Mass Timber Multifamily Construction

Products, Performance and Design

Mark Bartlett, PE
Regional Director | TX
WoodWorks – Wood Products Council

Carbon12 - Portland, OR; Credit: Kaiser + Path

"The Wood Products Council" is a Registered Provider with The American Institute of Architects Continuing Education Systems (AIA/CES), Provider #G516.

Credit(s) earned on completion of this course will be reported to AIA CES for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

This course is registered with AIA CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

Course Description

Due to their high strength, dimensional stability and positive environmental performance, mass timber building products are quickly becoming materials of choice for sustainably-minded designers. This presentation will provide a detailed look at the variety of mass timber products available for multifamily projects, including glue-laminated timber (glulam), cross laminated timber (CLT), dowel laminated timber (DLT), heavy timber decking, and other engineered and composite systems. Applications for the use of these products under modern building codes will be discussed, and examples of their use in U.S. multifamily projects reviewed. Mass timber's ability to act as both structure and exposed finish will also be highlighted, as will its performance as part of an assembly, considering design objectives related to structural performance, fire resistance, acoustics, and energy efficiency. Other topics will include detailing and construction best practices, lessons learned from completed projects and trends for the increased use of mass timber products in the future.

Learning Objectives

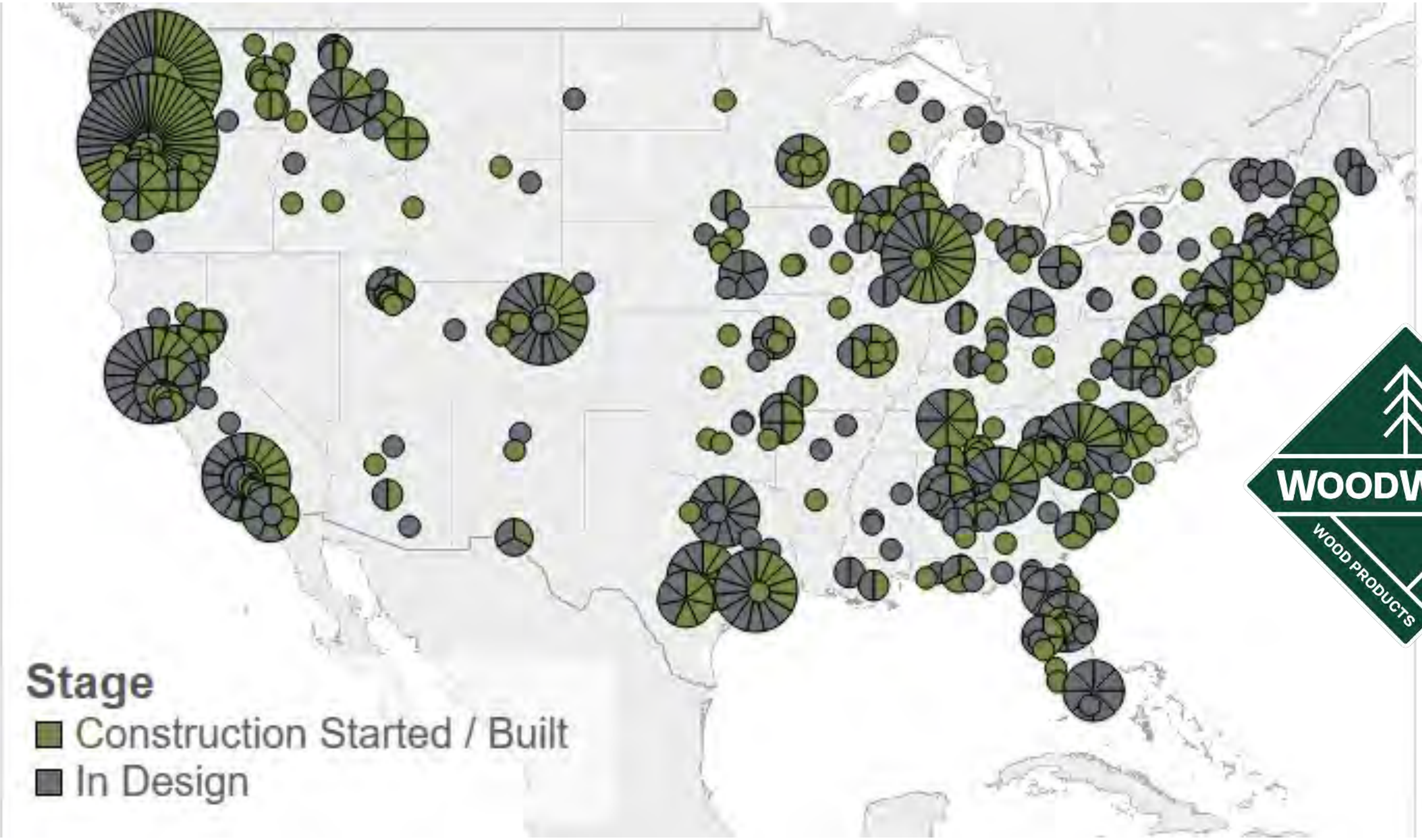
1. Identify mass timber products available in North America and consider how they can be used under current building codes and standards.
2. Review completed mass timber projects that demonstrate a range of applications and system configurations.
3. Discuss benefits of using mass timber products, including structural versatility, prefabrication, lighter carbon footprint, and reduced labor costs.
4. Highlight possibilities for the expanded use and application of mass timber in larger and taller buildings.

Mass Timber

- What is it? – Products
- Why use it? – Appeal
- How does it work? – Design topics
- Where is it used? – Case studies
- What's next?

Current State of Mass Timber Projects

As of June 2021, **1169** multi-family, commercial, or institutional, projects have been constructed with mass timber across the US, or they're in design.



OVERVIEW | TIMBER METHODOLOGIES

Heavy Timber
Photo: Benjamin Benschneider

Mass Timber
Photo: John Stamets

Glue Laminated Timber (Glulam)
Beams and Columns

Photo: StructureCraft

Cross-Laminated Timber (CLT)
Solid Sawn Laminations

Photo: LendLease

Cross-Laminated Timber (CLT)
SCL Laminations / Mass Plywood

Photo: Freres Lumber

Photo: LEVER Architecture

Nail-Laminated Timber (NLT)

Photo: Think Wood

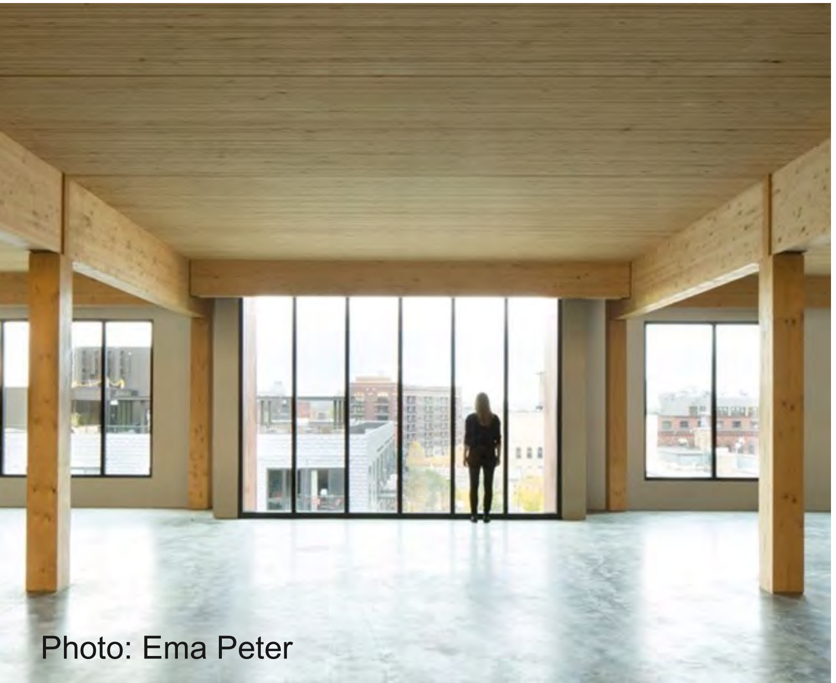


Photo: Ema Peter

Dowel-Laminated Timber (DLT)

Photo: StructureCraft

Photo: StructureCraft

Decking

Photo: Bernard André Photography

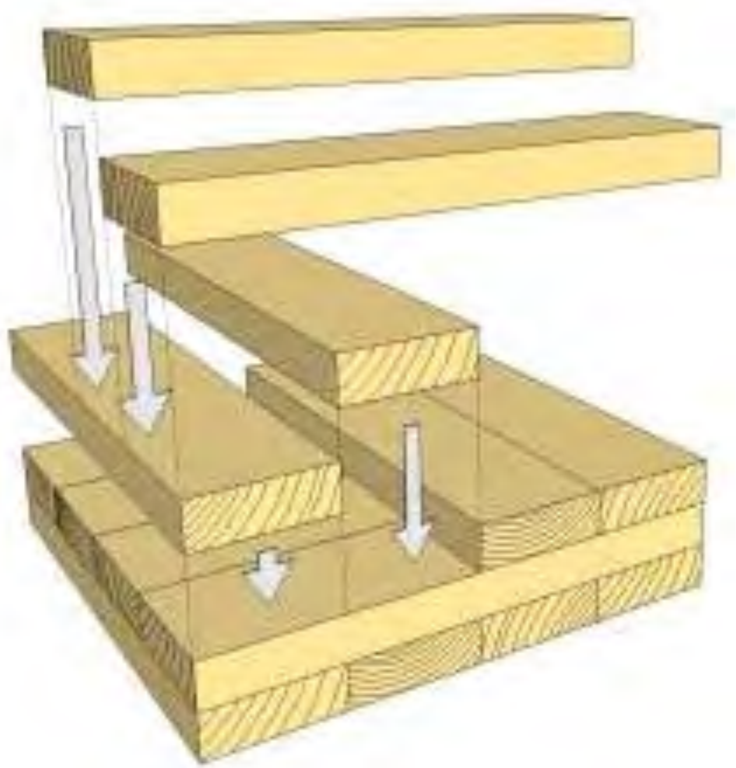
Mass Timber Products

Cross-laminated timber (CLT)

