



Mass Timber Expanding to the Industrial Sector

Melissa Kroskey, AIA, SE

Panelized Wood Roofs

Resources available at WoodWorks.org

[www.woodworks.org/search/
?query=panelized](http://www.woodworks.org/search/?query=panelized)

- Panelized Case Study
- Seismic Design Example
- Wind Design Example



Panelized Structures

Another Free WoodWorks Webinar on Wood Warehouses Available from The Wood Institute

Wood Construction Applications in Industrial and Warehouse Facilities

Credit: 2.5 AIA LU/HSW, 0.25 ICC CEU, 2.5 PDH

[www.woodinstitute.org/course/
view.php?id=132](http://www.woodinstitute.org/course/view.php?id=132)

- Panelized Roofs
- Engineering Tilt-Up Walls
- Diaphragm Detailing
- Cost Comparisons



180k SF Glulam Post + Beam, Completed 2007

Barrette Structural Manufacturing Plant



Cost & Design Optimization Checklists

How much does it cost?

- Requires holistic approach
- Cannot simply compare structural system cost
- Lightweight structure, savings?
- Beyond cost, value in return on investment?

www.woodworks.org/resources/mass-timber-cost-and-design-optimization-checklists/



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 *cost optimization* checklists will help guide coordination between designers and builders (general contractors, construction managers, estimators, fabricators, installers, etc.) as they are estimating and making cost-related decisions on a mass timber project. The *pre-design* checklist should be reviewed by the developer/owner, designers and builders.

WoodWorks offers a wide range of resources at woodworks.org, many of which are referenced in this document. We also recommend that designers and builders download the following:

Mass Timber Design Manual¹ – Includes technical papers, continuing education articles, expert Q&As and more, and is updated regularly. Published in partnership with Think Wood.

U.S. Mass Timber Construction Manual² – Provides a framework for the planning, procurement and management of mass timber projects.

