

Mass Timber Business Case Studies

November 2025



Jason Harding, courtesy naturallywood.com



Introduction

This document presents a series of business case studies that explore the financial performance of mass timber projects, providing quantitative data and qualitative insights to help developers and investors assess its economic viability.

Each case study measures investment success, challenges, and lessons learned from the developer's and project team's perspectives. Moreover, by analyzing strategy, risk, revenue, cost and schedule, these case studies enable direct comparisons between mass timber and traditional construction methods.

WoodWorks is seeking developers and owners with completed mass timber projects to share data for analysis, supporting education and training in the mass timber sector. The goal is to continuously expand case studies across various sectors and markets. To participate or learn more, please contact a WoodWorks staff member.

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About the Authors

This publication is a joint effort between WoodWorks, a Canadian Wood Council resource program, and BTY Group, an award-winning construction consultancy.

BTY provides expertise in real estate and infrastructure, assessing the financial feasibility of mass timber projects and delivering comprehensive project development solutions across planning, construction, operations, and transactions.

WoodWorks is the go-to resource for wood development, design and construction knowledge. Our experts provide free project support, continuing education and on-demand resources to make it easier to build with wood.



Thank You

The business case studies in this document would not be possible without support from the developers and owners who share their data. WoodWorks is grateful to these firms and individuals for their generosity in supporting our efforts to promote a deeper understanding of how mass timber can be a useful tool for developers, tenants, investors, industry and the greater community.

Contributors



Table of Contents

Affordable Rental Housing	<u>5</u>
North Van Phase 2 – North Vancouver, BC	<u>6</u>
Office	<u>14</u>
The Exchange – Kelowna, BC	<u>15</u>
Market Rental Housing	<u>23</u>
Parcel 19.1 – Vancouver, BC	<u>24</u>



Jason Harding, courtesy naturallywood.com

Affordable Rental Housing

North Van Phase 2

Catalyst Community
Developments Society



Image courtesy of Integra Architecture Inc.

Updated November 2025



Project Overview

North Van Phase 2 at 120 St Georges Avenue in North Vancouver BC is Catalyst's second project on land they are leasing from the City of North Vancouver. The project includes 179 units of affordable rental housing above the new North Shore Neighbourhood House (NSNH).

Catalyst is developing the shell space of the NSNH for the City as part of their project, while the City is managing the fit out. The Housing will be operated by Catalyst and includes 33 studios, 72 one-bedrooms, 56 two-bedrooms and 18 three-bedroom apartment homes, with 20% built as accessible units.

The building features a concrete podium for the first three floors and underground parking, with the upper 15 floors constructed using a hybrid mass timber system with steel columns, a prefabricated envelope, and clip-on balconies.

In February 2024, the provincial government announced that the City of North Vancouver and this project would be among the first supported by BC Builds, a new program aimed at accelerating construction of new housing.

Project information

Project City	City of North Vancouver
Project Address	120 St. Georges Avenue
Neighbourhood Plan	Lower Lonsdale
Phased Development	No
Gross Site Area (Sq.Ft)	23,653
Net Site Area (Sq.Ft)	23,653
Use / Tenure	Apartment Residential Use & Civic, Assembly, Child Care Uses
Zoning Proposed	CD-737

Gross Floor Area (Sq.Ft) – Residential	129,922
Gross Floor Area (Sq.Ft) – Civic	31,608
Total Storeys	18
Total Storeys (Mass Timber)	15
Total Storeys (Concrete podium)	3
Total Units	179
Total Below Grade Parking Levels	3












Project Team

Developer: Catalyst Community Developments Society	Structural Engineer: Glotman Simpson
Land Owner: City of North Vancouver	Electrical Engineer: Nemetz
General Contractor: Kindred Construction Ltd.	Mechanical Engineer: Rocky Point Engineering
Architect: Integra Architecture Inc.	Code: Jensen Hughes

Development Strategy

Why use Mass Timber?

The decision to incorporate mass timber in the North Van Phase 2 project was shaped by a combination of considerations, rather than a single mandate. Key influencing factors included:

1. **Stakeholder Support:** Early discussions with project stakeholders revealed strong enthusiasm for exploring mass timber, helping to build momentum for the approach.
2. **Carbon Reduction:** Mass Timber presented an opportunity to significantly reduce carbon emissions, particularly embodied carbon, offering a strong environmental advantage over conventional materials such as concrete or steel.
3. **Voluntary Choice:** The use of mass timber was not a project requirement, but a strategic decision based on shared interest and alignment with broader sustainability goals.
4. **Alignment with Government Priorities:** The use of locally sourced timber supports both municipal and provincial priorities around sustainability, economic development, and innovation in construction.
5. **Municipal Readiness:** The City of North Vancouver's building department was open to the mass timber approach, drawing on prior experience with similar projects and a willingness to support advanced building technologies.



Image courtesy of Integra Architecture Inc.

Development Risks and Mitigation

Catalyst, the design team and general contractor identified and addressed several risks associated with mass timber construction:

	Design Coordination	Insurance Premiums	Weather Protection	Schedule Optimization	Manufacturing Deposits
Risk	The point-supported mass timber structure requires a tighter column grid, which may affect unit layout and overall livability within the homes.	Course of Construction insurance for the mass timber tower could incur rates closer to that of a light wood frame building due to limited industry familiarity.	If not properly managed, moisture could lead to added costs and schedule delays due to required drying time or material replacement.	Mass timber construction may not achieve the expected schedule advantage over a concrete tower. If mass timber installation is delayed until the core is fully complete, the project will not benefit from concurrent construction and could face timeline setbacks.	Lenders may be reluctant to approve large deposits (20–30%) for off-site mass timber manufacturing, as they typically prefer to finance completed, on-site work that can serve as collateral.
Mitigation	Engage the architect and structural engineer one month ahead of other consultants to enable early coordination and optimize unit designs within the structural constraints. Coordinate floor plan layouts with column locations, aiming to place columns within walls where possible.	Engage insurance brokers early and provide detailed documentation on risk mitigation measures to support informed underwriting and appropriate pricing.	The budget will allocate funds for moisture control, including labour for water removal, construction protection measures, and a \$350,000 investment in a desiccant dehumidification system to pressurize the building and expel moisture. If framing occurs during the summer, these additional moisture management costs are expected to be reduced.	A climbing core system with a dedicated crane will be considered to enable parallel construction, with mass timber and the envelope system following four floors behind. Core work will begin before Levels 2–4 are complete to accelerate progress. Crane efficiency will be improved by using flat-packed, self-assembled panels lifted in batches of six, and a spider crane will support flexibility while reducing reliance on the main tower crane.	Anticipate challenges in securing mass timber manufacturing deposits and address them as a transitional issue by sharing precedents to build lender confidence and support funding.

