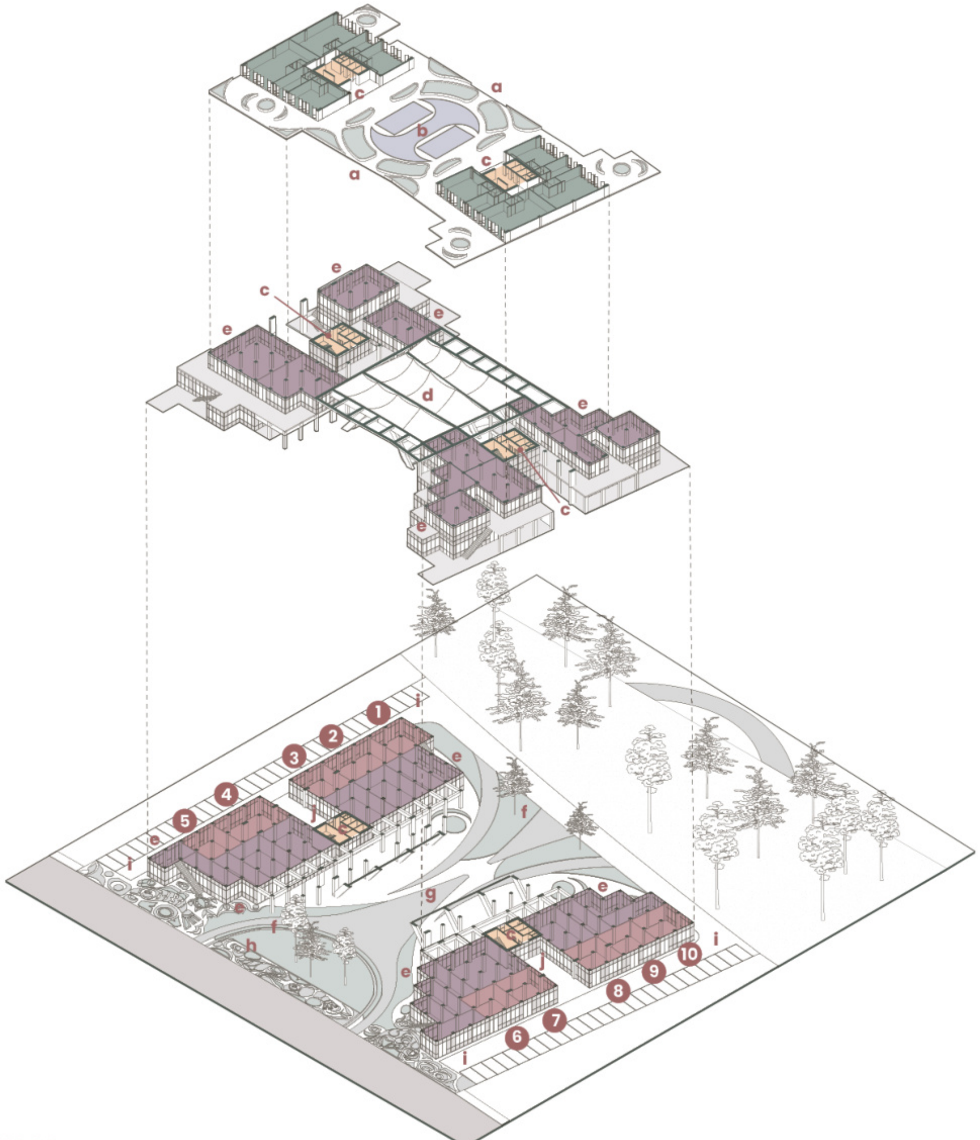
4. A total of nine residential floors are built. The rooftop level will be used for the installation of solar panels, water tanks, and service equipment.



5. Compact community urban gardens are arranged along the terraces of the residential tower. These garden will host native plant species, helping to preserve local fauna and provide organic food

community market

The first three floors are designated for commercial activities, including a community market with a flexible, independent structure. This space is inspired by the architecture of the Tsawwassen people's Long Houses and, therefore, houses all the public life of the complex. The goal is to provide a dynamic environment for services, recreation, work, and consumption for residents and the neighborhood. Located along the sides adjacent to the parking area are public workshops dedicated to community production, with activities focused on craftsmanship, culture, and gastronomy. At its center, the events plaza offers a large space for unplanned, routine uses such as street fairs, festivals, and cultural and political events. Above it is the residents' communal amenity floor, which includes recreational courts and community gardens for an organic food alternative. Finally, the market's stepped geometry creates terraces for public use and greenery. The open parking serves residents and visitors, optimizing space and reducing vacancy.



uses

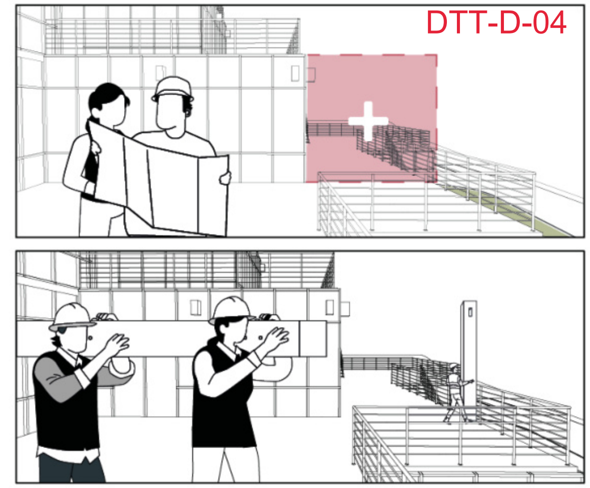
- a community gardens
- b leisure
- c vertical circulation
- d fabric coverings
- e businesses
- f multispecies park
- g event square
- h promenade
- i parking lot
- j residents' entrance

community workshops

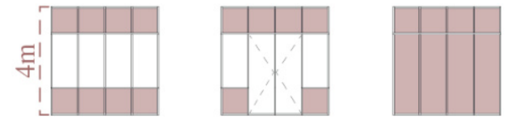
1. handicrafts
2. gardering
3. jewelry
4. industrial kitchen
5. woodworking
6. furniture
7. sewing
8. tapestry
9. repairs
10. mechanics

construction system

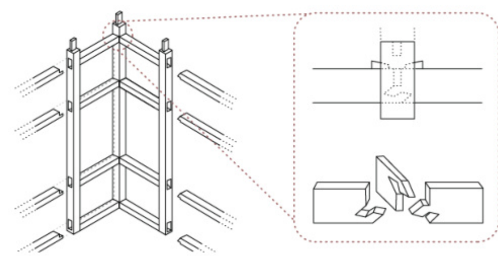
Initially, the layouts for the commercial spaces are delivered in various sizes, as we aim to democratize access to the complex's infrastructure. The structure was designed as a modular joinery system, allowing parts to be easily produced in the carpentry workshop and installed with minimal resources. The structural modules are 4x4x4 meters; thus, columns and beams share the same dimensions. Whereas partitions is 1x4 meters, endors are allowed to install doors, storefront glazing, and solid partitions. This ensures the architectural complex can be modified to meet changing demands.



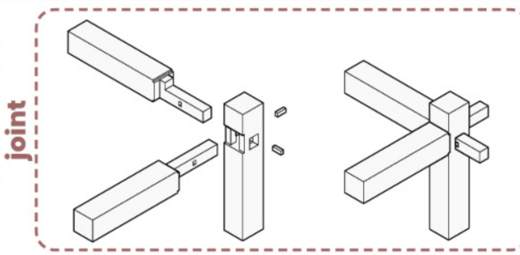
wall sealing



structural timber frame connection



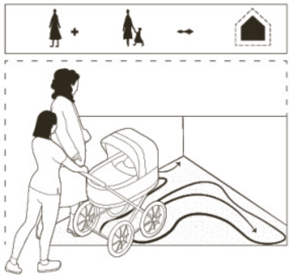
column-beam joint



live and grow

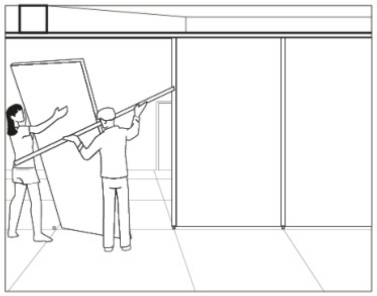
We designed homes that can keep up with each family's life journey. The whole inside of the building was created with a modular system, which can be altered according to the residents' demands.

It all begins with a student discovering a new city

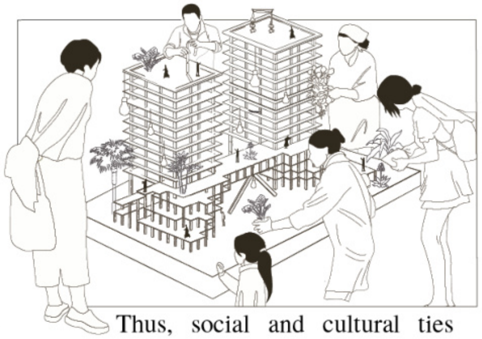


Over time, a new family emerges, requiring more space in their home.

The neighbor next door is willing to sell an empty module of their apartment.



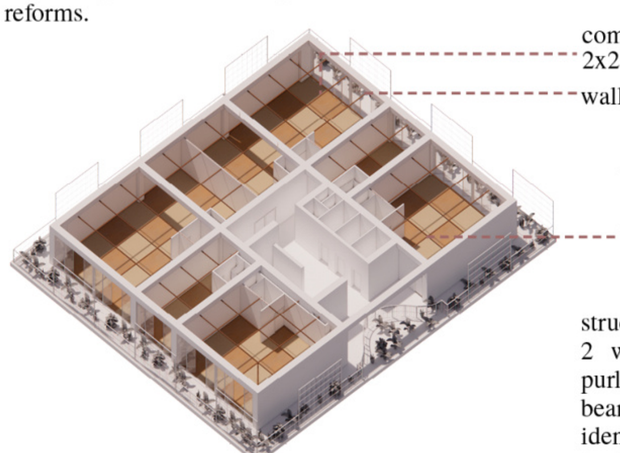
The family disassembled the walls that separated the apartment and expands their home.



Thus, social and cultural ties endure even amidst the changes of time.

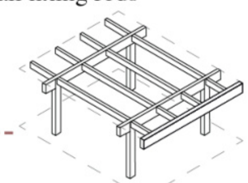
The walls are secured using rods anchored to the floor and ceiling, in modules of 2-by-2 meters, meanwhile, the walls may be assembled with 2-by-4 meter prefabricated panels. Therefore, to increase or decrease spaces, it is simply necessary to dismantle the structure and reassemble it in the next module, without generating waste. Thanks to the presence of the community carpentry workshop, the walls and fittings can be produced locally.

Initially, four main housing typologies are planned, aimed at different family profiles. The residences are distributed along the infrastructural core, with side services walls that accommodate the entire hydraulic and sewage infrastructure. This way, residents can arrange wet areas along the entire infrastructural axis without requiring extensive reforms.



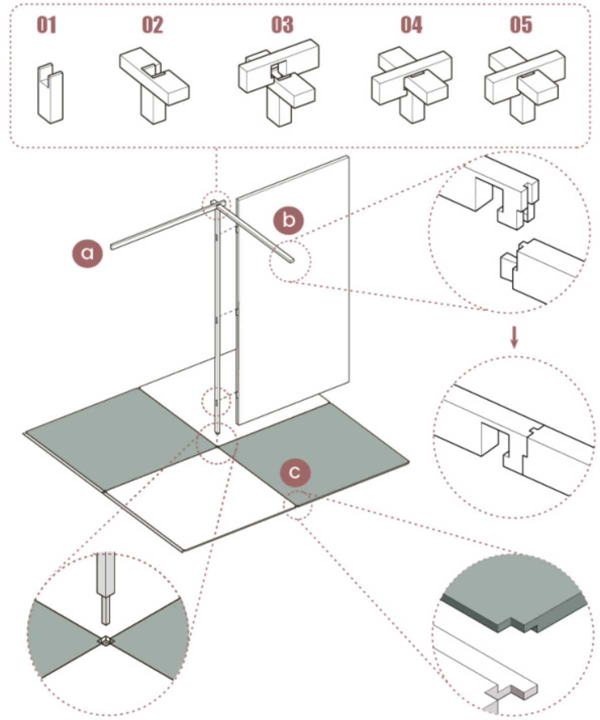
common wall/floor module 2x2m

wall fixing rods



structural module 8x8m, 2 way glulam beams with purlins.

beams and columns share identical modular dimensions to streamline construction.

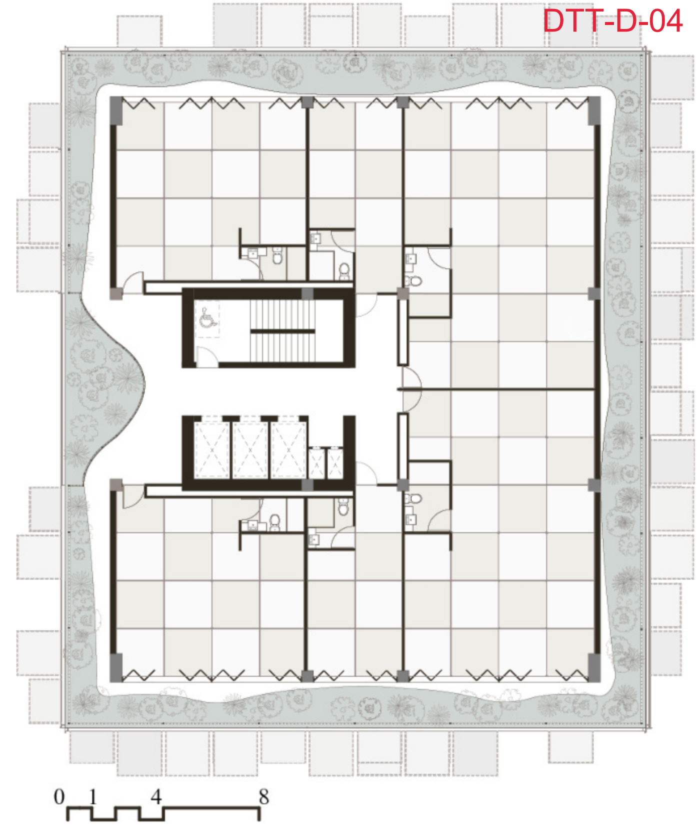


- a structural wood fitting for the division module
- b closing panel, which may or may not include a door
- c interlocking and alternating floors within the module

Thus, different types of occupation can be created.

1. singles, couples, and tourists (1 bedroom - 32m²)
2. elderly and small families (2 bedrooms - 68m²)
3. medium-sized families (3 bedrooms - 100m²)
4. large families (4 bedrooms - 136m²)

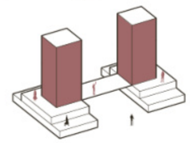
service wall



facades that tell stories

In this housing system, the landscaping reflects the expression of traditional Tsawwassen arts. The entrance promenade, for instance, showcases a beautiful permeable stone mosaic of fish swimming in the water, inspired by the artistic style of the Tsawwassen.

At the same time, the popular market and the facade of the residential tower are adorned with tapestry pieces crafted by local artists. This gives the building a distinctive aesthetic that stands out in the urban landscape and positions it as a potential tourist landmark for the city



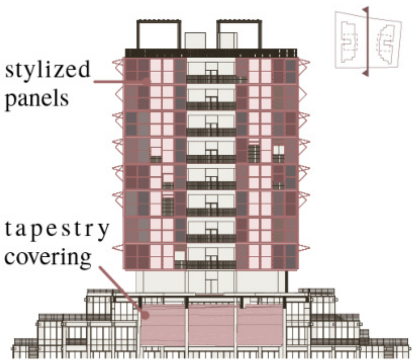
promoting greater visibility of Tsawwassen art while fostering cultural tourism

empowering small artisans through production demand and economic activity

ʔami ce:p

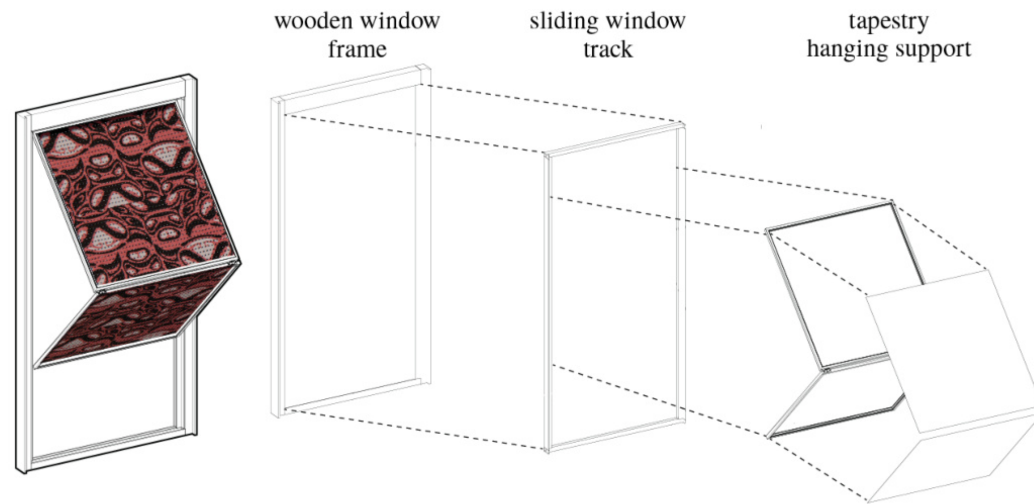
preserving and promoting artistic and cultural expressions within contemporary Canadian society

facade design

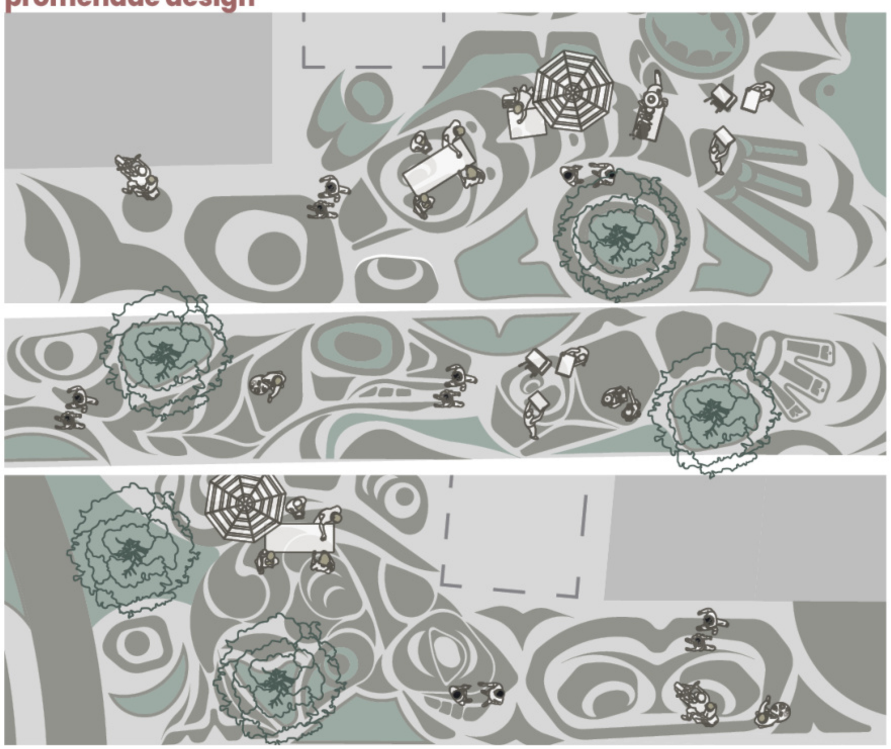


panel framing

The use of locally crafted tapestries not only supports Tsawwassen's small-scale artisans, but also contributes to preserve and promote the artistic and cultural heritage of Canada's Indigenous communities. The panels feature wooden frames and are retractable, allowing natural airflow and daylight to enter the residential units



promenade design

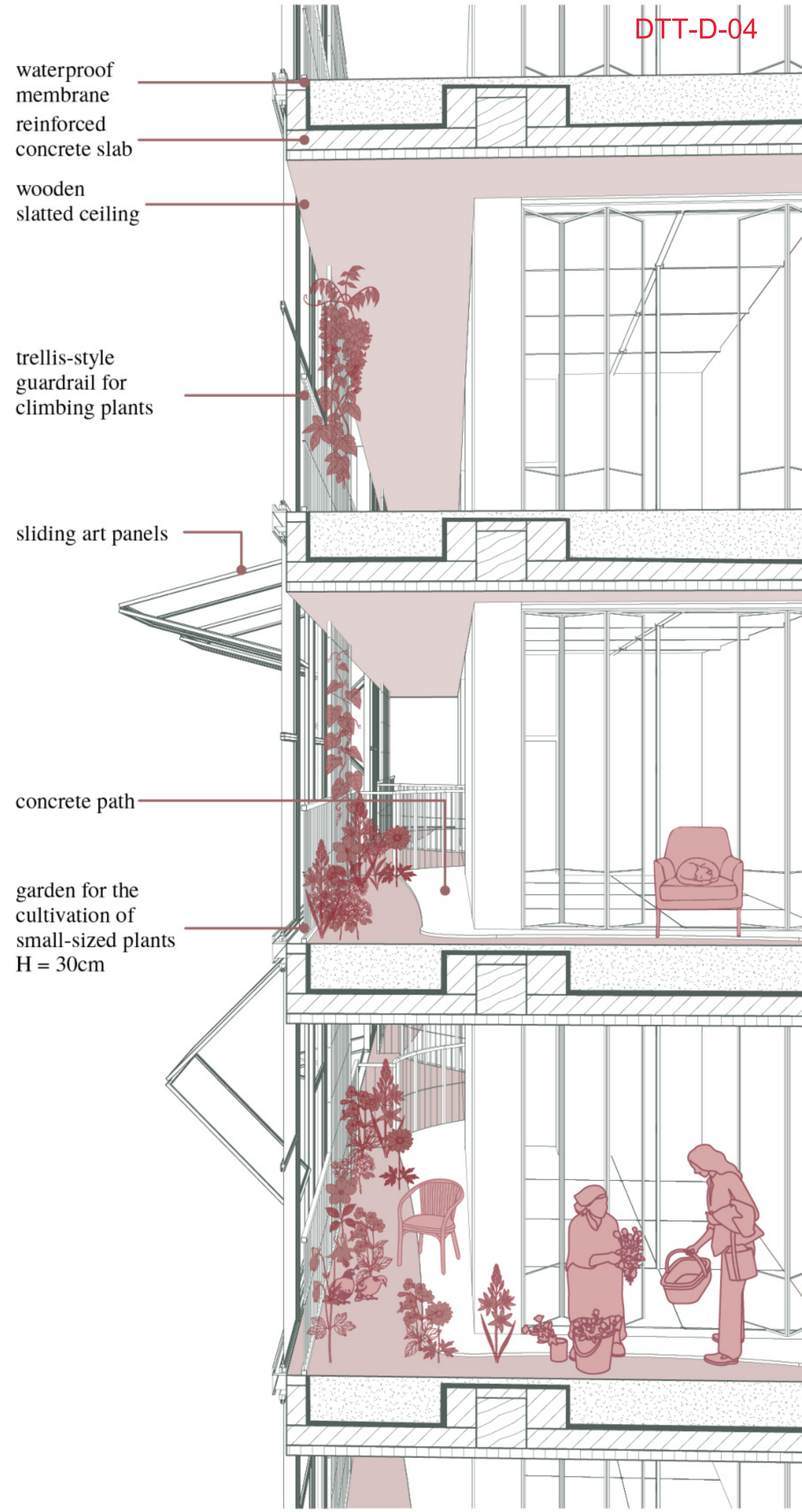


design panels

DTT-D-04

urban ecology

Throughout the entire building, we propose a multi-species landscape project that interacts with human, animal, plant, and water life. To achieve this, we will introduce native trees and shrubs species that can bloom and produce fruit in different seasons. This will provide urban wildlife with a continuous and organic food source. The species will be arranged as follows: (i) Ornamental plants will be placed mainly near the promenade and along the residential tower's balconies; (ii) Vegetables, medicinal plants and edible seeds will be planted in the community gardens, focusing on foods found in the local, traditional Tsawwassen cuisine; (iii) Flood-tolerant species will be planted near the riparian forest park border. This revitalization will also help with decarbonization and the recovery of native animal and plant presence in the city, as well as help mitigate the effects of urban heat islands.



areas

lot size (ft²)	87337
building sq ft above grade (ft²)	148734
FSR	1.703
Building effiiciency (%)	85%
non saleable/ rentable (sq ft)	22310.16
saleable/ rentable (sq ft)	126424.24
stories below grade	0 per tower
base floor	1 per tower
base floor	11 per tower
total stories (units)	12 per tower
residential	9
commercial	3
residences (units)	108
bedrooms (units)	108
residents (units)	324
area (ft²)	101,244
commercial (units)	54
area (ft²)	47,490
amenity space (ft²)	17,774

construction costs

residential tower
(8m x 4m x 4m modules, glulam beams with purlins)

		concrete		mass timber	
	area (ft²)	**$/sq ft**	**$/sq ft**	**$/sq ft**	**cost**
below grade	0	$315	0	$341	0
base floor	1327	$360	477,720	$459	609,093
above 1st storey	99917	$385	38,468,045	$491	49,059,247
balcony	**quantity**	**$/unit**	**$/unit**	**$/unit**	**cost**
	-	25,000	-	25,000	-

community market
(4m x 4m x 4m modules, glulam beams with purlins)

		concrete		mass timber	
	area (ft²)	**$/sq ft**	**$/sq ft**	**$/sq ft**	**cost**
below grade	0	$315	0	$289	0
base floor	22335	$360	8,040,641	$389	8,688,359
above 1st storey	25155	$385	9,684,775	$417	10,489,743
shedule costs (monthly overhead)	**cost** (per month)	**month**	**cost**	**month**	**cost**
	50,000	18	900,000	13	650,000
		total 57,571,181		**total** 69,496,442	

embodied carbon

residential tower
total building Sq footageft
101,244

embodied carbon
(kg/sq ft)

concrete	mass timber
6,69	3,07

total carbon

concrete	mass timber
677,223	310,394

community market
total building Sq footageft
47,490

embodied carbon
(kg/sq ft)

concrete	mass timber
6,69	2,6

total carbon

concrete	mass timber
317,664	123,536

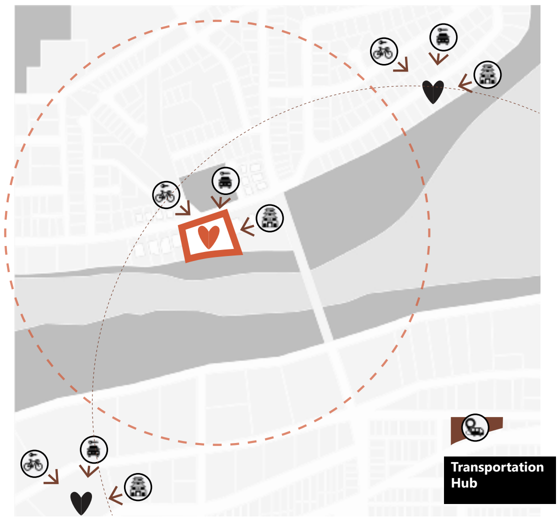
total carbon

concrete	mass timber
994,887	433,930

CO-RISE

A Prototype for Sustainable Living

This project redefines affordable housing through **a mass timber, co-operative model rooted in Tsawwassen's cultural** and ecological landscape. By integrating resident ownership, flexible living arrangements, and shared amenities, it establishes a benchmark for quality and affordability that goes beyond conventional housing delivery. The design leverages prefabricated timber systems for speed, sustainability, and lifecycle efficiency, while providing identity to the local community.