1 De Haro
San Francisco, CA
ARCHITECT:
Perkins+Will
ENGINEERS:
DCI Engineers
CONTRACTOR:
Hathaway Dinwiddie

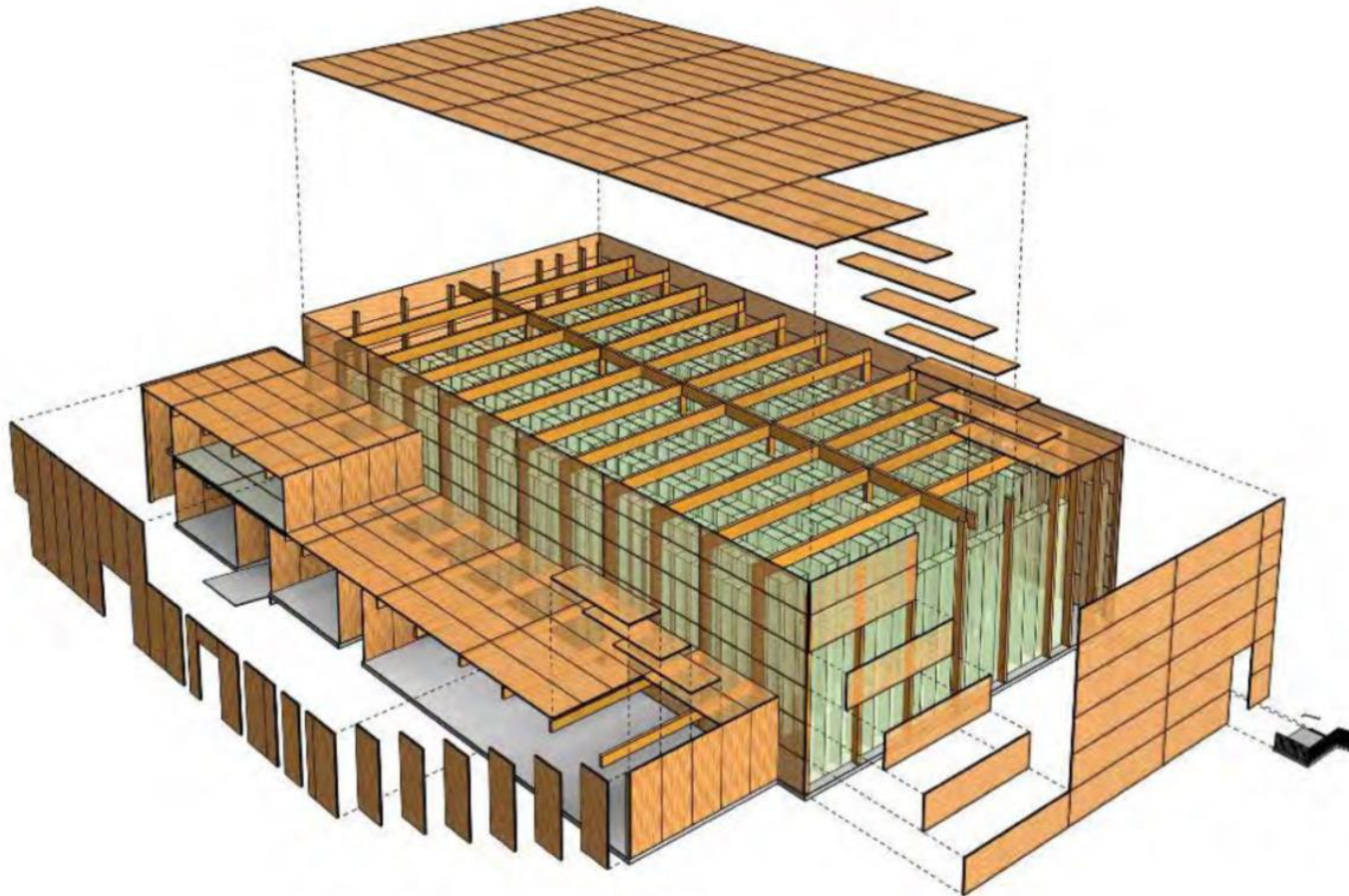


Photo: David Wakely

Potential Benefits	Project Goal ✓	Value Add ✓
Fast construction		
Aesthetic Value (Leasing velocity/ premiums) Healthy Building / Biophilia		
Lightweight structure; strength & performance objectives		
Labor shortage solution <ul style="list-style-type: none">• small crews• entry level workers		
Just-in-time delivery (ideal for dense urban sites)		
Environmentally friendly (low carbon footprint)		
Healthy forests/ wildfire resiliency & support rural economies		

Proof of Concept: Industrial Flex/ Manufacturing/ Warehouse

University of Arkansas Library Storage Facility



Miller Boskus Lack Architects



Chuck Choi

Cheaper, Potentially Faster, Just as Strong and Beautiful University of Arkansas Library Storage Facility