Revenue Comparison

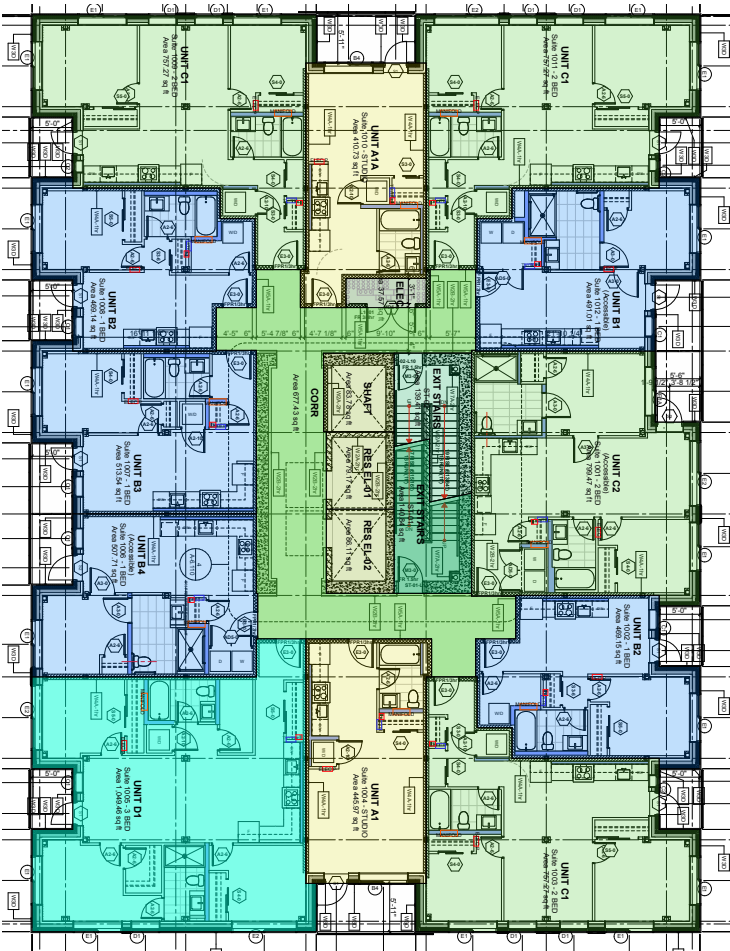
Rental Housing

The project aims to help residents access housing while bringing together non-profit, municipal, provincial and federal parties to maximize impact, showing how municipal land, accelerated approvals and financing from various levels of government can address urgent housing needs.

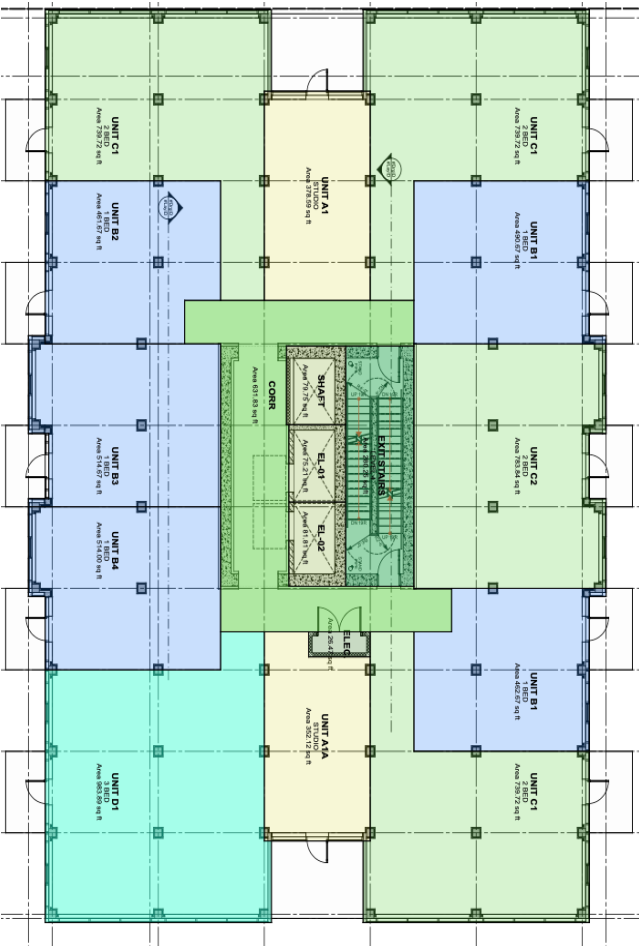
Unit Mix

The mass timber tower will provide 179 purpose-built rental homes. The homes range in size from studios to three-bedrooms, designed to accommodate singles, couples, families, and seniors.

Unit Mix	Size (SF)	Units (#)
Studio	400-460	33
One Bedroom	450-480	72
Two Bedroom	700-770	56
Three Bedroom	985	18
Total		179



Typical Floor Plan Layout



Typical Column Layout

Cost Comparison

	Mass Timber Tower Proforma (L4 Up)		Concrete Tower Proforma (L4 Up)	
Gross Buildable Area (L4 & Up)	125,039 ft²		125,039 ft²	
<u>Direct Construction – Cost Breakdown</u>				
Concrete Core Walls & Shear Walls	\$ 1,191,607	2.0%	\$ 1,191,607	1.9%
STRU: Steel Columns – Supply Only	\$ 1,071,125	1.8%	–	0.0%
STRU: Steel Beams/Angles – Supply Only	\$ 279,022	0.5%	–	0.0%
STRU: MT Floor/Roof Panels – Supply Only	\$ 4,681,699	7.7%	–	0.0%
STRU: MT & Steel Installation	\$ 1,020,446	1.7%	–	0.0%
STRU: Concrete Floor / Roof / Columns Construction	–	0.0%	\$ 7,772,200	12.3%
Topping Slab / Acoustic Mat	\$ 635,716	1.0%	\$ 635,716	1.0%
Ext. Envelope – Cladding / Windows	\$ 10,708,721	17.7%	\$ 10,708,721	17.0%
Ext. Envelope – Roofing	\$ 944,861	1.6%	\$ 443,300	0.7%
Modular Balcony – Supply & Install	\$ 2,891,726	4.8%	–	0.0%
Concrete Balcony – STRU / Coatings / Guardrails	–	0.0%	\$ 920,700	1.5%
Int. Finishes – Doors / Floor / Wall / Ceiling	\$ 5,487,506	9.0%	\$ 4,967,100	7.9%
Int. Finishes – Metals/Specialties/Millworks/Equipment	\$ 3,741,227	6.2%	\$ 3,741,227	5.9%
Elevator System	\$ 1,206,776	2.0%	\$ 1,206,776	1.9%
Mechanical System	\$ 13,794,437	22.7%	\$ 13,794,437	21.9%
Electrical System	\$ 6,950,134	11.5%	\$ 6,950,134	11.0%
<u>Indirect Construction - Cost Breakdown</u>				
Project Staff	\$ 4,404,220	7.3%	\$ 7,350,000	11.7%
General Expenses	\$ 530,776	0.9%	incl.	0.0%
Site Overhead	\$ 1,110,109	1.8%	incl.	0.0%
<u>Total Construction Cost (L4 Up)</u>	\$ 60,650,100		\$ 59,681,900	
<u>Construction Cost on GBA (L4 Up)</u>	\$ 485 /ft²		\$ 477 /ft²	
<u>Consultant Fees</u>				
Architectural	\$ 1,050,000	42.0%	\$ 1,050,000	48.8%
Envelope	\$ 135,000	5.4%	\$ 135,000	6.3%
Structural	\$ 180,000	7.2%	\$ 180,000	8.4%
Code	\$ 100,000	4.0%	\$ 100,000	4.7%
Mechanical and Electrical	\$ 135,000	5.4%	\$ 135,000	6.3%
BIM Modelling	\$ 349,000	14.0%	–	0.0%
Other Consultants	\$ 550,000	22.0%	\$ 550,000	25.6%
<u>Total Consultant Fees</u>	\$ 2,499,000		\$ 2,150,000	
<u>Insurance Fees</u>				
Course of Construction Insurance	\$ 1,736,358	2.9%	\$ 1,193,600	1.9%
<u>Construction Duration</u>				
Construction Duration (months)	42 month(s)		42 month(s)	

