MASS TIMBER+ SM

OFFSITE CONSTRUCTION CONFERENCE

PRODUCED BY WOODWORKS FEA Forest Economic Advisors

Rethinking Industrial Design: Wood's Expanding Role in Warehouses

Credits: 1.0 AIA/CES HSW LUs, 1.0 PHD credit, 0.10 ICC credit

Forrest Etter
Prologis

Amie Sullivan
KPFF Inc.

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AIA Approved Continuing Education

Course Description

As industrial owners and developers pursue more environmentally conscious building strategies, new hybrid approaches incorporating wood are gaining traction, while traditional panelized wood and steel roof systems are expanding beyond their West Coast roots. This session will explore the emerging use of mass timber elements in warehouse structures, as well as the benefits and challenges of adapting long-established hybrid panelized roof systems for broader U.S. markets. A leading industrial developer and expert structural engineer will share practical insights on the growing use of wood in industrial buildings, covering market trends, structural design, constructability, code compliance, and material availability.

Learning Objectives

1. Identify potential applications for mass timber elements within industrial warehouse structures and understand their potential for reducing environmental impact.
2. Evaluate design, engineering, and constructability considerations when integrating wood-based systems into industrial warehouse projects.
3. Understand how code compliance, regional material availability, and developer priorities influence the selection of hybrid structural systems in industrial development.
4. Review the impact an exposed wood structure has on the occupants compared to traditional structures through the principles of biophilic design.

Prologis
Ahead of What's Next

Forrest Etter
Director, Design & Construction Innovation

October 2025

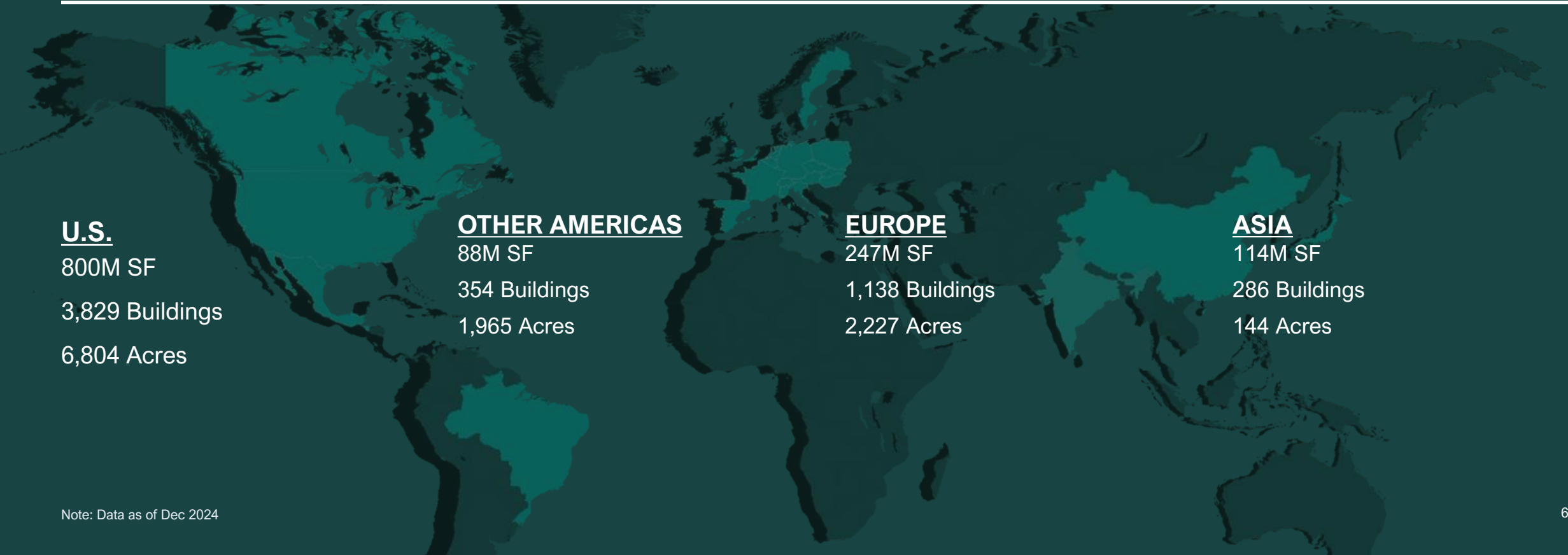
Global Scale. Local Presence.