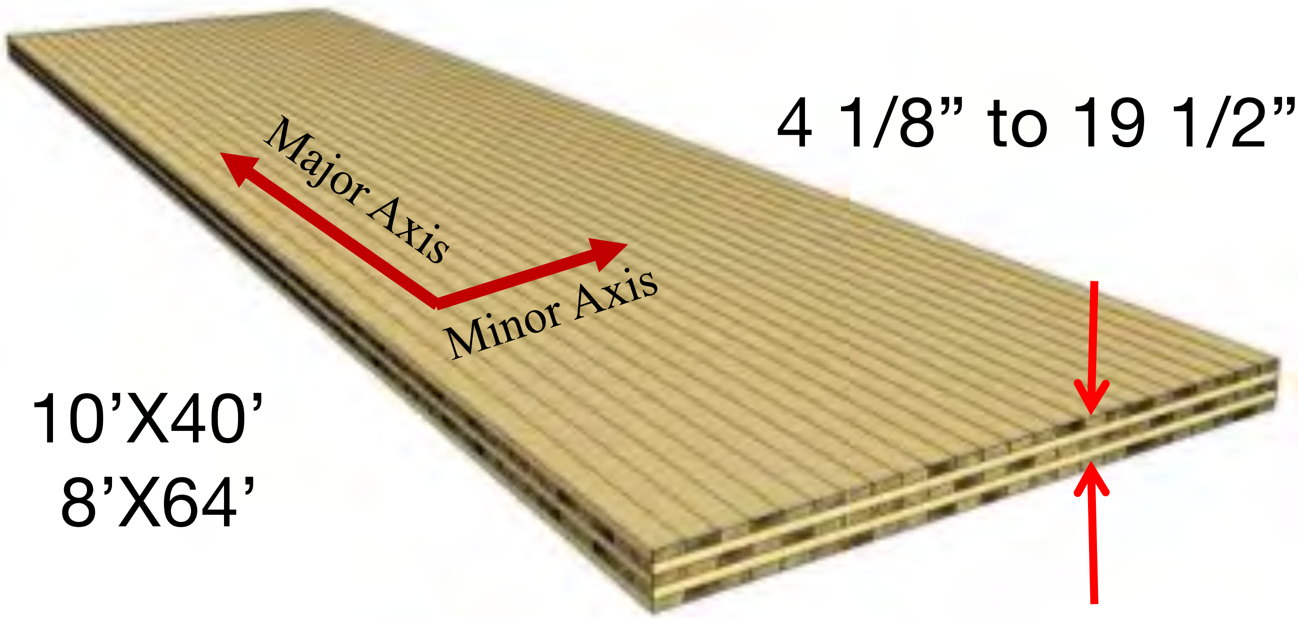
Mass Timber Products

Cross-Laminated Timber

- Solid wood panel
- 3 layers min. of solid sawn lams
- 90 deg. cross-lams glued together



4 1/8” to 19 1/2”



10’X40’
8’X64’

Mass Timber Products

Photo Credit: Sissi Slotover-Smutny

Image Source: Structurlam Products LP

CLT prefabrication

- Finished panels are planed, sanded, cut to size. Then openings are cut with precise CNC routers.
- Third party inspection at factory
- Custom engineered for material efficiency
- Custom designed for project
- Each panel numbered, delivered & installed in predetermined sequence

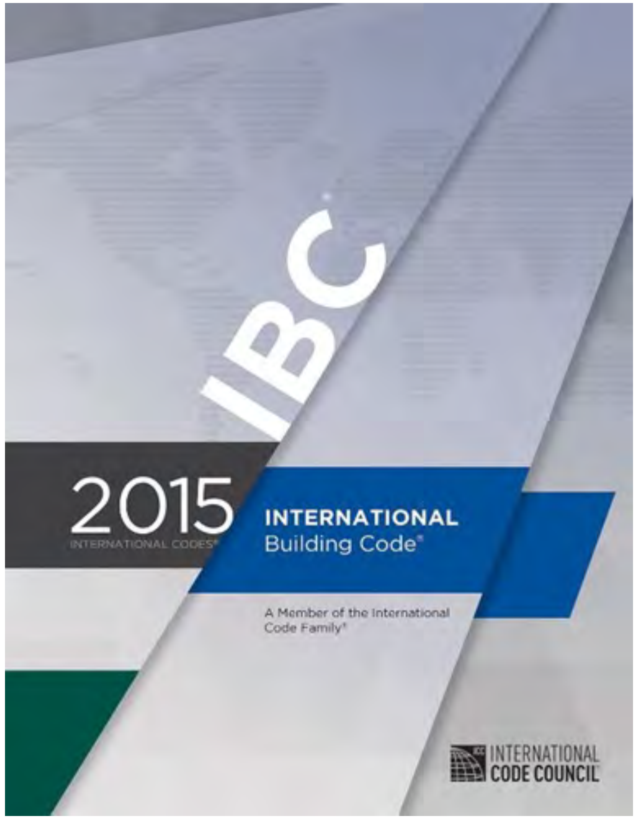
Mass Timber Products

In 2015 IBC, CLT is defined in Chapter 2 Definitions:

[BS] CROSS-LAMINATED TIMBER. A prefabricated engineered wood product consisting of not less than three layers of solid-sawn lumber or *structural composite lumber* where the adjacent layers are cross oriented and bonded with structural adhesive to form a solid wood element.

And is referenced in Chapter 23:

2303.1.4 Structural glued cross-laminated timber. Cross-laminated timbers shall be manufactured and identified in accordance with ANSI/APA PRG 320.



Mass Timber Products

Nail-Laminated Timber (NLT)

- Mechanically laminated solid timber panel
- Dimensional lumber
  - Nominal 2x, 3x, or 4x thickness
  - 4 in. to 12 in. width on edge
  - Laminations connected with nails
- Recognized in IBC 2304.8.3
  - Mechanically laminated decking

Image: Think Wood

Mass Timber Products

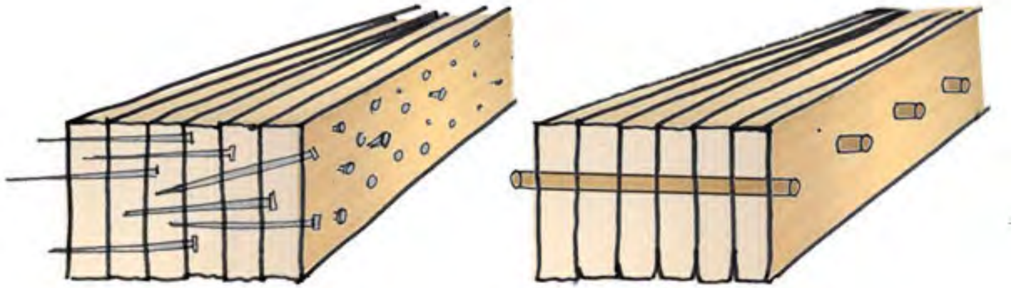
NLT panels can be built on-site, in-place or pre-fabricated offsite

Photo Credit: John Stamets

Photo Credit: StructureCraft

Mass Timber Products

Dowel-Laminated Timber (DLT)



- Hardwood Dowels in lieu of nails
- Not currently recognized as prescriptively permitted material in IBC
- Several DLT projects in Texas

Photo credit: StructureCraft Builders

Mass Timber Products

DLT profile options

PHOTO CREDIT: STRUCTURECRAFT BUILDERS

Mass Timber Floor Assembly

Common floor assembly:

- Finish floor (if applicable)
- Underlayment (if applicable)
- 1.5” to 3” thick concrete/gypcrete topping
- Acoustical mat
- WSP (if applicable; not shown)
- Mass Timber floor panels