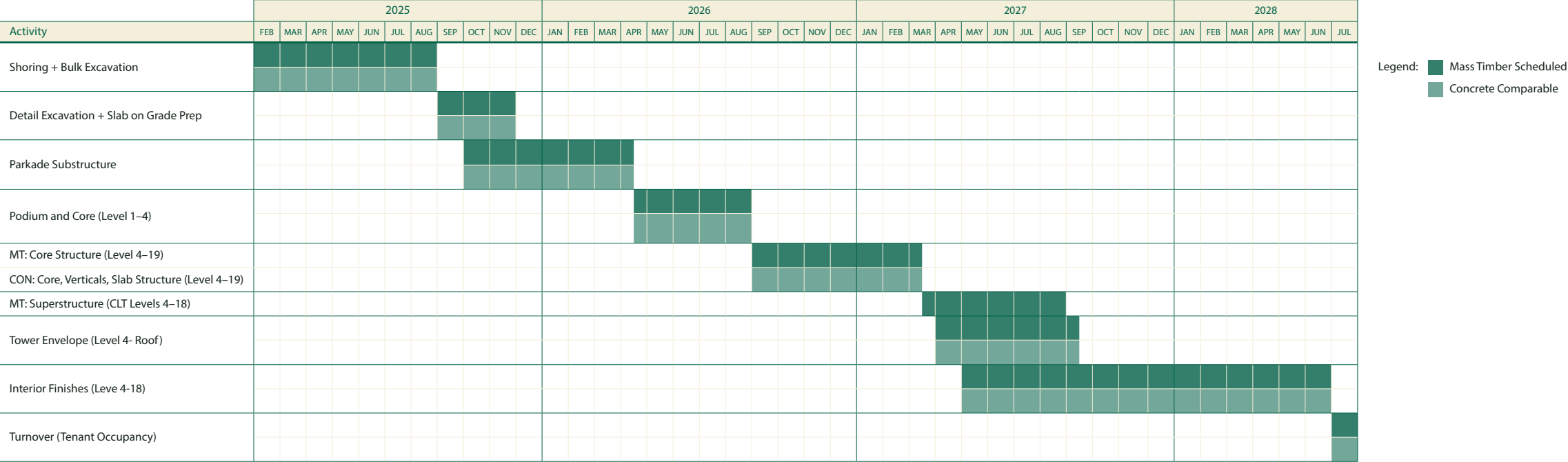
Cost Comparison Summary

This summary provides a cost comparison between mass timber and traditional concrete construction methods, with findings based on the specific design parameters and project conditions of this case study. Reported costs apply only to the tower structure, starting from level 4 (L4 Up). Only the towers were analyzed to ensure a direct and equitable comparison of costs specific to mass timber construction.

Key Findings:

1. **Cost Comparison:** The mass timber tower achieved near cost equivalency, with a difference of ~1.6% or \$8 per sq.ft when compared to a concrete alternative.
2. **Structural Floor and Roof Cost Comparison:** Using 5-ply CLT panels with structural steel columns versus a conventional concrete system revealed a 9% cost difference.
3. **Modular Speed Walls Used for Both Options:** To ensure consistency in this study, both structural systems employed modular speed wall systems. This standardization allowed the structural system to be isolated as the primary cost differentiator.
4. **Balcony System Cost Difference:** The mass timber design used prefabricated steel balconies to mitigate waterproofing issues at the CLT connection, whereas the concrete version utilized conventional concrete balconies, which proved more cost-effective in this case.
5. **Interior Finishes Premium:** The mass timber scheme showed an approximate 10% premium on interior finishes, mainly due to the additional fire-rated drywall on timber surfaces required for encapsulation.
6. **Insurance Costs for Mass Timber:** Builder's Risk Insurance was higher due to the insurance industry's limited familiarity with mass timber and its cautious approach to risk tolerance as a relatively new building technology.

Project Schedule Comparison



Key Findings

- The mass timber (MT) tower assumes the core will be built first using a self-climbing system. Once complete, the superstrucuture and envelope installation will begin on an ~8 day cycle.
- The installation assumes 5 days for the mass timber superstructure and 3 days for the speedwall installation. Due to site constraints, only one tower crane is possible, so crane time will rotate between installing the superstructure and envelope.
- The Concrete (CON) comparable includes the core, verticals and slab structure at ~8 working days per level, assuming the same lag time and duration as the mass timber (MT) tower.

Future Considerations

- Given site constraints, two tower cranes were not an option for this project. However, on a larger site, two cranes would allow the core and the superstructure to be constructed simultaneously, which could realize a potential saving of ~5 months.
- Alternatively, a self-climbing core that does not rely on tower crane usage could also accomodate overlapping scopes.

Lessons Learned

1. **Concrete Trade Availability:** Finding the right-sized contractor who was both interested and capable of handling the project's complexity and hybrid nature was key. Engaging a motivated mid-sized trade partner who could deliver high-quality results proved to be the ideal solution.
2. **Balcony Consideration:** A clip-on balcony was chosen for its ability to improve efficiency, with 20 installs per day, ensuring pre-weather-tight conditions, and allowing for direct cladding installation, all of which simplified the overall process. In contrast, the original CLT balcony design would have required extended exposure, additional weatherproofing, and more complex finishing, which would have increased both costs and complexity.
3. **Prefabricated Envelope:** Early engagement with the general contractor and trades confirmed that a prefabricated wall system was the best choice for envelope integrity, water tightness, and energy efficiency.

Successes

1. **Cost Comparable:** The mass timber tower achieved near construction cost parity with concrete construction for the tower, with only a ~1.6% premium.
2. **AHJ Engagement:** The City of North Vancouver was supportive of mass timber. There were no major roadblocks, and the project moved relatively seamlessly through the municipal approval and permitting process, supported by the City's experience and background working with mass timber.
3. **Early Consultant Engagement:** Bringing in architects, structural engineers, and code experts 4–8 weeks ahead of the rest of the team proved beneficial in aligning unit plans with the fixed column grid.
4. **Collaboration with Experienced Partners:** Partnering with Kindred, a general contractor experienced in mass timber construction, was essential to navigating unique challenges.
5. **Mass Timber Trade Coordination:** The team successfully leveraged Kindred's experienced roster and provided knowledge support to mechanical and electrical trades, helping to reduce risk-related pricing concerns.



Elevation view along St. Georges Avenue; courtesy of Integra Architecture Inc.



Perspective view at south-west corner; courtesy of Integra Architecture Inc.



Elevation along East 1st Avenue; courtesy of Integra Architecture Inc.

Office

The Exchange

Faction Projects Inc.



Ed White Photographics, courtesy naturallywood.com

Updated October 2025



Project Overview

Faction Projects Inc. undertook a four-storey mixed-use office and commercial mass timber development in Kelowna, BC. The structural system was a post and beam design, consisting of glulam columns and beams, and Nail Laminated Timber (NLT) panels, with a concrete elevator core and stairwells. The project used mass timber to achieve a long span open office and take advantage of design compatibilities with concrete. The planning grid commonly used in office buildings aligned well with the design capabilities of mass timber.

The decision to use mass timber was driven by a commitment to integrate new buildings within the site's existing industrial heritage. The team pursued NLT and hired local trades to self-perform the floor and roof slabs and further supported this approach by setting up their own temporary on-site plant to manufacture NLT. For the column structure, the team initially explored steel and Parallel Strand Lumber options but ultimately opted for glulam due to favourable pricing.

The logo for Faction Projects Inc. features the word "FACTION" in a bold, black, sans-serif font. The letter "O" is replaced by a red circle with a black outline. A small "INC" is written in a smaller font to the upper right of the "N".