Context & Place

- Situated in Vancouver, on ancestral Tsawwassen land, within a marshland landscape oriented to the river.
- At the edge of TOA3 zoning, 15 minutes from rapid transit, shops, and services.
- Surrounded by a mono-residential neighbourhood needing diversity.

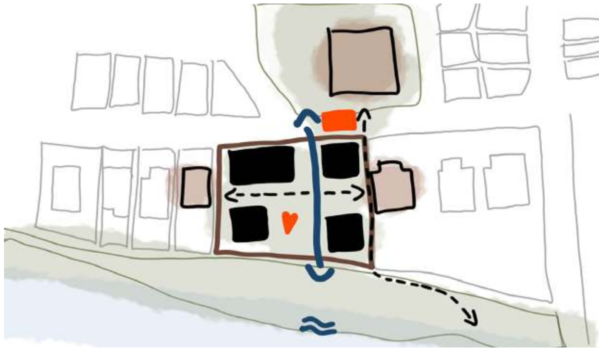
Opportunity

- Establish a community anchor that combines cultural, commercial, and public infrastructure.
- Create a safe, walkable hub that links housing with everyday services and sustainable transportation.
- Demonstrate a replicable model: by multiplying hubs like Co-rise across the neighbourhood, the area can evolve from mono-use suburbia into a connected, walkable, and identity-rich community.

Co-operative Housing Model

- Resident-owned, ensuring long-term affordability.
- Flexible layouts and shared amenities build resilience.
- Prefabricated timber construction reduces costs, accelerates delivery, and supports sustainability.

DTT-D-05



1 Gateway Hub
Threshold location: Positioned between a local school and regional transit hub, linking education, mobility, and community life.

2 Village Heart
New plaza acts as a connective tissue, prioritizing pedestrian safety — especially for children walking to school — and reinforcing a village-like pattern of walkable proximity.

3 Ceremonial Spine
A strong north-south axis organizes the plan around a ceremonial procession, anchoring arrival at the street and extending toward the river. This movement establishes a cultural and spatial narrative that honours Tsawwassen ways of gathering and connecting to water.

4 Courtyard
A secondary east-west axis connects adjacent buildings into a shared open courtyard, creating permeability and reinforcing a sense of communal stewardship.

5 Longhouse
At the heart of the shared courtyard sits a timber community centre, imagined as a place of ceremony, shared meals, learning, and intergenerational connection- an integral part of Tsawwassen culture. Here, stories are passed on, neighbours gather, and community life unfolds in daily rituals and seasonal events.

6 Elders
Celebrates elders as cultural anchors within the community, placed in the most private and protected location of the neighbourhood.

7 Mobility Hub
A mobility hub with e-bikes and e-car rentals on site, encouraging alternative and sustainable modes of transportation.

8 River Connection
To the south, a pier extends toward the Fraser River, evoking Tsawwassen's deep connection to the water and its fishing culture. This water edge also offers future potential as a transportation node — linking the community with the broader region through ferries or river shuttles.

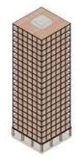
Commercial
Community
Residential
BOH

DTT-D-05

Full Life Cycle

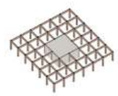
Architecture is no longer defined by the moment of construction, but by the entire life cycle of a building. Our proposal looks beyond completion, designing for how it is made, lived in, adapted, and ultimately disassembled. Every stage—from material sourcing to reuse—is considered, ensuring a system that delivers durability, carbon efficiency, and long-term value. This is not just a building—it's a circular framework for living.

1.Production
Responsibly sourced FSC-certified timber
Prefabricated panels and components
Digital material passport created for each unit



2. Construction
On-site assembly of prefabricated panels and modules
Just-in-time delivery minimizes staging and site waste
Core poured on-site; rest dry-assembled

3. Use & Maintenance
Modular interior allows unit adaptability over time
Exposed wood aging naturally—low maintenance



4. End of Life
Non-glued connections allow demounting
Materials sorted for reuse and remanufacturing
No mixed composite waste

5. Beyond
Refurbishment and reuse of components

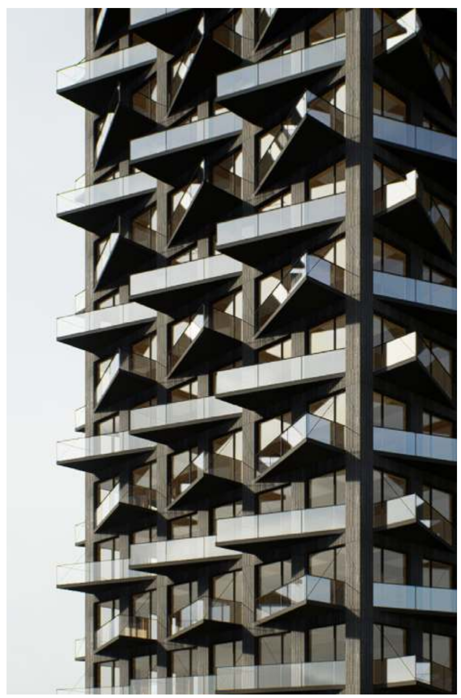
Structure

We employ a hybrid timber structure-mass timber columns and beams with CLT floor panels-to reduce embodied carbon, paired with a concrete core to meet BC Building Code requirements for fire protection and seismic performance.

3.6 x 3.6m

7.2 x 7.2m

We utilize a 3.6 m structural span for residential units and a 7.2 m span for ground-floor commercial spaces, enabling both programmatic flexibility and efficient on-site delivery of prefabricated components. This span strategy also optimizes material use, reducing structural costs while supporting modular construction logic.



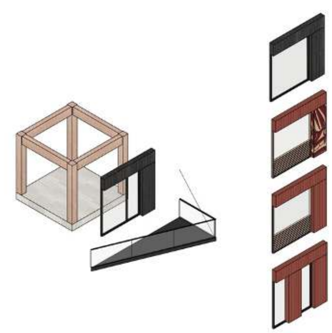
Facade

Modular: A single facade unit serves as the versatile base, adapting across the compound to create a unified yet diverse aesthetic full of personality.

Flexible: The same unit transforms—into window frames, shaded balconies, or striking geometric accents—tailoring to each space's needs.

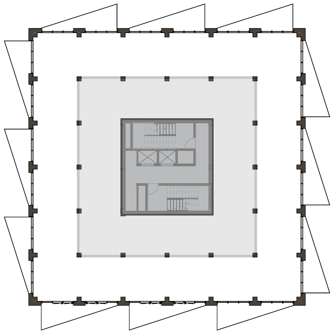
For the elders' section, CNC machine technology carves intricate patterns, drawing inspiration from Tsawwassen art to honor cultural heritage.

Sustainable doesn't mean boring!



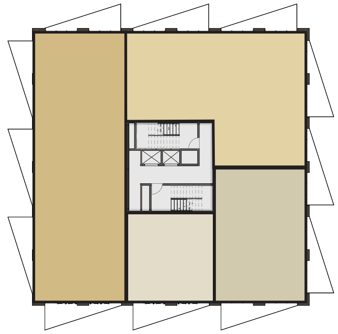
DTT-D-05

Units



GFA= 473 m²
Core Area = 54 m²
Efficiency = 88.6%

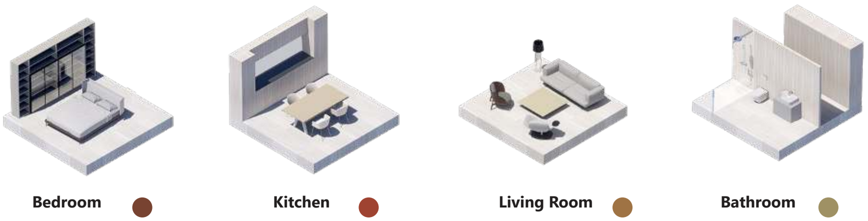
The open structural grid supports highly adaptable layouts. By concentrating services within the first bay, the remaining unit space enjoys taller ceilings and a more generous interior atmosphere. With a compact core and a floorplate efficiency of 88.6%, the design maximizes usable area—supporting affordability, flexibility, and future-proof planning.



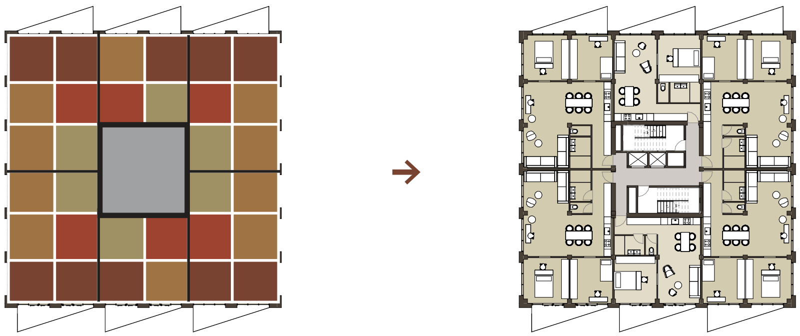
1 Bedroom 50 m² | **2 Bedroom 78 m²** | **3 Bedroom 130 m²** | **4 Bedroom 156 m²**

The modular grid enables a diverse mix of unit sizes—from compact 1-bedroom apartments to spacious 4-bedroom family homes—supporting intergenerational living and long-term adaptability.

From grid to home



Bedroom **Kitchen** **Living Room** **Bathroom**

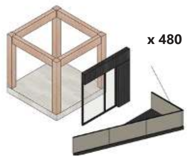


The 3.6 m structural grid yields a 13 m² room—an ideal unit of space that balances livability with modular efficiency. This compact module serves as the foundation for all apartment layouts, easily configured as a bedroom, kitchen, or living room. Over time, the apartment can grow and adapt to evolving household needs—such as welcoming a new family member or shifting functions without structural changes.
This diagram illustrates how a simple, repeatable unit becomes a richly programmed living environment through modular logic and off-site prefabrication.

DTT-D-05

System

Our system rethinks the high-rise as a low-carbon. This project demonstrates how a prefabricated mass timber system can deliver cost efficiency, carbon reduction, and architectural quality within a high-rise context. By carefully choosing our materials, we achieve a 60% reduction in embodied carbon and nearly 5% reduction in overall construction costs. Prefabrication shortens the construction schedule while enhancing precision and reducing waste. The result is a system that not only meets stringent code requirements but also sets a new benchmark for affordability, sustainability, and design excellence in tall timber construction.



CONSTRUCTION COSTS

		Concrete		Submission	
	Square footage	$/sq ft	Cost	$/sq ft	Cost
Below grade	0	$315	$0	299	$0
Base floor	5037.51	$360	$1,813,504	385	$1,939,441
Above 1st storey	95712.691	$385	$36,849,386	409	$39,146,491
	Quantity	$/unit		$/unit	
Balconies	114	$25,000	$2,850,000	$7,300	$832,200
	Cost per month	# Months	Cost	# Months	Cost
Overhead)	$50,000	18	$900,000	12	$600,000
TOTAL			**$42,412,890**		**$42,518,132**

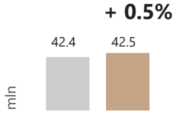
Interior surfaces are left exposed, eliminating the need for secondary finishes such as drywall and paint. The result is a clean, warm, and durable surface that performs as both structure and finish. This strategy alone leads to an estimated 5% reduction in total construction costs, while elevating spatial quality and reducing waste.

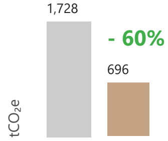
Prefabrication further enhances efficiency. Structural and envelope components are manufactured off-site under controlled conditions, then delivered and assembled with precision. This significantly reduces on-site labor and weather delays, contributing to a construction timeline up to six months shorter than conventional concrete systems.

EMBODIED CARBON

		Concrete		Submission	
	Sq ft	Embodied Carbon kg/sq ft	Total Carbon	Embodied Carbon kg/sq ft	Total Carbon
Total Building Sq Footage	258334	6.69	**1728000.29**	2.69	**696000.475**

Swapping concrete for CLT and glulam slashes embodied carbon by -42%—saving over 1,000 tonnes of CO_2e. Our balcony system even stores more carbon than it emits.
Additionally, designed for disassembly, each system component can be reused or repurposed—supporting a truly circular building lifecycle.





Together, these design and delivery choices offset the material premium of mass timber with measurable gains in speed, performance, and lifecycle economy.

Materiality

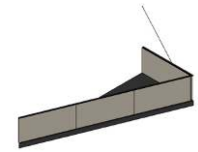
Structure

Span: 3.6m x 3.6m
CLT on glulam beams

Envelope

-Cedar siding tinted black
-50 mm Mineral Wool Rigid Insulation
-Self-Adhered Membrane (AWB)
-3-ply CLT Panel (90 mm)
-Smart Vapor Retarder
-Exposed CLT tinted black
-Wood-Framed Windows, Triple Glazing

Balcony



-Timber structure + anchors
-Waterproofing membrane
-Wood decking
-Glass railing system

	Structure	Envelope	Balcony
Submission	**Cost ~ $10,300/bay** +39.6% **Carbon ~ 364 kgCO_2/unit** -42%	**Cost ~ $5,500 / panel** +15.8% **Carbon ~ 650 kgCO_2e per panel** −18.8%	**Cost ~ $7,000/ unit** −72% **Carbon ~ −340 kg CO_2e** −168% **(net carbon stored)**
Concrete baseline	**Cost ~ $7,380** **Carbon ~ 630 kgCO_2e**	**Cost ~ $4,750** **Carbon ~ 800 kgCO_2e**	**Cost ~ $25,000** **Carbon ~ 500 kgCO_2e**

To meet BC Code requirements for fire safety in exposed timber, we apply a char-rated approach-carefully sizing structural members to maintain integrity under fire conditions-and integrate a high-performance sprinkler system. This allows us to forgo full encapsulation, preserving the natural character of the material.

CO-RISE

A Prototype for Sustainable Living

Financial & Delivery

Co-rise is built on a cooperative ownership model where residents purchase shares that grant the right to occupy a unit. This structure removes the developer profit margin and ensures that any surpluses are reinvested directly into building upkeep, community amenities, or the creation of future cooperatives.

Affordability is further strengthened by reduced construction costs: prefabrication shortens the building schedule, lowering both interest and carrying costs.

A mixed-use strategy introduces commercial spaces at the ground floor, generating steady rental income that offsets annual maintenance and contributes to the reserve fund—building resilience against rising service charges.

Shared amenities such as community rooms, and a mobility hub reduce the need for larger private units. By encouraging resource sharing, Co-rise delivers smaller, more efficient apartments with lower construction and operating costs per household.

Finally, **delivery** is supported by a clear approvals pathway. The project fits within TOA3 zoning with only minor relaxations, following the standard sequence of rezoning, development permit, and building permit. Cooperative tenure is already recognized in BC law, meaning no new legal framework is required.

Height & Site Efficiency
Current BC regulations permit mass timber construction up to 19 storeys. Co-rise extends this to 20 storeys, a modest but impactful step that allows more efficient use of the site. By slightly increasing the tower height, we reduce the footprint of the high-rise portion, freeing land for complementary low-rise buildings that transition more gently to the surrounding neighbourhood. This strategy not only maximizes affordability through better land use, but also creates a more context-sensitive edge condition — balancing tall **timber innovation** with the smaller scale of adjacent residential fabric.

Submission Data	
FSR	**3**
Lot size (sq ft)	**86,111**
Building sq ft Above Grade	**258,334**
Building efficiency (%)	**88.6**
non saleable/rentable (sq ft)	**31,000**
saleable/rentable (sq ft)	**227,334**
Total Stories above grade (#)	**19**
Total Stories (#)	**20**
Base floor (#)	**1**
Above 1st storey (#)	**19**
Stories below grade (#)	**0**
Units (#)	**183**
Bedrooms (#)	**495**
Amenity space (sq ft)	**23,681**
Non-residential (sq ft)	**27,986**

DTT-D-05

DTT-D-06

HOUSE OF ONE
DECODING TIMBER TOWERS

A NEW PARADIGM FOR SUSTAINABLE URBAN LIVING, DRIVEN BY TIMBER AND CONNECTIONS.

THIS DESIGN IS A VERTICAL COMMUNITY THAT REDEFINES URBAN LIVING THROUGH THE INTEGRATION OF TIMBER, STEEL, COMMUNITY FOCUSSED SPACES AND A COMMITMENT TO CARBON REDUCTION. IT AIMS TO CREATE A REPLICABLE MODEL FOR HIGH-DENSITY HOUSING THAT IS BOTH BEAUTIFULLY BUILT AND A CATALYST FOR INDUSTRY WIDE CHANGE.

THROUGH OPTIMIZED LAYOUTS SPREAD ALONG A 8-16-24' GRID PATTERN THE PROJECT AIMS TO BE COMPLETED 100% PRE FABRICATED. REMOVING ANY BELOW GRADE ELEMENTS, ALIGNING THE STRUCTURE DIRECTLY ON GRADE, REDUCES CARBON FOOTPRINT AND CREATES A LIGHT ON THE LAND DESIGN.

LOT SIZE = 87,250 SF

FSR = 4.8

MAX HEIGHT = 220'

TOTAL BUILDING AREA = 416,000 SF

NUMBER OF UNITS = 280

NUMBER OF BEDS = 542

ESTIMATED COST PER SF = $350

ESTIMATED PROJECT BUDGET = $150,000,000

ANATO-MIZE

STRUCTURE

- EXPOSED MASS TIMBER SUPERSTRUCTURE WITH FIRE RESISTENT COATING - BUILDING DESIGN ENSURES NO PUBLIC SPACE OR OPENING IS WITHIN 8 FEET OF STRUCTURAL TIMBER.

- STEEL PODIUM TO ALLOW FREE MOVEMENT ON THE LOWER LEVELS OF THE BUILDING.

- TIMBER AND STEEL ELEMENTS BASED ON A 17'-6" GRID WITH CONSISTENT SIZING THROUGHOUT TO ALLOW EASIER PREFAB-RICATION.

FIRE RESISTENCE

- EACH UNIT COMPRISES OF A FULLY ENCLOSED 2 HOUR RATED MINIMUM RATING.

- INDIVIDUAL SYSTEMS MINIMIZE UNIT PENETRATIONS AND SIMPLE LAYOUTS ALLOW EASY FIRE SUPPRESSION.

SYSTEMS

- SELF CONTAINED ERV AND FAN COIL UNITS GIVE TOTAL CUSTOMIZATION TO THE UNIT AND ALLOW IT TO ACT STAND ALONE TO THE REST OF THE STRUCTURE. SIMILAR FOR HOT WATER SYSTEMS.

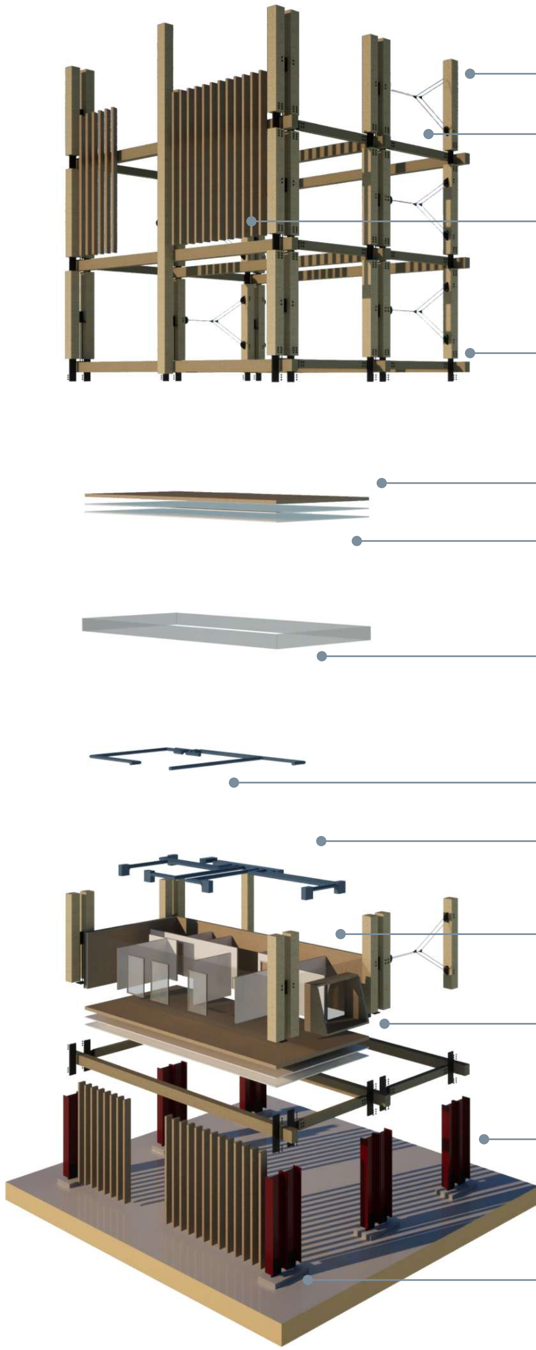
DESIGN FEATURES

- DESIGNED AS A WOOD FRAME BUILDING SITTING WITHIN A MASS TIMBER SUPERSTRUCTURE.

- LAYOUTS TAKE THE BENEFITS OF LOW RISE CONSTRUCTION, PREFABRICATION, AND STICK FRAMING TO STREAMLINE THE CONSTRUCTION PROCESS.

- STEEL PODIUM ALLOWS COMPLEX SITE LAYOUTS WITHOUT COMPROMISING FIRE RATINGS. WINDOW PLACEMENT ALLOWS EXPOSED MASS TIMBER

- STEEL PODIUM ALSO ALLOWS FLEXIBILITY WITHIN VARYING SITE CONSTRAINTS - WHETHER ADDITIONAL VERTICAL NON COMBUSTABILITY, OR IRREGULAR STRUC-TURAL SHAPES.



DTT-D-06

EFFICI-ENCY

LOADING DIAGRAM

- THE DIAGRAM BELOW SHOWS THE POTENTIAL LOADING AMOUNTS OF PREFABRICATED ELEMENTS. THE DIAGRAM SHOWCASES HOW TYPICAL SIZING CAN BE EFFICIENTLY LOADED INTO A STANDARD FLATBED TRUCK. ADDITIONAL SAVINGS COMPARED TO CONCRETE.

CONSTRUCTION COSTS

		Concrete		Submission	
	Square footage	$/sq ft	Cost	$/sq ft	Cost
Below grade	0.0	$0	$0	$0	$0
Base floor	16000.0	$360	$5,760,000	$400	$6,400,000
Above 1st storey	400000.0	$385	$154,000,000	$350	$140,000,000
	Quantity	$/unit		$/unit	
Balconies	38	$25,000	$950,000	$25,000	$950,000
	Cost per month	# Months	Cost	# Months	Cost
Overhead)	$50,000	18	$900,000	12	$600,000
TOTAL			**$161,610,000**		**$147,950,000**

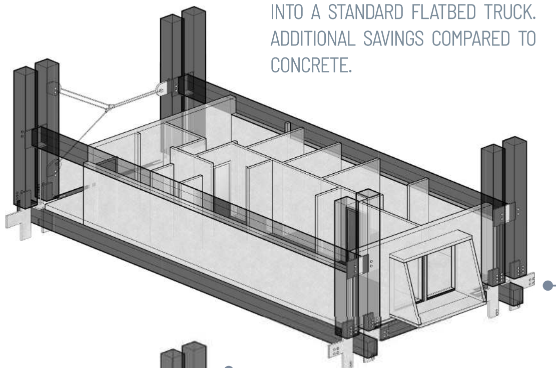
EMBODIED CARBON

		Concrete		Submission	
	Sq ft	Carbon	Total Carbon	Carbon	Total Carbon
Total Building Sq Footage	416000.0	6.69	**2782632.32**	2.69	**1119040**

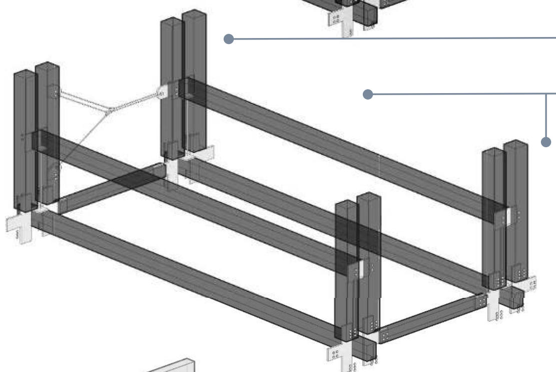
COST BASIS CALCULATION -

CONCRETE COMPARISON

SHIPPING ITEM	COUNT + SURPLUS	ESTIMATED LOADS
17'-6" GLULAM MEMBERS	770	8
56'-0" GLULAM MEMBERS	810	26
TYP. FLOOR PANELS	7,650	153
TYP. WALL PANELS	4,380	88

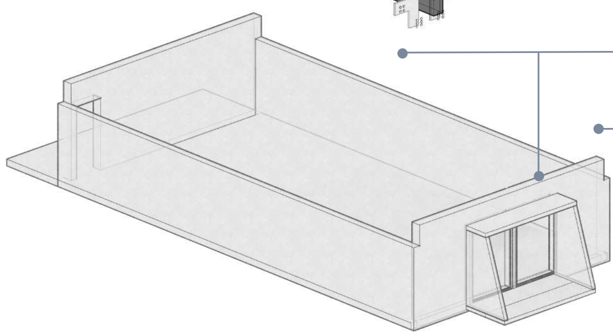


TYPICAL UNIT: PINE



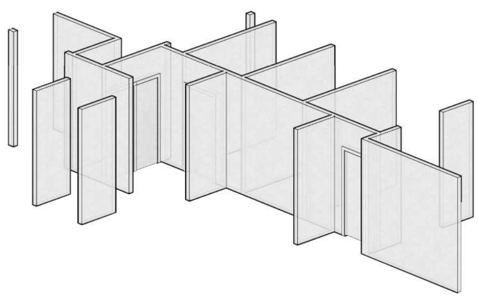
TYPICAL SUPERSTRUCTURE

GLULAM TIMBER MANU-FACTURED IN 17'-6" LENGTHS. SEALED AND FINISHED IN SHOP. ASSUMED 24" x 24" GLULAM.



TYPICAL EXTERIOR SHELL

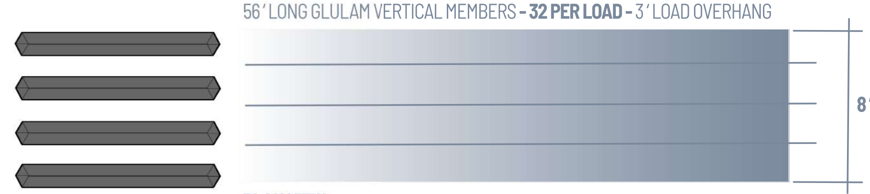
PRE FABRICATED WITHIN AN 8' GRID SYSTEM. FULL WALL ASSEMBLY PRE FABRICATED, LABELLED, AND LOADED TO MAXIMUM EFFICIENCY.