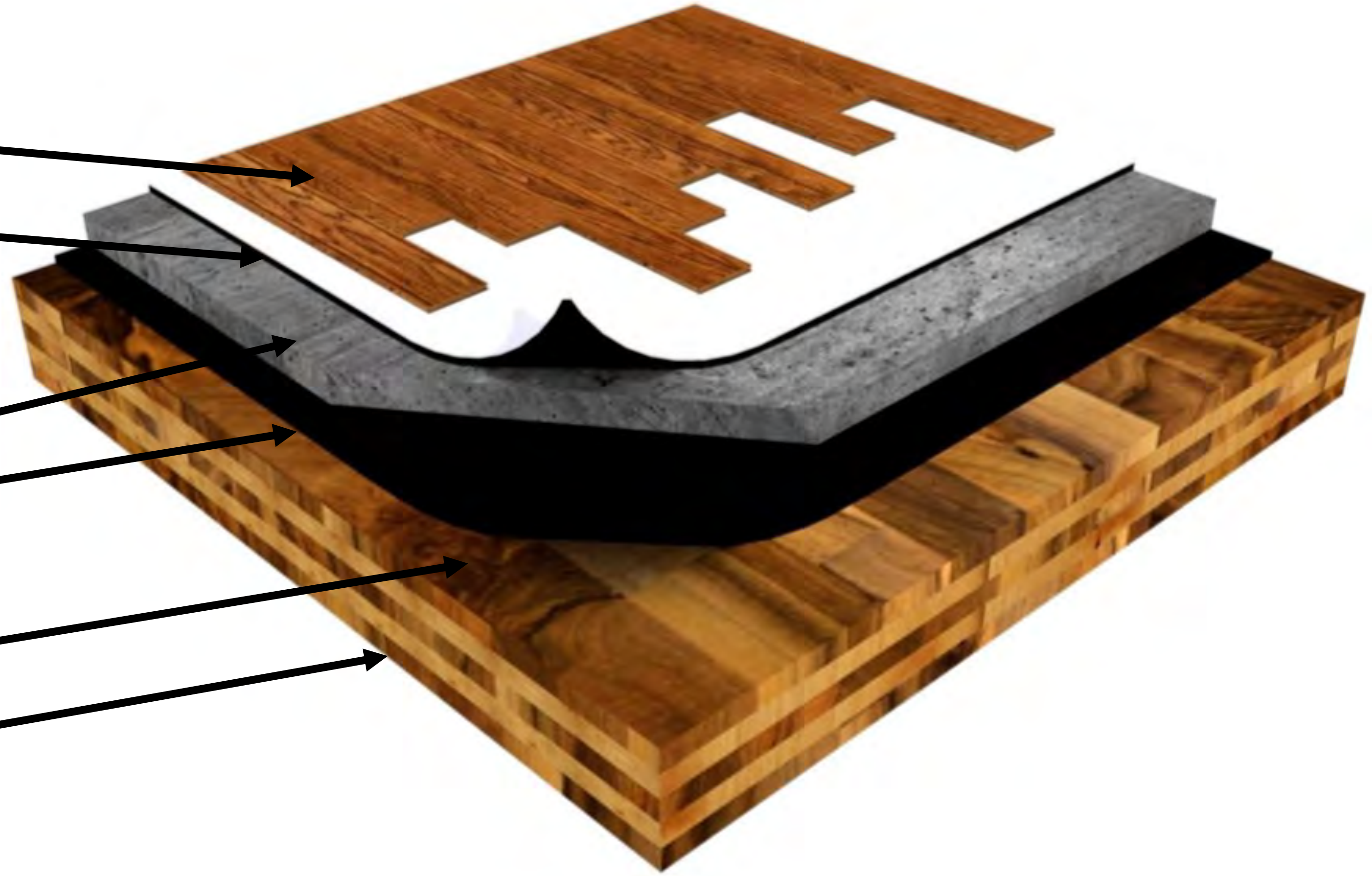
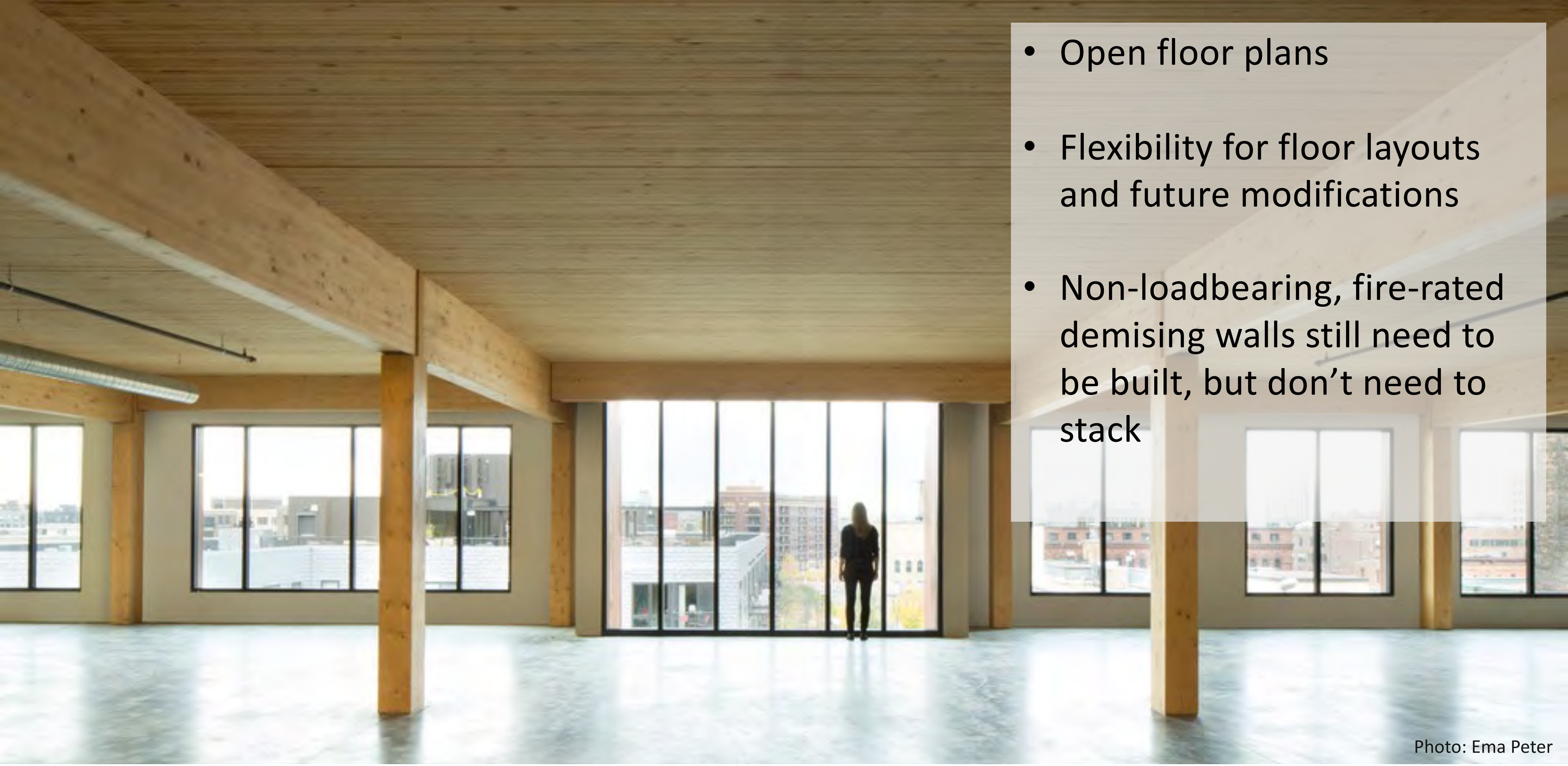


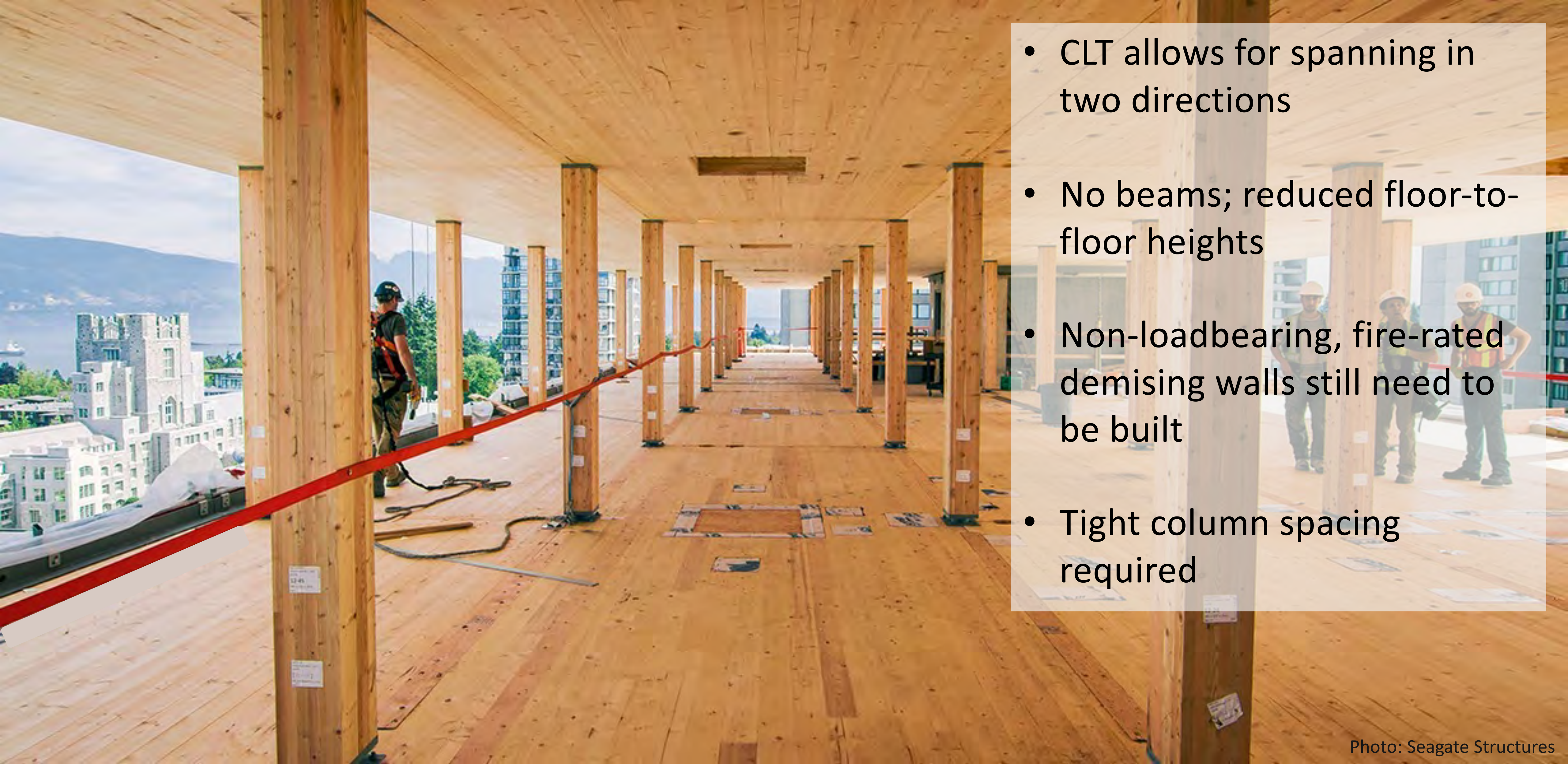
Image credit: AcoustiTECH



- Open floor plans
- Flexibility for floor layouts and future modifications
- Non-loadbearing, fire-rated demising walls still need to be built, but don't need to stack

Photo: Ema Peter

FRAMING OPTIONS | POST, BEAM + PLATE



- CLT allows for spanning in two directions
- No beams; reduced floor-to-floor heights
- Non-loadbearing, fire-rated demising walls still need to be built
- Tight column spacing required

Photo: Seagate Structures

FRAMING OPTIONS | POST + PLATE

- Fast and easy installation
- Small crew required for install
- Mass timber walls can’t be exposed due to acoustics
- Load-bearing, light-frame walls are more materially efficient /cost effective