Project information

Project City	Kelowna	Gross Buildable Area (Sq.Ft)	46,254
Project Address	750 Vaughan Ave. (Phase 3)	Total Exclusions (Sq.Ft)	878
Neighbourhood	Downtown, North End	Total FSR Area (Sq.Ft)	45,376
Gross Site Area (Sq.Ft)	153,838	Building Efficiency	98%
Phased Development	Yes (Three Phases)	Commercial Leasable Area (Sq.Ft)	45,376
Phase 3 Net Site Area	70,000	Total Storeys (Mass Timber)	4
Use / Tenure	Commercial Mixed-Use	Total Storeys (Concrete)	0
Zoning Permitted	I2 – General Industrial	# of Leaseable Units	~ 4 (Flexible)
Zoning Proposed	I2 – General Industrial	At Grade Parking Stalls	37

Project Team

Development Team: Faction Projects Inc.

Construction Manager: Faction Construction

Architect: Faction Architecture Inc.

Structural Engineer: RJC Engineers

Electrical Engineer: Falcon Engineering

Mechanical Engineer: Falcon Engineering

Code: GHL Consultants Ltd.

Development Strategy

Why use Mass Timber?

The decision to incorporate mass timber was driven by several key factors:

1. **Market Differentiation:** The project was designed to compete directly with new large-scale Class A offices and comparable concrete or steel buildings (e.g., tilt-up). The team determined that traditional light wood frame construction could not attract top-tier tenants. By using mass timber, the goal was to secure a 10–20% lease premium over typical wood-frame offices and appeal to high-end tenants through the visual appeal of exposed timber.
2. **Sustainability:** The project aimed to compete with concrete buildings in the office sector by emphasizing sustainability advantages.
3. **Local Economic Development:** The project aimed to demonstrate the feasibility of using local trades and lumber for production of NLT.
4. **Lightweight Construction:** The project intended to leverage the lighter weight of mass timber compared to concrete to achieve efficiencies in the raft slab design, which will be particularly beneficial given the site's poor soil conditions.
5. **Efficiency:** The project sought to realize the potentially significant time savings in the construction schedule.
6. **Innovation:** The project aimed to incorporate mass timber components without changing the fundamental design principles typically seen in a concrete office building (e.g. grid layouts).



Jason Harding, courtesy naturallywood.com

Development Risks and Mitigation

Faction identified and addressed several risks and mitigation strategies associated with mass timber construction:

	Material Procurement / Limited Supplier Competition	Market Lease Rates	Commodity Price Fluctuations	Experience
Risk	A limited number of local mass timber suppliers and dependence on a single source could restrict competitive pricing, reduce design flexibility, and create vulnerabilities to supply chain disruptions, potentially leading to project delays and cost overruns.	If tenants are unwilling to pay a 10–20% premium, or if exposed timber does not deliver the expected competitive advantage, the project may struggle to achieve projected rents. Risk of underperforming against concrete and steel alternatives, resulting in slower absorption, reduced cash flow, or pressure to discount rents to remain competitive.	Fluctuations in commodity lumber prices for 20' lamellas due to harvesting and mill schedules could significantly impact project costs.	Limited internal experience with complex mass timber buildings could lead to design inefficiencies, coordination issues, or construction delays.
Mitigation	Establish an on-site NLT production line to acquire greater control over pricing and supply. Utilize commodity lumber products and keep design generic enough to allow multiple suppliers to bid. Diversify the supply chain by exploring both local and international options and maintain close communication with suppliers and ensure flexibility to pivot to alternative suppliers if needed.	Emphasize unique sustainability features and exposed mass timber elements to differentiate the product in the market. Educate and tour prospective tenants through the space to showcase mass timber's value, demonstrating its Class A positioning and credibility as an alternative to concrete or steel to justify premium rents.	Self-perform the NLT using a time and materials approach. Source off-the-shelf lumber from local yards. Establish relationships with multiple suppliers, implement early procurement strategies, and explore alternative dimensions that meet project requirements.	The development and construction team will draw on previous mass timber experience and engage a consulting team with proven expertise to guide design, coordination, and execution.

Revenue Comparison

Commercial Revenue

Tenants	Size	Mass Timber \$/SF		Commercial Comparables \$/SF	Delta	
		Pro Forma	Realized			
Tenant 1	28,822	\$ 23.50	\$ 23.50	\$ 22.00	6.6%	Higher
Tenant 2	11,600	\$ 25.00	\$ 25.00	\$ 22.00	12.8%	Higher
Tenant 3	2,285	\$ 27.50	\$ 27.50	\$ 22.00	22.2%	Higher
Tenant 4	2,200	\$ 27.00	\$ 27.00	\$ 22.00	20.4%	Higher

Commercial Comparables

Name of Building	Comp 1	Comp 2	Comp 3	Market Average
Location	1180 Sunset Drive, Unit #205	460 Doyle Ave., Unit #406	460 Doyle Ave., Unit #404	
Types	Office	Office	Office	
Year Built	2019	2019	2019	
Comparable Location	Yes	Yes	Yes	\$ 22.00
Comparable Age	Yes	Yes	Yes	
Comparable Size	No	Yes	Yes	
Lease Rate \$/SF	\$ 22.00	\$ 24.00	\$ 20.00	
Total Leasable SF	912	3,546	3,559	

*All Comparable References are based on MLS – Realtors <https://www.realtor.ca/>

Target Tenants

Mass timber was a key factor in securing tenants, as it differentiated the project from concrete buildings. Tenants were drawn to the unique features of mass timber, and corporate tenants embraced the design after touring the site.

Although the project is presently divided into four tenancies, the design was developed to remain flexible, accommodating a variety of tenant layouts and sizes to appeal to a wide range of commercial users.

Revenue and Market Absorption

The project realized a 6–22% lease premium over comparable office spaces in Kelowna and was 90% leased at completion demonstrating the viability and premium of mass timber in the office sector.