$218B
Assets under management

1.3B
Square feet on four continents

20
Countries

2.8%
Global GDP flows through our distribution centers



U.S.
800M SF
3,829 Buildings
6,804 Acres

OTHER AMERICAS
88M SF
354 Buildings
1,965 Acres

EUROPE
247M SF
1,138 Buildings
2,227 Acres

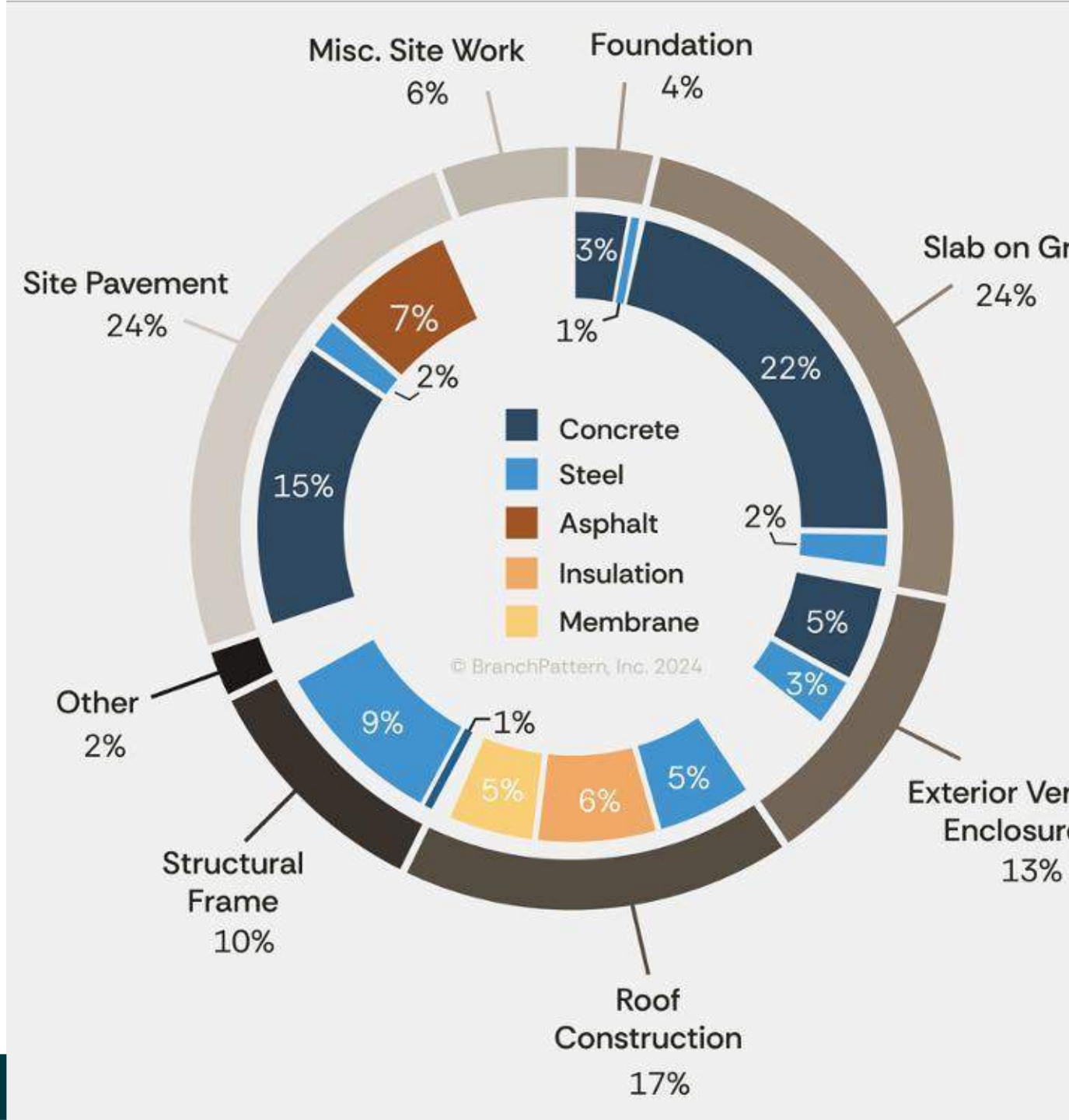
ASIA
114M SF
286 Buildings
144 Acres

Note: Data as of Dec 2024

Why Mass Timber for a Warehouse?

Lifecycle Assessment (LCA) Insights: Concrete and steel contribute significantly to embodied carbon.

- Concrete – **46%**
- Steel – **22%**



Our History With Mass Timber

Le Havre DC7
Le Havre, France

Moissy II DC1-4
Paris, France

2016

Bologna Interporto DC 14
Bologna, Italy

Marly DC1
Paris, France

2018

Vemars DC7
Paris, France

Cologne Niehl DC2
Netherlands

Douvrin DC1-4
Lille, France

2019

NW Logistics
Portland, Oregon
1st CLT Mezz. in Americas

IPC 13
San Leandro, California
(conceptual)