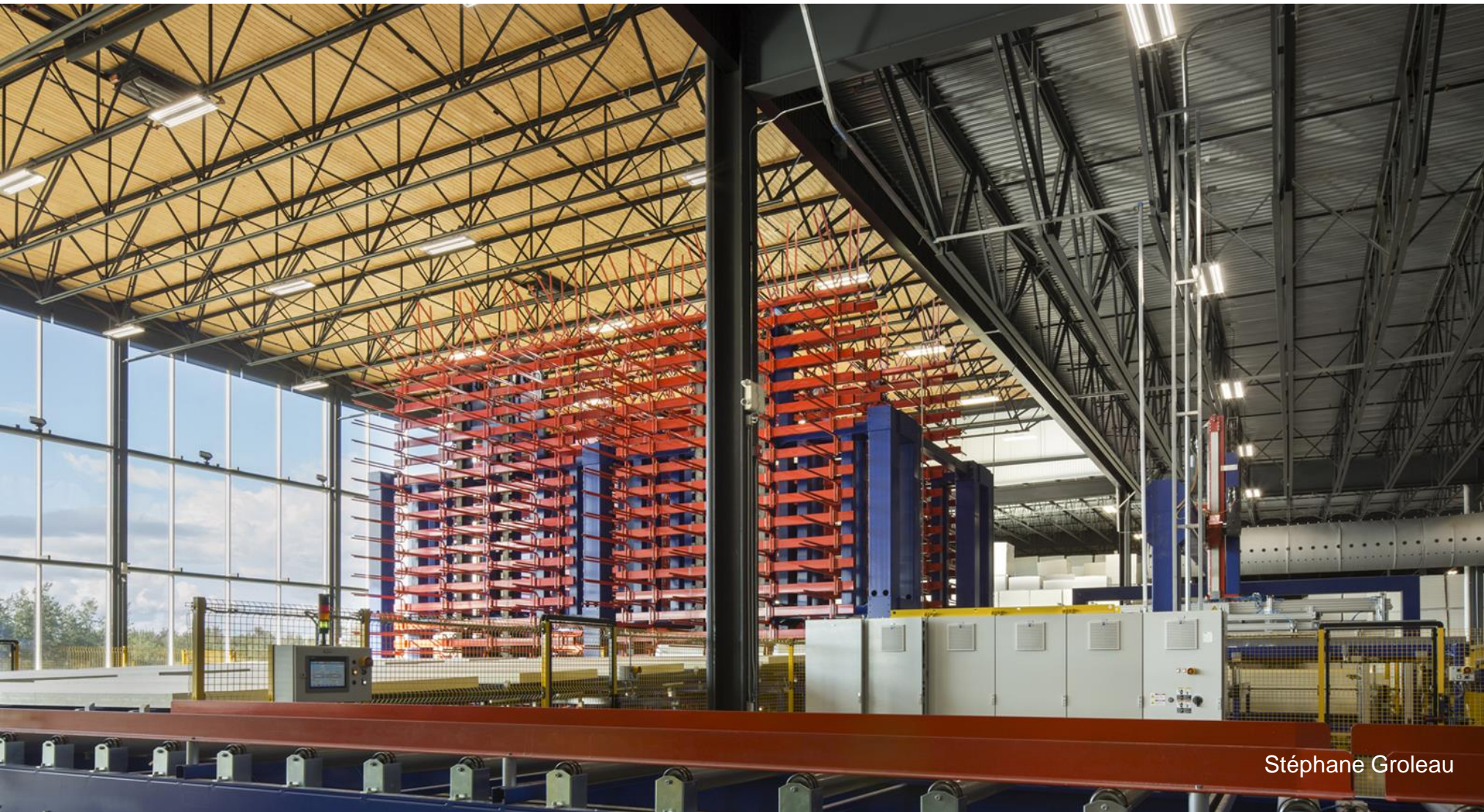


Chuck Choi



CLT Ceiling: Warmth of Natural Wood Material