Ed White Photographics, courtesy naturallywood.com

Cost Comparison

	Mass Timber Pro Forma		Mass Timber Realized		Light Wood Frame Comparable Pro Forma	
Gross Buildable Area	41,275 ft²		41,275 ft²		41,275 ft²	
<u>Direct Construction – Tower Cost Breakdown</u>						
Concrete Foundation incl. detail excavation	\$ 575,000	5.2%	\$ 575,000	5.3%	\$ 564,000	5.2%
Concrete SOG incl. engineering backfill	\$ 106,000	1.0%	\$ 106,000	1.0%	\$ 106,000	1.0%
Concrete/CMU Core Walls & Shear Walls	\$ 375,000	3.4%	\$ 375,000	3.4%	\$ 434,200	4.0%
STRU: MT Columns – Supply Only	\$ 400,000	3.6%	\$ 400,000	3.7%	–	0.0%
STRU: MT Beams – Supply Only	\$ 475,000	4.3%	\$ 475,000	4.4%	–	0.0%
STRU: MT Floor/Roof Panels – Supply Only (NLT)	\$ 1,050,000	9.6%	\$ 1,050,000	9.7%	–	0.0%
STRU: MT Installation	\$ 350,000	3.2%	\$ 350,000	3.2%	–	0.0%
STRU: Light Wood Framed	–	0.0%	–	0.0%	\$ 1,745,500	16.2%
Topping Slab / Acoustic Mat	\$ 125,000	1.1%	\$ 125,000	1.1%	\$ 125,000	1.2%
Ext. Envelope – Cladding/Windows/Roofing	\$ 2,250,000	20.5%	\$ 2,250,000	20.7%	\$ 2,227,200	20.6%
Int. Finishes – Doors/Floor/Wall/Ceiling/Specialties	\$ 550,000	5.0%	\$ 550,000	5.1%	\$ 720,800	6.7%
Mechanical System – Rough-in	\$ 1,998,000	18.2%	\$ 1,998,000	18.4%	\$ 1,998,000	18.5%
Electrical System – Rough-in	\$ 575,000	5.2%	\$ 575,000	5.3%	\$ 575,000	5.3%
<u>Indirect Construction Cost Breakdown</u>						
Project Staff	\$ 1,961,000	17.8%	\$ 1,845,000	17.0%	\$ 2,108,000	19.5%
General Expenses	incl.	0.0%	incl.	0.0%	incl.	0.0%
Site Overhead	incl.	0.0%	incl.	0.0%	incl.	0.0%
Offsite Construction Cost	\$ 200,000	1.8%	\$ 200,000	1.8%	\$ 200,000	1.9%
Other Construction Cost	–	0.0%	–	0.0%	–	0.0%
Total Construction Cost	\$ 10,990,000		\$ 10,874,000		\$ 10,803,700	
Construction Cost on GBA	\$ 266/ft²		\$ 263/ft²		\$ 262/ft²	
<u>Consultant Fees</u>						
Architectural	\$ 472,000	54.6%	\$ 472,000	54.6%	\$ 472,000	65.1%
Structural	\$ 118,000	13.6%	\$ 118,000	13.6%	\$ 118,000	16.3%
Code	\$ 70,400	8.1%	\$ 70,400	8.1%	\$ 70,400	9.7%
Mechanical and Electrical	\$ 32,600	3.8%	\$ 32,600	3.8%	\$ 32,600	4.5%
BIM Modelling	\$ 140,000	16.2%	\$ 140,000	16.2%	–	0.0%
Other Consultants	\$ 32,100	3.7%	\$ 32,100	3.7%	\$ 32,100	4.4%
Total Consultant Fees	\$ 865,100		\$ 865,100		\$ 725,100	
<u>Insurance Fees</u>						
Property Insurance	\$ 13,500	8.8%	\$ 13,500	6.9%	\$ 20,300	11.3%
Construction Insurance	\$ 140,000	91.2%	\$ 162,000	82.9%	\$ 140,000	77.6%
Wrap Up Liability	incl.	0.0%	\$ 20,000	10.2%	\$ 20,000	11.1%
Total Warranty Costs	\$ 153,500		\$ 195,500		\$ 180,300	
<u>Construction Finance Fees</u>						
Construction Duration	29 month(s)		38 month(s)		34 month(s)	
Construction Interest Cost per Month	\$ 47,900		\$ 47,600		\$ 46,700	
Total Construction Loan Interest	\$ 1,389,000		\$ 1,809,000		\$ 1,588,000	

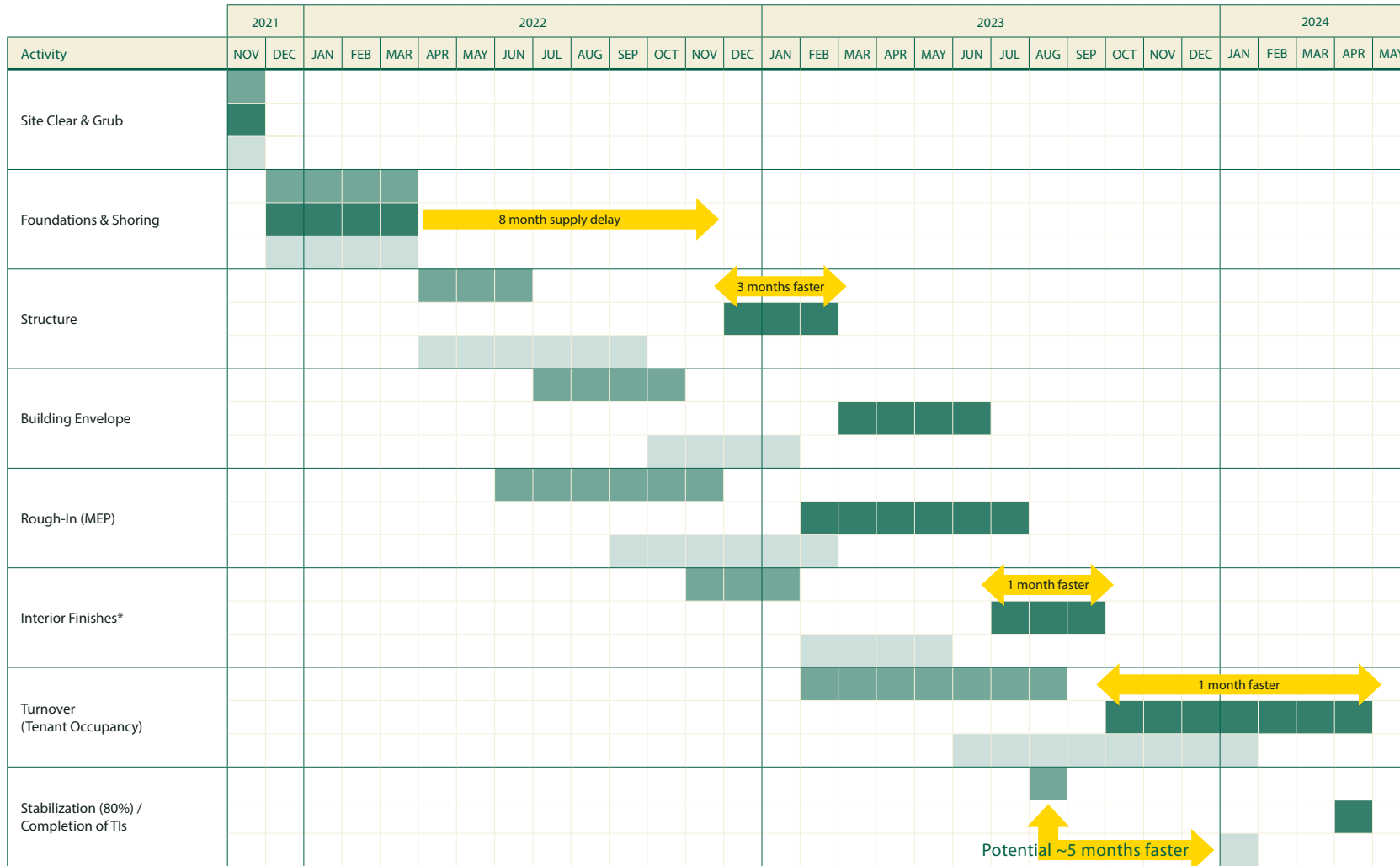
Cost Comparison Summary

This summary presents a project-specific comparison between mass timber and traditional light wood framing systems, based on the unique design and scheduling parameters of this case study.

Key Findings:

- Structural Cost Comparison:** The mass timber structure – comprising site-built NLT panels with glulam columns and beams – was found to be approximately 22% more expensive than traditional light wood framing. This result is specific to the materials and construction methods selected for this design.
- Ceiling System Cost Impact:** The light wood framing system required direct-mounted drywall ceilings due to its construction nature. In contrast, the mass timber design utilized exposed NLT ceilings, which resulted in cost savings on ceiling finishes.
- Impact of Schedule and Material Lead Times:** The project analysis showed that, without the delivery delays typically associated with glulam columns and beams, the overall pro forma costs for mass timber could be comparable to light wood framing. This is largely due to the shorter construction duration for mass timber, estimated to be about 5 months faster in this scenario.