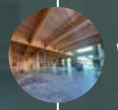
2022

Nexus
San Leandro, California

San Leandro 38
San Leandro, California

2024

Prologis Evergreen
Ontario, Canada



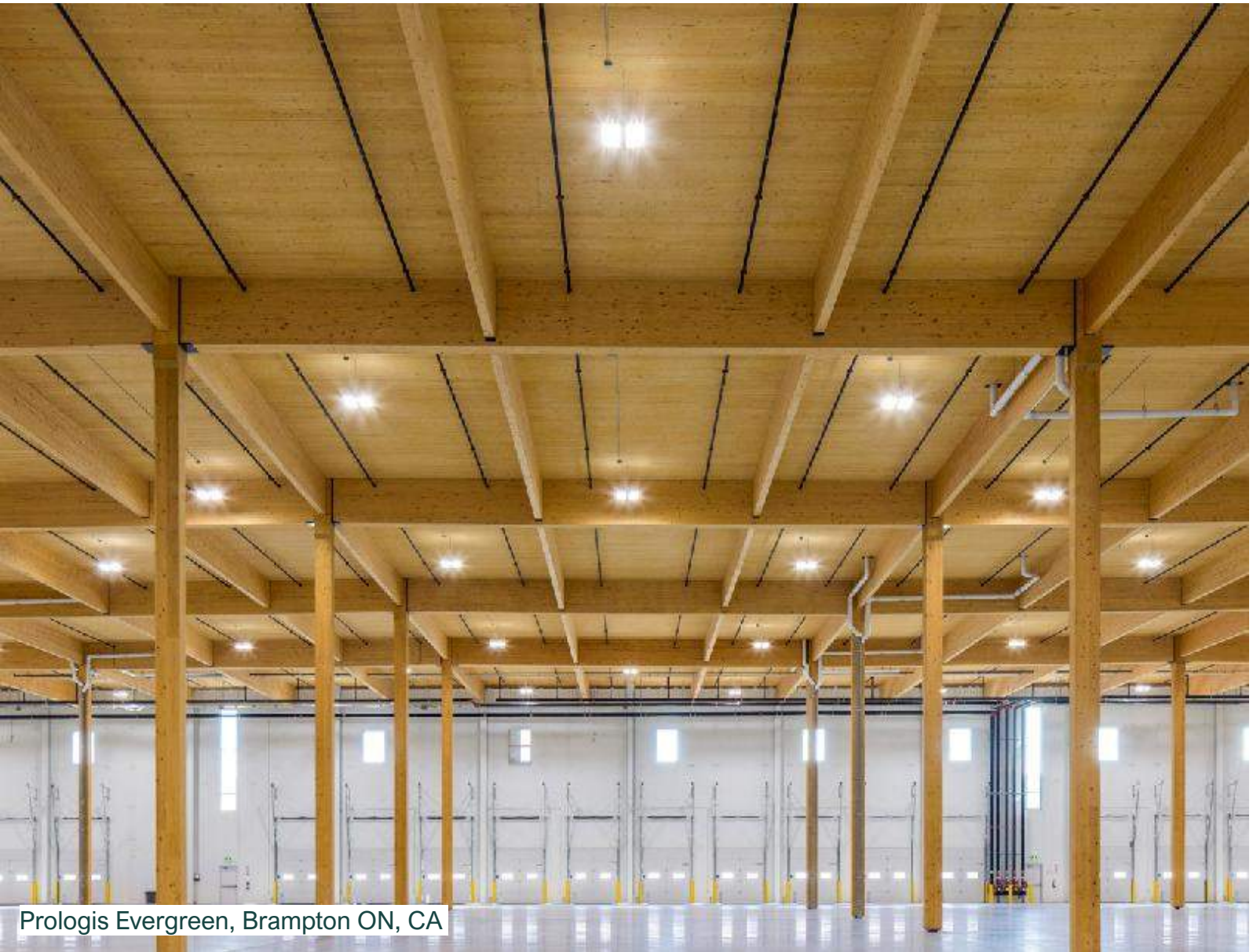
1919 Williams
San Leandro, California

Dutra II
Rio de Janeiro, Brazil

2025

SP 26
São Paulo, Brazil

2027



Prologis Evergreen, Brampton ON, CA

Warehouse Building Elements for Consideration

- Structural Frame
- Exterior Walls/Skin
- Roof Decking
- Mezzanine

Prologis Nexus

San Leandro, California

Project Overview:

Spec office

Size: *4,902 ft² mezzanine*

Grid spacing: *24’ x 30’*

Structure:

- Mass Timber **columns, beams, & deck**
- Tilt-up concrete exterior walls

Prologis Evergreen

Brampton, Ontario, Canada

Project Overview:

Size: *246,007 ft^2 | 36’ clear height*

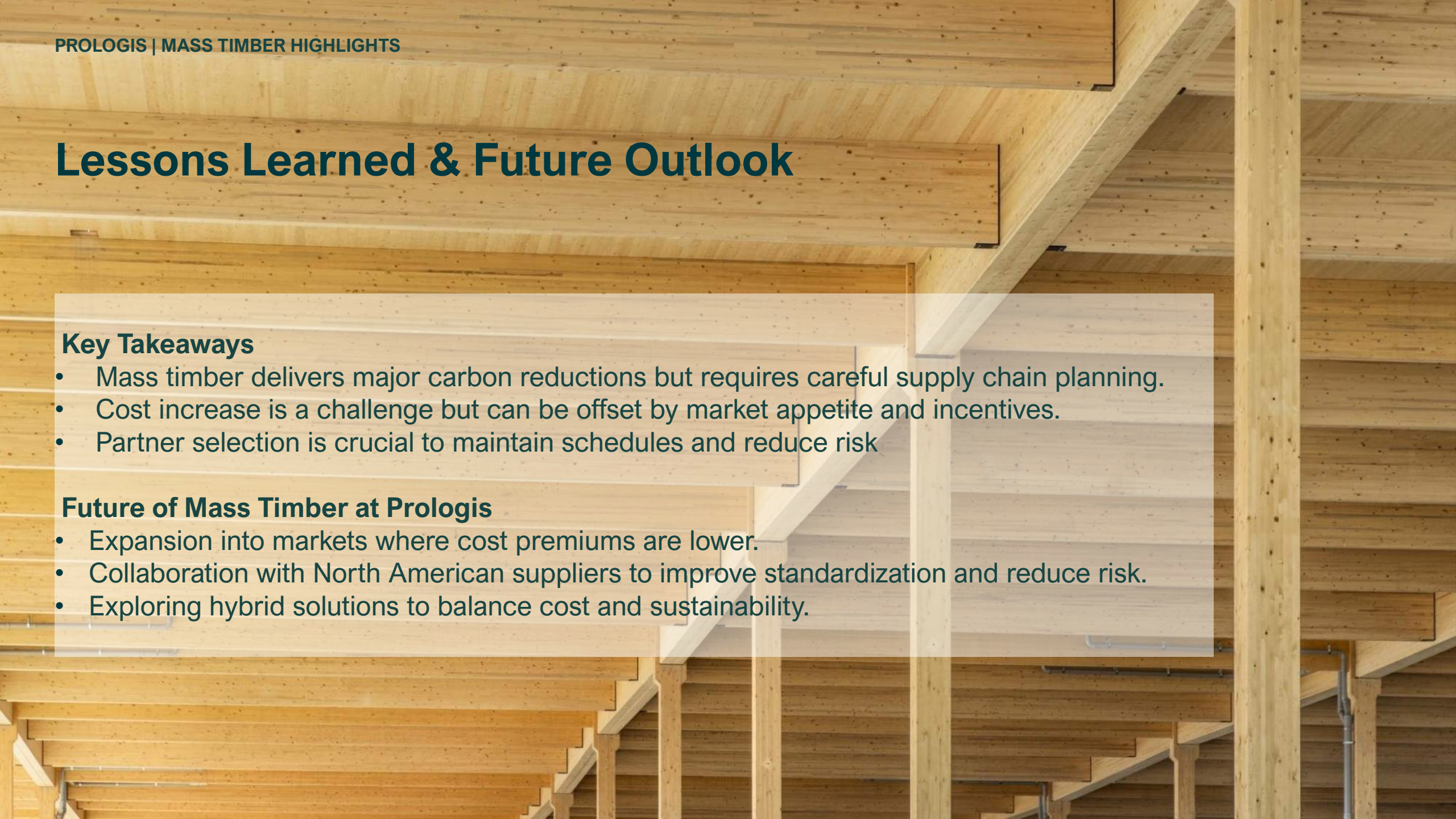
Grid spacing: *54’ x 50’*

Structure:

- Mass Timber **columns, beams, & roof deck**
- SIN-Beam steel perimeter framing
- Precast concrete walls
- **2,400 m^3 of CLT**

1,034,000 kg/m^3 CO2 carbon reduction impact

Lessons Learned & Future Outlook



Key Takeaways

- Mass timber delivers major carbon reductions but requires careful supply chain planning.
- Cost increase is a challenge but can be offset by market appetite and incentives.
- Partner selection is crucial to maintain schedules and reduce risk

Future of Mass Timber at Prologis

- Expansion into markets where cost premiums are lower.
- Collaboration with North American suppliers to improve standardization and reduce risk.
- Exploring hybrid solutions to balance cost and sustainability.


PROLOGIS®

Rethinking Industrial Design

kpff

Amie Sullivan, PE SE

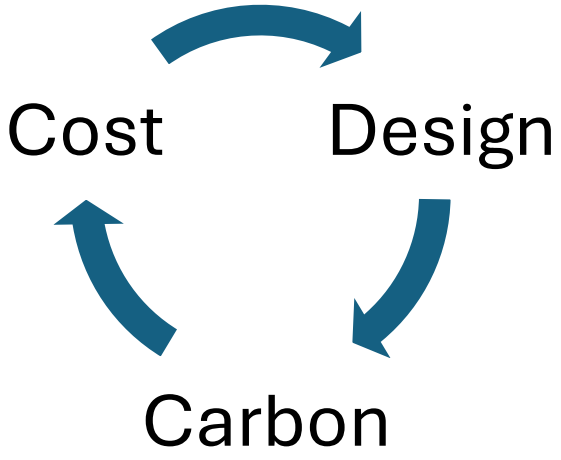
Opportunity

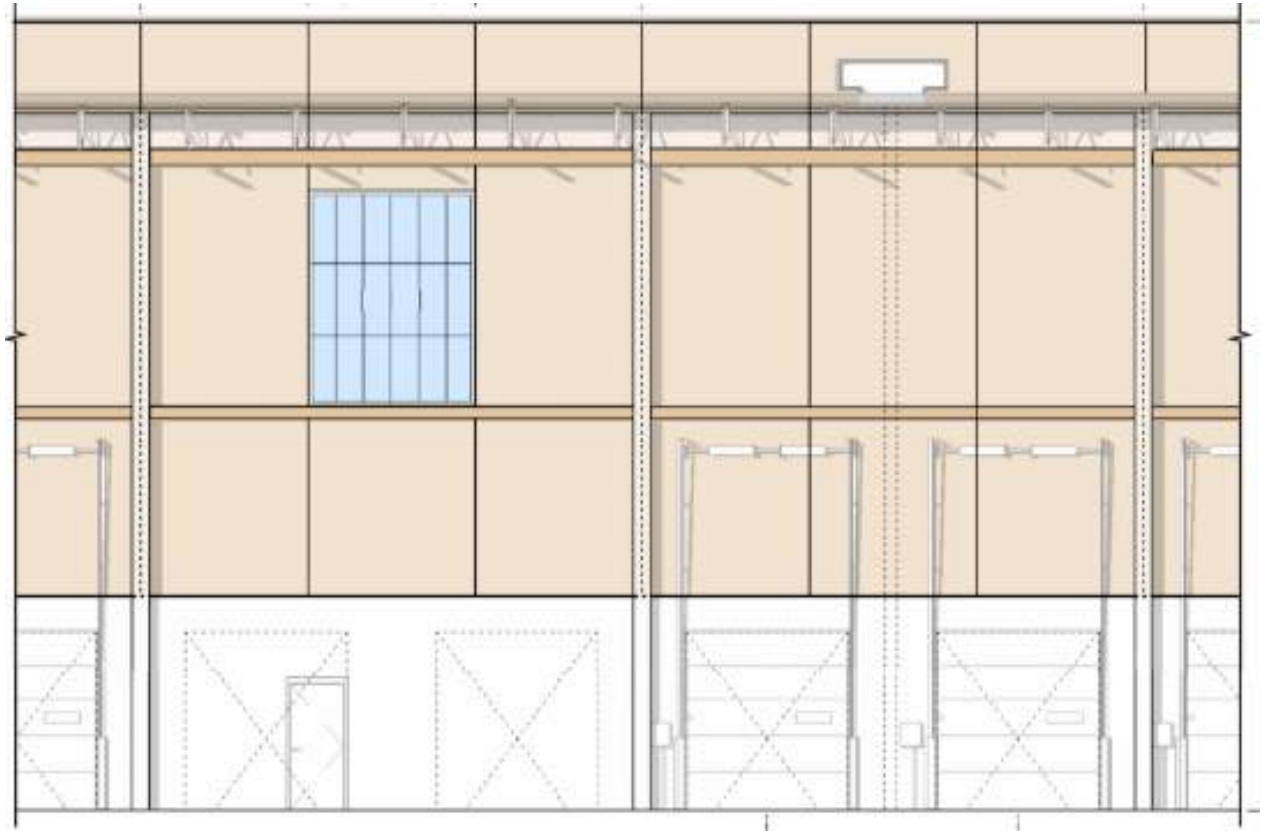
- **Cost Competitive Solutions** Compared to Baseline
- Significant **Reduction in Embodied Carbon**
- Improve **Quality of Space** for End Users