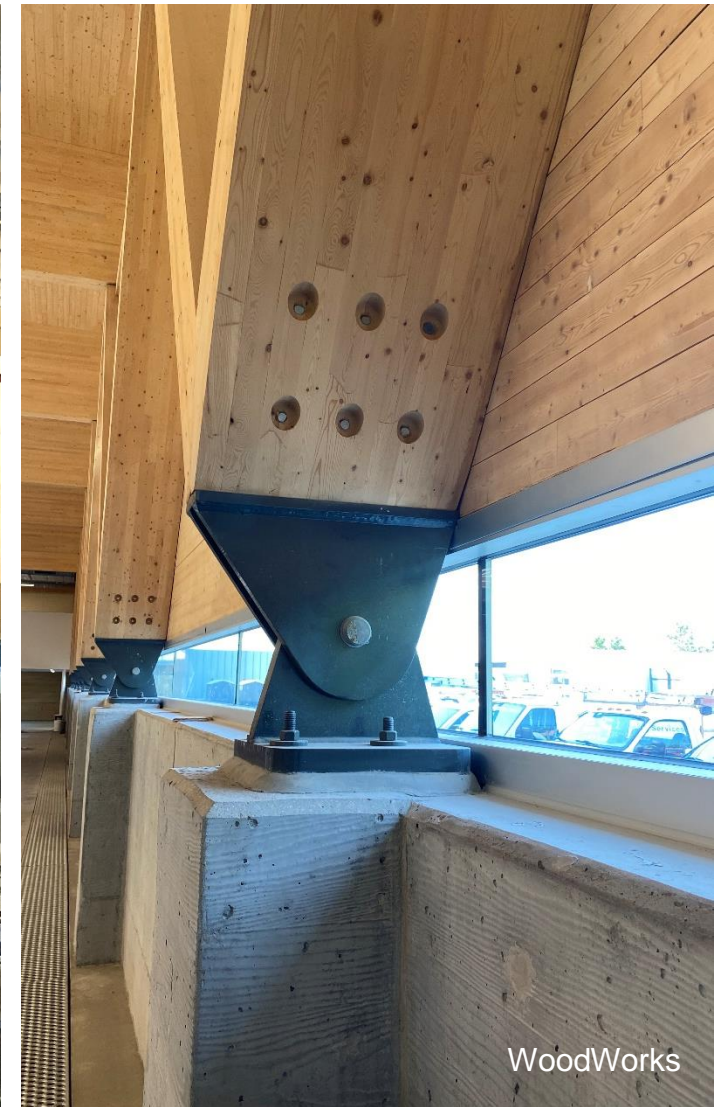
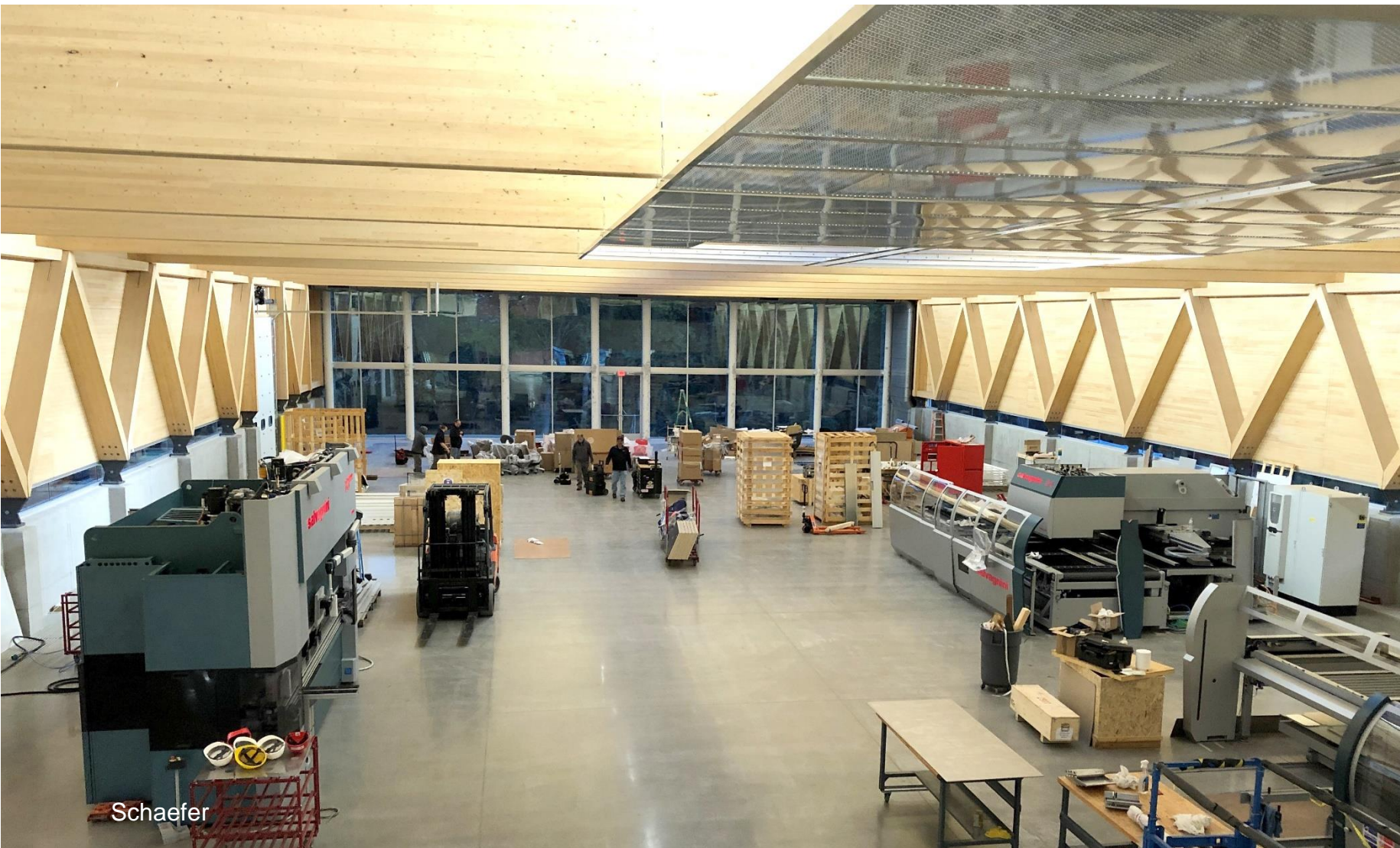
Soprema Factory