Project Schedule Comparison



Key Findings

- If the project did not incur an 8-month supply delay, the mass timber building had the potential to realize a schedule savings of 5-months over the conventional comparable
- The mass timber structure finished 3 months faster than the conventional comparable
- Interior finishes (base building only) finished 1 month faster than the conventional comparable
- Tenant turnover finished 1 month faster than the conventional comparable

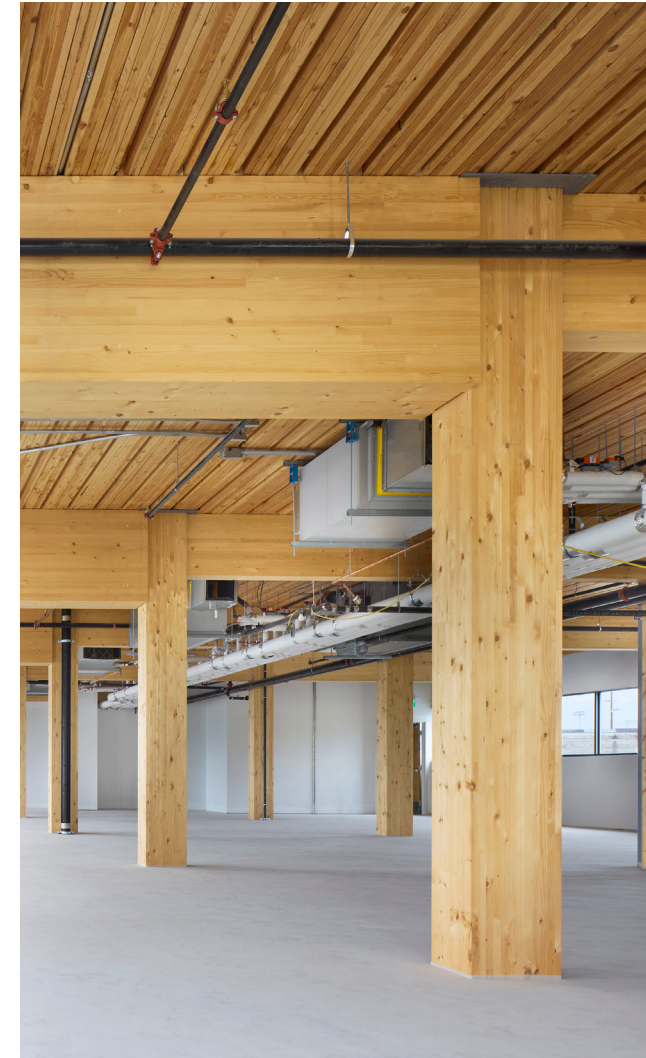
Legend:
 Mass Timber Scheduled
 Mass Timber Actual
 Conventional Comparable

Lessons Learned

1. **Supply Chain Diversification:** The importance of diversifying suppliers became evident after the challenges faced when the first mass timber supplier could not fulfill their contract, causing an 8-month delay.
2. **On-Site Production Benefits:** On-site NLT production demonstrated that self-performing certain aspects of construction can provide greater control over quality and timelines.
3. **Market Education:** Tours of the product provided immediate buy-in from prospective tenants and assisted in achieving targeted lease rates. Emphasizing unique sustainability features justified premium pricing.
4. **Flexibility in Design:** Keeping designs flexible by utilizing commodity products like NLT and glulam enabled multiple suppliers to participate, enhancing competition and ensuring effective material sourcing.

Successes

1. **Market Differentiation:** The project realized a 6–22% lease premium over comparable office spaces in Kelowna, and 90% were leased at occupancy.
2. **On-Site Fabrication:** Successfully implemented on-site production of NLT panels, demonstrating the feasibility of using local trades to produce mass timber.
3. **Drawing Coordination:** The use of BIM modelling (base LOD 300+ with some elements at LOD 350) ensured successful coordination between consultants with minimal issues.
4. **Experienced Teams & AHJ's Collaboration:** The project successfully implemented several alternative solutions thanks to the expertise of the design team and the willingness of the Authority Having Jurisdiction (AHJ) in Kelowna to collaborate.
5. **Insurance:** Under the building code, the structure could have been built using traditional light-wood-frame (LWF) methods. Insurance was easier to procure due to the enhanced performance of mass timber relative to the LWF building type insurers were familiar with.



Jason Harding, courtesy naturallywood.com

Market Rental Housing

River District Parcel 19.1

Wesgroup Properties



Image courtesy of DIALOG

Updated October 2025



Project Overview

Wesgroup Properties, a Vancouver-based developer known for complex master-planned communities, is proposing a tall mass timber tower at River District in Vancouver, BC.

The application is for a 19-storey mixed-use residential tower comprised of 17 storeys of mass timber over a 2-level concrete podium, alongside a 6-storey mid-rise rental building. The development will deliver approximately 240 rental and strata homes over a level of retail that includes an Urgent Care Centre.

The tower will use a hybrid structural system featuring point-supported cross-laminated timber (CLT) floor panels with steel columns, concrete shear walls, and prefabricated curtain wall assemblies. The podium and underground parkade levels will be constructed in concrete.



Project information

Project City	Vancouver	Uses	Residential and Commercial
Project Address	3575 Sawmill Crescent	Zoning Proposed	CD-1
Neighbourhood Plan	East Fraserlands	FSR Proposed	3.62
		Total Storeys	19
Site Size (Sq.Ft)	59,092	Total Storeys (Mass Timber)	17
Gross Floor Area Proposed (Sq.Ft)	249,551	Total Storeys (Concrete Podium)	2
Net Floor Area Proposed (Sq.Ft)	214,075	Total Units	151
Leasable Residential Area (Sq.Ft)	163,297	Total Levels Below Grade	2
Leasable Commercial Area (Sq.Ft)	13,787	Parking Stalls	232

Project Team

Developer: Wesgroup Properties
Architect: DIALOG
General Contractor: Wesgroup Contracting Ltd.

Structural Engineer: Fast + Epp
Electrical Engineer: AES
Mechanical Engineer: AME Group
Code Consultant: GH

Development Strategy

Why use Mass Timber?

Wesgroup's decision to pursue mass timber aligns with their long-term focus on sustainability and the potential future of the development industry.

1. Long-Term Vision: Embracing mass timber aligns with Wesgroup's strategic outlook on the future of construction and sustainable urban development.
2. R&D Focus: This first mass timber project is seen as a foundation for future learning, with expectations that subsequent projects will benefit significantly (and incrementally) from early-stage insights.
3. "Made in Canada": Wesgroup is committed to Canadian-sourced solutions, supporting domestic innovation and supply chains.
4. Regulatory Leadership: The strategy includes working within current regulations while pushing the boundaries on materials and construction techniques to advance industry standards.



Image courtesy of DIALOG

Development Risks and Mitigation

Wesgroup identified and addressed several risks and mitigation strategies associated with mass timber construction:

	Industry Innovation	Cost Premiums	Limited Suppliers	Municipal Approval
Risk	Simultaneously innovating in both materials (mass timber) and processes (prefabrication) in an industry resistant to change may lead to unforeseen challenges and inefficiencies.	The project may face cost premiums for a mass timber tower, including the concrete core, floor panels, balconies, and envelope system, due to the specialized scope and the newness of the material and methodology adoption across the industry.	Limited supplier options for mass timber in Western Canada may lead to reduced competition, higher costs, and potential supply chain vulnerabilities.	Proposed design variances, such as requesting a variance to enlarge the tower plate and reduce balcony requirements, may not be approved and require resubmission, delaying project schedule.
Mitigation	The project will adopt a point-supported system that closely resembles typical concrete tower construction, minimizing deviations from established practices while still incorporating mass timber elements.	The design system will be optimized by using a framed wall assembly instead of a more expensive curtain wall system. Balconies, which would have accounted for 8% of hard costs, will be replaced with Juliette balconies to simplify the façade and reduce thermal bridging concerns.	The project team will diversify the supplier base by exploring both local and international options for mass timber components. Industrial-grade CLT will be specified, and encapsulation will be considered to optimize cost-efficiency without compromising quality. Early procurement strategies will be implemented, and flexibility in design will be maintained to accommodate various supplier capabilities.	Understanding the desire of the City of Vancouver to innovate and increase the use of mass timber, Wesgroup will demonstrate the desired outcome, and how those objectives can be mutually achieved through policy changes in a real world demo.