TYPICAL INTERIOR WALLS

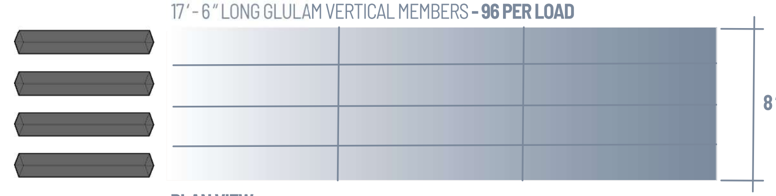
FRAMED ON SITE AFTER SHELL HAS BEEN ERECTED - SITE FRAMING INTERIOR PANELS ALLOWS CONSTRUCTION TO CONTINUE IN OTHER PARTS OF THE BUILDING WHILE INSTALL OF PREFABRICATED ELEMENTS IS HAPPENING.

56' LONG GLULAM VERTICAL MEMBERS **- 32 PER LOAD -** 3' LOAD OVERHANG



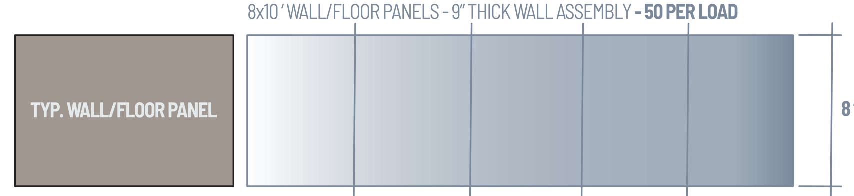
PLAN VIEW

17'-6" LONG GLULAM VERTICAL MEMBERS **- 96 PER LOAD**

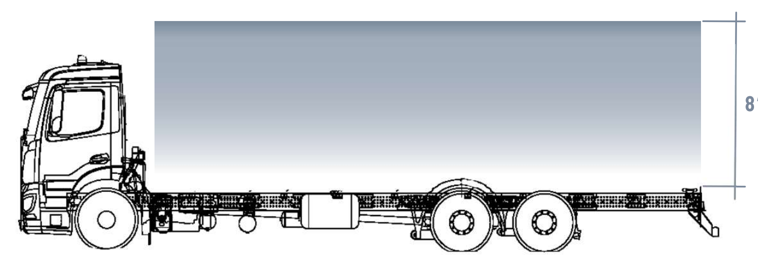


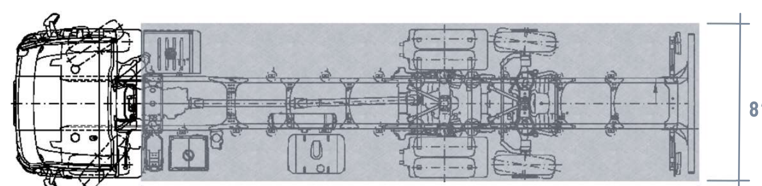
PLAN VIEW

8x10' WALL/FLOOR PANELS - 9" THICK WALL ASSEMBLY **- 50 PER LOAD**



PLAN VIEW





PLAN VIEW

53' - EXTENDED DECK

DESIGN-ATE

MAIN FLOORPLAN

- THE PRIMARY APPROACH TO THE MAIN RESIDENTIALM LAYOUT IS THE CONNECTION OF DIVERSITY THAT CAN BE ACHIEVED IN LARGE SCALE MULTI FAMILY BUILDINGS. EACH FLOOR CONTAINS THE ABILITY TO HOUSE SINGLE OCCUPANTS TO LARGER FAMILIES.

- CONNECTING THE DIVERSITY WITHIN THE FLOORPLAN IS A LARGE COMMUNAL SPACE THAT FEATURES A SHARED KITCHEN, BALCONY, LOUNGE SPACE AND DINING AREA. THIS SPACE ACTS AS A HUB FOR EACH LEVEL AS WELL AS AN EXTENSION TO EACH UNIT. ALSO PROVIDING AN OUTDOOR SPACE LARGE ENOUGH TO HOLD MULTIPLE PERSONS.

- LARGE COMMON CORRIDOR RUNNING ON THE EXTERIOR OF THE BUILDING ALLOWS THIS FLOORPLAN TO ACHIEVE LOWER SETBACK CLEARANCE FOR LIMITING DISTANCES. BY PLACING THE UNITS ON ONE SIDE OF THE BUILDING WE CAN FOCUS ON ONE COMMUNAL VISUAL ASPECT, WHICH IN THIS DESIGN IS THE BREEZEWAY THAT CONNECTS TO THE RIVER

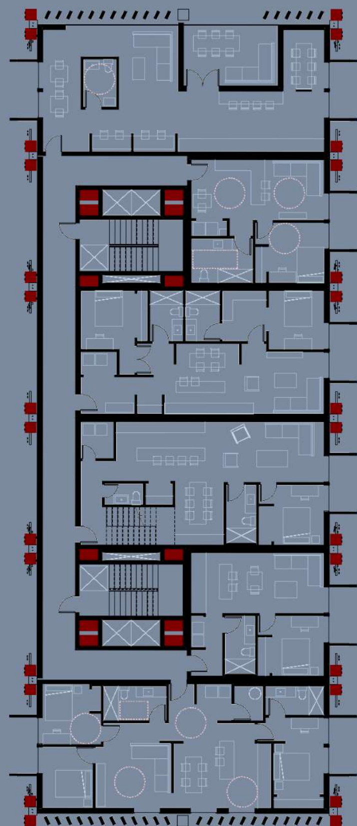
TYPICAL UNITS

- THE TYPICAL UNITS, CREATED WITHIN THE 8 ' GRID AND A STANDARDIZED WINDOW OPENING LOCATION, MAXIMIZE SPACE, NATURAL LIGHTING AND FLUIDITY.

- REMOVING BALCONEYS FROM EACH UNIT LOWERS PER SQUARE FOOT COST PLACED ON THE OWNER AND ALLOWS AN EASIER FIRE SEPERATION FOR EXPOSED TIMBER.

- VERTICAL WALL FINS ENCAPSULATING THE OPERABLE WINDOWS ENSURE A MINIMUM 8 ' CLEARANCE IS ACHIEVED FROM OPENINGS TO EXPOSED TIMBER.

- LAYOUTS CAN BE OPTIMIZED WITH INDIVIDUAL MECHANICAL SYSTEMS SUCH AS HIGH EFFICIENCY ERV UNITS AND FAN COILS.



THE GROVE: COMMUNITY
ADA

SUBALPINE: 1 BED 1 BATH
ADA
550 SF

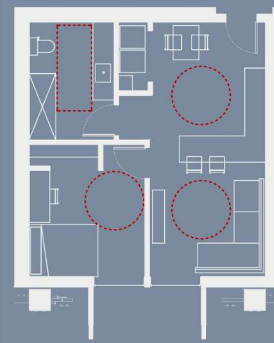
PINE: 2 BED 2 BATH
1000 SF

HEMLOCK: 4 BED 3 BATH
2000 SF

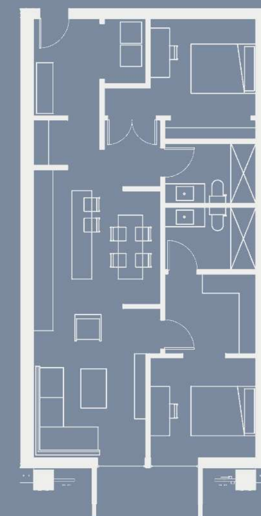
SPRUCE: 1 BED 1 BATH
550 SF

DOUGLAS FIR: 3 BED 2 BATH
PARTIAL ADA
1175 SF

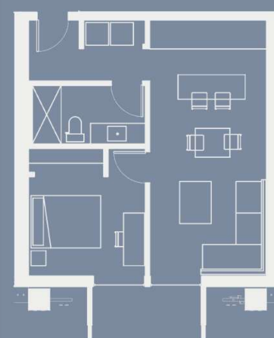
TYPICAL RESIDENTIAL FLOORPLAN



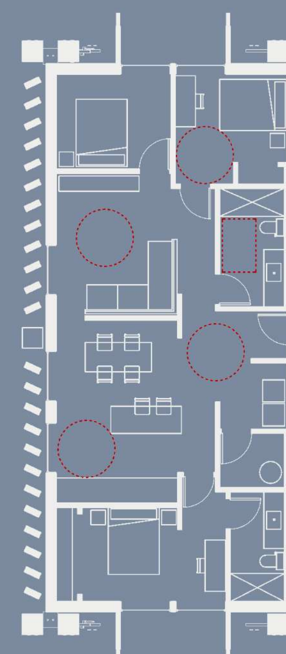
SUBALPINE



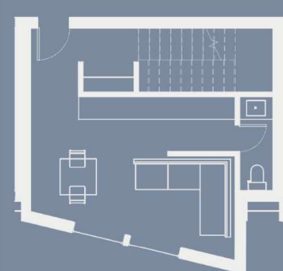
PINE



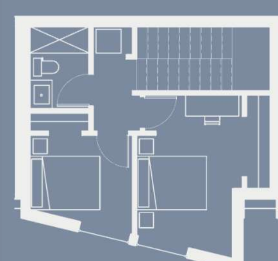
SPRUCE



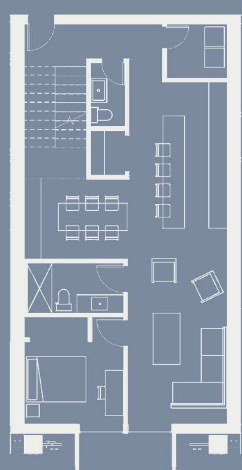
DOUGLAS FIR



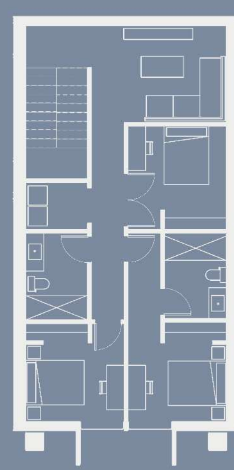
BIRCH - PODIUM - LOWER



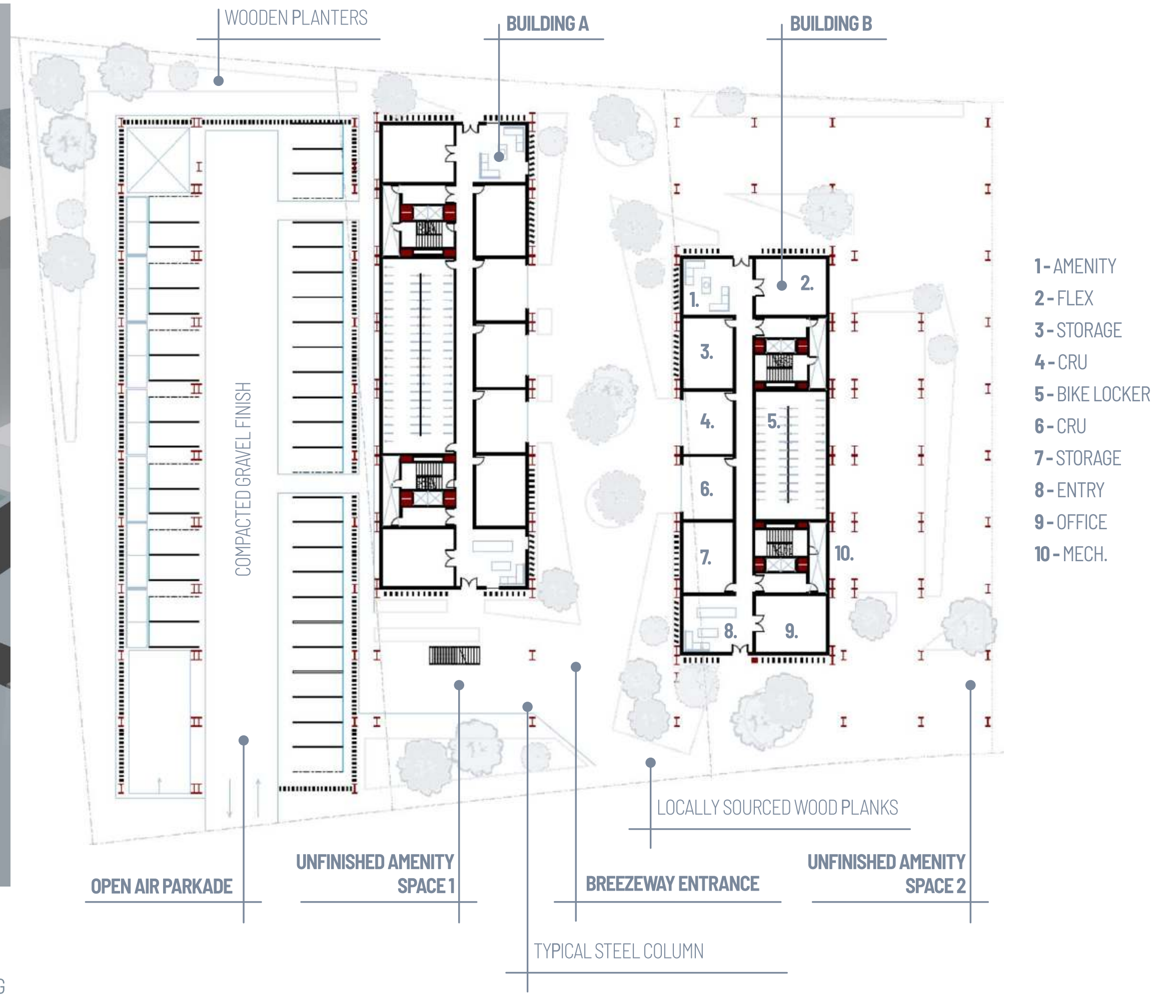
BIRCH - PODIUM - UPPER



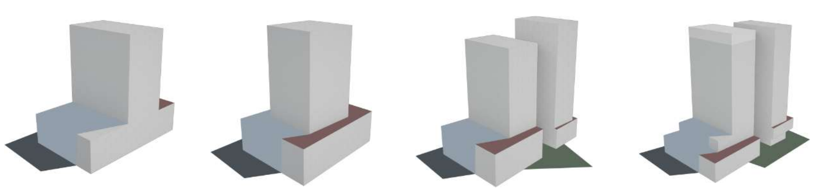
HEMLOCK - LOWER



HEMLOCK - UPPER



COMMUNITY SPACES
APARTMENT UNITS
TOWNHOUSE UNITS
CORRIDOR - REDUCING LIMITING DISTANCE OPENINGS



MASS 1 MASS 2 MASS 3 MASS 4

FLOUR-ISH

MASSING

- PROGRESSING FROM ONE LARGE BUILDING WITH A PODIUM TO A DECISIVE SEPERATION DESIGNED TO MIMIC THE FLOW OF THE SURROUNDING RIVER. CARBON SEQUES-TRATION IS MAXIMIZED THROUGH THE EXPOSED WOODEN MASSES.

SUN PATH

- SOUTH FACING WINDOWS ARE NATURALLY SHADED FROM EXPOSED TIMBER WALL FINS.

GROUND FLOOR

- THE BUILDING GROUND FLOOR IS COMPRISED OF STEEL I-BEAMS TO ENSURE FIRE RESISTENCE IS MET TO ENSURE FIRE RESISTENCE IS MET WITHIN CLOSE CONTACT PUBLIC SPACES.

- ENTRYWAYS, COMMERCIAL RENTAL UNITS, STORAGE, AND BIKE SPACES FILL THE MAIN FLOORPLAN. VOID SPACES WITHIN THE STEEL FRAME OFFER FUTURE DEVELOPMENTS THAT CAN ADAPT THE BUILDING THROUGH-OUT ITS USE.

- PLANTERS MIMIC THE SHAPES OF RUGGED COASTAL ROCKS THAT PROTUDE INTO THE PATHS OF WATERS.

- SITE LAYOUT MAXIMIZES PUBLIC AND TENANT SPACES THROUGHOUT, CONNECTING THE STREET TO THE WATERFRONT

DTT-D-06

CALCU- LATE

DIAGRAM 1

- DIAGRAM 1 HIGHLIGHTS THE BENEFITS OF UTILIZING LOCALLY SOURCED, CERTIFIED, SUSTAINABLE MATERIALS.

- CURRENT EMBODIED CARBON HAS MET THE ACHIEVABLE EC TARGET.

- EMOBODIED CARBON IS SIGNIFICANTLY BELOW COMPARED TO A TYPICAL BUILDING

- THE REDUCTION OF CONCRETE TO FOUNDATIONAL PIERS HAS DRASTICALLY REDUCED THE EMBODIED CARBON IN THE PROJECT.

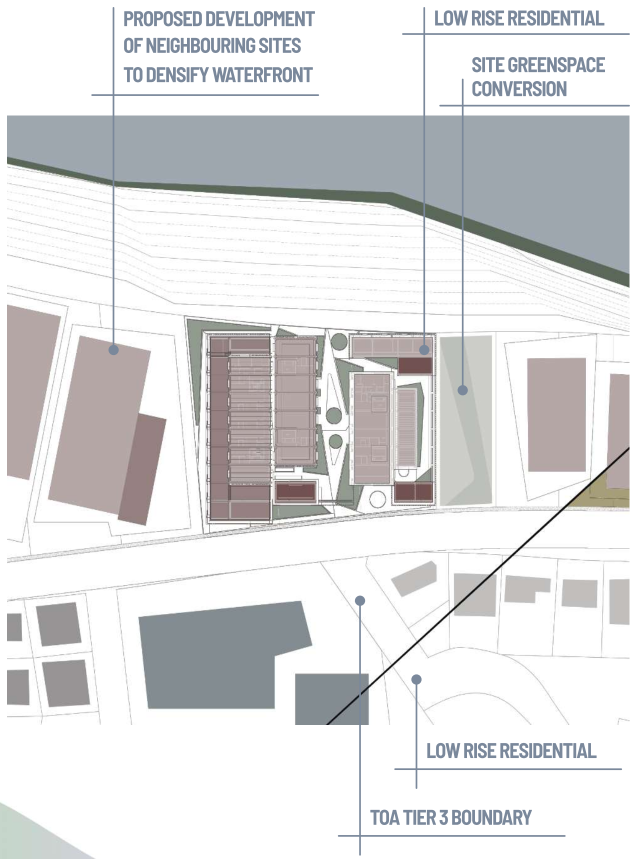
REGUL- ATE

EXISTING

- THE DESIGN PUSHES THE CURRENT BOUNDARIES FOR MASS TIMBER STRUCTURES IN ALL ASPECTS. SPECIFICALLY DUE TO EXPOSED MASS TIMBER ELEMENTS.

- THE INCREASED HEIGHT AND DENSITY WITHIN A TRADITIONAL LOW RISE AREA MAY NECESSITATE MORE NOVEL INTERPRETATIONS OR VARIANCES REGARDING SITE COVERAGE, SETBACKS, AND NEIGHBOURHOOD GUIDELINES.

-



PUSHING STEP CODE BOUNDARIES

- THE MASS TIMBER STRUCTURE CONTRIBUTES TO A HIGH PERFORMANCE THERMAL ENVELOPE DUE TO THE WOODS INSULATING PROPERTIES AND CARBON SEQUESTRATION.

- EACH FLOORPLAN WILL NECESSITATE RIGOUROUS AIR TIGHTNESS TESTING, WITH MINIMAL OPENINGS ALLOWING A HIGHER PERFORMANCE WALL ASSEMBLY.

- HIGH EFFICIENCY INDIVIDUAL MECHANICAL SYSTEMS MINIMIZE OPERATIONAL ENERGY CONSUMPTION. ALLOWING SOLAR TO PUSH ITS GRID USE.

COMPLIMENTING BC BUILDING CODE

- THE BUILDINGS DESIGN LEVERAGES RECENT BC BUILDING CODE AMENDMENTS THAT PERMIT INCREASED HEIGHT AND AREA FOR MASS TIMBER CONSTRUCTION.

- ENCAPSULATION AND ROBUST FIRE RATED SYSTEMS EXCEED STANDARD HIGH RISE FIRE PROTECTION FOR A BUILDING OF THIS SCALE.

- ACCESSIBLE UNITS ARE OPTIMIZED THROUGHOUT THE ENTIRITY OF THE STRUCTURE.

PROVIDING A CATALYST

- THE PROJECTS APPROACH TO FULLY PREFABRICATING THE SUPERSTRUCTURE AND ASSEMBLIES ALLOWS IT TO SCALE INTO VARIOUS SITUATIONS AND SITE BOUNDARIES.

- STEEL AND TIMBER HYBRID STRUCTURE PRESENTS A FOUNDATIONAL WAY TO ACHIEVE LARGER MASS TIMBER STRUCTURES THAT ENSURE PROPER FIRE SEPERATION.

- THOUGHTFUL UNIT DESIGNS AND COMMUNAL SPACES CREATE A BLUEPRINT FOR DENSIFICATION THAT DOES NOT SUFFOCATE ITS OCCUPANTS.

- THIS DESIGN SETS A POWERFUL PROOF OF CONCEPT FOR THE USE OF MASS TIMBER IN HIGH RISE RESIDENTIAL CONSTRUCTION. THE TWO TOWER CONFIGURATION PUSHES THAT BOUNDARIES OF WHAT IS TECHNICALLY AND ECONOMICALLY FEASIBLE.

- BY SUCCESFULLY NEVIGATING THE COMPLEXITIES OF COMPLIANCE AND ENGINEERING REQUIREMENTS, THE PROJECT OPENS THE DOOR FOR OTHER DEVELOPERS TO REPLICATE THE TOWER DESIGN IN TIMBER CONSTRUCTION.

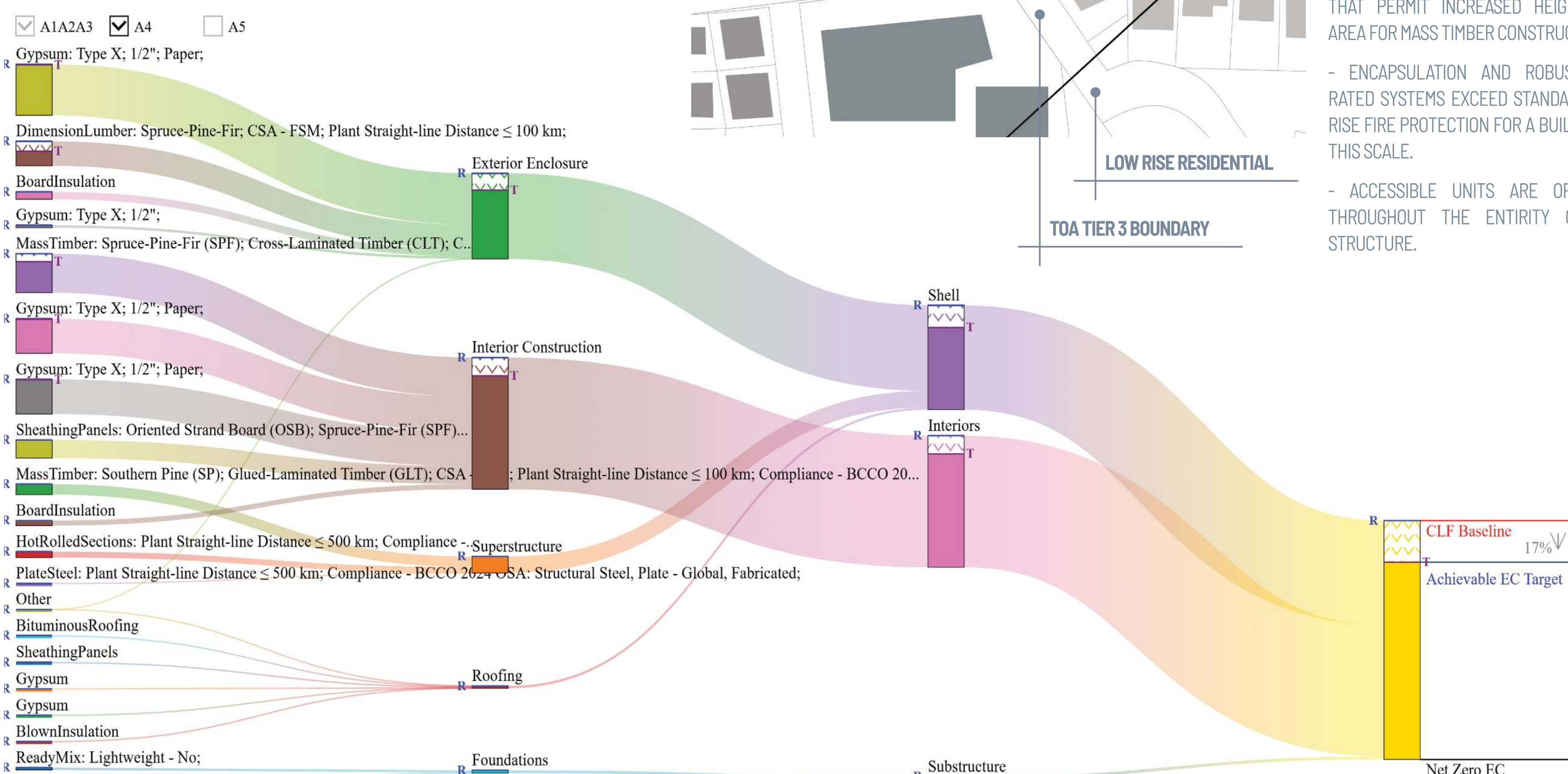
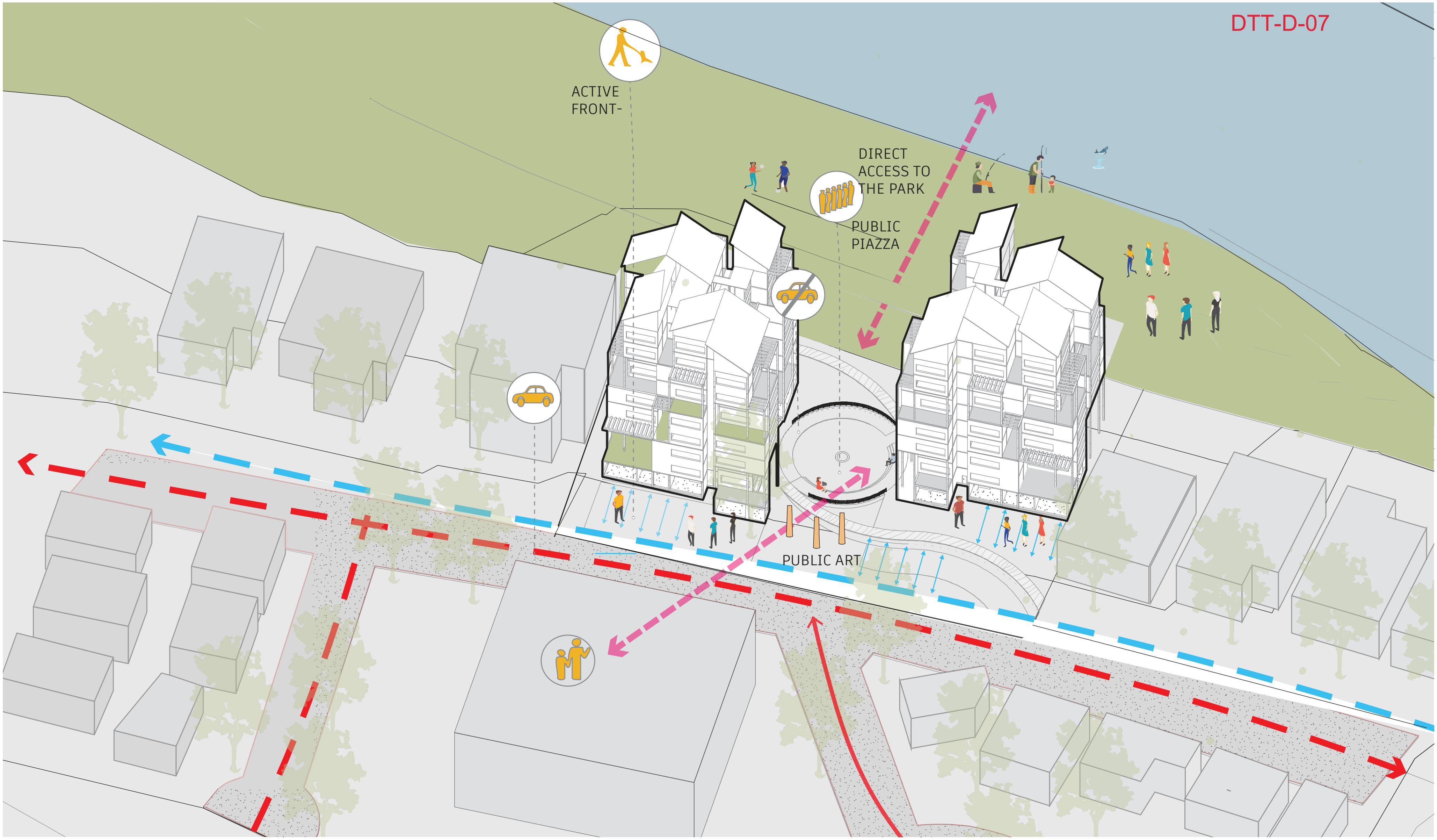


DIAGRAM 1 - GWP SAVINGS OPPORTUNITIES



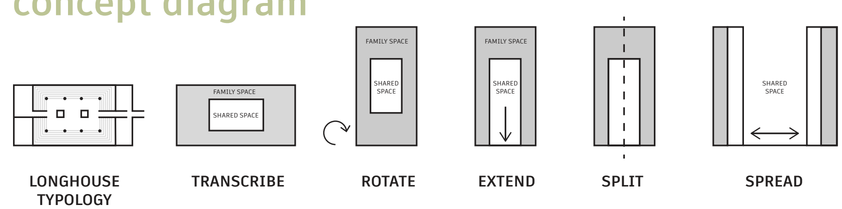
longhouse echo

reimagining the longhouse in a timber tower community

Longhouse Echo is a project that brings a traditional form architecture to a contemporary setting by taking inspiration from and echoing the longhouse typology. Drawing from Tsawwassen First Nation values, the project envisions a culturally grounded, family focused and community oriented space where intergenerational living flourishes and deep connections to land and water are honored within higher-density housing forms.