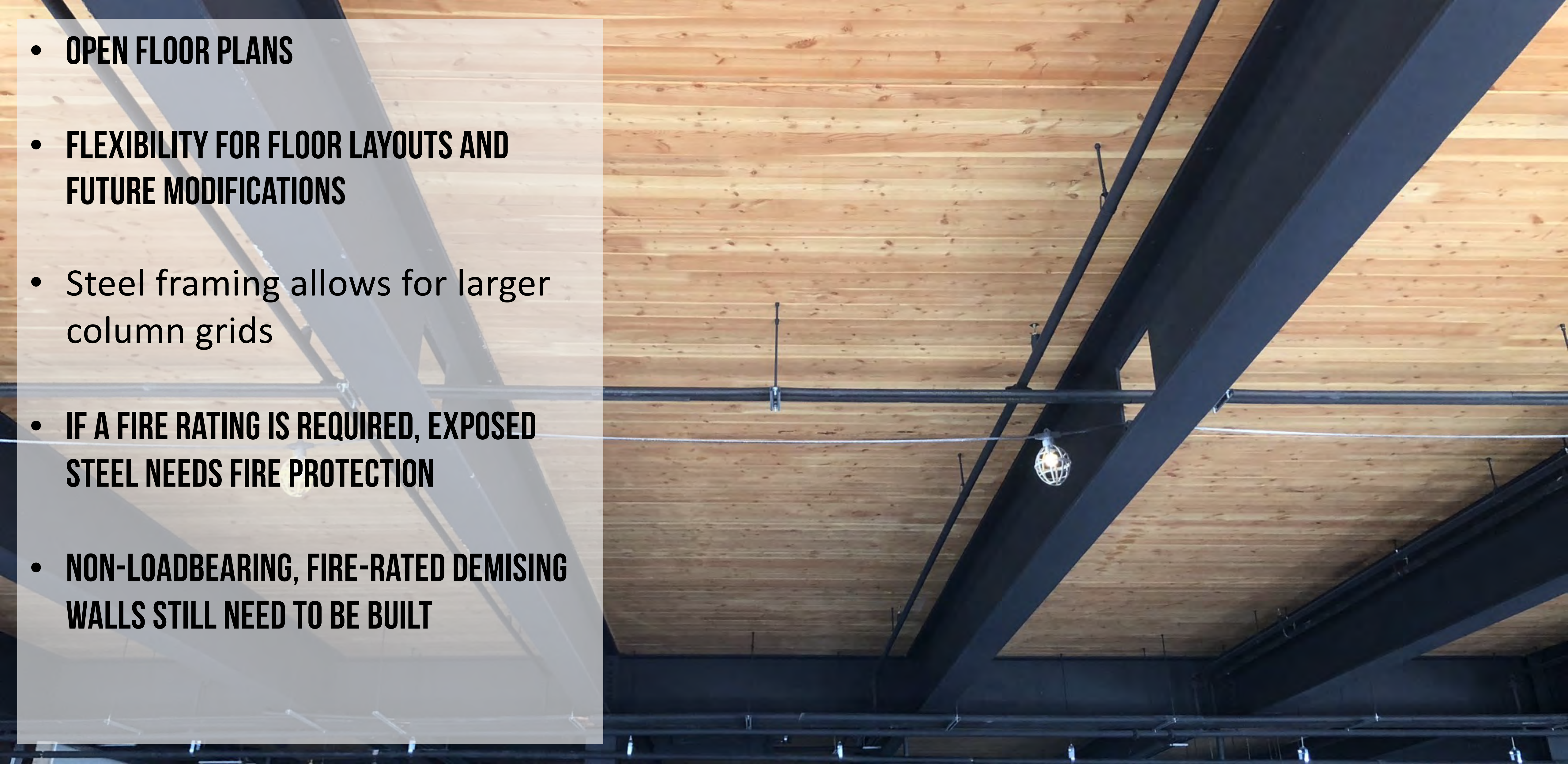
Photo: Lendlease

FRAMING OPTIONS | HONEYCOMB

- Light-frame walls more cost effective
- Field-built, light-frame walls may have tolerance issues with mass timber
- Prefabrication of walls will speed up construction and improve quality

Photo: John Klein

FRAMING OPTIONS | HYBRID LIGHT-FRAME + MASS TIMBER



- OPEN FLOOR PLANS
- FLEXIBILITY FOR FLOOR LAYOUTS AND FUTURE MODIFICATIONS
- Steel framing allows for larger column grids
- IF A FIRE RATING IS REQUIRED, EXPOSED STEEL NEEDS FIRE PROTECTION
- NON-LOADBEARING, FIRE-RATED DEMISING WALLS STILL NEED TO BE BUILT

FRAMING OPTIONS | HYBRID STEEL + MASS TIMBER

Is Mass Timber a Good Fit for Your Multi-Family Project?

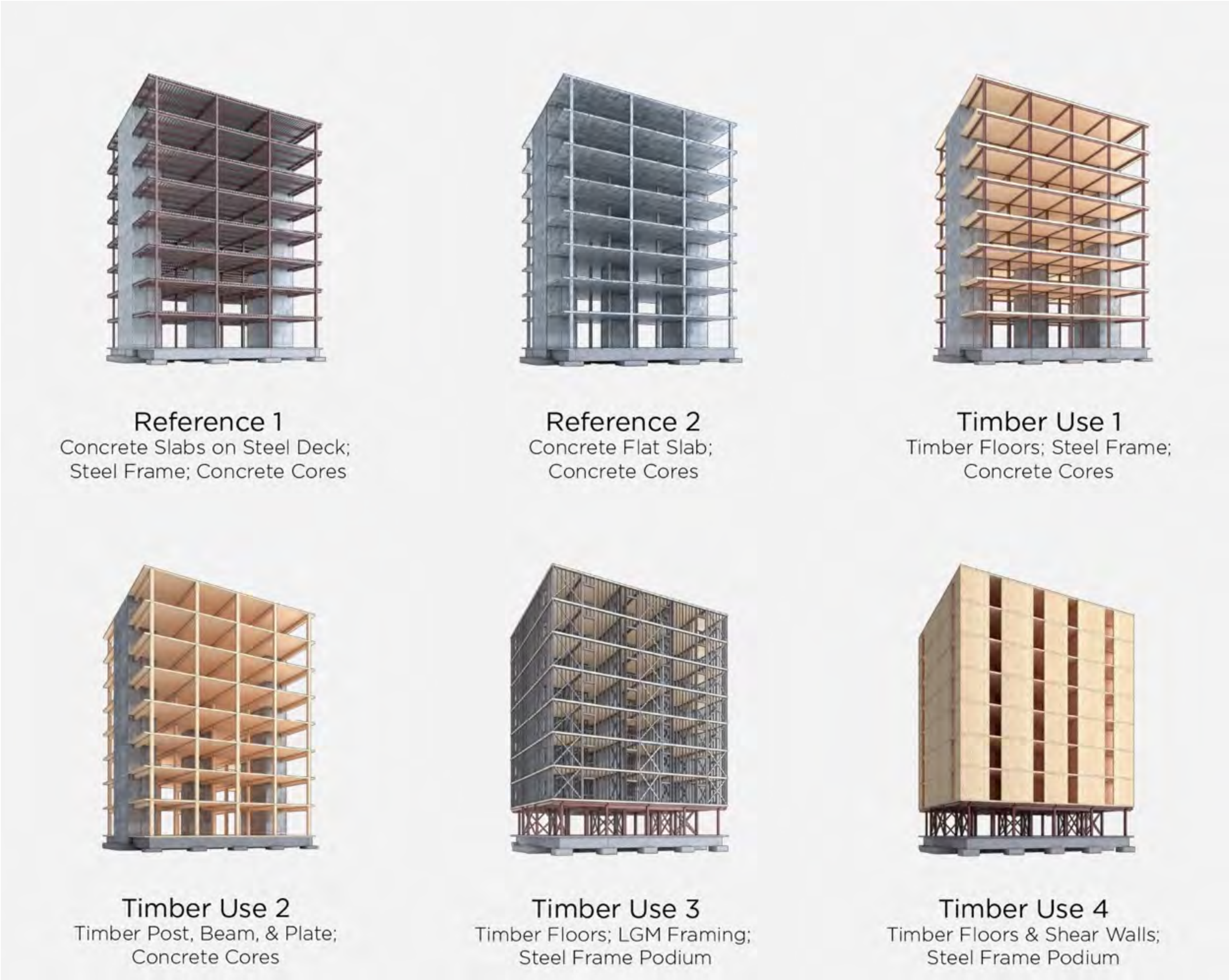
Ascent, Milwaukee, WI
Source: Korb & Associates Architects

Why do you want to use mass timber?

Why does the developer want to use mass timber?

Know your Why

- Cost
- Speed of Construction
- Sustainability
- Lightweight Structure
- Market Distinction (i.e. higher rents)
- Leasing Velocity
- Resale Value



Source: Generate Architecture + Technologies

Cost (Remember your Why)

- Mass Timber vs. Light-frame
- MT-LF Hybrid vs. Light-frame
- Mass Timber vs. Concrete
  Mass Timber vs. Steel
- Material Costs vs. Total project costs
- Speed of Construction
- Costs vs. Creating Value

Seattle Mass Timber Tower: Detailed Cost Comparison

Fast Construction

- Textbook example done by industry experts
- Mass timber vs. PT concrete
- Detailed cost, material takeoff & schedule comparisons

“The initial advantage of Mass Timber office projects in Seattle will come through the

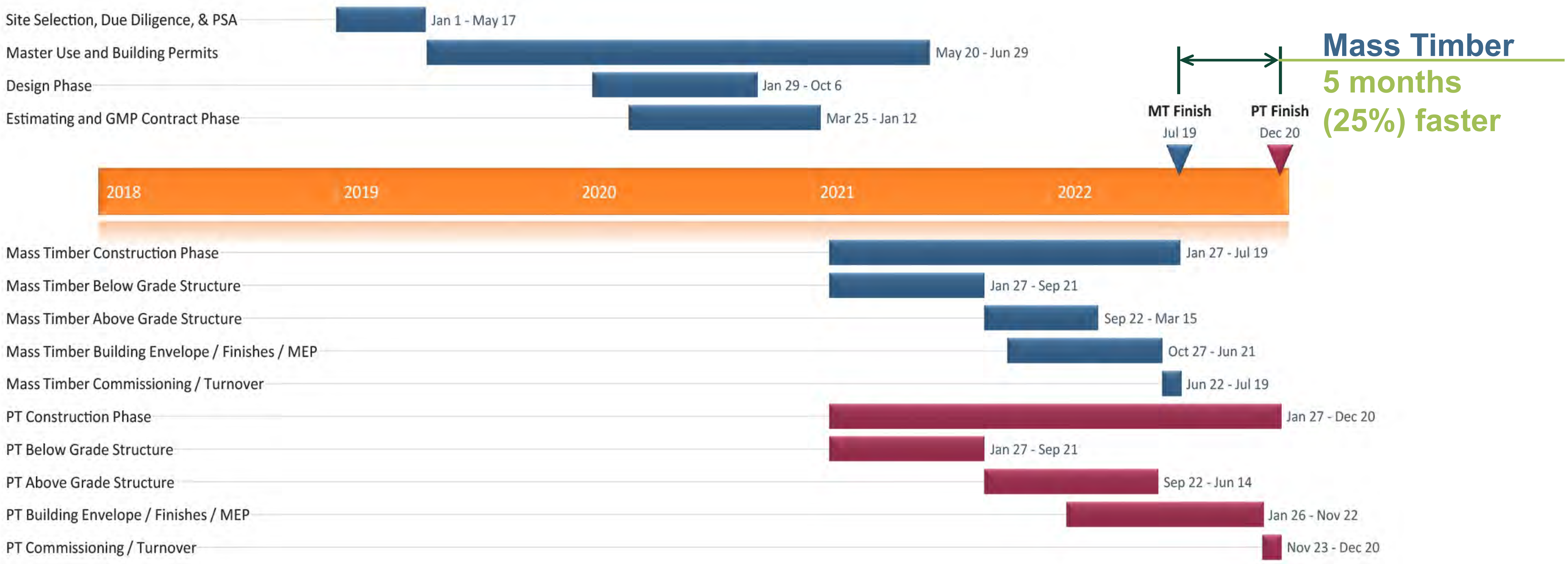
leasing velocity

that developers will experience.”