Photo Credit: Kendall McCaughtery

Opportunity

- Highly Repetitive
  → Kit of Parts





Hybrid Solutions

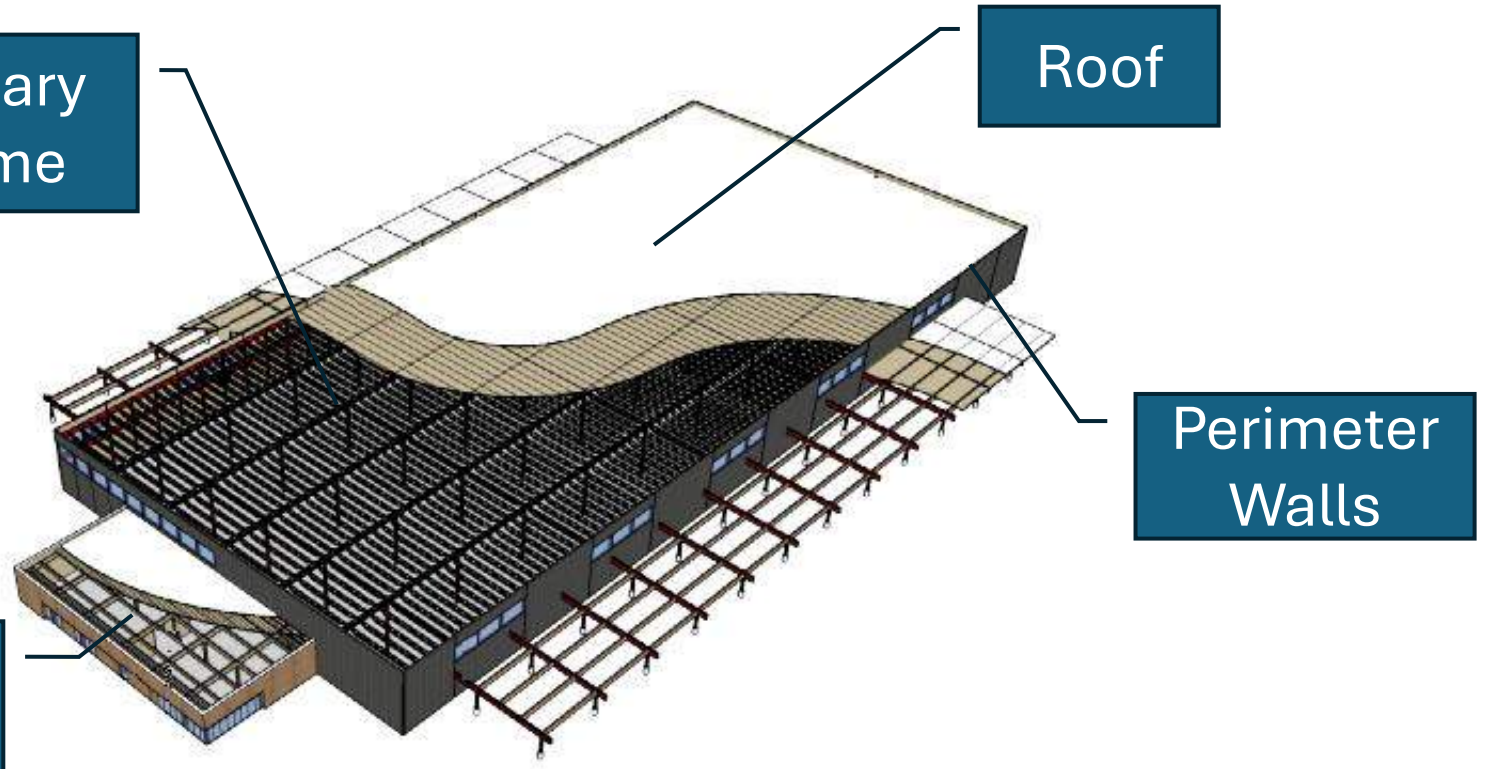
Kit of Parts Approach

Hybrid Solutions

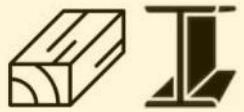
Cost Design

0

Carbon

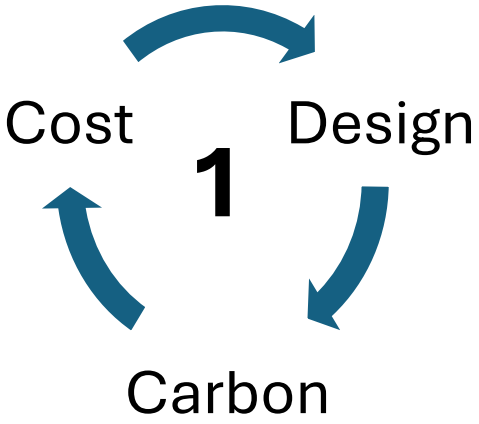


Hybrid Solutions



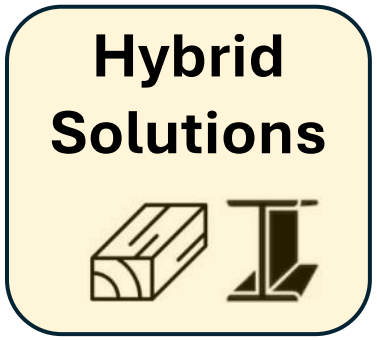
Kit of Parts Approach

Hybrid Solutions



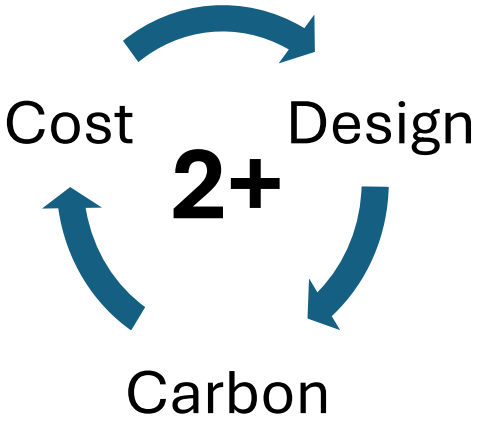
Full Mass Timber Solution

- ✓ Lower Carbon
- X Higher Cost
- X Deep GL Beams (impacts to clear height or building height)
- X More Fiber Than Needed



Kit of Parts Approach

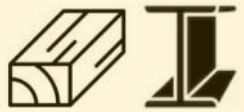