The development intends to be a living expression of TFN's journey of renewal and self-determination. The core focus is creating a space that fosters collective well-being, ensuring that culture and community remain at the heart of daily life. By bringing together tradition with contemporary design practices, the project imagines a space that reflects the strength, unity, and vision of the Tsawwassen people.

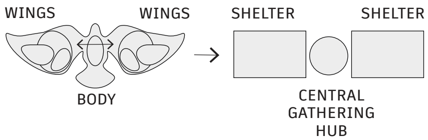
concept diagram



echo of ideas

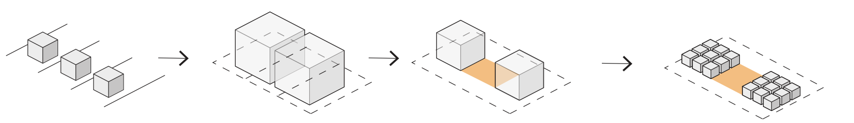
1 echo 1 - the symbolism

One symbol of the TFN is the **eagle**, both a protector and a unifier. To translate this idea architecturally: the body forms the central community space, while the wings form the residential areas.



2 echo 2 - the site

The strategy for arranging the site was **increasing density** through verticality, **promoting community** in an activated central space, and **connecting the land and water** with the neighbourhood.

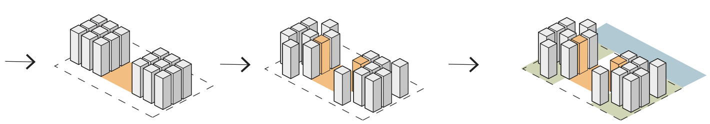


DIVIDED
individual lots and separate lives

UNITE
the 3 lots into 1 one for higher density living

ACTIVATE
central space with layered activity + shared resources

ARTICULATE
2 buildings are broken into tower assemblies



STACK
extend towers to increase density

OFFSET
and stagger the blocks to soften the verticality

CONNECT
the neighbourhood to the water and land with an activated green corridor

3 echo 3 - the values

The programming, materiality and spatial planning of the space is informed by TFN cultural values. The spaces are designed with **sustainability, sharing** and **socializing** in mind.

SUSTAINABILITY & ENVIRONMENTAL STEWARDSHIP
is achieved through mass timber construction, vertical gardening and dedicated green spaces.

SHARING OF RESOURCES, KNOWLEDGE & SPACE
is encouraged through communal art studios and galleries, designated workshop spaces for cultural activities.

COMMUNITY AS ONE BIG FAMILY
is about providing the community kitchen, dining hall and courtyard firepit as spaces to socialize and gather.

business plan

DTT-D-07

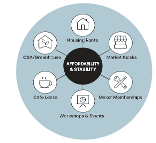
1 Executive Intent

The development program includes a variety of integrated community components designed to generate revenue and foster community engagement:

Diversified Micro-Revenue Strategy: The financial resilience of the project is built on a "diversified micro-revenue strategy that mitigates risk and ensures long-term stability." This includes:

2 Development program

- Below Market Affordable (18 units)
- Mid-Affordable (30 units)
- Near-Market (18 units)
- 25% Market Rate (30 units)

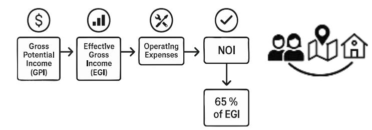


3 Operating Model (Financial Proforma)

Gross Potential Income (GPI) =Effective Gross Income = Operating Expenses =NOI
Lifecycle Value: Reduced Carbon deduction 50–25% vs. Concrete lows.
Processes directly = efficient prefabrication, law-form, and reliable lifecycle value.

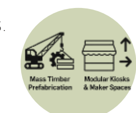
4 Governance & Partnerships

Land & Operations: Community.
Land Trust model. Tsawwassen First Nation (TFN).



5 Systemization & Cost Strategy

Mass Timber prefabrication – standardized wall and floor panels produced regionally.
Mass Timber= lower Carbon Footprint
Modular kiosks and maker spaces adaptable to different sites.
Vertical Garden = Food Production= total
Rough annual yield by crop type per building Typology :



Leafy greens (lettuce, kale, salad mix):
~25–50 kg/m²/yr = 1,800–3,600 kg/yr total
(≈ 24,000–48,000 salad servings, at 75 g/serving)

Tomatoes (greenhouse):
~40–60 kg/m²/yr = 2,880–4,320 kg/yr total
(≈ 19,200–28,800 servings, at 150 g/serving)
· Outdoor field range: 8–15 kg/m²/season → 576–1,080 kg/yr

6 Systemization & Cost Strategy

Short-Term Activation
Market kiosks provide immediate community engagement and early revenue.
Mid-Term Growth
Expansion through CSA programs, cafés, and youth programs, reinforcing food security, local economy, and cultural vibrancy.
Long-Term Resilience
Fully occupied housing and a self-sustaining community economy complete the integrated cycle, ensuring affordability and stability over time.

DTT-D-07

a day in our community

The central piazza is the beating heart of daily life—radiating warmth and activity. Around its edges, residents flow between a communal kitchen, creative workshops, and a lively art gallery. These shared spaces spark chance encounters, invite collaboration, and nurture a deeper sense of belonging. The piazza becomes more than just a gathering space—it is the stage where community life unfolds, weaving together culture, creativity, and connection.

1 community kitchen

Ben and Maya plan a surprise retirement dinner for their dad. They book the community kitchen, and neighbours roll in with aprons chopping, stirring, and prepping side by side until the tables fill with the meals they've made together.

2 vertical garden

Elliot and his friends love filling baskets with fresh vegetables and fruit. One afternoon he shares a crate with the neighbours. They love it and ask to join him, turning the garden into a shared harvest.

3 daycare +playground

Day care in their building makes Olivia and Jack's day easy: lift down, quick hand-off, lift up and no commute detours. Noon peek, five-o'clock hugs, everything is closer and calmer.

4 workshops

With Grandma Edith and Grandpa Walter leading, neighbors learned cedar weaving, traditional salmon prep, and community songs with drumbeat, turning a simple workshop into a celebration.

5 art studio + gallery

Mike is an artist moved in recently and rented the corner gallery on ground level. By the weekend he hung his work and started drop-in classes, turning the place into the neighborhood's little art room.

6 courtyard firepit

Maya, Liam and Mark gather at the firepit courtyard as Grandma Edith and Grandpa Walter share the community's history and traditions. By dusk, the kids carry the traditions and history lessons home.

DTT-D-07

residential layout catalogue

Layouts are planned for evolution without relocation. Organized on a simple 12'×12' grid, the layout supports flexible stacking, clean circulation, and offsets for balconies, daylight, and cross-ventilation. Units are adaptable: a 3-bedroom can shift to a 2-bedroom by releasing one module, or link vertically with an internal stair to support multigenerational living or rental that people of all ages can call these homes their own. Stacking patterns are varied to respond to different community needs. Every floor connects to a shared, alternate floor vertical garden. This creates double-height green spaces, drawing in sunlight and bringing neighbours together across levels.

In a three-bedroom home, William, Sarah, David, Emma, and Noah live together—three generations bound by daily life, tradition, and shared care.

John and Mary reshape two rooms into three giving each child space while keeping the family together.

David and Clara adding an office space in 2 bed so they could work

Ethan added an office to his parents' two-bedroom home, working close while sharing more time with them

Emma lives in a 1 bed unit, yet still feels the warmth of community as family.

Expecting their first child, the couple added a bedroom to their unit, growing within the same community.

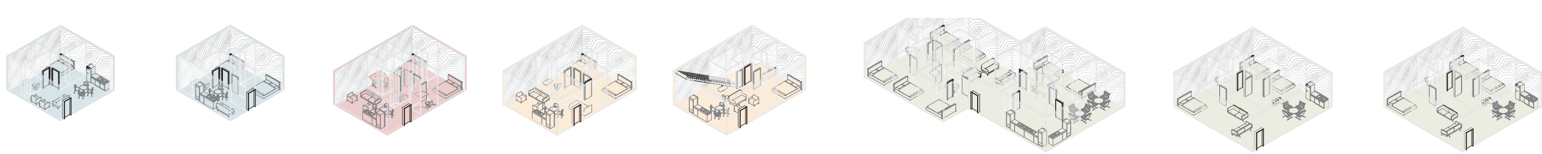
The family welcomed their grandparents by renting a connected unit, turning everyday living into a reunion.

A group of retired friends rented combined units, choosing to live together for joy and a stronger bond.

DTT-D-07

through the longhouse

The sectional view reimagines the longhouse concept of arranging communal activities at the core and private life around the center. The section shows one possible stacking strategy of the units, with other variations adaptable to evolving community needs. The flexible framework balances privacy with collective belonging, allowing residents to live independently while remaining connected to their neighbours. Within this vertical environment, generations grow together, learning traditions and history, strengthening cultural roots and sustaining a connection with the land.



DTT-D-07

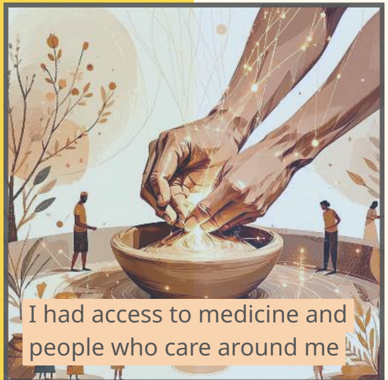
perspective unfolded

The views illustrate how daily life flourishes through community. Shared spaces foster traditions, celebrations, and everyday exchanges, where residents gather to learn, trade, and connect. Locally owned businesses and gardens sustain the neighbourhood, offering fresh produce and meaningful work. Spaces for communal yoga and meditative practice further strengthen bonds, nurturing well-being alongside cultural continuity. At its core, the design champions community, family, and culture as the true foundations of a thriving society.

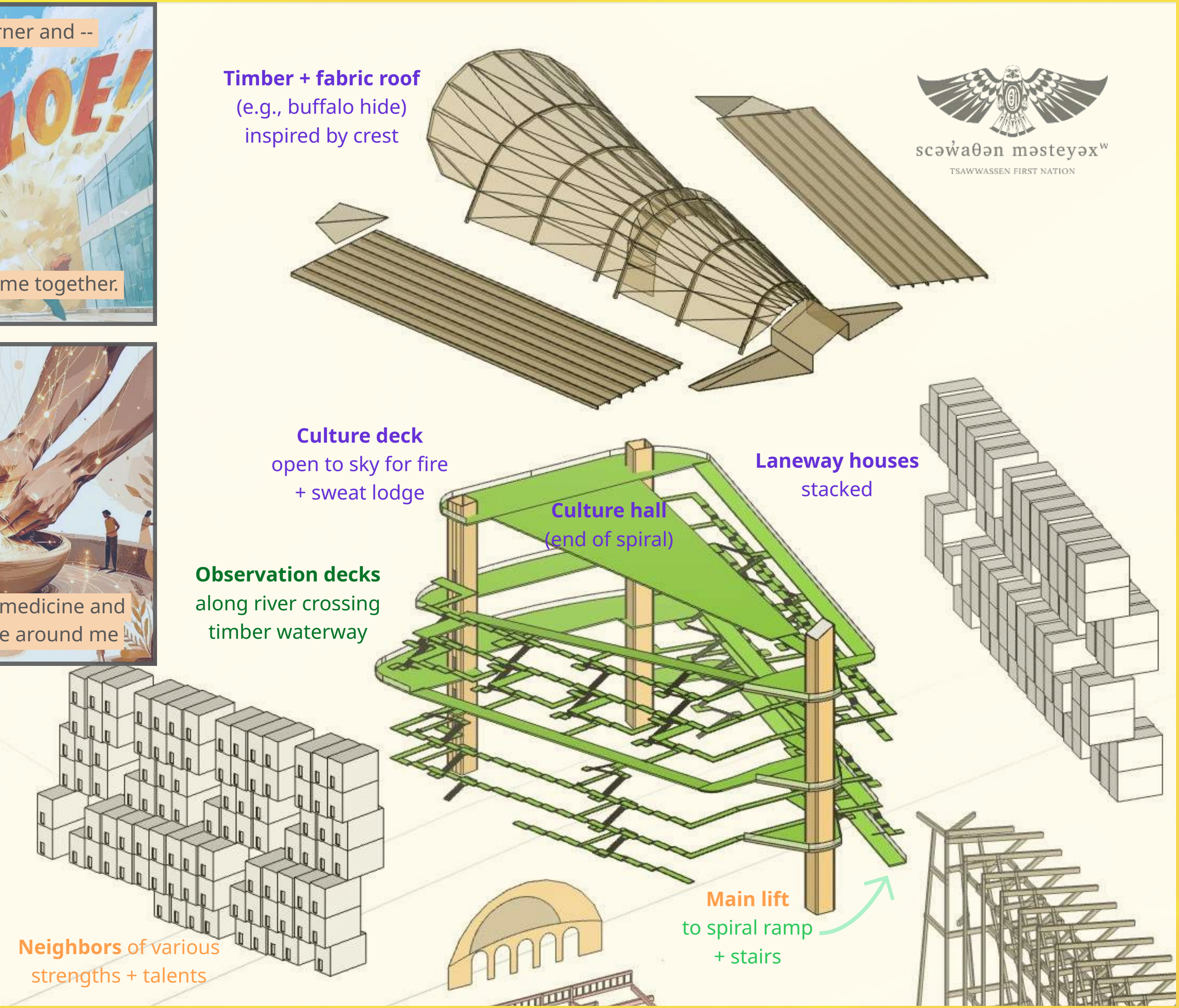
DTT-D-08

I staggered toward ...
the last standing bottle.
It was light
and almost empty.
The last drop shone and I stuck out my tongue.
It's not enough. *It never is,* said a voice ..
Where streets are called by your name
I turned and saw no one ...
A ghostly figure said,
Walk with me.
They sounded like my voice
So I stood and trod toward them. It felt warmer that day.

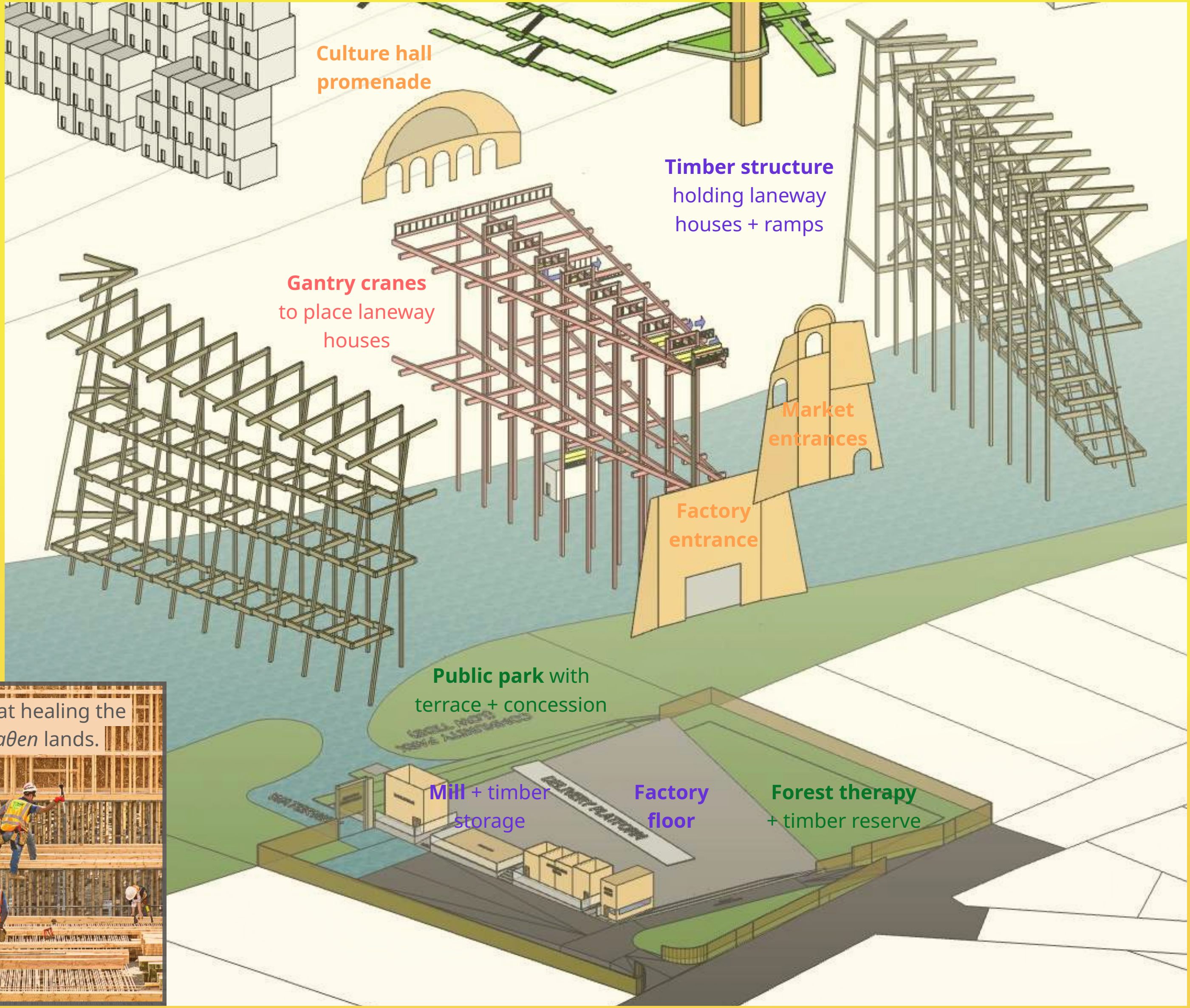

I turned the corner and --
NAZOE!
-- everything came together.


I had access to medicine and people who care around me

Things

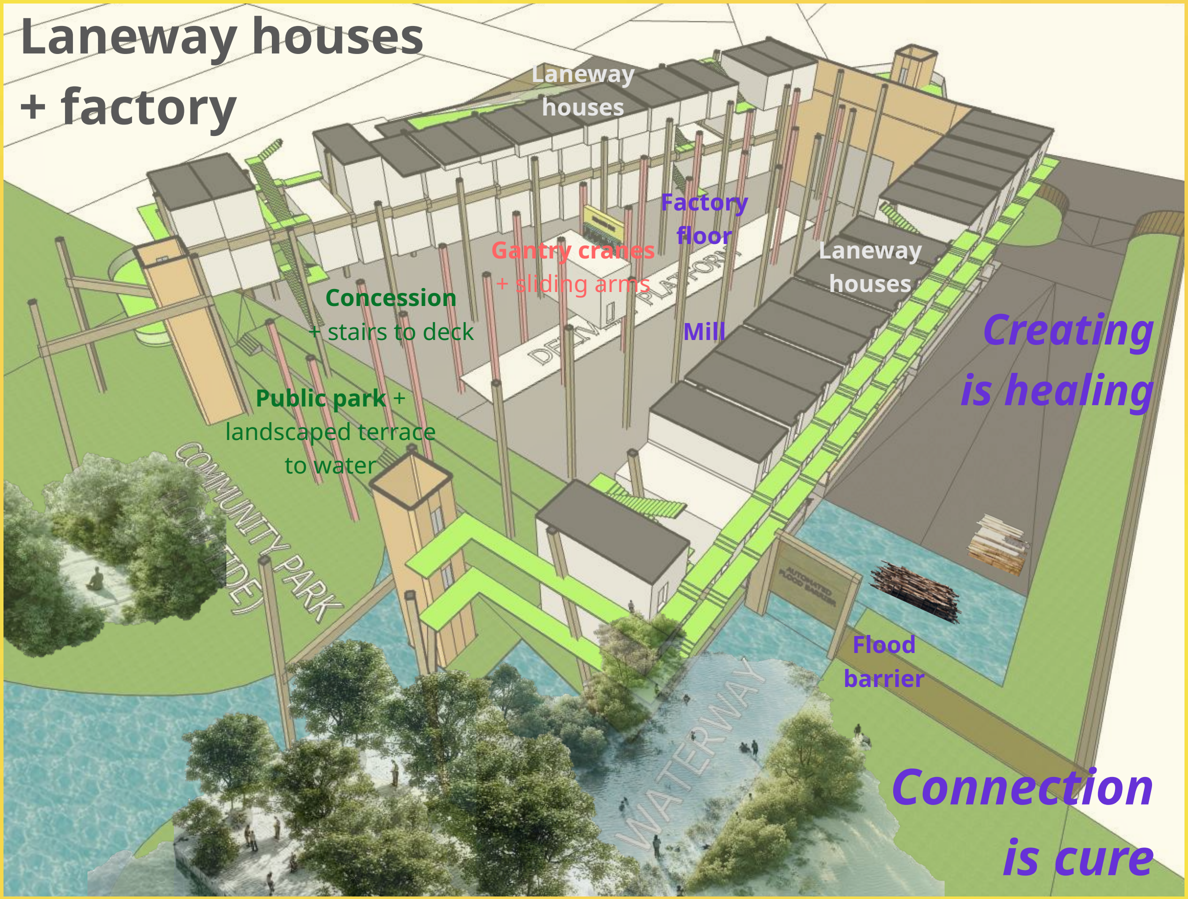

Timber + fabric roof
(e.g., buffalo hide)
inspired by crest
scəw̓aθən məsteyəxʷ
TSAWWASSEN FIRST NATION
Culture deck
open to sky for fire
+ sweat lodge
Laneway houses
stacked
Culture hall
(end of spiral)
Observation decks
along river crossing
timber waterway
Main lift
to spiral ramp
+ stairs
Neighbors of various
strengths + talents

Falling in Place

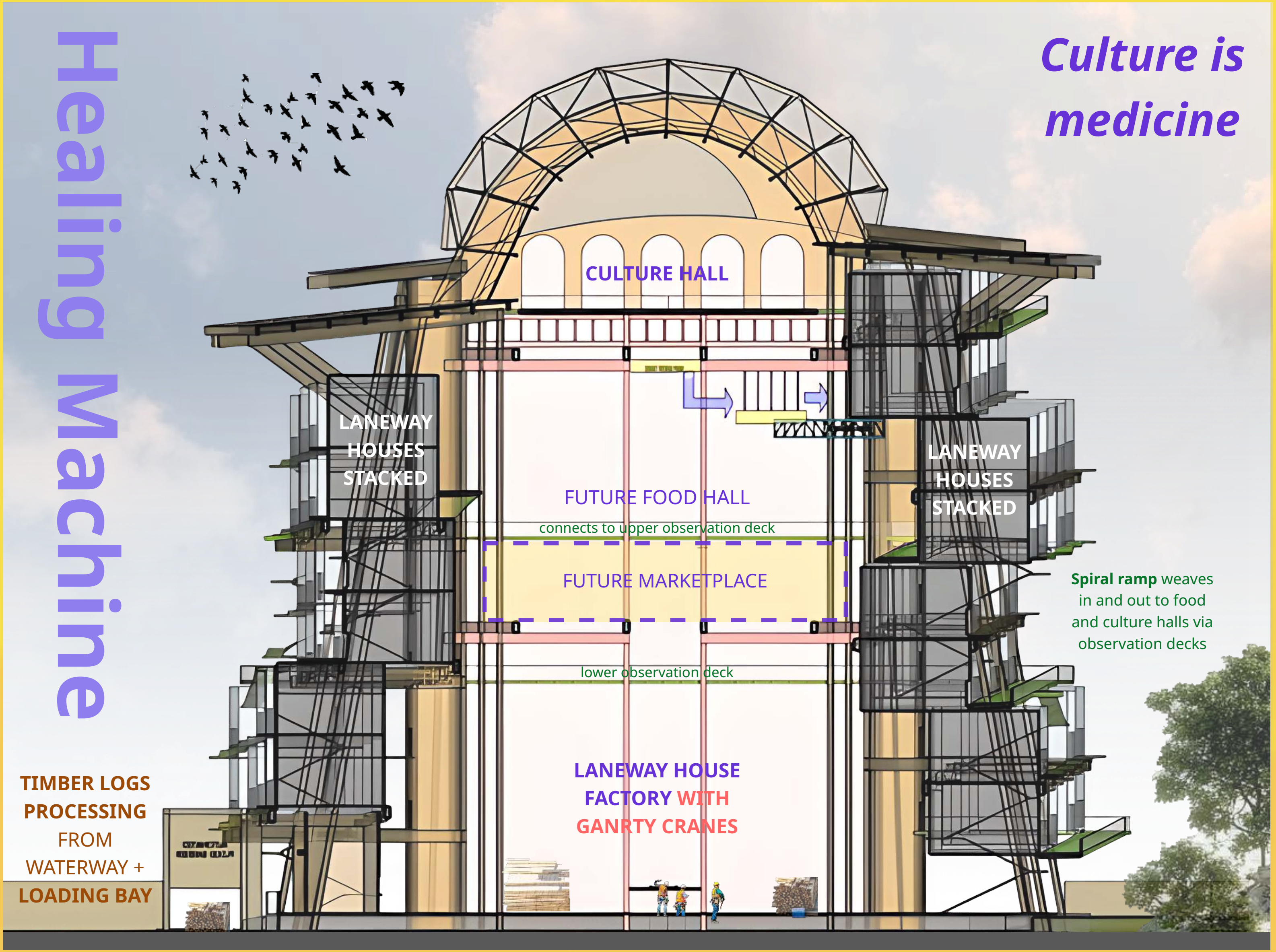


… and a hand at healing the city from *sc̓əwaθen* lands.