- Connor Mclain, Colliers

Seattle Mass Timber Tower
Fast Construction

Construction Schedule:



Source: Tall With Timber
A Seattle Mass Timber Tower Case Study by DLR Group[1]

Seattle Mass Timber Tower

Faster Construction + Higher Material Costs = Cost Competitive

System	Mass Timber Design	PT Concrete Design	Mass Timber Savings
Direct Cost of Work	$86,997,136	$85,105,091	2.2%
Project Overhead	$ 9,393,750	$11,768,750	-20.2%
Add-Ons	$ 8,387,345	$ 8,429,368	-0.5%
Total	**$104,778,231**	**$105,303,209**	**-0.5%**

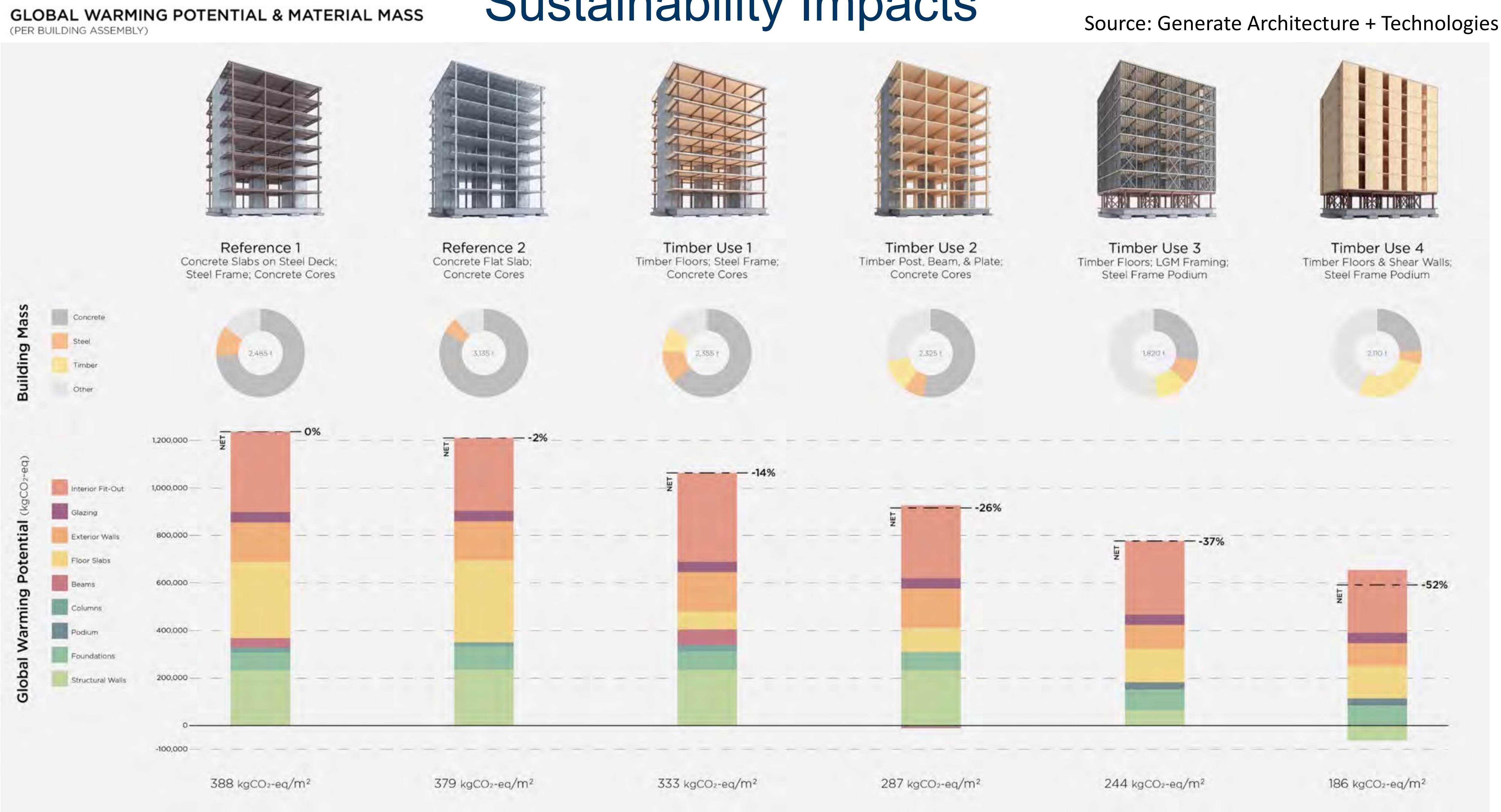
Source: DLR Group | Fast + Epp | Swinerton Builders

Speed of Construction

Forte – Time Lapse

Sustainability Impacts

Source: Generate Architecture + Technologies



Lightweight Structure

- 75% lighter weight than concrete
- Reduced Foundations
- Lower base shear in seismic regions
- Safer jobsite
- Vertical Additions

Above: Timber Lofts, Milwaukee, WI
Credit: ADX Creative and Engberg Anderson Architects

Left: 69 A Street, Boston, MA
Credit: Greg Folkins

VERTICAL ADDITIONS AND ADAPTIVE REUSE

KEY DESIGN CONSTRAINTS

ACME Timber, New Haven, CT Credit: Grey Organschi Architecture

CONSTRUCTION TYPES

- Type IV-A, IV-B, IV-C (Tall Wood)
  - New in IBC 2021
  - AMMR for older codes
  - Will the AHJ allow?

- Type IV-HT vs. Type III-A
  - Similar allowable heights and areas
  - Concealed spaces in III-A only
    - This changes in IBC 2021
  - Fire ratings more stringent for III-A

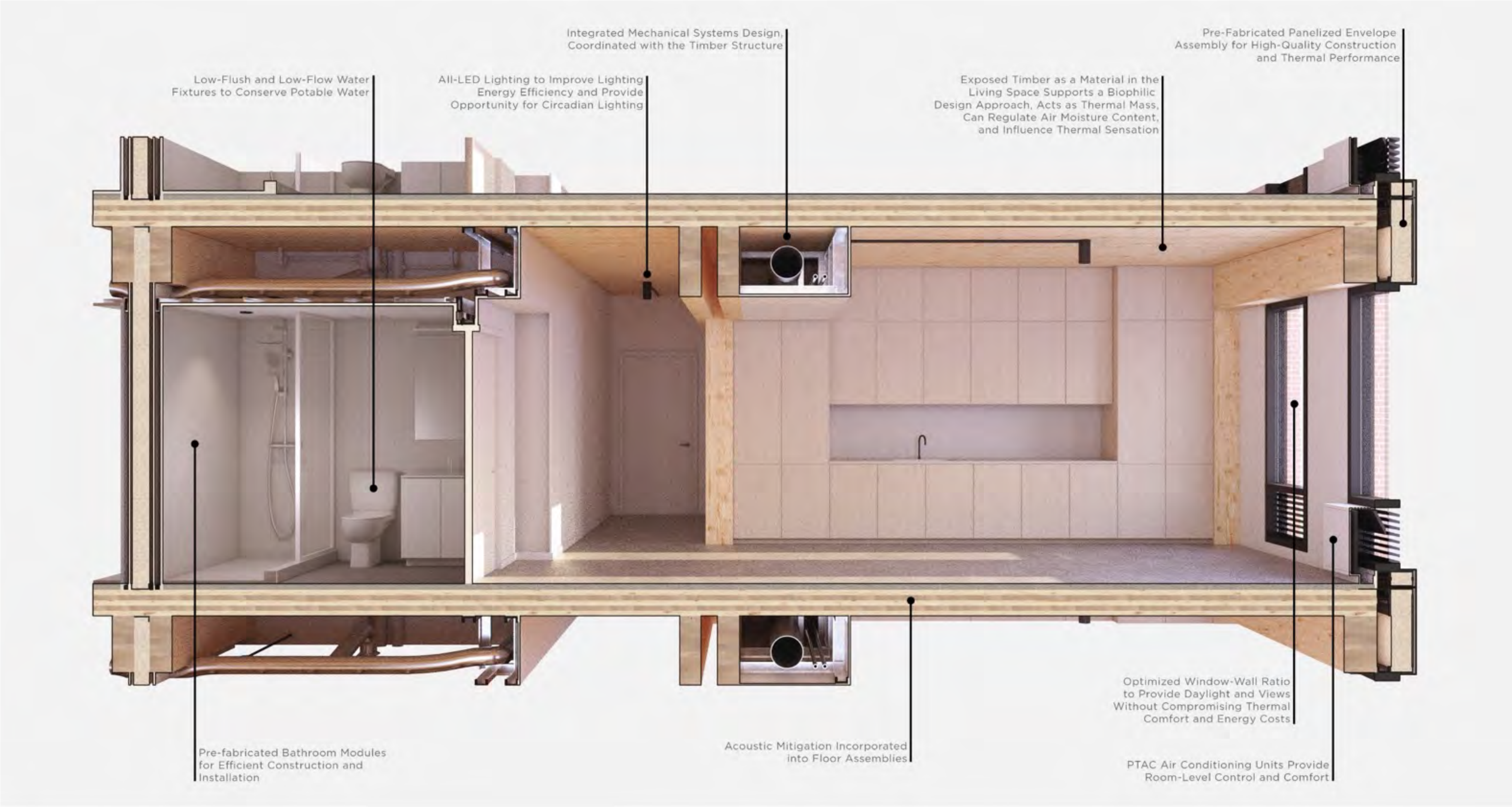
- Type III-A and V-A
  - 1-hour fire rating for exposed wood elements

- Type III-B and V-B
  - No fire rating for exposed wood elements, but…

	Construction Type (All Sprinklered Values)							
	IV-A	IV-B	IV-C	IV-HT	III-A	III-B	V-A	V-B
Occupancies	Allowable Building Height above Grade Plane, Feet (IBC Table 504.3)							
A, B, R	270	180	85	85	85	85	70	60
	Allowable Number of Stories above Grade Plane (IBC Table 505.4)							
A-2, A-3, A-4	18	12	6	4	4	3	3	2
B	18	12	9	6	6	4	4	3
R-2	18	12	8	5	5	5	4	3
	Allowable Area Factor (At) for SM, Feet² (IBC Table 506.2)							
A-2, A-3, A-4	135,000	90,000	56,250	45,000	42,000	28,500	34,500	18,000
B	324,000	216,000	135,000	108,000	85,500	57,000	54,000	27,000
R-2	184,500	123,000	76,875	61,500	72,000	48,000	36,000	21,000

For multi-unit residential buildings, walls and floors between dwelling or sleeping units are required to have a fire-resistance rating of 1/2 hour in Type II-B, III-B and V-B construction when sprinklered throughout with an NFPA 13 system, and 1 hour for all other construction types (IBC 420,708 and 711).