Hybrid Solutions



Hybrid Solution

- Element by Element
  - Primary Frame
  - Roof Decking
  - Perimeter Walls
  - Foundations & Slab-on-Grade

Hybrid Solutions

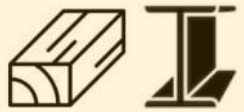


Kit of Parts Approach

Hybrid Solutions

- Primary Frame
  - OWSJ & Girders w/ Steel Columns
- Roof Decking
  - Swap Metal Deck for Panelized Wood Roof

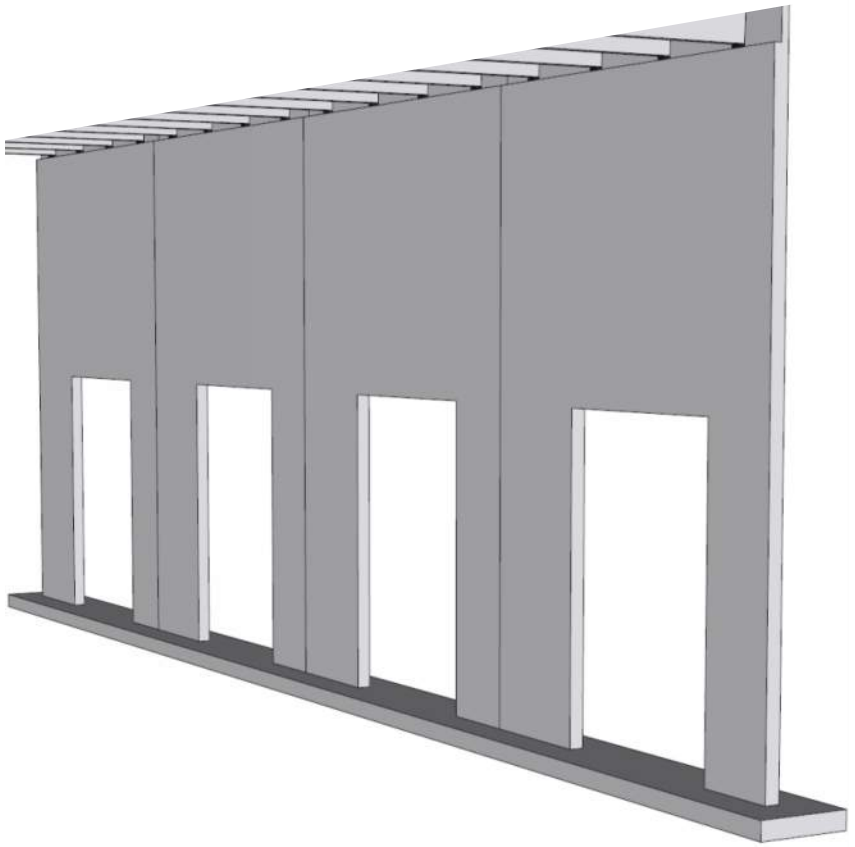
Hybrid Solutions



Kit of Parts Approach

Hybrid Solutions

- Exterior Walls
  - Swap Concrete Tilt for CLT
- Foundations
  - Low Carbon Concrete



Material Efficiency

Kit of Parts Approach

Hybrid Solutions

Roof Construction – What's Efficient?