Structure + Ramp + Laneway Houses + Nature + Culture = Healing Machine



DTT-D-08


Healing Machine
Culture is medicine
CULTURE HALL
LANEWAY HOUSES STACKED
LANEWAY HOUSES STACKED
FUTURE FOOD HALL
connects to upper observation deck
FUTURE MARKETPLACE
Spiral ramp weaves in and out to food and culture halls via observation decks
lower observation deck
LANEWAY HOUSE FACTORY WITH GANRTY CRANES
TIMBER LOGS PROCESSING FROM WATERWAY + LOADING BAY

Takes Flight

Inspired by true stories, *Where Streets* is a collab between digital agency AP and EG UrbanLab. *Where Streets* highlights how local modular timber construction of laneway houses may address both the housing and opioid crises. With community as method, *Healing Machine* houses diverse treatment approaches beneath two wings centering culture as medicine.

Acknowledgments
Much work were completed on the unceded territories of the *kʷikʷəƛ̓əm* First Nation. Team Lead **DG** thanks *Dene* Elder Joe, and Elders Yoshi and Dr Martin for their friendship and wisdom. All cultural annotations are suggestions subject to decisions by *sc̓əwaθen* Nation.
Lead Architect: **LM**
UDMH Intern: **LK**

Stats: Site Area: 8,112.57 sqm
219 x2-storey units of 800 sqft (1-3 bdrm)
Commercial/culture: 1,457sqm x4 storeys
Shared residential spaces: 1,597 sqm
Total: 23,688 sqm over 17 storeys
Floor-Area Ratio (FAR): **2.92**

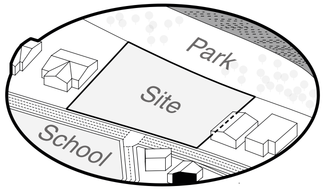
DTT-D-09

Heartwood

How can a modular maufacturing of timber building enrich the community?

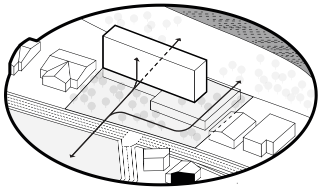
'Heartwood' is named after the core of the wood that provides strength. It envisions a co-living community by a prefabricated core and composite floor system. Its modular construction ensures efficient delivery, rapid assembly, and minimal disruption. It reimagines collective living through the warmth and resilience of timber.

With a simple yet robust structure as its foundation, community space drives the design, shaping the building's elevation and creating a portal that connects people to the river and park. Respecting the Tsawwassen First Nation's inclusion in the area, shared halls and open community spaces close to the ground form the heart of the project. These spaces welcome ceremonies, exhibitions, and communal meals, extending memories and cultural exchange from residents to the wider neighborhood.



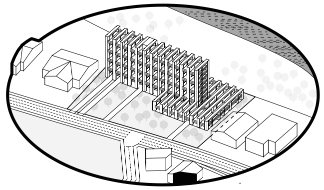
Context

A school in front and riverside in the back, the site works as an important connector between culture and nature.



Reverence

With the co-op residential over 3rd floor, two floors of open community space will work as a portal between the city and riverside.



Community

Front of the building becomes a core community space, with a shared hallway lounge and open canopies for residents facing the wide garden open to the public.

Decoding Core

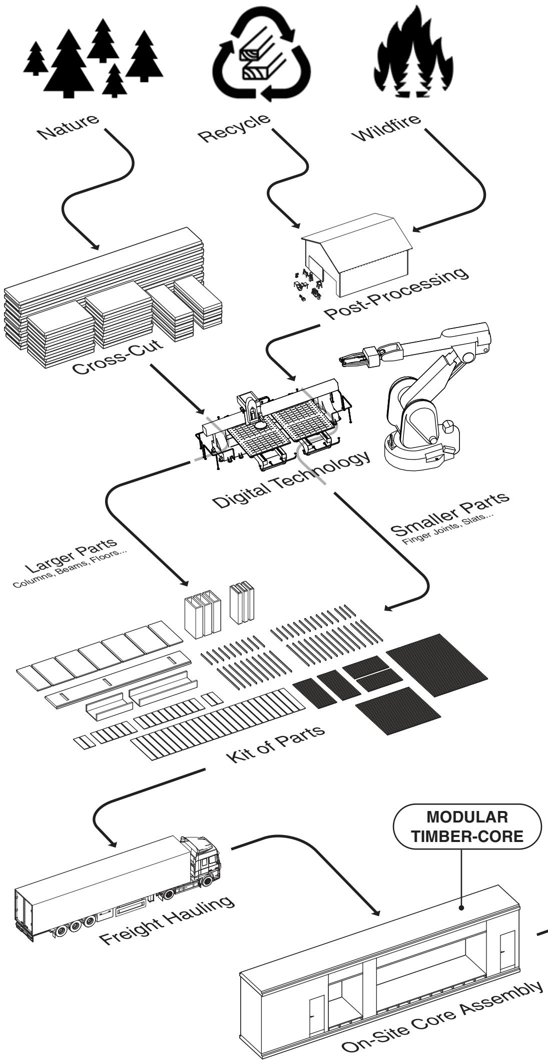
How do you unitize on-site built timber structure while provide flexibility in space usage?

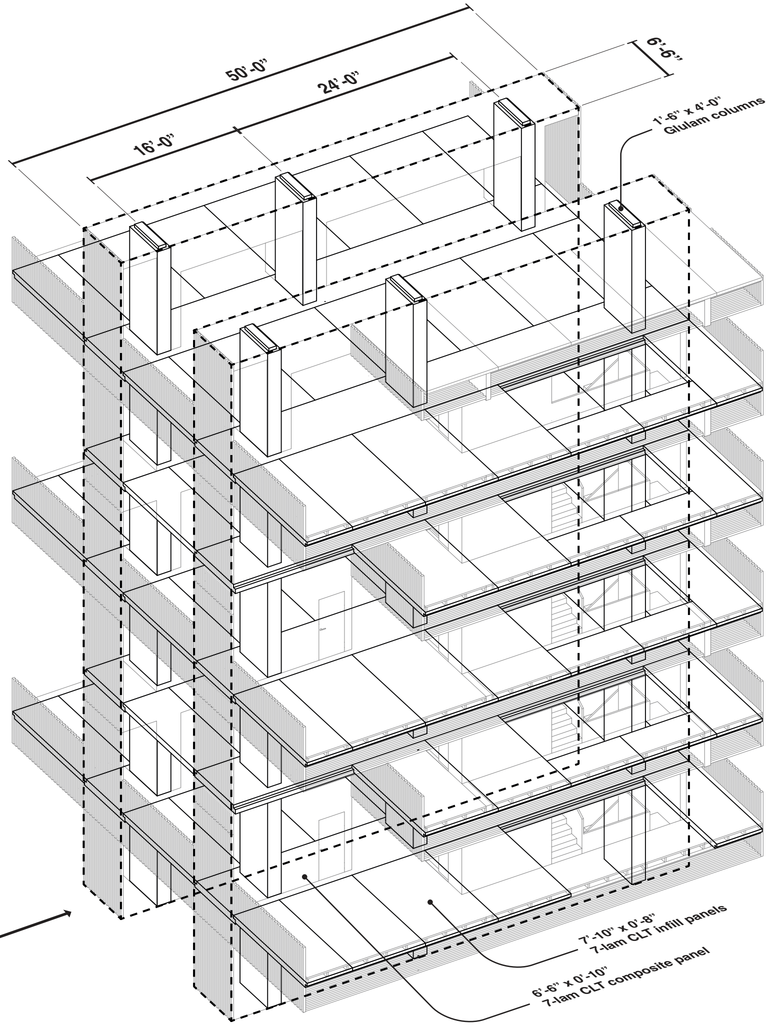
The design of Heartwood began with understanding the building's core. While many high-rise timber buildings rely on concrete for structural stability, our goal was to create a timber-based core. This is achieved through a modular, prefabricated timber core system with minimal additional steel components.

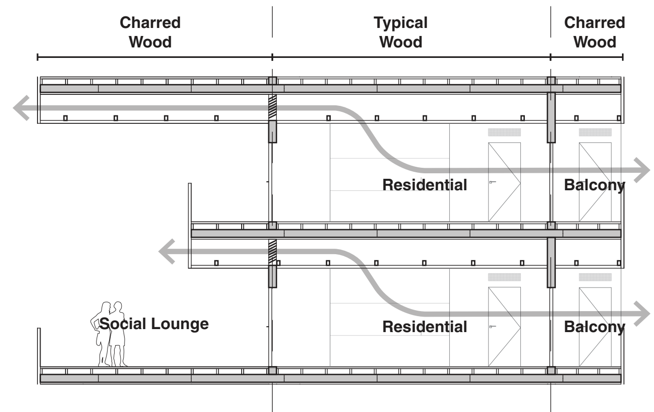
The prefabricated timber core allows rapid on-site construction through precise assembly, reducing construction time by up to 50%. Its off-site fabrication minimizes waste and emissions, while the natural materials provide durability, thermal efficiency, and a significantly lower environmental impact—offering up to 170% carbon benefit compared to traditional concrete cores. Engineered for safety, the timber core achieves a two-hour fire rating and resists seismic and wind forces up to 120 mph. The modular system can be stacked floor by floor, supporting up to 12 stories.

The timber supply comes from multiple sources, including forests, wood waste, and charred wood from wildfires. Each material undergoes a digital milling and detailing process, where smaller pieces are transformed into finger-jointed members for structural components using CNC technology. These elements are then delivered to form the timber core. Combined with the composite floor system, this approach reduces the total number of members required for the entire building.

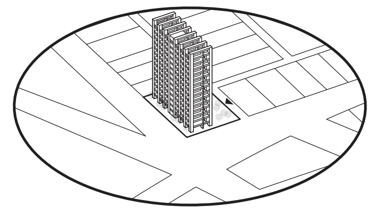
Finally, the combined structural system, anchored by the timber core, informs how the building is occupied and operated. Its clarity allows easy adaptation to diverse site conditions. Whether in a dense urban setting or a natural landscape, the system can scale from a micro-housing unit with a single core to a multi-family high-rise with numerous units. Using Site D as a baseline, this approach offers Vancouver residents a new way of living in residential buildings.



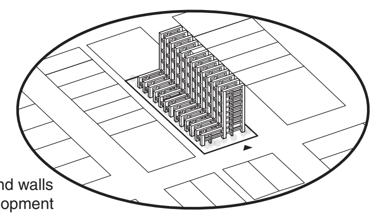




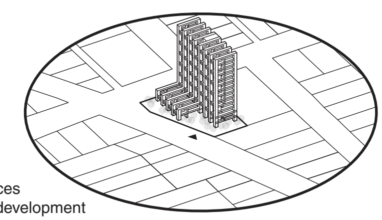
Material Finish and Ventilation
The building's exterior surface is charred wood, a natural method that enhances durability. This method requires no additional chemical coatings, avoiding extra costs and health risks. Slatted wood ceilings promote ventilation, allowing the timber to breathe and preventing decay.



Site A Application
TOA Tier 1 / 20 stories high
Total of 8 cores
Compact and various unit sizes
Market condominium development



Site B Application
TOA Tier 2 / 10 stories high
Total of 13 cores
Outdoor & social spaces with sound walls
Purpose-built rental housing development

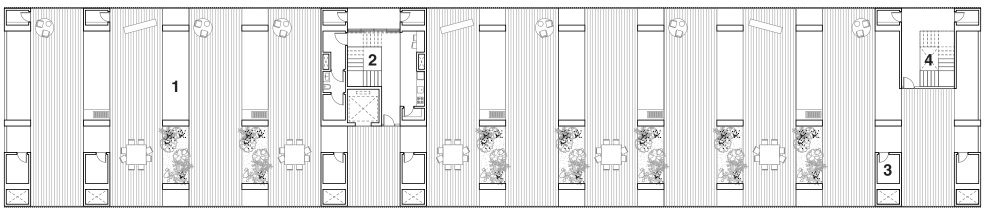


Site C Application
TOA Tier 2 / 12 stories high
Total of 8 cores
Balanced out unit and social spaces
Public sector or government-led development

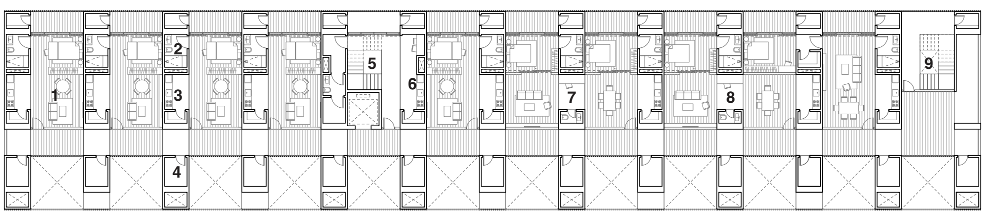
Social Lounge

Inspired by the longhouse system, a symbol of shared wealth for the Tsawwassen First Nation, our design reinterprets this tradition through a generous, shared community hall. This space allows residents to gather and engage with one another, fostering a sense of belonging. Rather than duplicating corridors to maximize units, we prioritized communal space, embracing a reduction in marketable area to honor cultural values and strengthen social connections. In this way, Heartwood celebrates community over profit, offering a residential experience rooted in shared life and human connection.

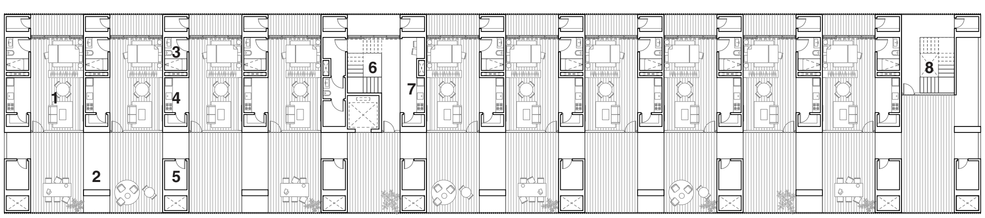
Outside homes, certain cores are dedicated to circulation, while others function as a shared kitchen that act as a hub of the community life. These kitchens are more than functional spaces. They honor the Tsawwassen First Nation, enabling residents to continue cherished traditions of trade and barter. They also recognize the cultural and spiritual importance of foods such as salmon, crab, and eulachon, creating opportunities for intergenerational exchange, storytelling, and the preservation of community heritage within the building.



Roof Plan
1. Roof Lounge
2. Central Stair / Elevator
3. MEP / Storage
4. Egress Stair



Typical Floor Plan A (4F, 6F, 8F)
1. Studio Unit
2. Bathroom
3. Kitchen
4. MEP / Storage
5. Central Stair / Elevator
6. Shared Kitchen
7. 2 Bedroom Unit
8. 1 Bedroom Unit
9. Egress Stair



Typical Floor Plan B (3F, 5F, 7F)
1. Studio Unit
2. Social Lounge
3. Bathroom
4. Kitchen
5. MEP / Storage
6. Central Stair / Elevator
7. Shared Kitchen
8. Egress Stair

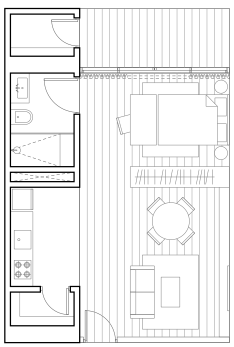
Flexible Home

Heartwood offers multiple housing types that flexibly expand according to family size. A studio unit occupies one core, while family units can occupie multiple cores, depending on the desired area and layout.

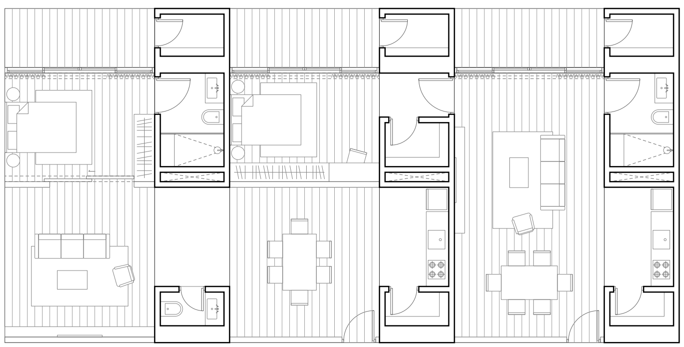
Each core works purely functional. It contains storage, MEP, bathroom and kitchen, allowing the spaces in between to become loft-style rooms that can be freely furnished. Residents could add extra partitions for optimal use, enabling full customization of their living environment.

Pro Forma

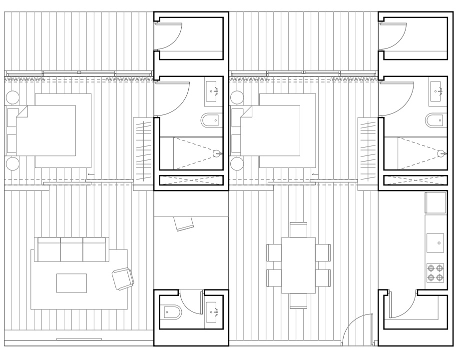
	BASE CASE			SUBMISSION		
FSR:			5			3
Lot Size:			25,540 ft^2			87,375 ft^2
Building Area above Grade:			127,700 ft^2			105,820 ft^2
Building Efficiency (%):			85%			78%
Total Stories above Grade:			18			8
Total Stories:			21			9
Stories below Grade:			3			1
Units:			86			61
Bedrooms:			178			64
Amenity Space Area:			850			1,290
Non-residential Area:			3,000			23,380
Construction Cost						
			Mass Timber			Mass Timber
	ft^2	$/ ft^2	Cost	ft^2	$/ ft^2	Cost
Below Grade:	75,000	$299	$22,425,000	6,940	$299	$2,075,060
Base Floor:	8,700	$403	$3,506,000	20,660	$403	$8,325,980
Above 1st Storey:	119,000	$431	$51,289,000	85,150	$431	$36,699,650
	Quantity	$/Unit		Quantity	$/Unit	
Balconies:	86	$25,000	$2,150,000	64	$25,000	$1,600,000
	Cost per	Months		Cost per	Months	
Schedule Costs:	$50,000	16	$800,000	$50,000	8	$400,000
Total			$80,170,100			$49,110,690
Embodied Carbon						
	ft^2	Embodied	Total	ft^2	Embodied	Total
Building Area:	202,700	2.69	542,112.31	114,737	2.49	285,695.13



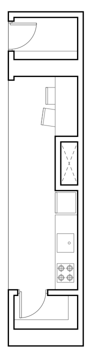
Studio Unit Area: 575 sqft
Count: 52



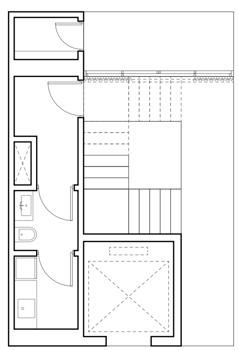
1 Bedroom Unit Area: 860 sqft
Count: 6



2 Bedroom Unit Area: 1150 sqft
Count: 3



Shared Kitchen



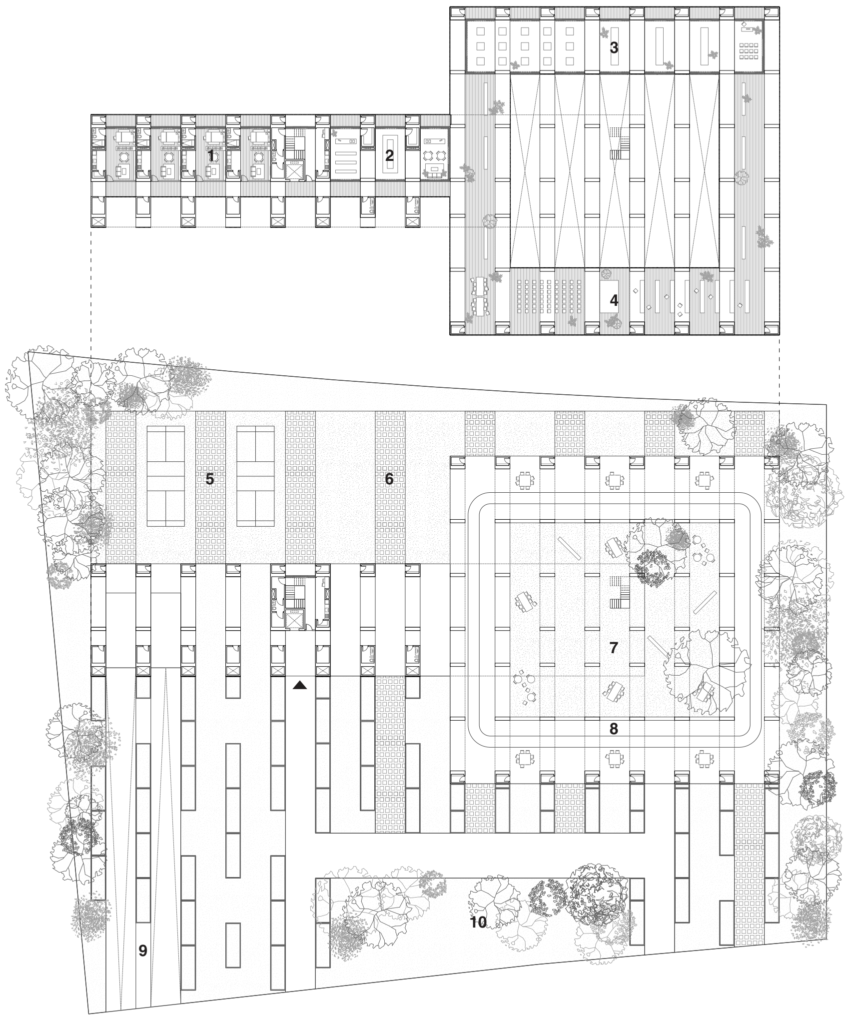
Circulation Core

Reverencing Land

How do you connect with the land?

Respecting the site as sacred ancestral land for the Tsawwassen First Nation, the building is lifted and the ground level becomes an open portal connecting the park at the front with the riverside at the back. Composite floors and columns create shaded areas for rest and enjoying the landscape.

The ground level of the raised garden bed features ceremonial firepits and natural play areas for all ages, while also serving as an all-day resting space. The second floor platform functions as a public art space and other outdoor public events and performances, with office, retail, and amenity areas for management and revenue. These shared spaces provide the residents opportunities to share the lifestyle while creating a buffer between private and public realms.

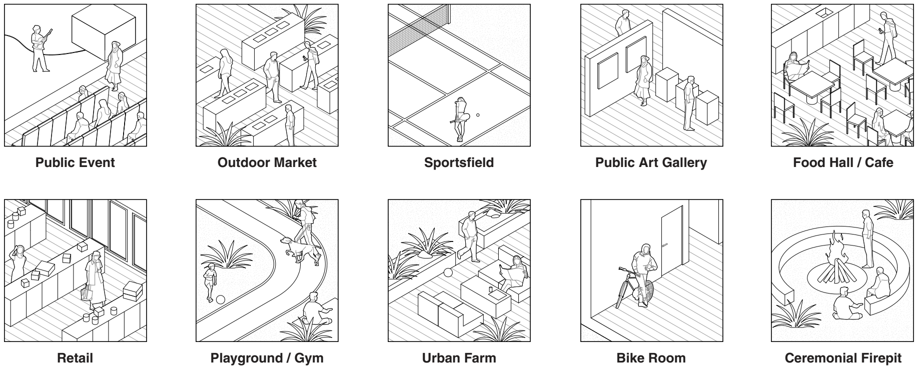


Ground Floor / L2 Plan
1. Residential
2. Retail and Amenity space
3. Indoor Social / Gallery
4. Outdoor Social / Gallery
5. Recreation Court
6. Garden
7. Courtyard
8. Peristyle
9. Underground Parking Lot Entry (80 Lots)
10. Front Gardeen

Social Community

Open, low, outdoor spaces are central to Heartwood, celebrating the community and those who will live within it. The residential units are organized as compact, core-based apartments with shared corridor lounges, fostering daily interaction. Opposite these intimate living areas, public spaces unfold into a wide, square-shaped courtyard, creating a communal heart where residents can gather, connect, and engage with the environment.

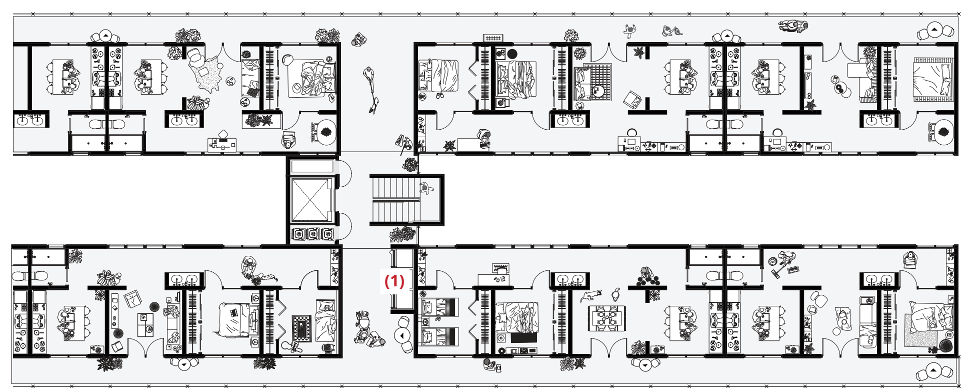
This low-rise public courtyard is a place where people all meet along, and where the public is introduced the culture. The evenly spaced cores open into flexible communal spaces where residents can gather, celebrate, and engage in everyday life. These spaces flow naturally into the riverside garden, creating a seamless connection between indoor and outdoor environments. Heartwood fosters cultural enhancement, storytelling, and collective memory, allowing both residents and the public to experience and participate in a living cultural landscape.



Həńq̓əmińəm̓

The SEA we face

H is our name, it was very important for us to tran venerate the Tswwassen culture in our project. Grabing the name of the language they speak, Həńq̓əmińəm̓, to represent this design for them from them. It was a perfect coincident that matches our basis of design in this MPP project. In floor plan with a rigorous structure of shear walls that compose the architecture spaces and at the same time is a modular structure easy to ensamble toghether and in elevation with two towers facing each otherThis project is designed to be a catalisty for MPP or CLT mass construction that is easy to replicate trough out different manufacturers with different dimension module, in any site. In this design option for our site we decided to make a hybrid articulation where the heart of the project live, the community and mixes use spaces where it can be round, orthagonal their own independent structure added or not added. This project is as flexible as it can get and it consists on linear affordable units with an independent circulation core in between two modules thuse always creating an ventilation patio between units and maintains two towers facing each other at all times.