MEP SYSTEMS, ROUTING, INTEGRATION



INTEGRATED SYSTEMS

The Tallhouse building system prioritizes the integration of design, engineering, and construction. This results in a high performance building finely tuned to meet energy, comfort, acoustic, and design criteria that has been vetted by constructability experts to ensure fast, efficient production.

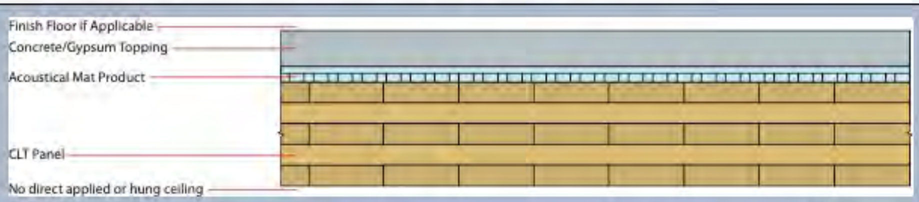
Utilizing Pre-Fabricated Facade Panels and Bathroom Modules that are manufactured off-site in factories allows for reducing construction time on-site, higher quality control practices, and safer labor conditions for construction workers. Efficient routing of duct-work conserves material, and associated embodied carbon, allowing more exposed timber all while providing the air quality needed for healthy living. Water conserving fixtures reduce potable water use as a precious resource, while maintaining reliable performance.

Credit: John Klein, Generate Architecture

ACOUSTICS

Railyard Flats, Sioux Falls, SD Credit: WoodWorks

Table 1: CLT Floor Assemblies with Concrete/Gypsum Topping, Ceiling Side Exposed



CLT Panel	Concrete/Gypsum Topping	Acoustical Mat Product Between CLT and Topping	Finish Floor	STC[1]	IIC[1]	Source
CLT 5-ply (6.875")	1-1/2" Gyp-Crete®	Maxxon Acousti-Mat® 3/4	None	47[2] ASTC	47[2] AIIC	1
			LVT	-	49[2] AIIC	
			Carpet + Pad	-	75[2] AIIC	
			LVT on Acousti-Top®	-	52[2] AIIC	
			Eng Wood on Acousti-Top®	-	51[2] AIIC	
		Maxxon Acousti-Mat® ¾ Premium	None	49[2] ASTC	45[2] AIIC	
			LVT	-	47[2] AIIC	
			LVT on Acousti-Top®	-	49[2] AIIC	
		USG SAM N25 Ultra	None	45[6]	39[6]	15
			LVT	48[6]	47[6]	16
			LVT Plus	48[6]	49[6]	58
			Eng Wood	47[6]	47[6]	59
			Carpet + Pad	45[6]	67[6]	60
			Ceramic Tile	50[6]	46[6]	61
			None	45[6]	42[6]	15

FIRE RESISTANCE, CONSTRUCTION TYPE, GRID

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary structural frame[f] (see Section 202)	3[a]	2[a]	1	0	1	0	HT	1	0
Bearing walls Exterior[e, f] Interior	 3 3[a]	 2 2[a]	 1 1	 0 0	 2 1	 2 0	 2 1/HT	 1 1	 0 0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior[d]	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	$1^1/_2$[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	HT	1[b,c]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.

b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

c. In all occupancies, heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.

d. Not less than the fire-resistance rating required by other sections of this code.

e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).

f. Not less than the fire-resistance rating as referenced in Section 704.10.

Panel	Example Floor Span Ranges
3-ply CLT (4-1/8" thick)	Up to 12 ft
5-ply CLT (6-7/8" thick)	14 to 17 ft
7-ply CLT (9-5/8")	17 to 21 ft
2x4 NLT	Up to 12 ft
2x6 NLT	10 to 17 ft
2x8 NLT	14 to 21 ft
5" MPP	10 to 15 ft


Credit: David Barber, ARUP


Carbon 12, Portland, OR Credit: Kaiser+Path

CASE STUDIES

360 WYTHE AVENUE - BROOKLYN, NY

Credit: Flank

TIMBER LOFTS
MILWAUKEE, WI

Source: ADX Creative and Engberg Anderson Architects

Source: Think Wood

ADOHI HALL DORMATORY UNIVERSITY OF ARKANSAS

CONDOS AT LOST RABBIT, MS

Lost Rabbit, MS
Credit: Everett Consulting Group

THE POSTMARK APARTMENTS - SHORELINE, WA

Credit: Katerra, Hans-Erik Blomgren

CIRRUS - DENVER, CO

Credit: KL&A Engineers & Builders

CANYONS - PORTLAND, OR

Credit: Jeremy Bittermann & Kaiser + Path

THE DUKE – AUSTIN, TX

Mass timber construction
The future's looking up

Photo credit: Alex Schreyer

Tall Wood Projects in the US

- Current Prescriptive Code Limit, R-2 - 5 stories or 85 feet
- Over 85 feet- Alternate Means and Methods Request (AMMR) through performance-based design
- Based on the 1910 Heights and Areas Act

Photo credit: Alex Schreyer

Carbon 12 – Portland, OR (completed 2018)

Credit: Baumberger Studio/PATH Architecture

Tall Wood Projects

Murray Grove
London, United Kingdom
8 Stories
2009

Forté
Melbourne, Australia
10 Stories
2012

TREET
Bergen, Norway
14 Stories
2015

Brock Commons
Vancouver, Canada
18 Stories
2017

HoHo
Vienna, Austria
24 Stories
2017

Source: ThinkWood

Brock Commons

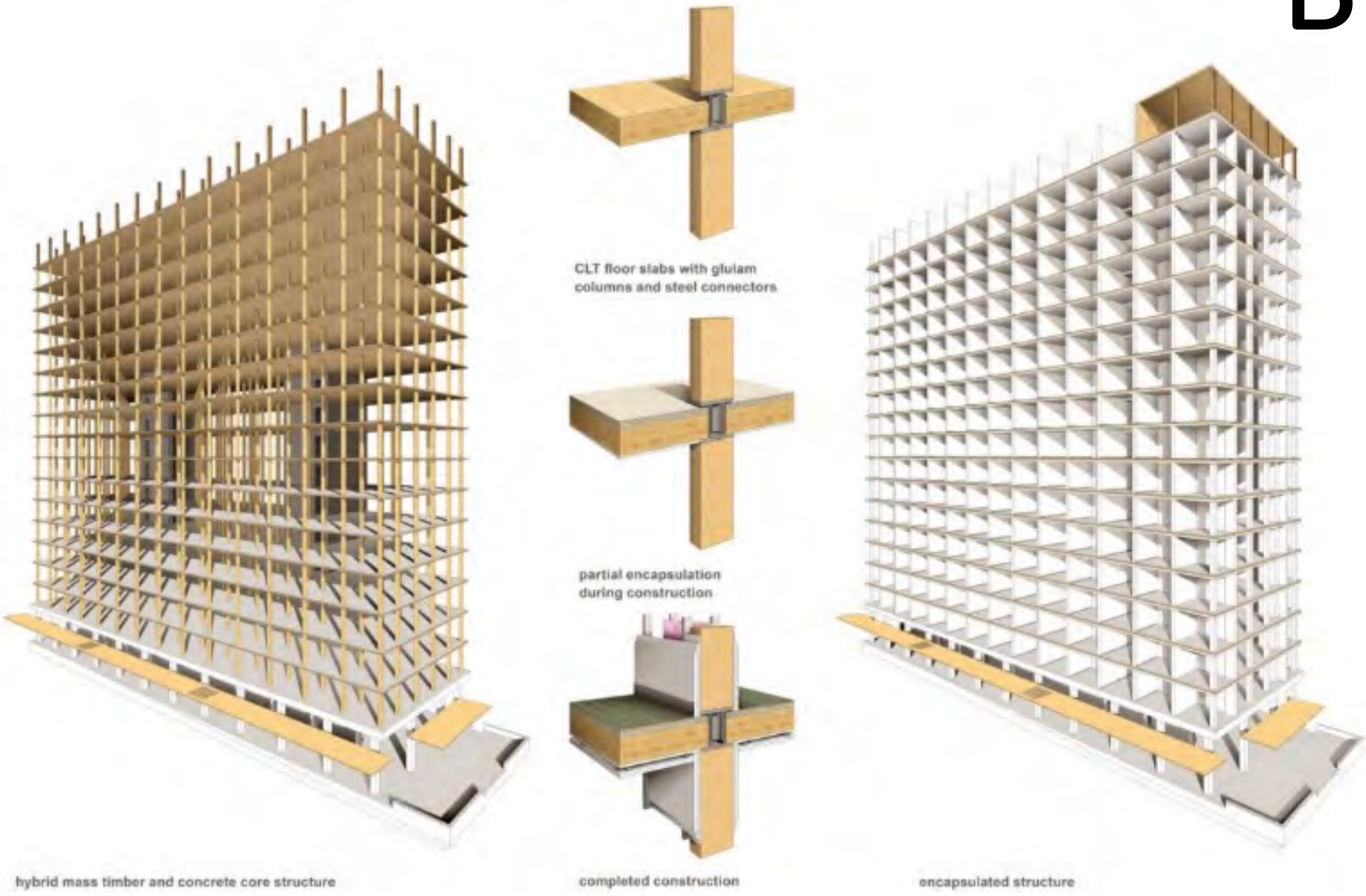
Vancouver, BC

- Completed Fall 2017
- 18 Stories
- 174 FT
- 156,000 SQ.FT.