Revenue Comparison

Target Tenants

The project is designed to appeal to a diverse range of residents, including young families seeking more space and access to schools, parks, and amenities; downsizers looking for waterfront living and a quieter environment; and young professionals seeking rental options in a growing community.

Family Housing Mix

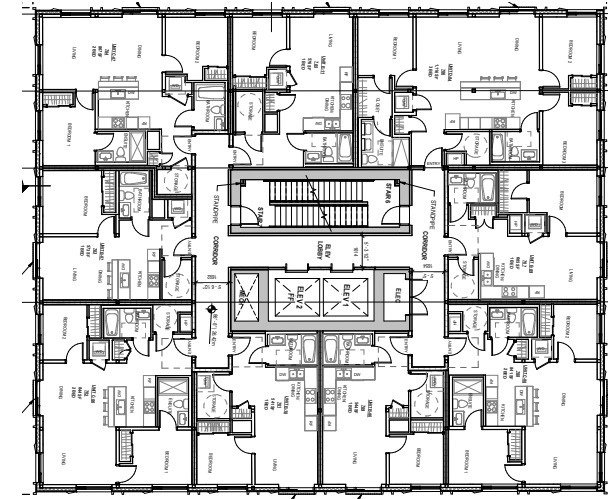
The City of Vancouver's Family Housing Mix Policy requires rezoning projects to include at least 35% of units with two or more bedrooms and a minimum of 10% with three or more bedrooms, supporting high-density, family-oriented living.

The proposed project includes eight units per floor, with 1 three-bed and 3 two-bed units to meet these requirements. These larger units are strategically located at the tower corners to maximize efficiency.

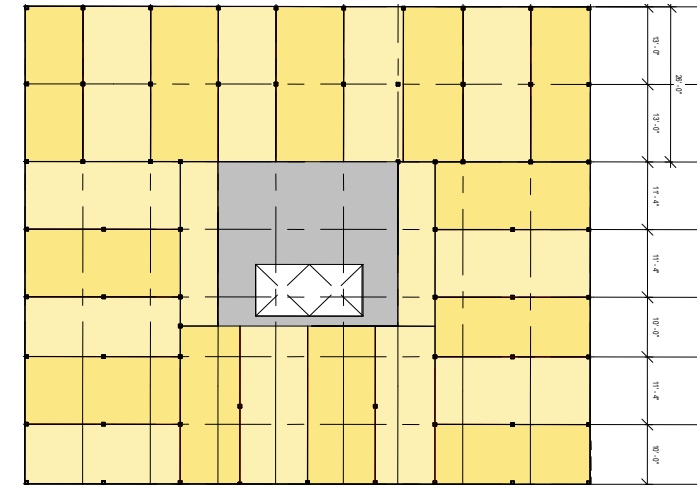
Market & Product Position

The mass timber building is positioned to compete directly with concrete rental products on a price-per-square-foot basis, supported by comparable performance in noise control, aesthetics, and fire safety.

Exposed timber in the homes was considered but ultimately deemed too risky for a market residential product, given the uncertainty around its ability to command a rental premium. It also required higher-grade materials and additional finishing, increasing costs. Instead, encapsulation ensures cost efficiency while maintaining tenant expectations and value perception in line with concrete construction.



Typical Floor Plan Layout



Typical Panel & Column Layout

Cost Comparison

This summary compares the costs of three tower projects: one with mass timber and two with concrete. Reported costs apply only to the tower structure, starting from level 3.

	Mass Timber Tower Proforma		Concrete Tower Proforma (V1)		Concrete Tower Proforma (V2)	
Gross Buildable Area (L3 & Up)	139,212 ft²		139,212 ft²		139,212 ft²	
	Juliet Steel Balconies Framed Wall Assembly		Juliet Steel Balconies Framed Wall Assembly		Typ. Concrete Balconies Window Wall Assembly	
<u>Direct Construction – Tower Cost Breakdown</u>						
Concrete Core Walls & Shear Walls	\$3,401,887	6.3%	\$3,401,887	7.0%	\$3,401,887	6.3%
STRU: Concrete Floor / Roof / Columns	-	0.0%	\$4,707,194	9.7%	\$5,273,928	9.7%
STRU: Steel Columns – Supply Only	\$1,996,328	3.7%	n/a	0.0%	n/a	0.0%
STRU: Steel Beams / Angles – Supply Only	\$106,414	0.2%	n/a	0.0%	n/a	0.0%
STRU: MT Floor / Roof Panels – Supply Only	\$3,192,423	5.9%	n/a	0.0%	n/a	0.0%
STRU: MT & Steel Installation	\$1,629,553	3.0%	n/a	0.0%	n/a	0.0%
Topping Slab / Acoustic Mat	\$740,706	1.4%	\$487,242	1.0%	\$441,869	0.8%
Ext. Envelope – Cladding	\$3,747,425	6.9%	\$3,521,550	7.3%	\$211,605	0.4%
Ext. Envelope – Windows	\$1,689,824	3.1%	\$1,587,970	3.3%	\$6,996,008	13%
Ext. Envelope – Roofing	\$196,866	0.4%	\$160,000	0.3%	\$169,284	0.3%
Int. Finishes – Doors / Floor / Wall / Ceiling	\$8,048,629	14.8%	\$6,800,000	14%	\$7,194,578	13.3%
Int. Finishes – Metals / Specialties / Millworks / Equipment	\$3,670,594	6.8%	\$3,449,350	7.1%	\$3,649,502	5.61%
Elevator System	\$1,213,121	2.2%	\$1,140,000	2.4%	\$1,206,149	2.2%
Mechanical System	\$11,494,317	21.1%	\$10,801,500	22.3%	\$11,428,270	21.2%
Electrical System	\$5,077,122	9.4%	\$4,771,100	9.9%	\$5,047,948	9.3%
<u>Indirect Construction Cost Breakdown</u>						
Project Staff	\$1,170,555	2.2%	\$1,100,000	2.3%	\$1,163,828	2.2%
General Requirements	\$2,021,868	3.7%	\$1,900,000	3.9%	\$2,010,249	3.7%
Site Overhead	\$-	0.0%	\$-	0.0%	\$-	0.0%
Other Construction Cost	\$4,895,048	9.02%	\$4,600,000	9.5%	\$5,819,144	10.8%
Total Construction Cost	\$54,292,680		\$48,427,793		\$54,014,256	
Construction Cost on GBA	\$390 /ft²		\$348 /ft²		\$388 /ft²	
<u>Consultant Fees</u>						
Architectural	50% Higher					
Envelope	50% Higher					
Structural	60% Higher					
Code	60% Higher					
Mechanical and Electrical	No Difference					
BIM Modelling*	No Difference					
Other Consultants	No Difference					
<u>Insurance Fees</u>						
Construction Insurance	\$1,542,9092	2.84%	\$572,605	1.27%		
Wrap-up Insurance	No Difference					
<u>Construction Finance Fees</u>						
Construction Duration	28 month(s)		29 month(s)		29 month(s)	