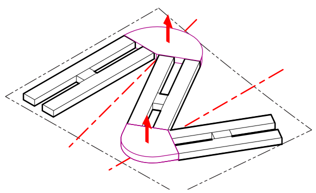


BASIC PLAN

Communal living, mix of flexible rooms that can be addapted to 1BR, 2BR, 3BR and Family living. Thanks to the linear floor plan the arrangement between sites can be different, thus permiting modularity, replicability and catalyst for housing change with MPP or CLT. Long corridors connecting community spaces and public gathering areas among neighbouts while inside the housing the mirrored wider corridor becomes a service patio also symbolizing a longhouse. Structure in shear walls is strong enough to cantiliver the two corridors.

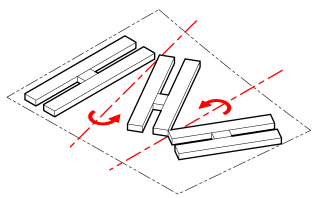
(1) Washer Dryer Station

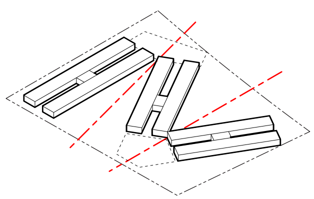
CONFIGURATION FLEXIBILITY



THE TOWERS
Two mirrored towers of housing

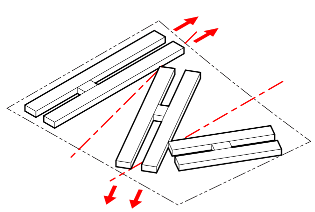
THE AXES
Two axes for articulation

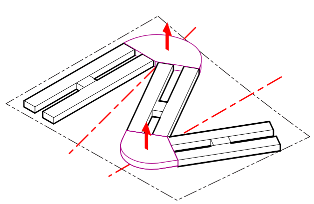




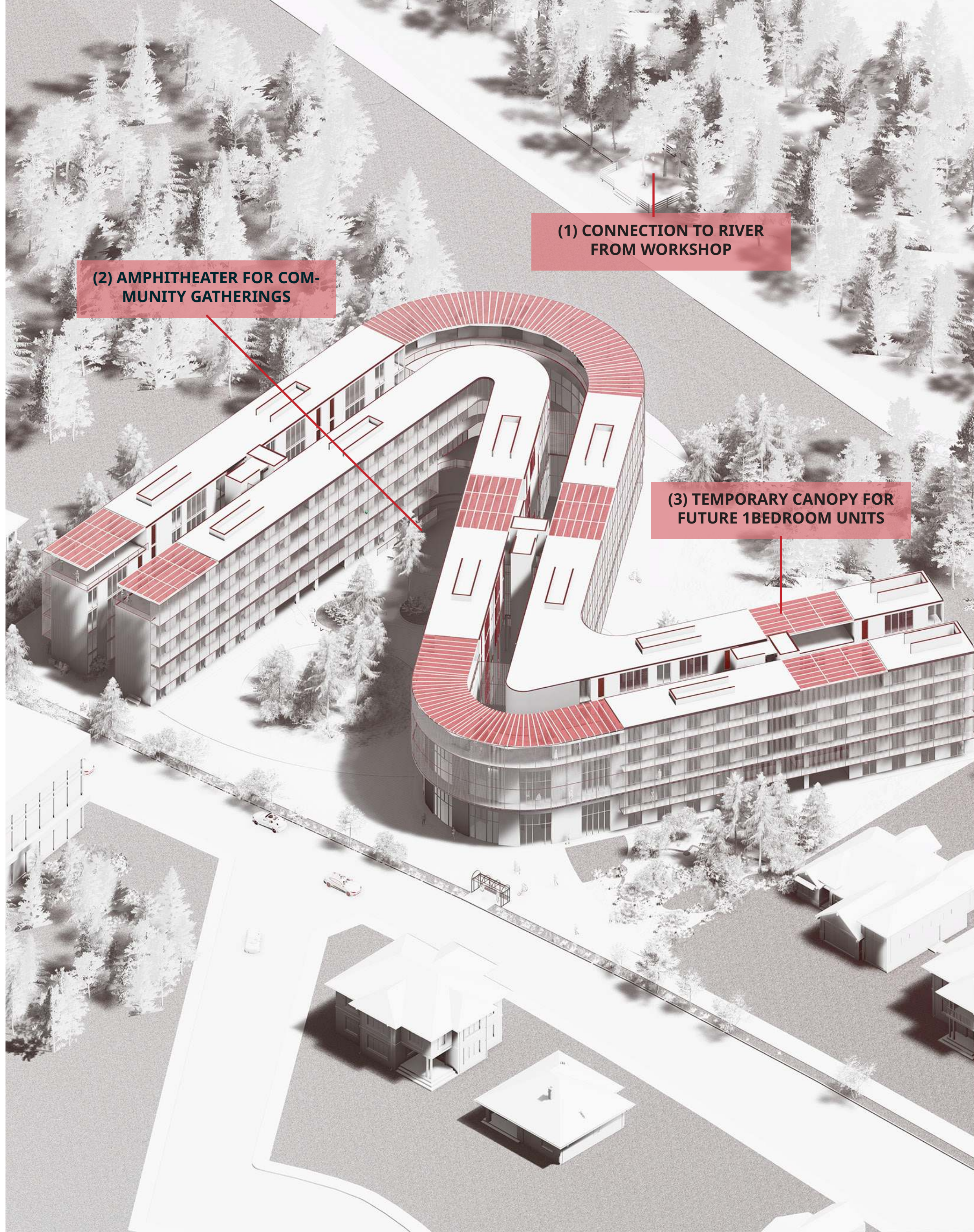
FUTURE BUILD
Future ammenities in an orthagonal modular grid in order to continue using MPP or CLT system

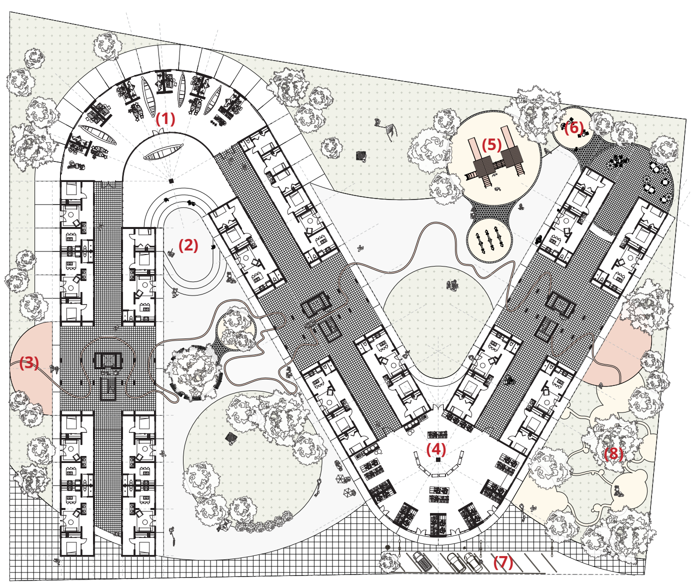
THREE BUILDINGS
Three independent buildings with more housing and allocation of community program troughout the buildings





HYBRID SYSTEM
Hybrid construction system with two independent articulation structure in this case concrete





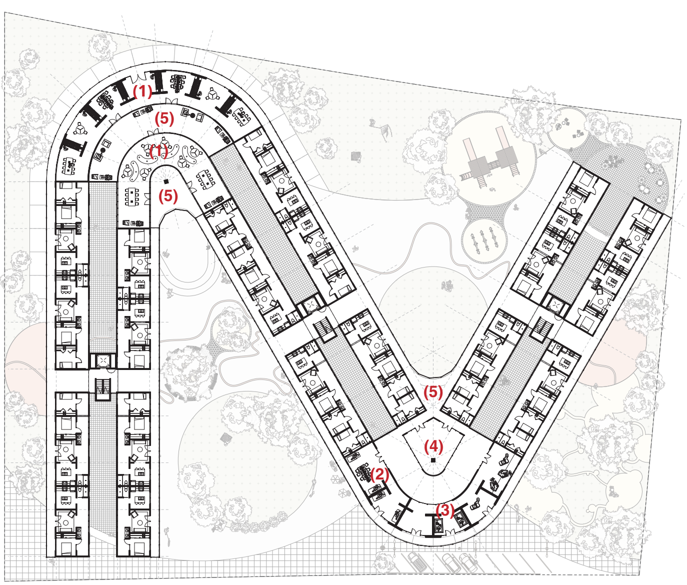
(1) WOOD WORKSHOP
(2) AMPHITHEATER
(3) RIVER PATH
(4) COMMUNITIES SUPERMARKET
(5) PLAYGROUND
(6) GARDENING BEDS
(7) CAR SHARE FOR TENANTS
(8) SALISH ECOSYSTEM SANCTUARY

LEVEL 1 AND 2

1 BEDROOM	6
2 BEDROOM	8
FAMILY	1

NORTH AMMENITY
Double height canoe making workshop. Where the Tsawwassen community can gather to venerate the ancestry art of canoe making and or families can leart to build wooden furniture for ther houses. Where we are laso proposing a connection directly to the river for them to fish and try the canoes. This space also connects to an amphitheater for community assemblies.

SOUTH AMMENITY
Double height supermarket and storage for anything the communit grows in the gardens or fish with their canoes in the river. Something to give back to the community where neighboors and school can buy.



(1) LIBRARY AND CLASSROOMS
(2) CLINIC
(3) CHILD CARE
(4) GYM
(5) OUTDOOR SPACE

LEVEL 3 AND 4

1 BEDROOM	8
2 BEDROOM	6
3 BEDROOM	4
FAMILY	1

NORTH AMMENITY
Double height library, classroom and reading spaces plus exterior terraces.

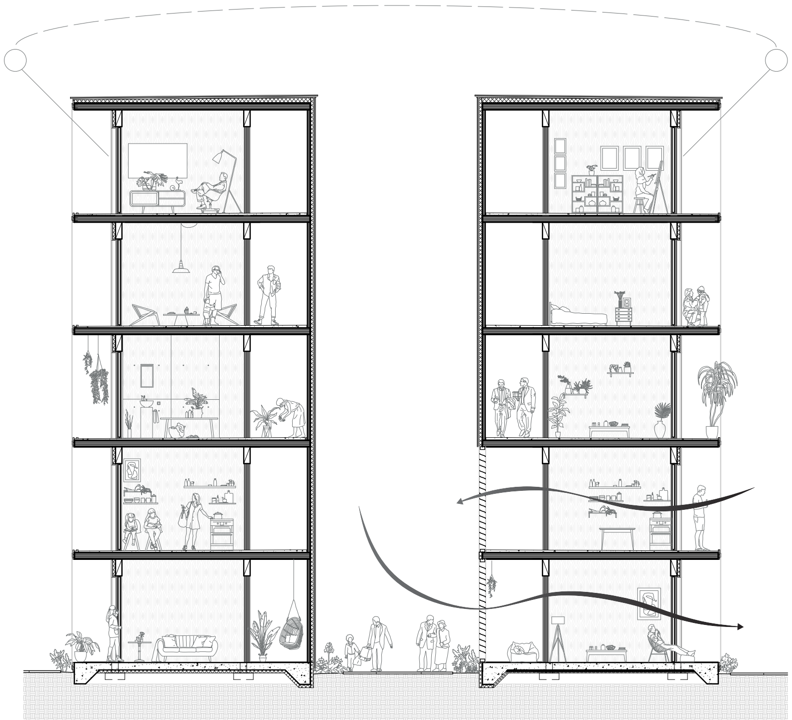
SOUTH AMMENITY
General medicine consultations for the community and daycare plus a indoor gym.

LEVEL 5

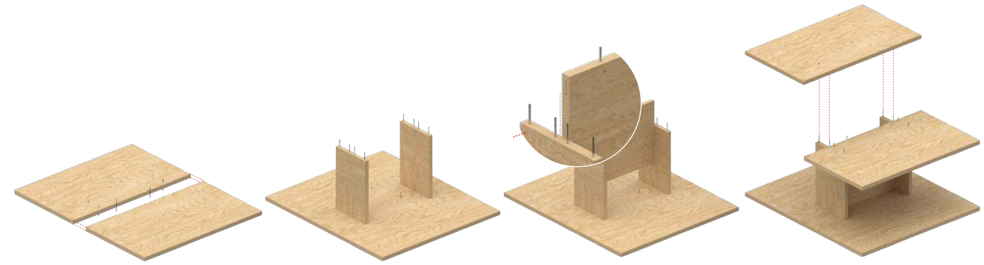
1 BEDROOM	11
2 BEDROOM	4
3 BEDROOM	5

AMMENITY
Outdoor terraces and future units

DTT-D-10



Its very important to mention that for sealing system and envelope enclosure we are using a system of insulation attached to the facade of the unit with reclaimed plywood and reclaimed wooden slats arragend in different modules along the height of the facade. All exteriors are as much reclaimed wood as possible. For ventilation and ilumination as our section depicts we have a ventilation systems with jalousie windows on the interior patios permiting cross ventilation system.



All housing is modular with our MPP Manufacturer having panel dimensions of 42FT X 12FT we divided our floor panl in 21FTX12FT giving us a basic module of 3FT which in case of metric 3FT is 0.9144m the closest module to 1m so it could be easily replicated to other countris with metric manufacturers. Then the H structure shear wall system is 10ft wide by 10ft tall wich comes from a panel of 60ftx10ft giving us 6 panels and lastly our H shorter walls being 6ft wide by 10ft tall. All our facade modules being a multiple of 3 mainly being 6ft or 3ft troughtout the whole project.

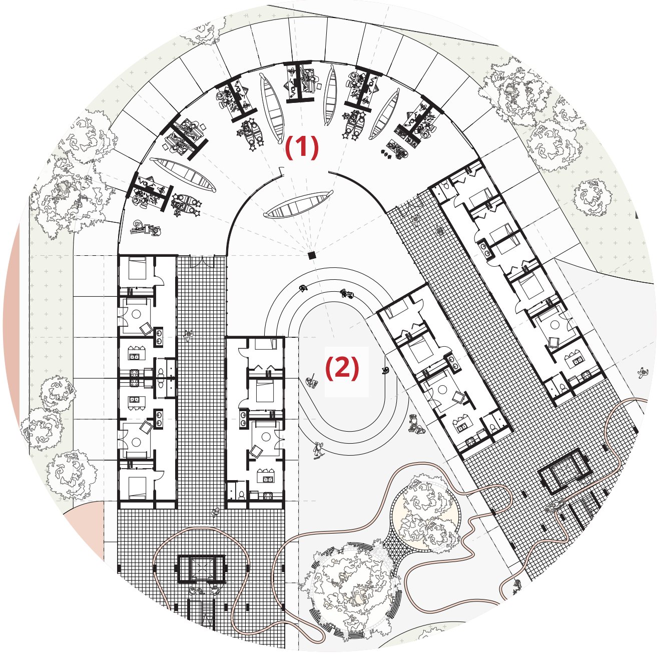
We ended up doing the cost analysis with MPP from Freres since its more affordable than CLT and a Pacific North West unique modular material. Its more flexible in basis of design than CLT but our proposal could be analyzed with both materials.

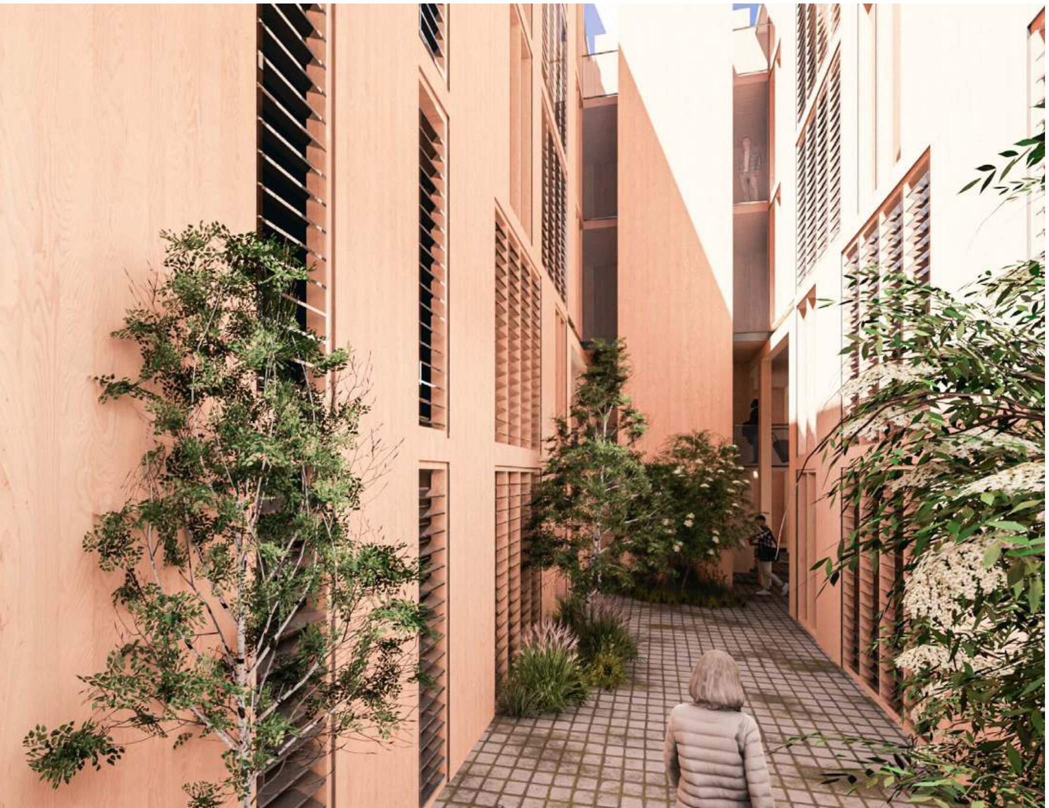
COST BASE CASE ANALYSIS	BASE CASE	[illegible]
FSR	5	2.19
Lot Size	25,540 SF	87,337 SF
Building Area Above Grade	127,700 SF	191,425 SF
Building Efficiency	85%	85%
Non Saleable/Rentable	19,155	28,714
Saleable/Rentable	108,545	162,711
Total Stories Above Grade	18	5
Total Stories	21	5
Base Floor	1	1
Above 1St Storey	17	4
Stories Below Grade	3	-
Units	86	88
Bedrooms	178	158
Amenity Space	850 SF	28,514 SF
Non-Residential	3,000 SF	3,000 SF

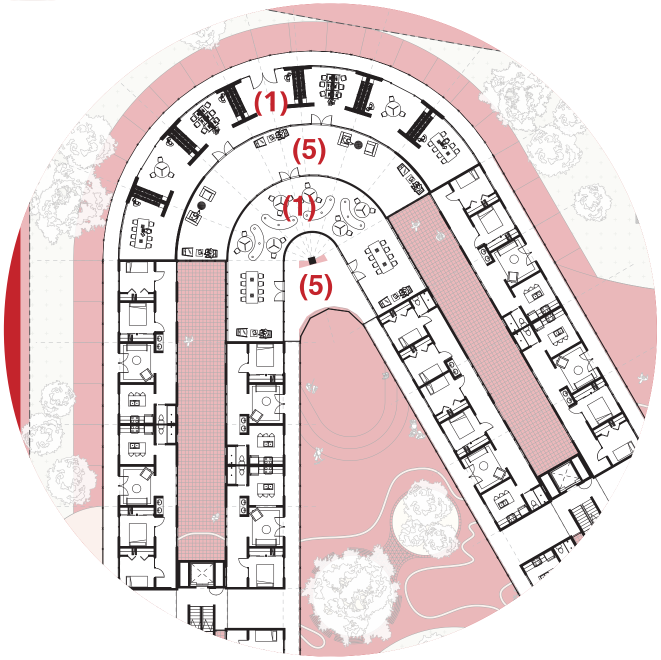
CONSTRUCTION COSTS		CONCRETE		MASS TIMBER			CONCRETE		MPP	
Below Grade	75,000 SF	$315	$23,625,000	$299	$22,425,000	0 SF	$315	$0	$300	$0
Base Floor	8,700 SF	$360	$3,132,000	$403	$3,506,100	38,285 SF	$360	$13,782,600	$350	$13,399,750
Above 1st Storey	119,000 SF	$385	$45,815,000	$431	$51,289,000	153,140 SF	$385	$58,958,900	$255	$39,050,700
Balconies	86	$25,000	$2,150,000	$25,000	$2,150,000	0	$25,000	$0	$25,000	$0
Schedule Costs (Overhead/Construction Time)	$50,000 / Mo.	18 Months	$900,000 / Mo.	16 Months	$800,000	$50,000 / Mo.	18 Months	$900,000	12 Months	$600,000
TOTAL			$75,622,000		$80,170,100			$73,641,500		$53,050,450

EMBODIED CARBON		CONCRETE		MASS TIMBER			CONCRETE		MPP	
	Area	Embodied	Total	Embodied	Total	Area	Embodied	Total	Embodied C	Total Carbon
	202,700 SF	6.69 kg/SF	1,355,864 kg/SF	2.69 kg/SF	546,112 kg/SF	191,425 SF	6.69 kg/SF	1,280,445 kg/SF	2.69 kg/SF	516,847 kg/SF

We believe elders should live mixed troughout the building not segregated in their own corner. Also not necesarilly living in 1 Bedroom unit where they live solo, instead they can live in families and there fore we have considered a four bedroom unit. The Tsawwassen venerate they elderly as we all should.



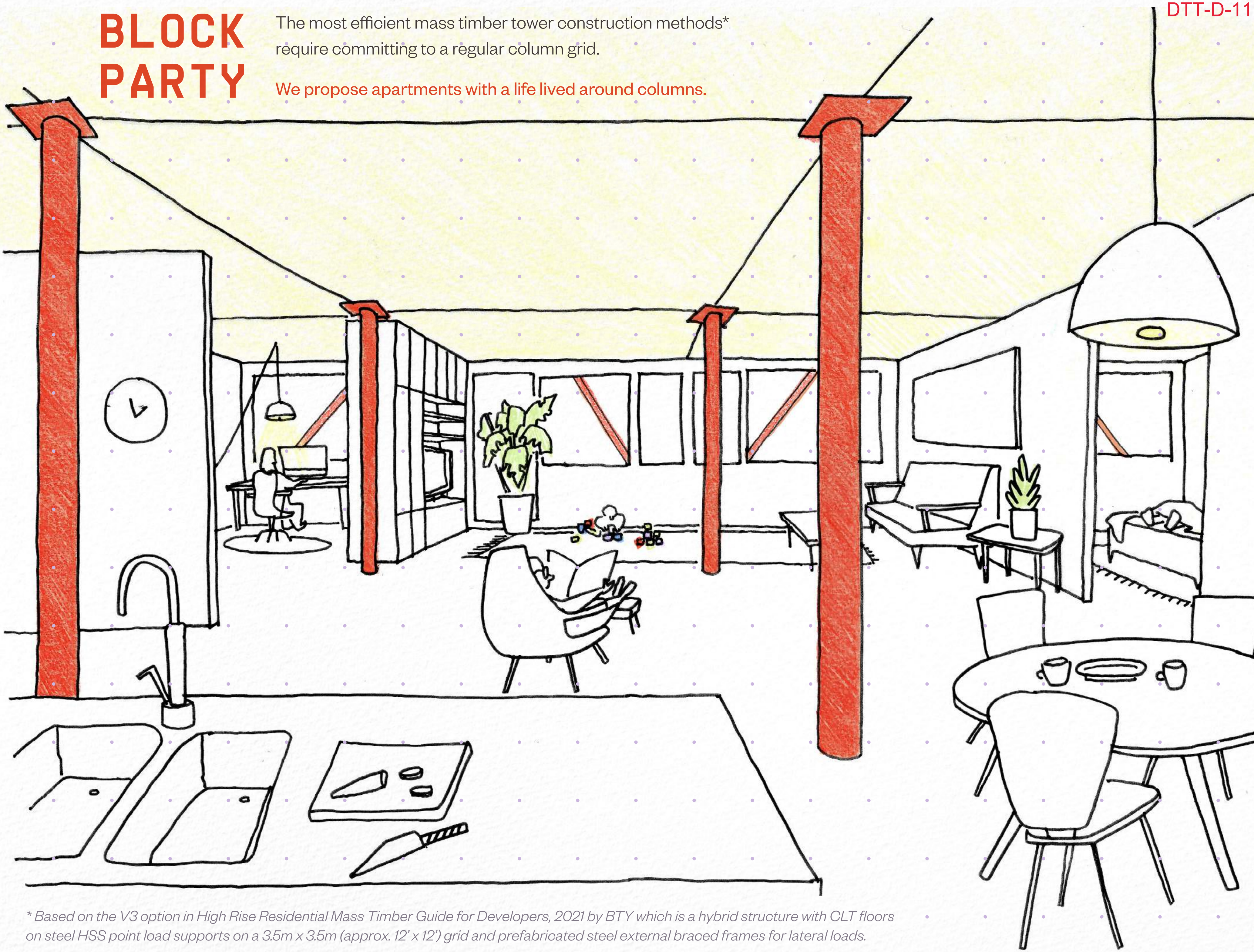




BLOCK PARTY

The most efficient mass timber tower construction methods* require committing to a regular column grid.

We propose apartments with a life lived around columns.



* Based on the V3 option in High Rise Residential Mass Timber Guide for Developers, 2021 by BTY which is a hybrid structure with CLT floors on steel HSS point load supports on a 3.5m x 3.5m (approx. 12' x 12') grid and prefabricated steel external braced frames for lateral loads.

Unit Plans and Flexibility

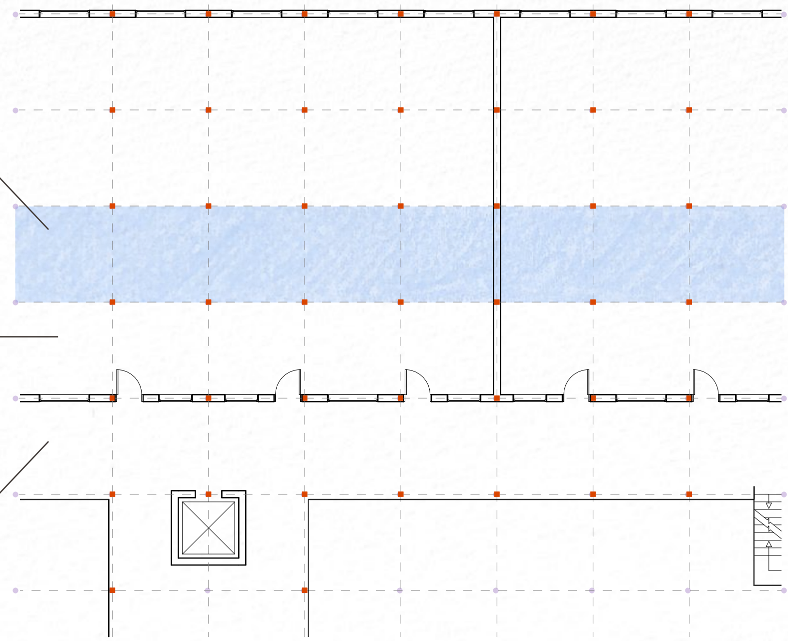
The irony is that keeping to a rigid 12' x 12' point-load column grid allows for more flexibility for interior layouts.