Photo credit: Acton Ostry Architects

Brock Commons

Vancouver, BC



- 5-ply CLT panels, 2-way span
- ~9’X13’ column grid

Photo credit: Acton Ostry Architects

Brock Commons

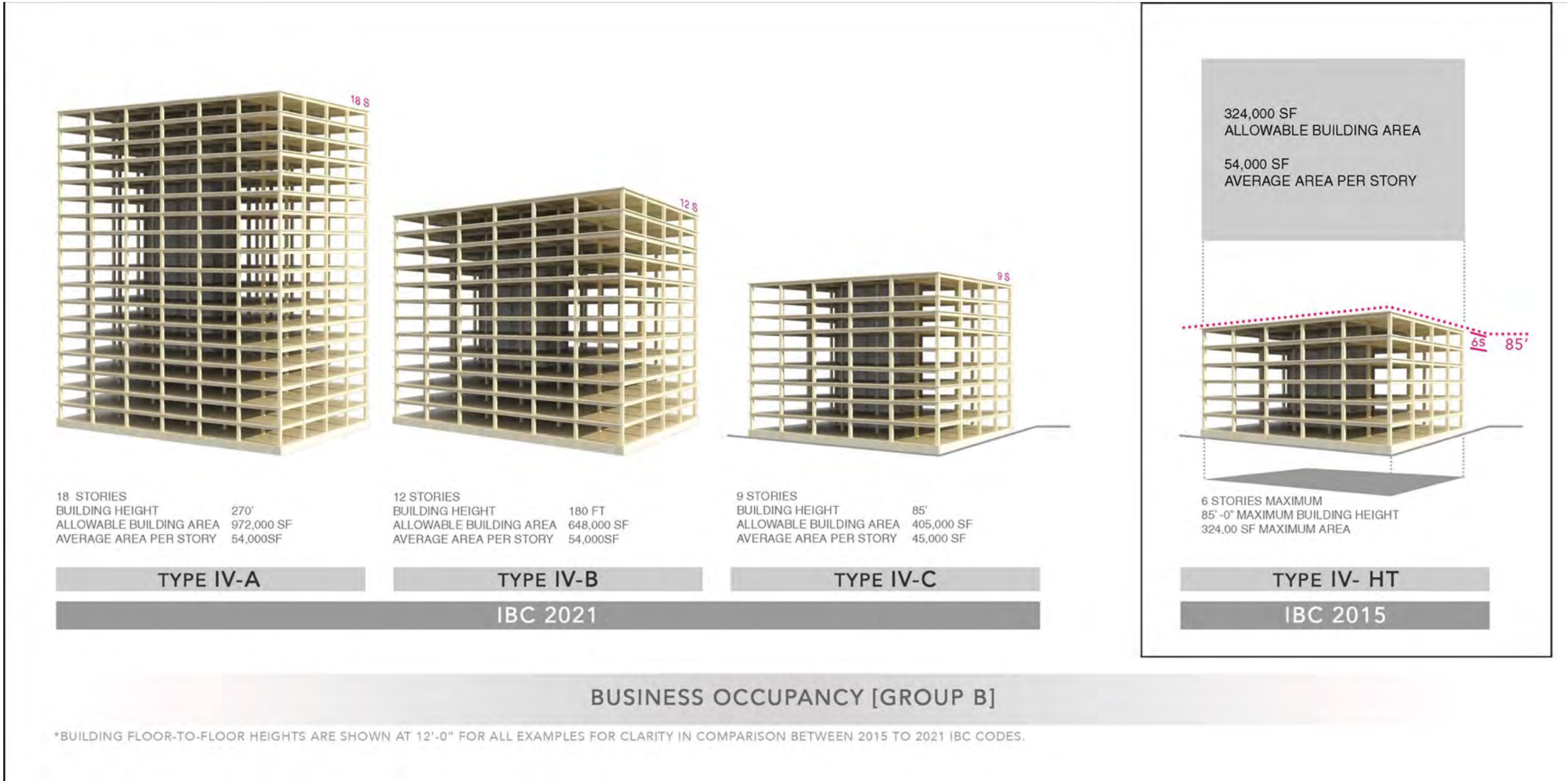
Vancouver, BC

Brock Commons

Vancouver, BC

- 17 stories of timber installation
- Started
  - June 6, 2016
- Finished
  - August 10, 2016

2021 IBC Tall Wood – Type IV Const.



INTRO, CLEVELAND

512,000 SF

297 Apartments, Mixed-Use

9 Stories | 115 ft

8 Timber Over 1 Podium

Photo: Harbor Bay Real Estate Advisors, Image Fiction | Architect: Hartshorne Plunkard Architecture

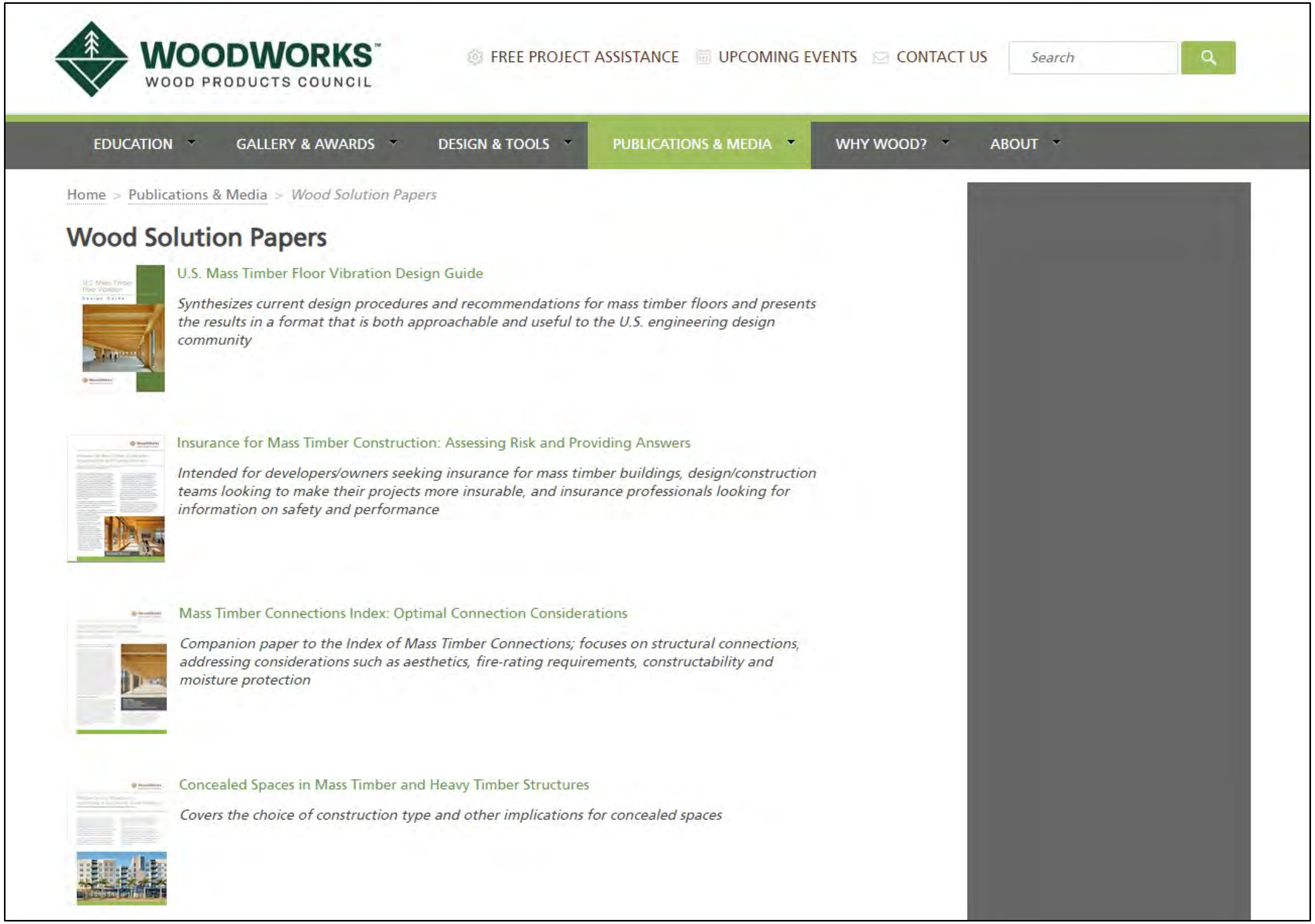
ASCENT, MILWAUKEE

25 STORIES

19 TIMBER OVER 6 PODIUM, 284 FT

Photo: Korb & Associates Architects | Architect: Korb & Associates Architects

Additional Resources – WoodWorks.org



WOODWORKS™ WOOD PRODUCTS COUNCIL

FREE PROJECT ASSISTANCE | UPCOMING EVENTS | CONTACT US | Search

EDUCATION | GALLERY & AWARDS | DESIGN & TOOLS | PUBLICATIONS & MEDIA | WHY WOOD? | ABOUT

Home > Publications & Media > *Wood Solution Papers*

Wood Solution Papers

U.S. Mass Timber Floor Vibration Design Guide

Synthesizes current design procedures and recommendations for mass timber floors and presents the results in a format that is both approachable and useful to the U.S. engineering design community

Insurance for Mass Timber Construction: Assessing Risk and Providing Answers

Intended for developers/owners seeking insurance for mass timber buildings, design/construction teams looking to make their projects more insurable, and insurance professionals looking for information on safety and performance

Mass Timber Connections Index: Optimal Connection Considerations

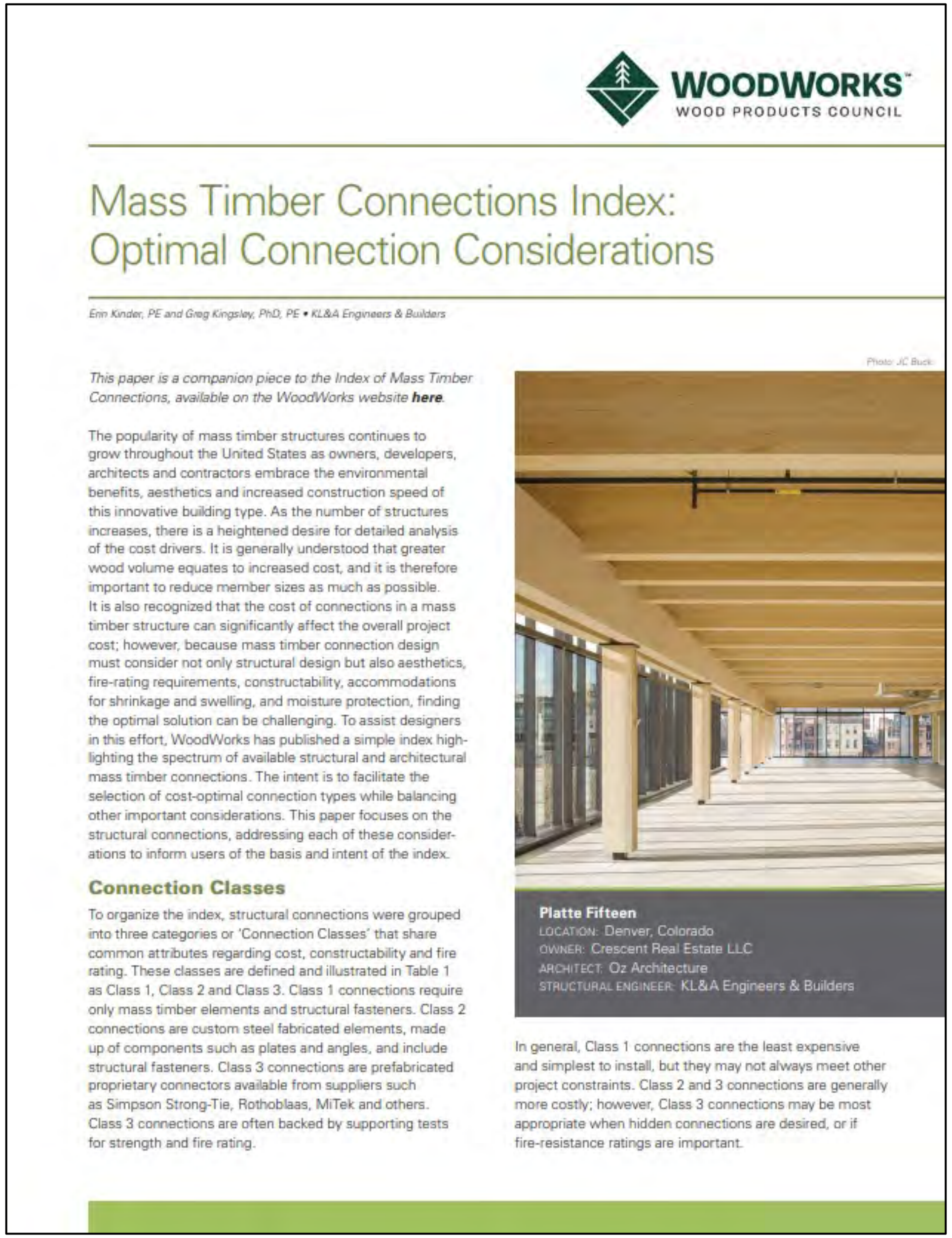
Companion paper to the Index of Mass Timber Connections; focuses on structural connections, addressing considerations such as aesthetics, fire-rating requirements, constructability and moisture protection