*Typical for all projects

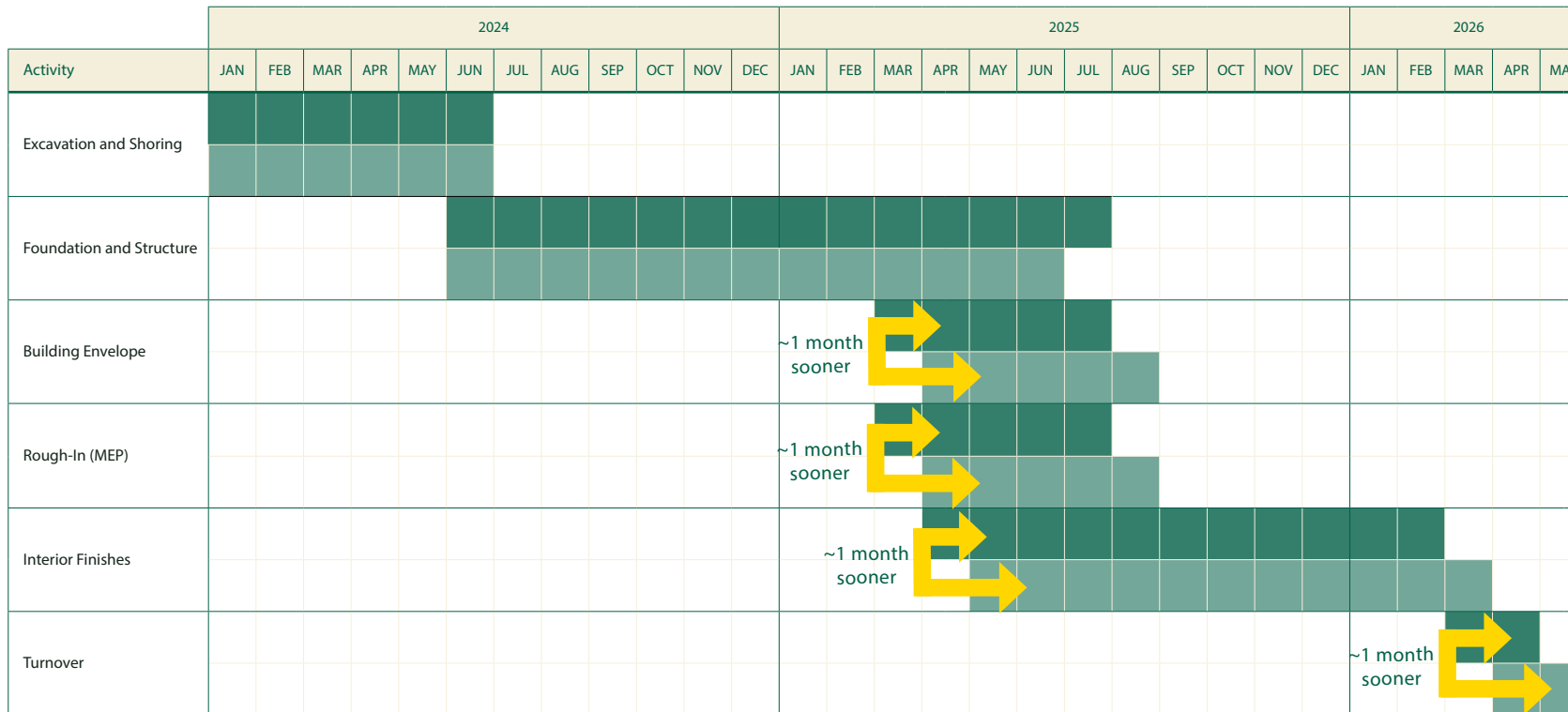
Cost Comparison Summary

The analysis is based on the specific design parameters and project conditions of the case studies. Only the towers were analyzed to ensure a direct and equitable comparison of costs specific to mass timber construction.

Key Findings:

- Cost Competitiveness:** The mass timber tower achieved cost parity with the Concrete Tower (V2) for the above-ground portion of the tower. The mass timber tower (without balconies) was priced at \$390 PSF, comparable to concrete construction (with balconies) at \$388 PSF.
- Wall Assembly:** An exterior framed wall assembly proved more cost-effective and schedule-friendly for a mass timber tower than the typical window wall system used in concrete towers.
- Balcony System Cost Difference:** Balconies were a major cost driver (8% of hard costs), leading to their removal from the tower design to simplify the facade and reduce thermal bridging concerns. Juliet balconies were a more affordable and cost-effective solution.
- Interior Finishes Premium:** The mass timber scheme showed an approximate 5-10% premium on interior finishes, mainly due to the additional fire-rated drywall on timber surfaces required for encapsulation.
- Increased Consultant Cost and Timing of Spend:** A select group of experienced consultants in mass timber were engaged for the project at a premium compared to a typical concrete project. Wesgroup engaged in a more intensive design process (than a typical project) in the early design stages with consultants to optimize a mass timber approach, with the deemed justification of understanding and ensuring an effective, efficient, and cost-competitive design.
- Course of Construction Insurance:** Premiums were a key challenge, as initial guidance indicated closer to ISO Class 1 - Frame combustible material rates (approx. 4-5x higher) would apply to mass timber once it arrived on site.

Project Schedule Comparison



Legend: ■ Mass Timber Scheduled
 ■ Concrete Comparable

Key Findings

- The mass timber building is able to forecast a small schedule savings over a conventional concrete comparable.
- The project pursued sequencing of fly forming the concrete core that was then followed by the install of the superstructure. Not pursuing these scopes concurrently reduced potential schedule savings that mass timber can achieve.
- The mass timber structure allowed the building to be enclosed and made weather-tight more quickly, which enabled interior finishing work to begin sooner than would be possible with conventional construction methods.
- A framed wall assembly proved to be more schedule-friendly and efficient for mass timber compared to the typical window wall system used in concrete towers.
- More effort and cost were invested prior to the first City application to optimize the project for mass timber, with the expectation that this upfront consultant premium would be offset by construction efficiencies.

Lessons Learned

1. Point Supported Structure: Permitted relatively flexible design, simplifying coordination of mechanical, electrical, and plumbing systems with drops and runs, rather than working around beams.
2. Unit Layouts: The unit plans were less flexible to fit within the point support grid system and certain unit dimensions were limited by absolute CLT panel width (11'4").
3. Column Selection: While mass timber columns were cost competitive, the dimensions of the columns took up too much square footage of livable space within the units. Steel columns were selected because they can be buried in the walls, and have a smaller footprint.
4. Phased Construction: To mitigate higher insurance costs associated with mass timber compared to concrete, a phased approach was adopted. Concrete work is scheduled for completion first (including core), followed by mass timber and steel installation, minimizing the duration of higher insurance rates applied to wood.
5. Material Sourcing: The team explored both Canadian and European suppliers, with European options being cost competitive. However, differences in panel sizes and shipping limitations would have required a shift to a post-and-beam system, further complicating the M+E layouts, and increasing the floor to floor heights.

Design Evolution



Image courtesy of DIALOG

Successes

1. Cost Parity: Achieved cost parity with concrete construction for the above-ground portion of the tower through strategic design revisions. Note that this excludes underground costs, which would bring the blended rate to approximately \$500 PSF.
2. Regulatory Support: Secured approval from the City of Vancouver for design changes that simplified the building form and increased floor plate size demonstrating flexibility in working with innovative construction methods.
3. Balcony Alternatives: Removing balconies and replacing them with Juliet railings saved the project \$25,000 in hard cost per unit and was a major win for making mass timber viable.
4. Stakeholder Relationships: Developed a strong, transparent working relationship with local government staff. Wesgroup maintained open communication throughout the project, sharing in-depth details about challenges faced and proposed solutions. This approach facilitated ongoing support and flexibility from the City of Vancouver.

Elite Network Members



Funders



Natural Resources
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