- Each apartment needs to have at least one first row 12' x 12' square for entry and at least one second row square for kitchens and washrooms.
- Demising walls are always placed along the column grid. They may jog vertically and horizontally or may be removed to fit growing families overtime.
- External circulation lowers long-term maintenance and occupancy costs and creates spaces for neighbourly interactions.
- The squares are sold with minimal finishes, with exposed timber CLT ceilings, concrete floors and either roughed-in plumbing for residents to finish or a basic washroom and kitchen unit that can be included to meet occupancy requirements.

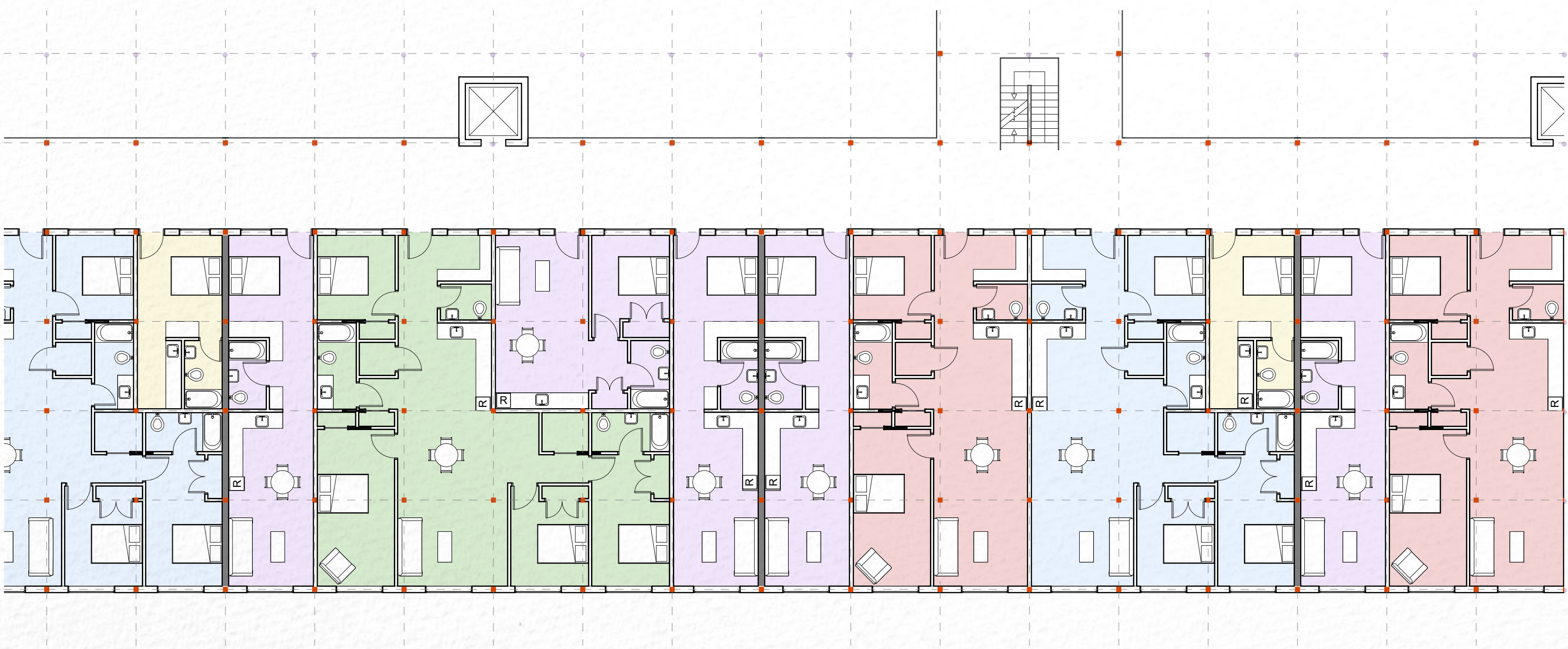
Mechanical and plumbing services are organized within the second row of squares.

Entrances are in the first row of squares off the external walkway.

Circulation is via external bolt-on steel walkways and stairs.



Every third floor, a steel truss bridge connects buildings and has internal and external shared space.



Studio

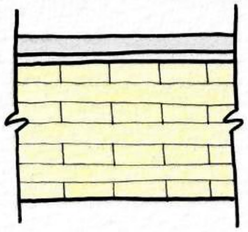
1 Bed

2 Bed

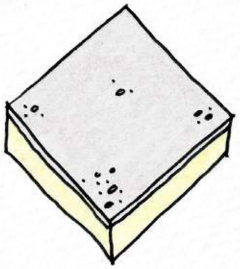
3 Bed

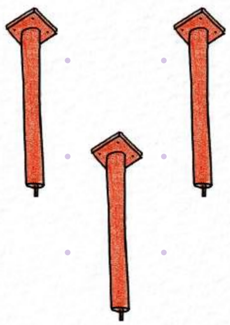
4 Bed

PREFAB HYBRID TIMBER AND STEEL STRUCTURE COMPONENTS

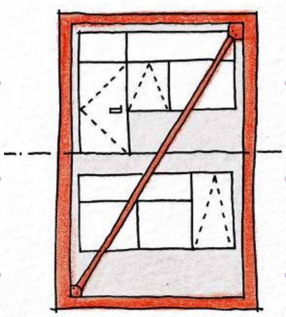


- 12'x 12' floor panel (7-ply CLT with a concrete topping and acoustic matt) achieves the fire, acoustic requirements.
- *Proposing industry-standardized CLT floorplate either 10'x10' or 12'x12', 5-ply or 7-ply to correspond to the preferred grid sizes 3-3.5m.*

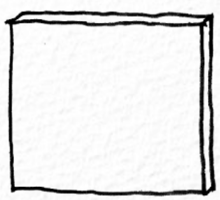




- 8'-8" steel HSS flat plate post with intumescent paint finish. Point load, no beams, so services can run in either direction for best efficiency. Steel makes for smaller posts and reduces risk of rotting from flooding.
- 12' x 19'-6" prefab envelope (one square wide, two squares high) - with external braced exo-skeleton frame for lateral loading. Complete with factory-installed strip windows, exterior doors, cladding and insulation.
- *Envelope panels can follow one floor behind the structure (to meet code requirement of enclosing at least every fourth floor of wood construction)*

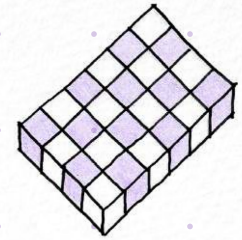


- 12' x 8'-8" prefab demising wall and 8'-8" high prefab internal unit walls in 4', 6' and 10' lengths.
- 12' wide bolt-on steel walkways
- 24' wide steel truss bridge



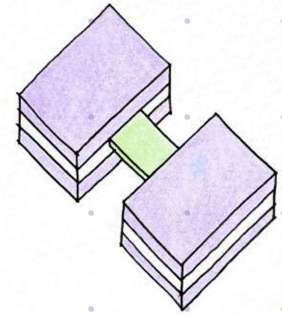
- External steel stair
- Concrete elevator core

SQUARES



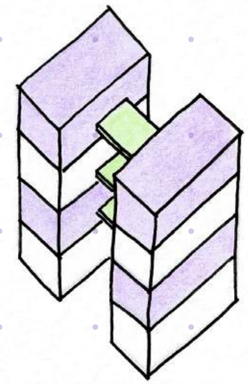
48 SQUARES per floor
= up to 24 PEOPLE in 2 to 12 APARTMENTS.

BLOCKS



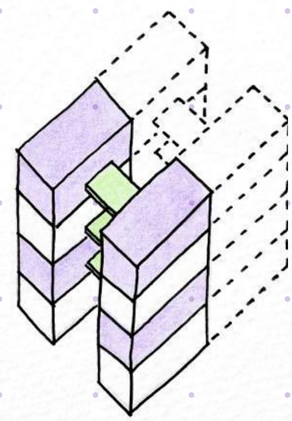
3 floors and a shared internal and external space make a BLOCK
= 72 people

TOWERS



4 stacked BLOCKS create a 12-storey TOWER
= 288 PEOPLE (432 people in 18-stories)

COMMUNITIES



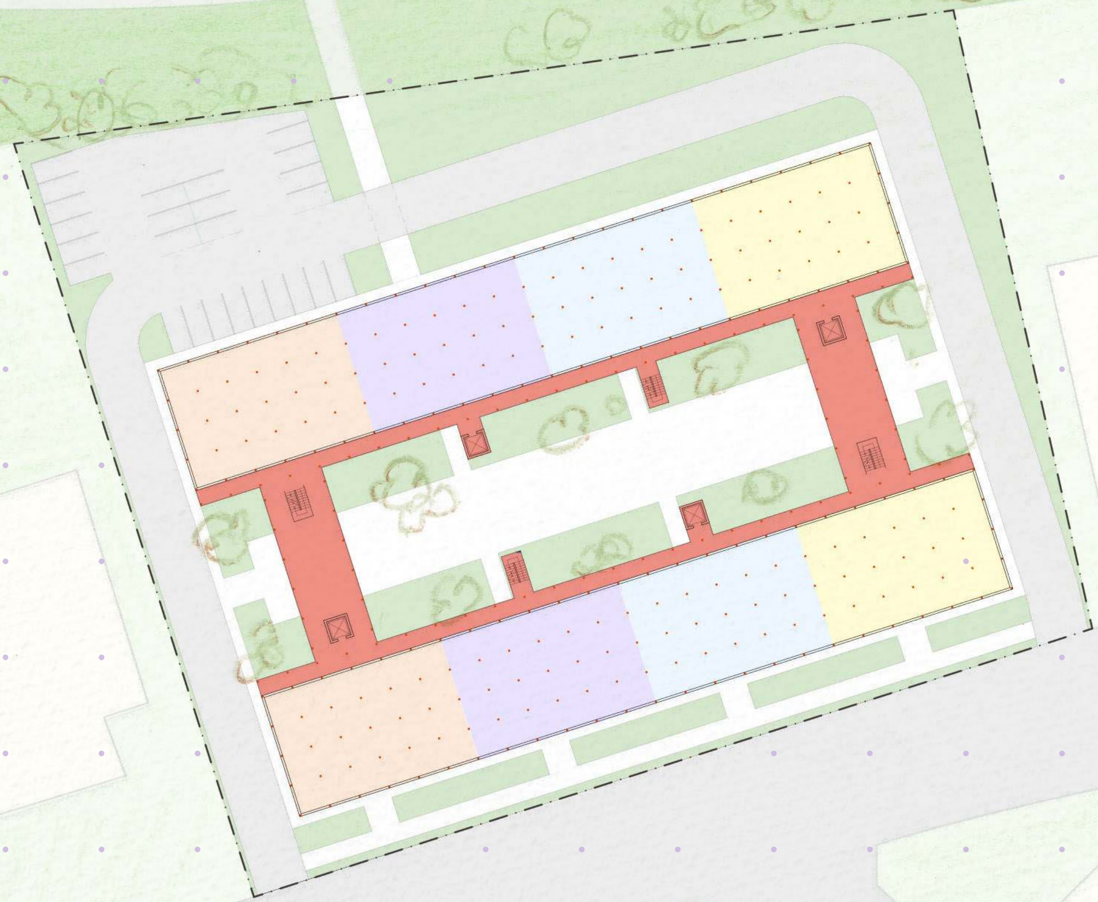
TOWERS can stand alone or, on larger sites, they can be connected laterally into COMMUNITIES

Site Plan

Site D is on Tsawwassen First Nation land. The brief asked for living spaces for youth, families and Elders (fully-accessible) in a variety of unit sizes gathered around community spaces. Core community values of intergenerational living, gathering, and maintaining connection with the lands and waters are to be honoured.

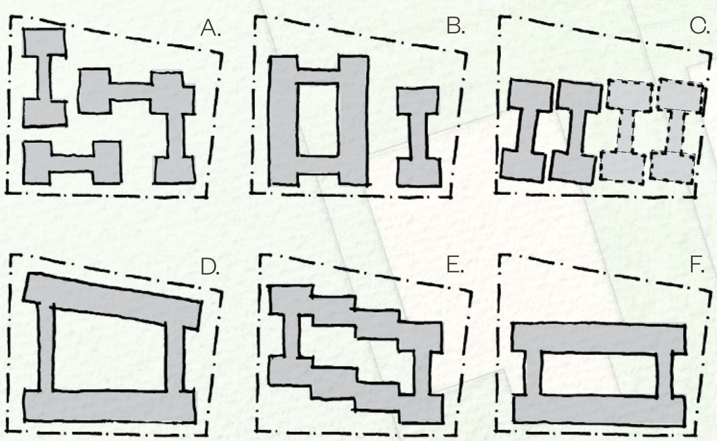
Our design was developed to support intergenerational living or found family groups as well as providing options for individuals, couples, single parents and nuclear family arrangements.

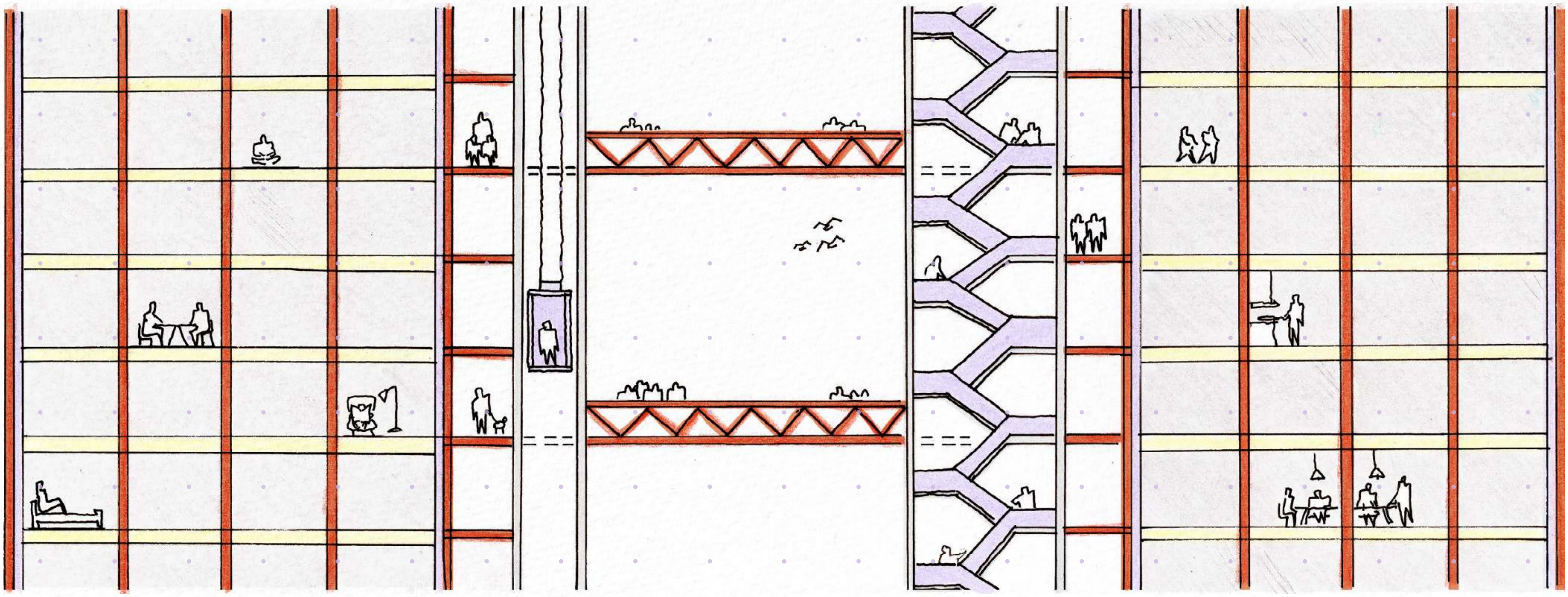
Larger social events for all the blocks can take place on the ground level which can have raised garden beds, natural playscapes, ceremonial fires and a dock on the river for fishing excursions. The parking lot can double as a space for basketball, pickleball, or learning to bike.



ADAPTABILITY

The block module is flexible for different scales of sites and lends itself to development over time on a larger parcel such as Site D.





Regulatory Considerations

SUGGESTED CHANGE 1:

Increase the maximum height for wood structures from 138ft (42m) to 143 feet (43.6m). Reason: to accommodate 12 stories with the switch from 8" concrete slab to a 7-ply CLT floor assembly with a typical 8'-8" clear height in each suite.

SUGGESTED CHANGE 2:

Increase the maximum stories from 12 to 18 with a corresponding 215 feet (65.4m) height allowance.

Fire and acoustic ratings are achieved through encapsulated timber (max 30% exposed). Only the ceiling is exposed timber. The 7-ply floor assembly gives a 2-ply char layer and assists with meeting the acoustic rating.

Moisture control is achieved by (1) having no timber exposed on the exterior, (2) envelope panels can follow every two floors of structure to enclose (every 4 floors is required) and (3) CLT panels to have a factory-applied top-coat and edge sealer.

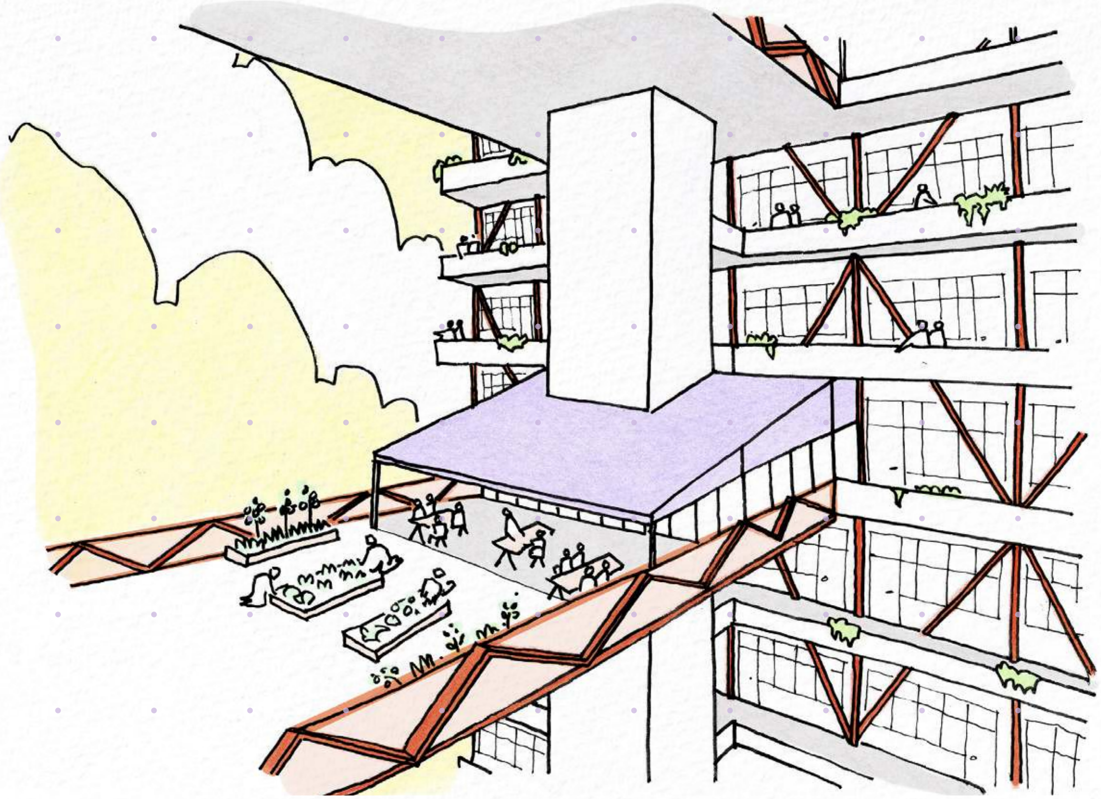
Bridge Connections

The block arrangements make for smaller, secure groupings within a larger tower model so that connections are developed at a scale where block residents know each other and can connect on the bridge to share childcare, perform daily activities and host regular gatherings.

Development Types

The design can support owned or rented market or non-market housing, co-housing or mixed-use buildings, but co-operative housing may be the best fit, as the ownership model would allow each 12' x 12' square to be purchased as a share.

Owners can add or remove (purchase or sell) squares over time.



Pro-Forma

To reduce the cost premium for prefab hybrid (20-25% more than a concrete tower for an irregular design, according to BTY) we propose a rectangular building mass with a regular grid, no larger spans and no internal core.

The construction schedule of a hybrid mass timber-steel structure with a steel core is 20% shorter than concrete, but a steel core is larger and more costly. In our design, the concrete elevator core is separated from the timber-steel structure, connected by external bolt-on steel walkways. The core can be completed in parallel to the main building to further reduce construction time.

Buildings can have smaller foundations because the proposed hybrid assembly is lighter than a concrete frame.

Hybrid lends itself to the methods and skills of the existing steel industry including fabrication through 3D models, prefabrication shops, certified installers and proficiency in meeting tolerances.

Same steel trade can handle steel posts, walkways and stairs, mass timber floors and exterior wall assembly. Interior wall assembly could also be by the same trade with prefab modular wall panels in CLT or stick frame.

The exposed timber ceilings will have a premium for visual grade but the alternate would be 5-ply CLT with two layers of GWB on an acoustic channel, which requires another trade. The exposed wood provides a connection to nature.

COST BASE CASE ANALYSIS

FSR	5	
Lot size (sq ft)	65,340	
Building sq ft Above Grade	331776.0	
Building efficiency (%)	100	External circulation
Non saleable/rentable (sq ft)	0	
Saleable/rentable (sq ft)	331776	
Total Stories (#)	12	
Stories below grade (#)	0	
Base floor (#)	1	
Above 1st storey (#)	11	
Units (#)	264	
Bedrooms (#)	704	
Amenity space (sq ft)	13824	
Non-residential (sq ft)	3456	

Construction costs

		Concrete		Block Party	
	Square footage	**$/sq ft**	**Cost**	**$/sq ft**	**Cost**
Below grade	0.0	$315	$0	$0	$0
Base floor	27648.0	$360	$9,953,280	$403	$11,142,144
Above 1st storey	304128.0	$405	$123,171,840	$431	$131,079,168
	Quantity	**$/unit**		**$/unit**	
Balconies	352	$25,000	$8,800,000	$25,000	$8,800,000
	Cost per month	**# Months**	**Cost**	**# Months**	**Cost**
Schedule Costs (Monthly Overhead)	$50,000	18	$900,000	12	$600,000
TOTAL			**$142,825,120**		**$151,621,312**

Embodied Carbon

		Concrete		Block Party	
	Sq ft	**Embodied Carbon kg/sq ft**	**Total Carbon**	**Embodied Carbon kg/sq ft**	**Total Carbon**
Total Building Sq Footage	408960.0	6.69	2735541.619	3	1226880

DTT-D-12

Building Statistics

FSR: 3.14
Lot Size: 884,65 SF
Gross Building Size: 278,053 SF
Number of Residential Units: 370
Number of Beds: 458
Shared Social Spaces: 46084 SF
Commercial Retail Spaces: 18,256 SF

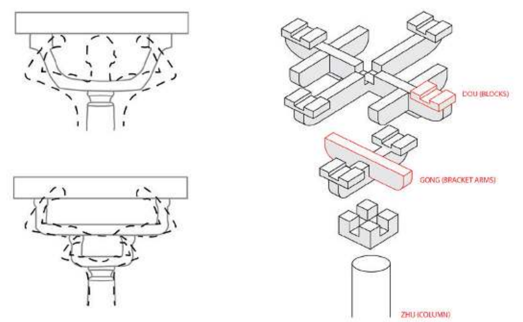
Floating Village

A timber structure lifted to embrace water, culture, and community.

Our design journey began with a simple but ambitious idea: “the building as a park, and the park as a building.” To achieve this, we approached the park not as a collection of disconnected features - paths, trees, benches - but as a living system. Using a process of deconstruction, transformation, and reconstruction, we distilled its essential characteristics: cohabitation, redundancy, adaptation, complexity, modularity, and multi-layered structure. A park, like nature, is not static; it is dynamic, resilient, and inherently modular.

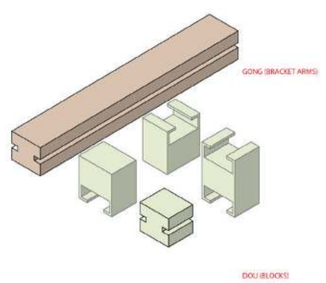
This understanding led us to see nature as a series of building blocks that are replicable. Just as all life on earth is formed from four base components, our design sought to reclaim urban land through a similarly modular system. The concept evolved into an inverted pyramid structure inspired by the ancient Chinese architectural element 斗拱 (dougong). By breaking this traditional system apart, we identified our own “DNA” for the vertical village: the beam and the bracket - structural elements that, when multiplied and layered, create a new architecture of community and resilience.

Massing Reference

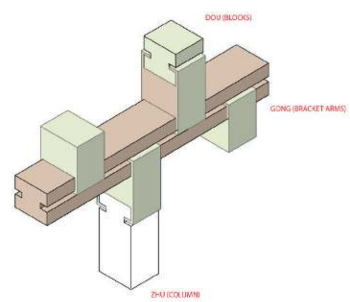


Schematic diagram of the abstract form of larger bracket as column capital replaced by interlocking self-similar smaller brackets to increase the stiffness as well as to transfer the roof and beam load sequentially to the column.

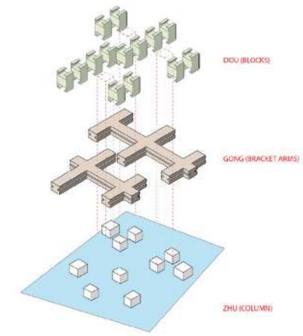
Massing Diagram



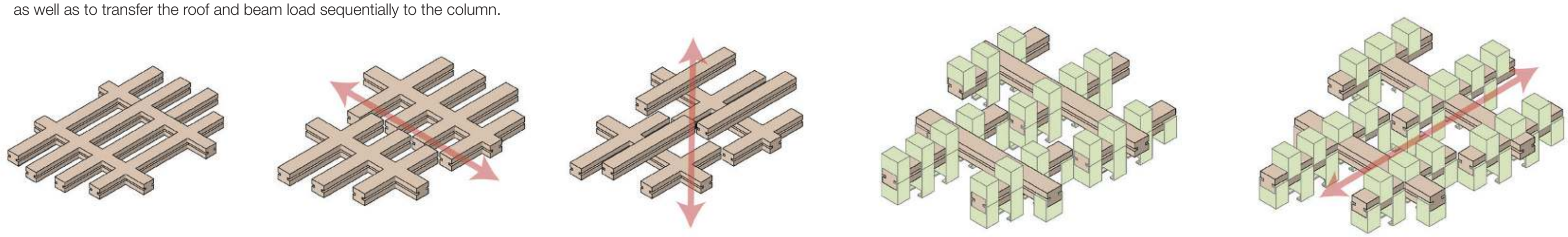
DNA Building Blocks



Dou-Gong Interlocking Method



Using the Lifted-up Method to give the land back to the community

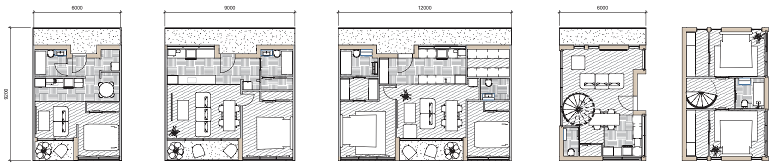


Both dou and gong are strategically staggered vertically, horizontally, and in depth to ensure privacy and minimize direct views between units. The resulting offsets create voids and terraces, providing residents with access to outdoor green spaces within the vertical village.