Stéphane Groleau

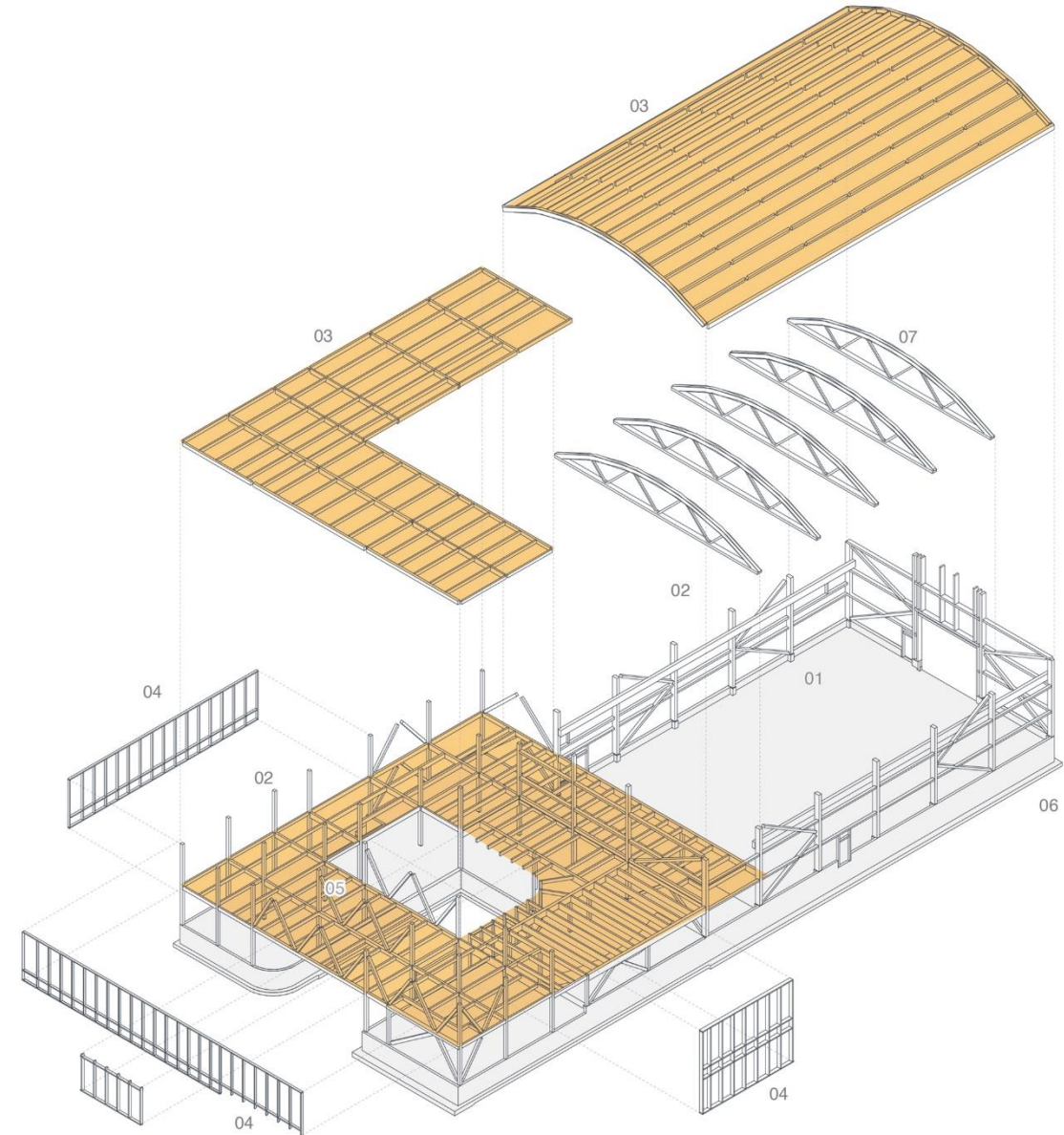
Reinforcing Brand & Creating a Warm Atmosphere for Sales