- OWSJ for long spans
- Panelized wood for shorter spans
- Material where material is needed

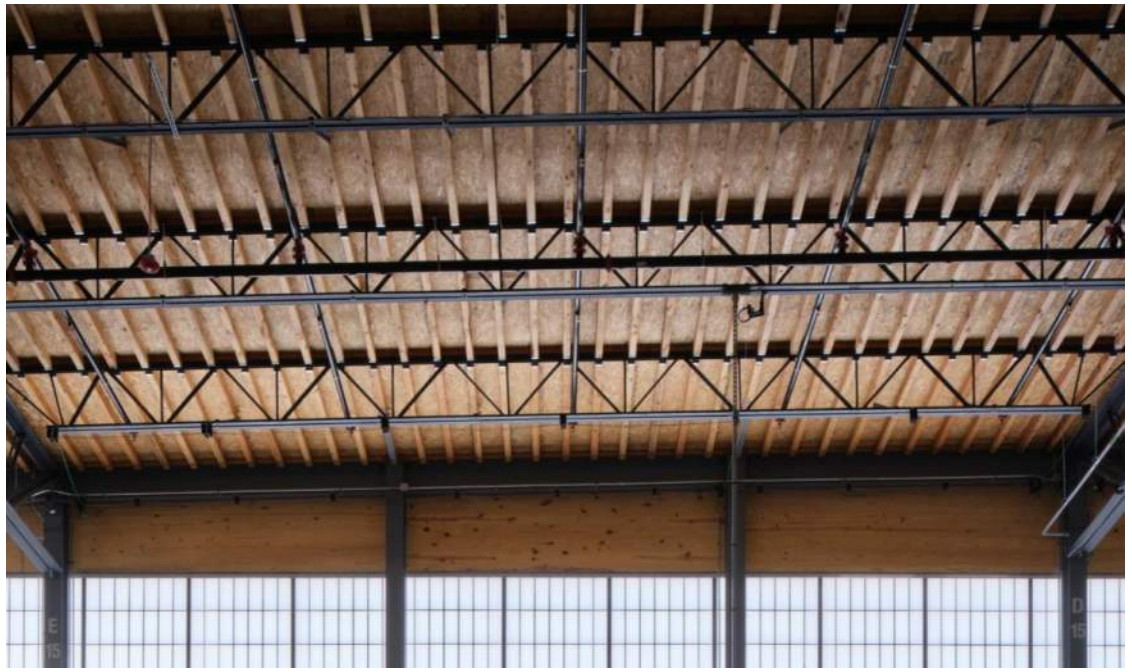


Photo Credit: Kendall McCaughtery

Material Efficiency

Kit of Parts Approach

Hybrid Solutions

Wall Construction – What's Efficient?

- CLT wall panels for out of plane loads
- CLT wall panels for in place shear loads
- Columns for gravity loads

Photo Credit: Kendall McCaughtery

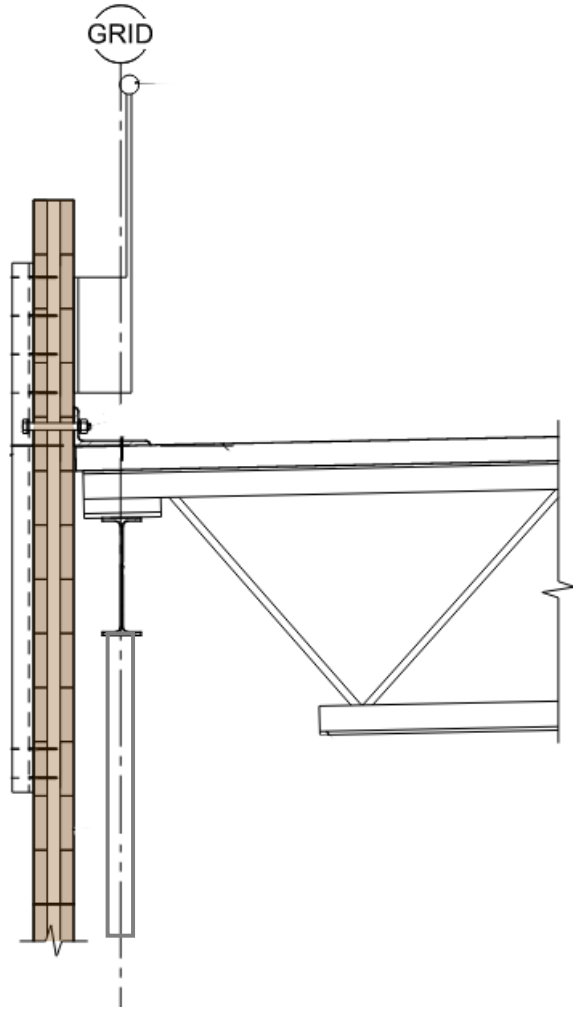
Material Efficiency

Kit of Parts Approach

Hybrid Solutions

Wall Construction

- Columns for gravity loads



Material Efficiency

Kit of Parts Approach

Hybrid Solutions

Wall Construction

Code Path: *Shear Walls*

- AMMR → IBC 2024
- SDPWS 2021
  - Section 4.63
  - Exception for SDC A, B
- R = 1.5
- Ω = 2.5
- Cd = 1.5

WoodWorks' Expert Tip: CLT Shear Wall Options in the U.S.