DTT-D-12

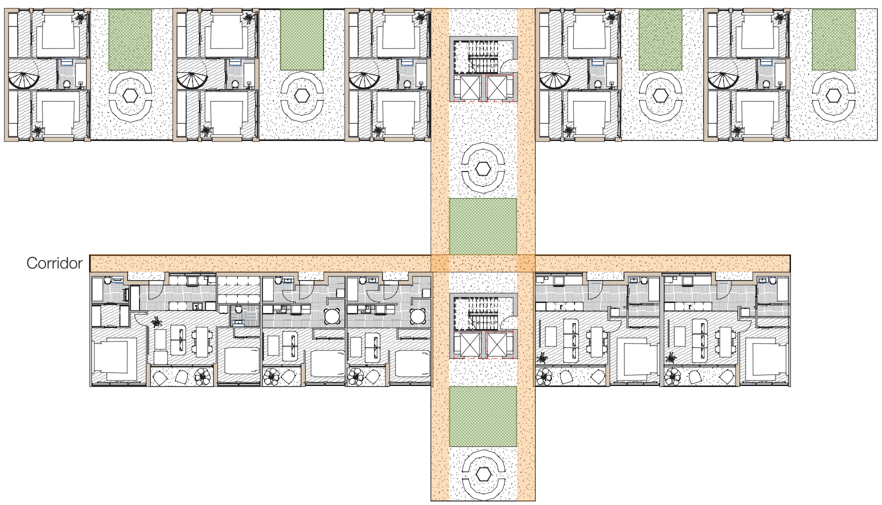
Typical Unit Layouts

Gong Units | Dou Units

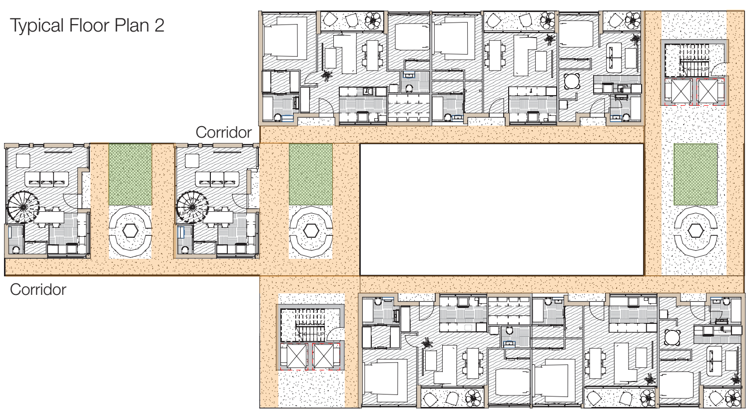


Studio | 1- Bedroom | 2- Bedroom | Double Floor 2- Bedroom

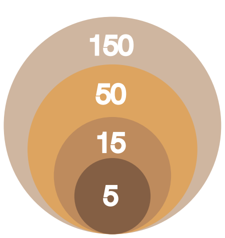
Typical Floor Plan 1



Typical Floor Plan 2



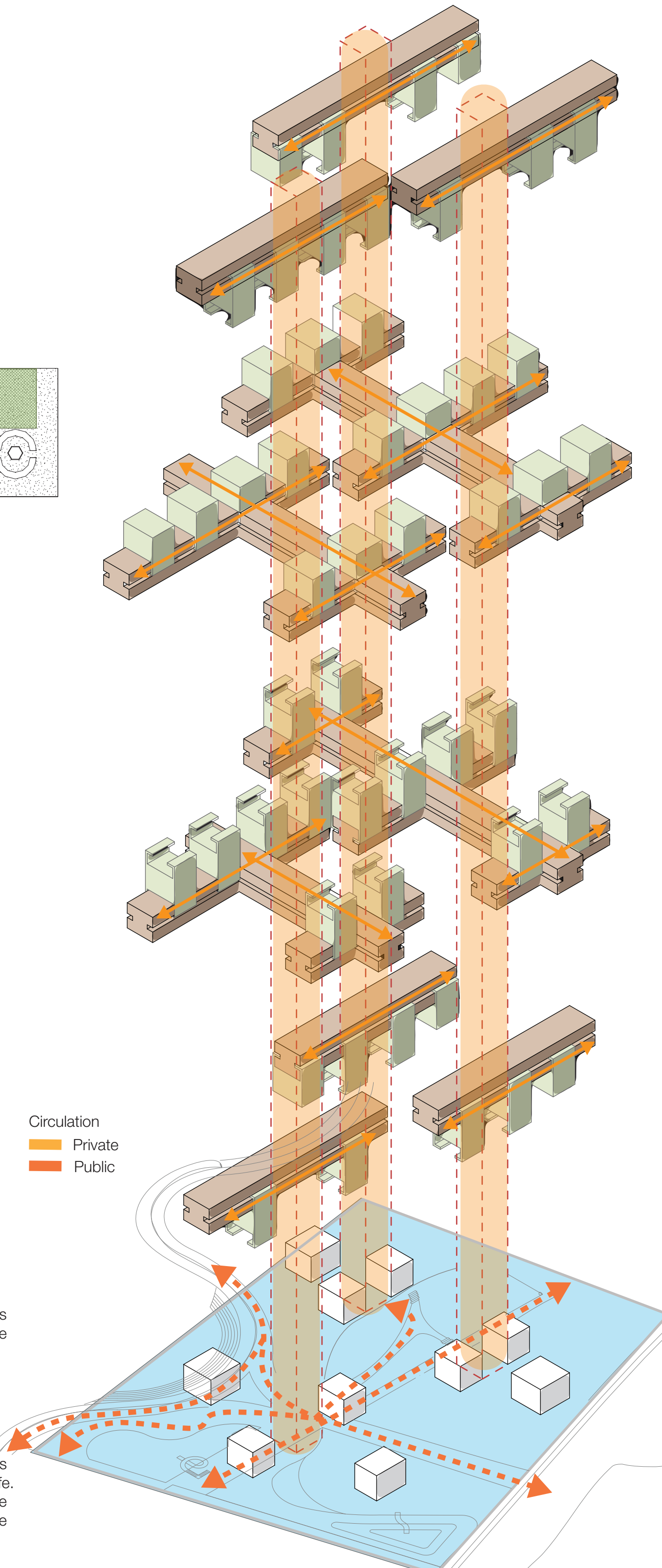
Robin Dunbar's Theory



At this point the transformation step is completed. And next was to reconstruct. Humans thrive in a village setup, in a village the fear of strangers disappears, as there is no strangers, for example. The question became how do we bring the village to the city? For that we turned to Dunbar numbers that ….

Up to 5 the immediate family this will be the unit
Up to 50 this will be the floor
Up to 150 this will be the bloc: multiple floors that shares one core. Or the village

These are recursive hierarchy of private, semi private/public, public spaces, covers human need from one individual to whole society for healthy, well being, thriving life. Then comes the project which is multiple villages put together and they share the land as a resource, a frame that hosts villages and yet it continues beyond the side boundary

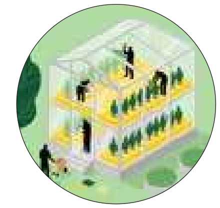


Activities in the gathering areas

Table tennis

Volleyball

Playground

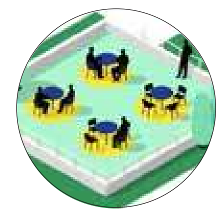


Urban Greenhouses

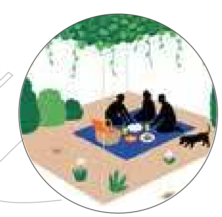
Dense vegetation

Plants in pots

Culture Exange Area

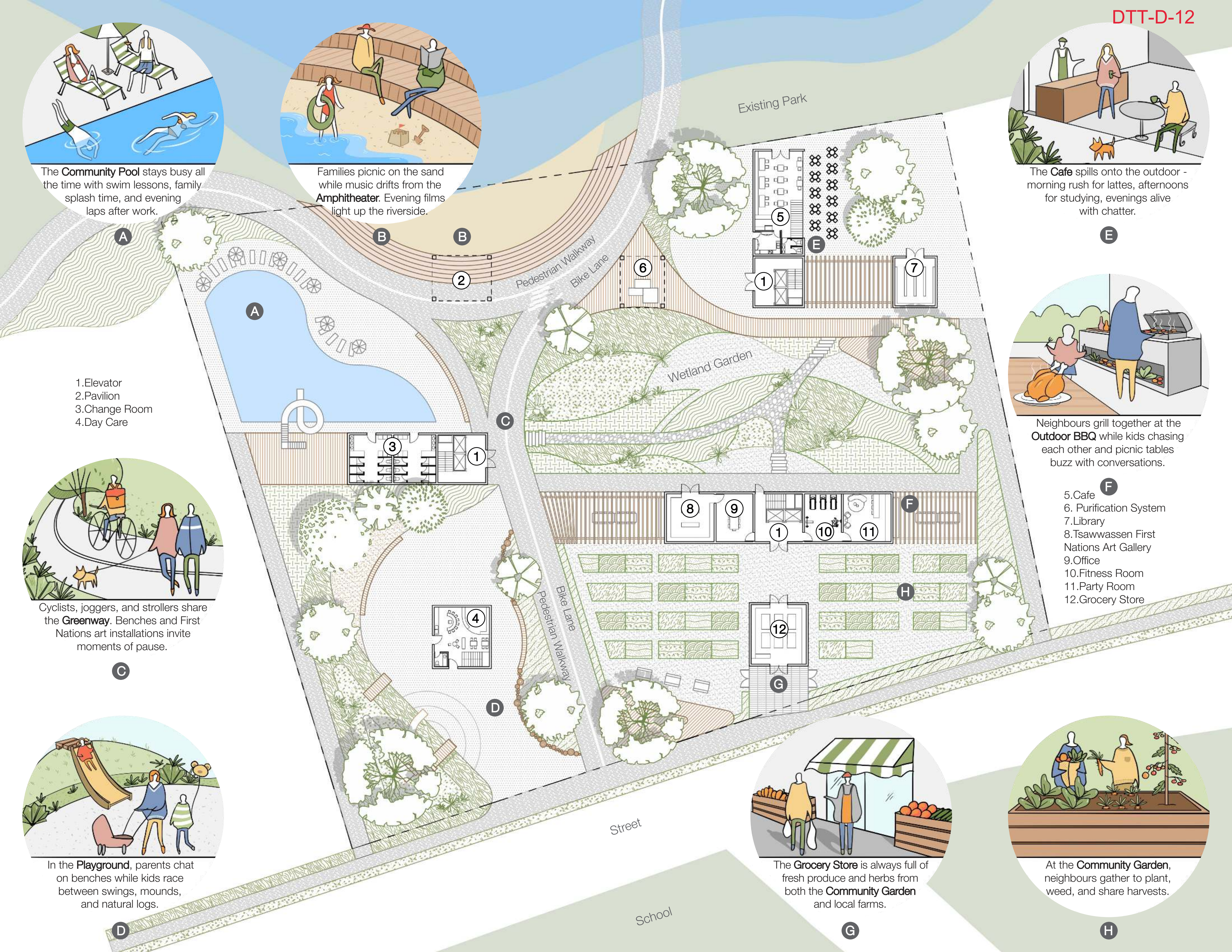


Terraces



Picnic

Fitness


DTT-D-12
The Community Pool stays busy all the time with swim lessons, family splash time, and evening laps after work.
A
Families picnic on the sand while music drifts from the Amphitheater. Evening films light up the riverside.
B
The Cafe spills onto the outdoor - morning rush for lattes, afternoons for studying, evenings alive with chatter.
E
Existing Park
Pedestrian Walkway
Bike Lane
Wetland Garden
1.Elevator
2.Pavilion
3.Change Room
4.Day Care
Neighbours grill together at the Outdoor BBQ while kids chasing each other and picnic tables buzz with conversations.
F
5.Cafe
6. Purification System
7.Library
8.Tsawwassen First Nations Art Gallery
9.Office
10.Fitness Room
11.Party Room
12.Grocery Store
Cyclists, joggers, and strollers share the Greenway. Benches and First Nations art installations invite moments of pause.
C
Bike Lane
Pedestrian Walkway
Street
School
In the Playground, parents chat on benches while kids race between swings, mounds, and natural logs.
D
The Grocery Store is always full of fresh produce and herbs from both the Community Garden and local farms.
G
At the Community Garden, neighbours gather to plant, weed, and share harvests.
H

Sustainable Diagram

Air Quality

The staking and shifted staggered design creats a lot of pocket areas, that brings fresh air in and out the units. The greenery decorates the building also improve the air quality

Water Recycle Reuse system

Integrating water recycle-reuse systems conserves freshwater resources, reduces utility costs, supports sustainable stormwater management

Chimney Effect

The circulation of cold and hot air strengthen the natural ventilation and also reduce the active cooling and heating in the some extreme weather in Metro Van

Solar Panel

Installing solar panels on the roof generates renewable energy, reduces operating costs, lowers the building's carbon footprint, and contributes to long-term sustainability goals.

Greenroof

A green roof enhances building performance by reducing stormwater runoff, improving insulation and energy efficiency, and contributing to urban biodiversity and occupant well-being.

Bird Migration Nests

Incorporating bird migration nests on the roof supports urban biodiversity, provides safe habitats for migratory species, and strengthens the project's ecological and sustainability credentials.

The Construction Material Pyramid

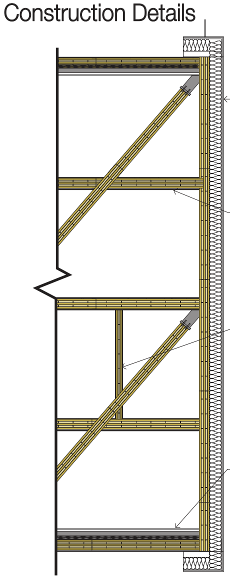
| kg $CO_{2\ eq}$
| module A1-A3

Floating Village

Your pyramid:
-4,003,542.7 kg $CO_{2\ eq}$

-155 kg $CO_{2\ eq}/m^2$

Construction Details



Structural Wall(Exterior)
12mm Facade
25mm Timber Lath
1mm Weather Protection Sheeting
300mm Insulation
250mm Cross- Laminated Timber
12mm Gypsum

Floor Slab(Interior)
15mm Floor Finish
120 Concrete
34x70 Timber Lath
250mm Cross- Laminated Timber

Non-Structural Wall(Interior)
12.5mm Gypsum
160-180 mm Cross- Laminated Timber
12.5mm Gypsum

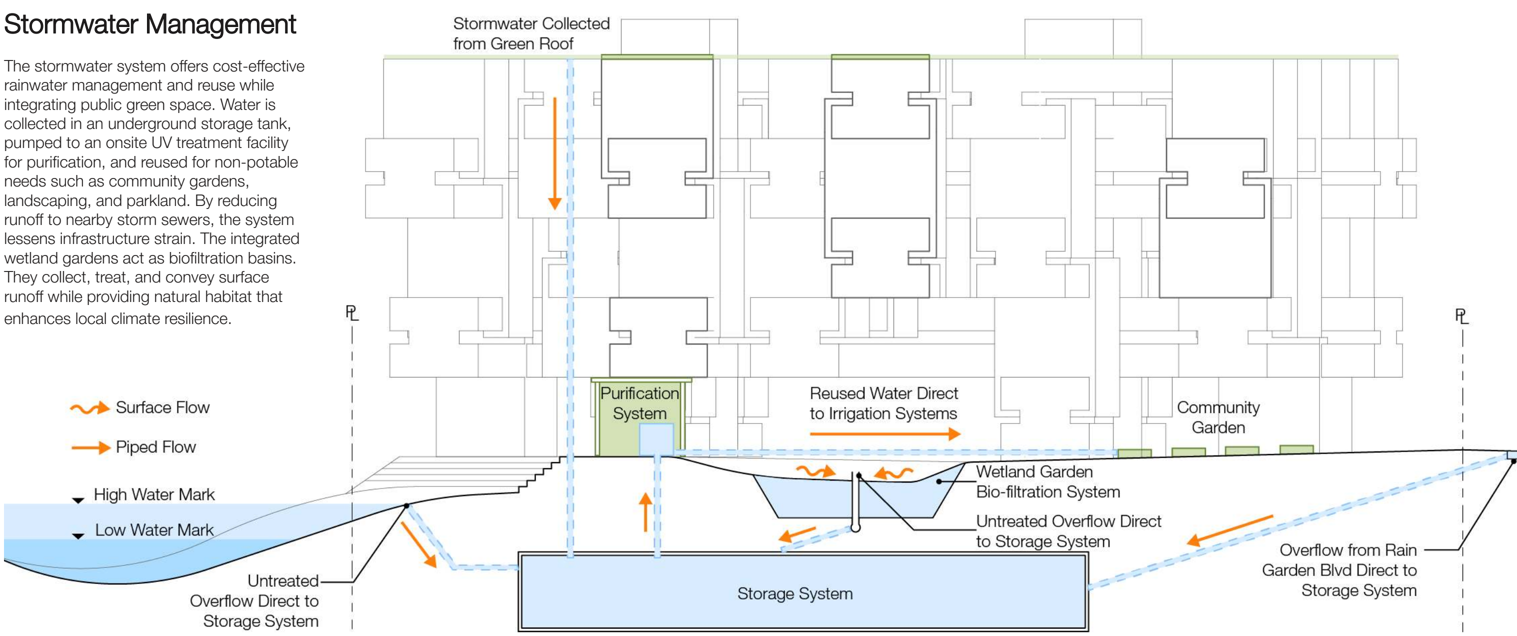
Floor Slab(Exterior)
15mm Floor Finish
50mm Putty
120 Concrete
80mm Insulation
250mm Cross- Laminated Timber
34x70 Timber Lath
15mm Gypsum

Elevated Structure

Inspired by the Tsawwassen people's orientation toward the sea, the design intentionally engages with water rather than resisting it. It embraces seasonal flooding by guiding overflow through carved channels extending from the adjacent park into on-site wetland gardens. These gardens absorb and filter water, reducing flood risk and creating a resilient, living landscape. By elevating the structure, the open ground level also provides indoor and outdoor amenities accessible to both residents and the wider neighborhood. The design is intended to be replicable and scalable, allowing it to be applied across larger urban areas to manage seasonal flooding and strengthen climate resilience.

Stormwater Management

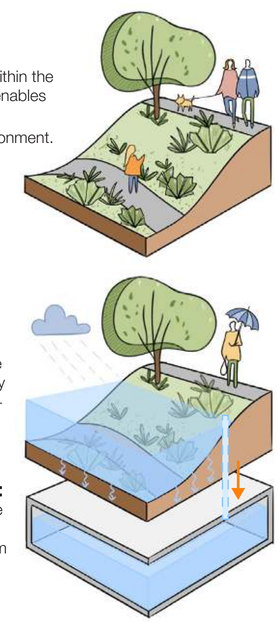
The stormwater system offers cost-effective rainwater management and reuse while integrating public green space. Water is collected in an underground storage tank, pumped to an onsite UV treatment facility for purification, and reused for non-potable needs such as community gardens, landscaping, and parkland. By reducing runoff to nearby storm sewers, the system lessens infrastructure strain. The integrated wetland gardens act as biofiltration basins. They collect, treat, and convey surface runoff while providing natural habitat that enhances local climate resilience.



Dry Condition:
The flagstone pathway within the sunken wetland garden enables users to engage with the surrounding natural environment.

Wet Condition:
People walk along the perimeter of the wetland garden while enjoying the garden view. Water slowly infiltrates through the bio-filtration system.

Extreme Storm Event:
The underground storage system temporarily holds stormwater captured from both onsite and offsite sources before being treated and reused.



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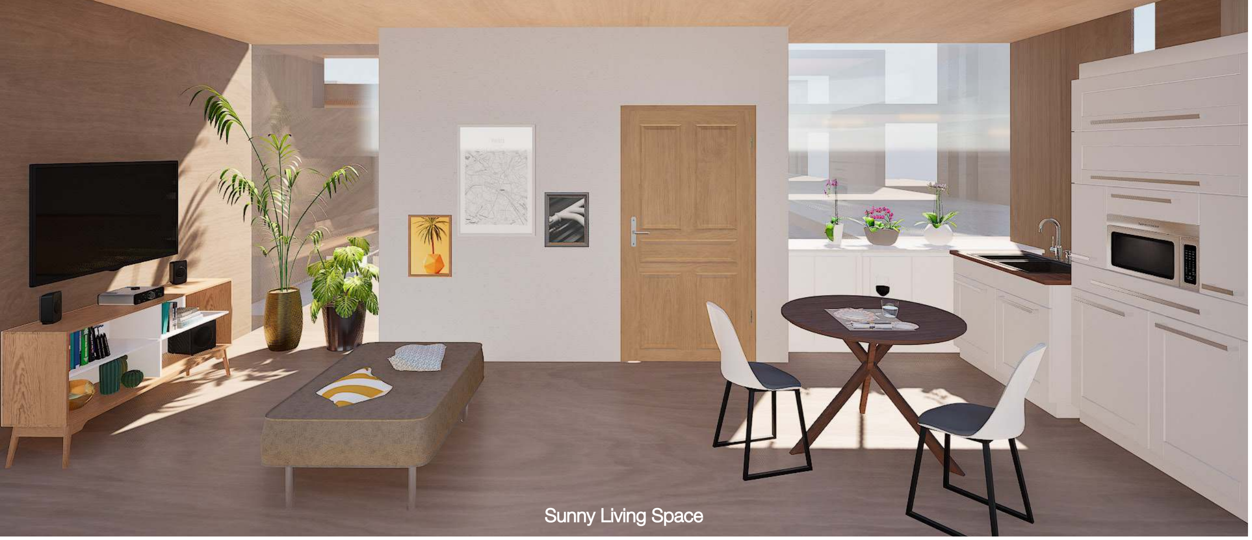
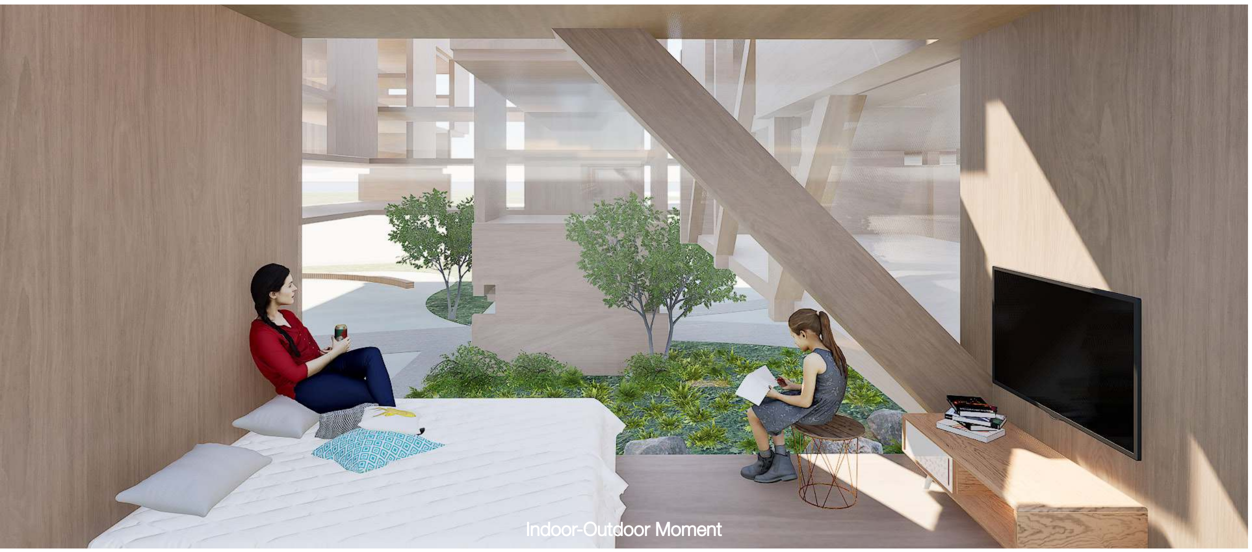


Sunny Living Space



Indoor-Outdoor Moment

Wetland Garden Experience

Base Case Analysis

BASE CASE

FSR	5
Lot size (sq ft)	25,540
Building sq ft Above Grade	127700.0
Building efficiency (%)	85
non saleable/rentable (sq ft)	19155
saleable/rentable (sq ft)	108545
Total Stories above grade (#)	18
Total Stories (#)	21
Base floor (#)	1
Above 1st storey (#)	17
Stories below grade (#)	3
Units (#)	86
Bedrooms (#)	178
Amenity space (sq ft)	850
Non-residential (sq ft)	3000

CONSTRUCTION COSTS

		Concrete		Mass Timber	
	Square footage	**$/sq ft**	**Cost**	**$/sq ft**	**Cost**
Below grade	75000.0	$315	$23,625,000	$299	$22,425,000
Base floor	8700.0	$360	$3,132,000	$403	$3,506,100
Above 1st storey	119000.0	$385	$45,815,000	$431	$51,289,000
	Quantity	**$/unit**		**$/unit**	
Balconies	86	$25,000	$2,150,000	$25,000	$2,150,000
	Cost per month	**# Months**		**# Months**	
Schedule Costs	$50,000	18	$900,000	16	$800,000
TOTAL			**$75,622,000**		**$80,170,100**

EMBODIED CARBON

		Concrete		Mass Timber	
	Sq ft	**Embodied**	**Total Carbon**	**Embodied**	**Total Carbon**
Total Building Sq Footage	202700.0	6.69	**1355864.354**	2.69	**546112.31**

FLOATING VILLAGE

FSR	3.143072401
Lot size (sq ft)	88,465
Building sq ft Above Grade	278053
Building efficiency (%)	85
non saleable/rentable (sq ft)	41707.95
saleable/rentable (sq ft)	236345.05
Total Stories above grade (#)	10
Total Stories (#)	10
Base floor (#)	1
Above 1st storey (#)	9
Stories below grade (#)	0
Units (#)	370
Bedrooms (#)	458
Amenity space (sq ft)	46084
Non-residential (sq ft)	18256

CONSTRUCTION COSTS

		Concrete		Mass Timber	
	Square footage	**$/sq ft**	**Cost**	**$/sq ft**	**Cost**
Below grade	0.0	$315	$0	$299	$0
Base floor	9128.0	$360	$3,286,080	$403	$3,678,584
Above 1st storey	268925.0	$405	$108,914,625	$431	$115,906,675
	Quantity	**$/unit**		**$/unit**	
Balconies		$25,000	$0	$25,000	$0
	Cost per month	**# Months**	**Cost**	**# Months**	**Cost**
Schedule Costs (Monthly	$50,000	18	$900,000	16	$800,000
TOTAL			**$113,100,705**		**$120,385,259**

EMBODIED CARBON

		Concrete		Mass Timber	
	Sq ft	**Embodied**	**Total Carbon**	**Embodied**	**Total Carbon**
Total Building Sq Footage	278053.0	6.69	**1859902.078**	2.69	**747962.57**