Salvagnini Industrial Showroom Expansion



Innovation: Improving & Optimizing Production Facilities

SmartMill Head Office



Environmental

Social

Governance



Climate change



Greenhouse gas (GHG) emissions



Resource depletion



Waste & pollution



Working conditions



Impact on local communities



Health & safety



Employee relations & diversity



Executive pay



Bribery & corruption



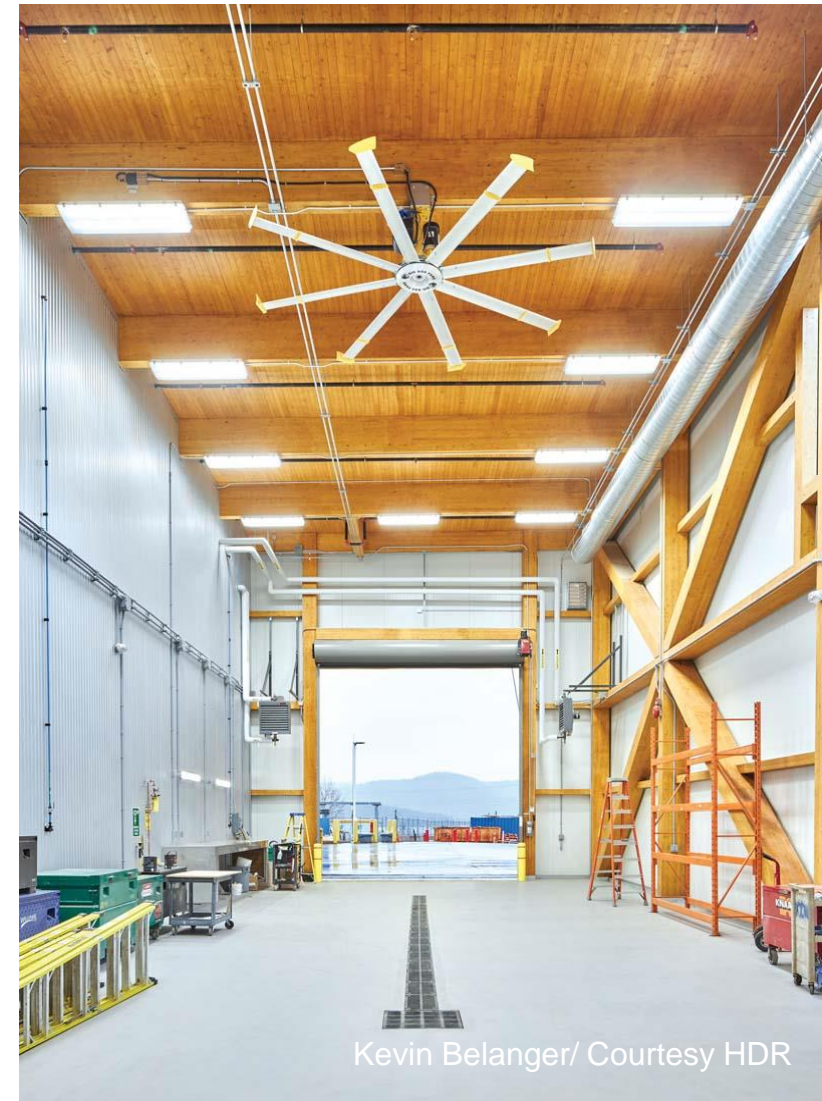
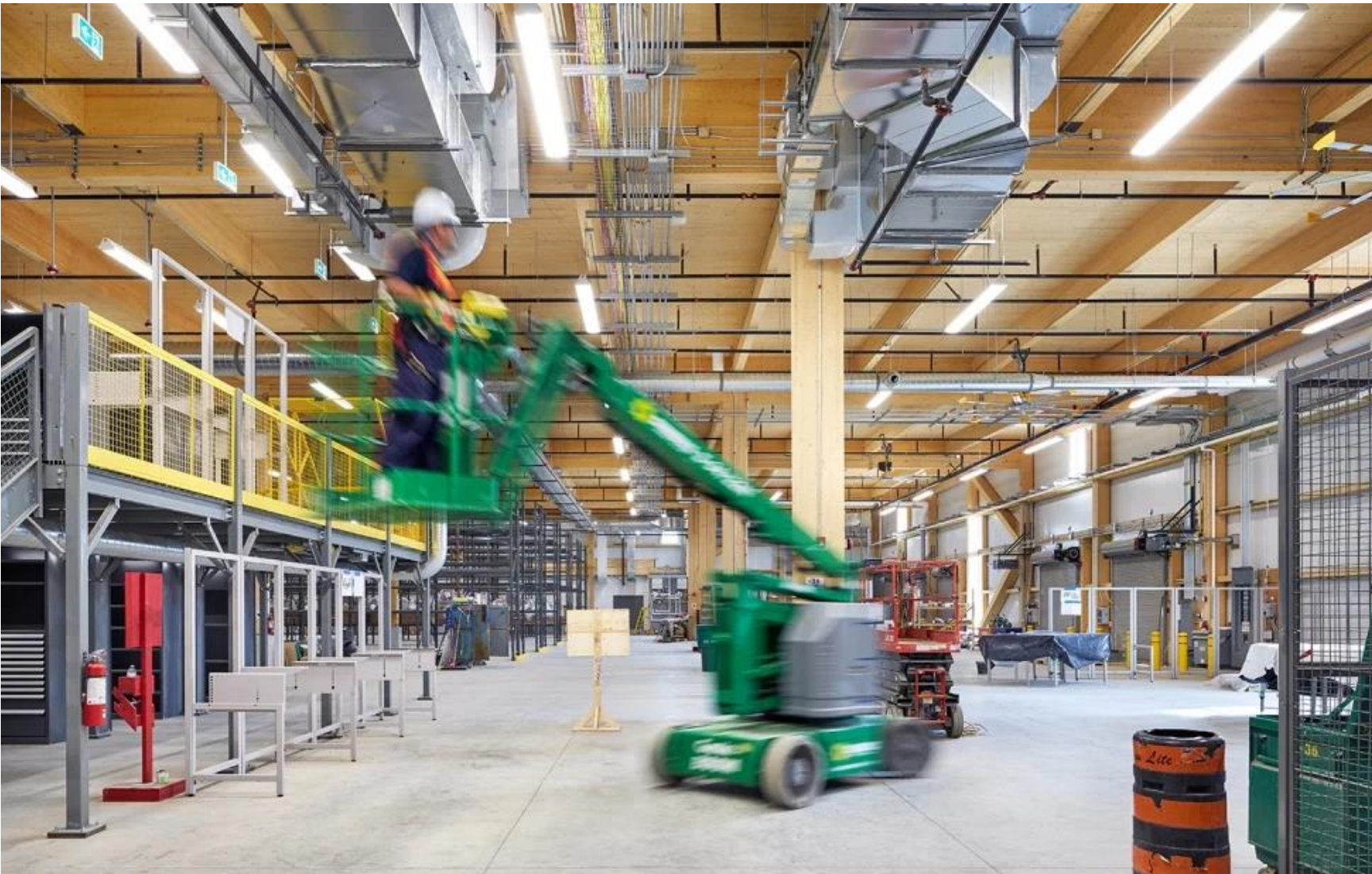
Political lobbying & donations