Kit of Parts Approach

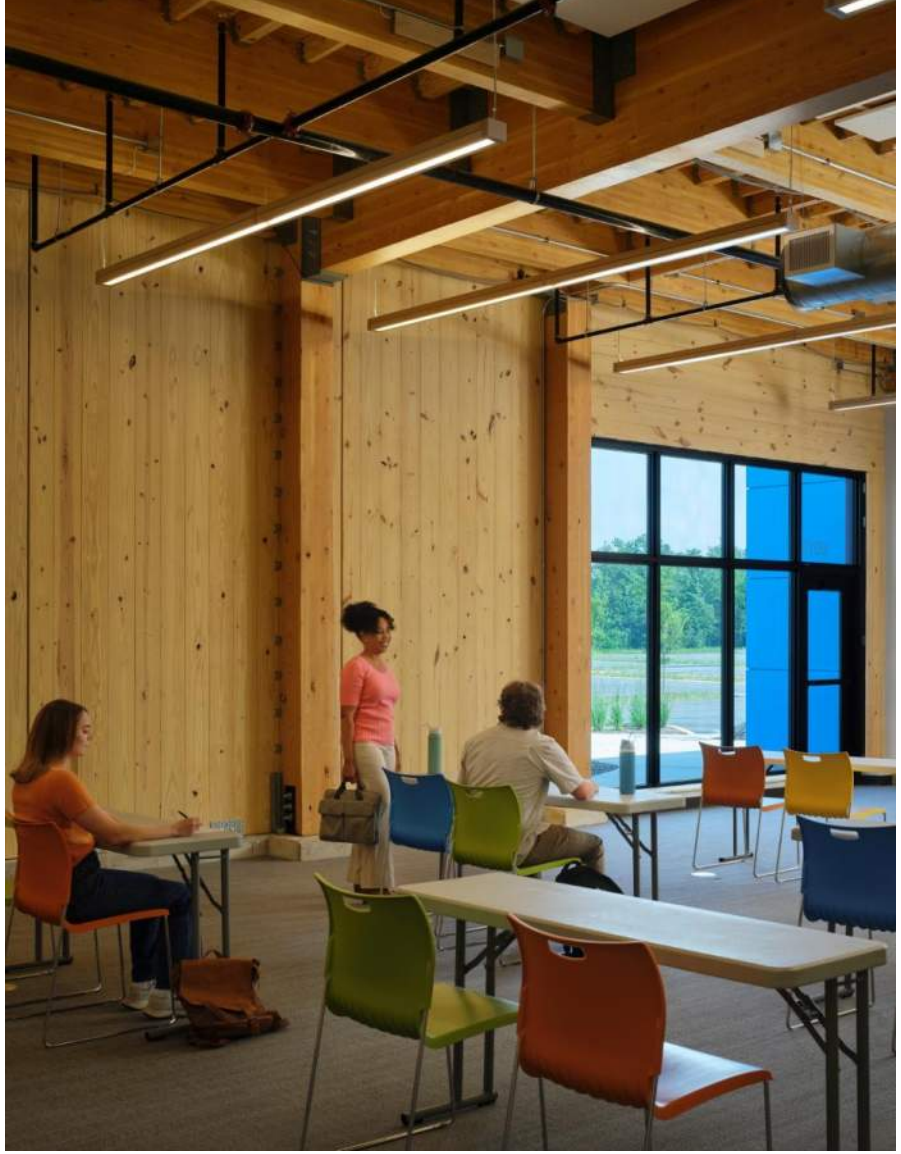
Other Considerations and Resources Available

- **Fabrication Efficiency:** *Connections for GLs and Panels*
  - Mass Timber Connections Index: Optimal Connection Considerations
  - WoodWorks Index of Mass Timber Connections

- **Competitive Bids From Suppliers:** *Press and Panel Sizes*

- **Transportation Limits:** *Shipping Limits and Premiums*

- **Erection Efficiency:** *Construction Considerations*



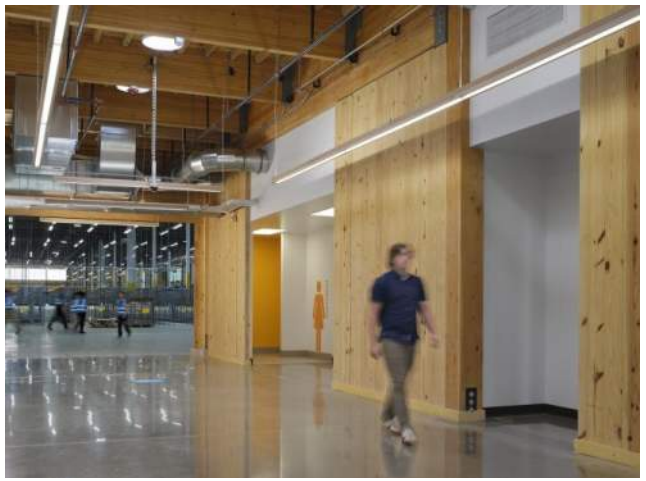


Photo Credit: Kendall McCaughtery