Concealed Spaces in Mass Timber and Heavy Timber Structures

Covers the choice of construction type and other implications for concealed spaces

Additional Resources

thinkwood.com



WOODWORKS
WOOD PRODUCTS COUNCIL

Mass Timber Connections Index: Optimal Connection Considerations

Erin Kinder, PE and Greg Kingsley, PhD, PE • KL&A Engineers & Builders

This paper is a companion piece to the Index of Mass Timber Connections, available on the WoodWorks website ***here****.*

The popularity of mass timber structures continues to grow throughout the United States as owners, developers, architects and contractors embrace the environmental benefits, aesthetics and increased construction speed of this innovative building type. As the number of structures increases, there is a heightened desire for detailed analysis of the cost drivers. It is generally understood that greater wood volume equates to increased cost, and it is therefore important to reduce member sizes as much as possible. It is also recognized that the cost of connections in a mass timber structure can significantly affect the overall project cost; however, because mass timber connection design must consider not only structural design but also aesthetics, fire-rating requirements, constructability, accommodations for shrinkage and swelling, and moisture protection, finding the optimal solution can be challenging. To assist designers in this effort, WoodWorks has published a simple index highlighting the spectrum of available structural and architectural mass timber connections. The intent is to facilitate the selection of cost-optimal connection types while balancing other important considerations. This paper focuses on the structural connections, addressing each of these considerations to inform users of the basis and intent of the index.

Connection Classes

To organize the index, structural connections were grouped into three categories or 'Connection Classes' that share common attributes regarding cost, constructability and fire rating. These classes are defined and illustrated in Table 1 as Class 1, Class 2 and Class 3. Class 1 connections require only mass timber elements and structural fasteners. Class 2 connections are custom steel fabricated elements, made up of components such as plates and angles, and include structural fasteners. Class 3 connections are prefabricated proprietary connectors available from suppliers such as Simpson Strong-Tie, Rothoblaas, MiTek and others. Class 3 connections are often backed by supporting tests for strength and fire rating.

Photo: JC Buck

Platte Fifteen
LOCATION: Denver, Colorado
OWNER: Crescent Real Estate LLC
ARCHITECT: Oz Architecture
STRUCTURAL ENGINEER: KL&A Engineers & Builders

In general, Class 1 connections are the least expensive and simplest to install, but they may not always meet other project constraints. Class 2 and 3 connections are generally more costly; however, Class 3 connections may be most appropriate when hidden connections are desired, or if fire-resistance ratings are important.

Additional Resources

WOODWORKS
WOOD PRODUCTS COUNCIL

Fire Design of Mass Timber Members

Code Applications, Construction Types and Fire Ratings

Richard McLain, PE, SE • Senior Technical Director • WoodWorks
Scott Breneman, PhD, PE, SE • Senior Technical Director • WoodWorks

For many years, exposed heavy timber framing elements

Inventory of Fire-Resistance Tested Mass Timber Assemblies

WOODWORKS
WOOD PRODUCTS COUNCIL

Resistance Tests of Mass Timber Floor / Roof Assemblies

CLT Grade or x Minor Grade	Ceiling Protection	Panel Connection	Floor Topping	Load Rating	Fire Resistance Achieved (Hours)	Source	Testing Lab
650 Fb 1.5E MSR x SPF #3	2 layers 1/2" Type X gypsum	Half-Lap	None	Reduced 36% Moment Capacity	1	1 (Test 1)	NRC Fire Laboratory
1/#2 x SPF #1/#2	1 layer 5/8" Type X gypsum	Half-Lap	None	Reduced 75% Moment Capacity	1	1 (Test 5)	NRC Fire Laboratory
E1	None	Topside Spline	2 staggered layers of 1/2" cement boards	Loaded, See Manufacturer	2	2	NRC Fire Laboratory March 2016
E1	1 layer of 5/8" Type X gypsum under Z-channels and furring strips with 3 5/8" fiberglass batts	Topside Spline	2 staggered layers of 1/2" cement boards	Loaded, See Manufacturer	2	5	NRC Fire Laboratory Nov 2014
E1	None	Topside Spline	3/4 in. proprietary gypcrete over Maxxon acoustical mat	Reduced 50% Moment Capactiy	1.5	3	UL
E1	1 layer 5/8" normal gypsum	Topside Spline	3/4 in. proprietary gypcrete over Maxxon acoustical mat or proprietary sound board	Reduced 50% Moment Capactiy	2	4	UL
E1	1 layer 5/8" Type X gyp under Resilient Channel under 7 7/8" I-Joists with 3 1/2" Mineral Wool beween Joists	Half-Lap	None	Loaded, See Manufacturer	2	21	Intertek 8/24/2012
E1M5 2100 x SPF #2	None	Topside Spline	1-1/2" Maxxon Cyp-Grete 2000 over Maxxon Reinforcing Mesh	Loaded, See Manufacturer	2.5	6	Intertek, 2/22/2016
V1	None	Half-Lap & Topside Spline	2" gypsum topping	Loaded, See Manufacturer	2	7	SwRI (May 2016)
1950 Fb MSR x SPF #3	None	Half-Lap	None	Reduced 59% Moment Capacity	1.5	1 (Test 3)	NRC Fire Laboratory
1/#2 x SPF #1/#2	1 layer 5/8" Type X gypsum	Half-Lap	None	Unreduced 101% Moment Capacity	2	1 (Test 6)	NRC Fire Laboratory
1/#2 x SPF #1/#2	None	Half-Lap	None	Unreduced 101% Moment Capacity	2.5	1 (Test 7)	NRC Fire Laboratory

WOODWORKS
WOOD PRODUCTS COUNCIL

Mass Timber Cost and Design Optimization Checklists

WoodWorks has developed the following checklists to assist in the design and cost optimization of mass timber projects. The *design optimization* checklists are intended for building designers (architects and engineers), but many of the topics should also be discussed with the fabricators and builders. The

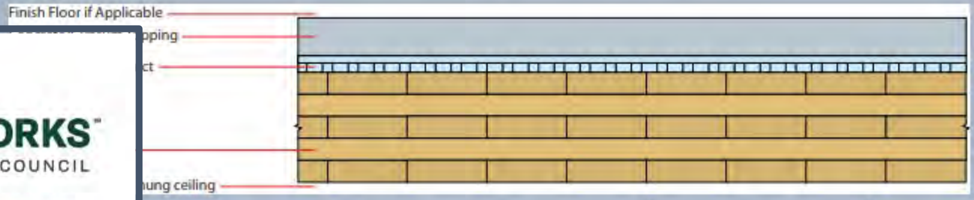
First Tech Federal

Additional Resources

Inventory of Mass Timber Acoustic Assemblies

WOODWORKS
WOOD PRODUCTS COUNCIL

Table 1: CLT Floor Assemblies with Concrete/Gypsum Topping, Ceiling Side Exposed



Acoustical Mat Product Between CLT and Topping	Finish Floor	STC[1]	IIC[1]	Source

WOODWORKS
WOOD PRODUCTS COUNCIL

Acoustics and Mass Timber: Room-to-Room Noise Control

Richard McLain, PE, SE • Senior Technical Director • WoodWorks

WOODWORKS
WOOD PRODUCTS COUNCIL

Tall Wood Buildings in the 2021 IBC *Up to 18 Stories of Mass Timber*

Scott Breneman, PhD, SE, WoodWorks – Wood Products Council • Matt Timmers, SE, John A. Martin & Associates • Dennis Richardson, PE, CBO, CASp, American Wood Council

In January 2019, the International Code Council (ICC) approved a set of proposals to allow tall wood buildings as part of the 2021 International Building Code (IBC). Based on these proposals, the 2021 IBC will include three new construction types—Type IV-A, IV-B and IV-C—allowing the use of mass timber or noncombustible materials. These new types are

Questions?

This concludes The American Institute of Architects Continuing Education Systems Course

Mark Bartlett, PE

Regional Director | TX

WoodWorks – The Wood Products Council

mark.bartlett@woodworks.org

C:214-679-1874

Thank You


UW MercerCourt, credit WG Clark Construction and Ankrom Moisan Architects


credit www.naturallywood.com


Cathedral of Christ the Light
Skidmore, Owings & Merrill LLP
Cesar Rubio Photography

Copyright Materials

This presentation is protected by US and International Copyright laws. Reproduction, distribution, display and use of the presentation without written permission of the speaker is prohibited.

© The Wood Products Council 2021

Disclaimer: The information in this presentation, including, without limitation, references to information contained in other publications or made available by other sources (collectively "information") should not be used or relied upon for any application without competent professional examination and verification of its accuracy, suitability, code compliance and applicability by a licensed engineer, architect or other professional. Neither the Wood Products Council nor its employees, consultants, nor any other individuals or entities who contributed to the information make any warranty, representative or guarantee, expressed or implied, that the information is suitable for any general or particular use, that it is compliant with applicable law, codes or ordinances, or that it is free from infringement of any patent(s), nor do they assume any legal liability or responsibility for the use, application of and/or reference to the information. Anyone making use of the information in any manner assumes all liability arising from such use.