Board diversity & structure

Transitioning to a More Resilient and Carbon-Literate Campus

Canadian Nuclear Logistics (CNL) Chalk River Laboratories



Kevin Belanger/ Courtesy HDR

Long Lead Times for Steel Framing? Consider Wood!

Janicki Industries: B10 Manufacturing Facility



Mass Timber Business Case Studies: Value Creation Analysis

Development Overview

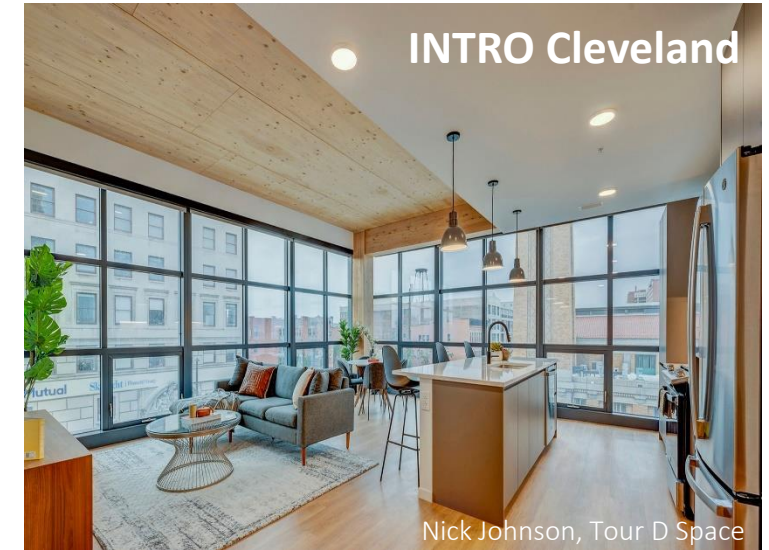
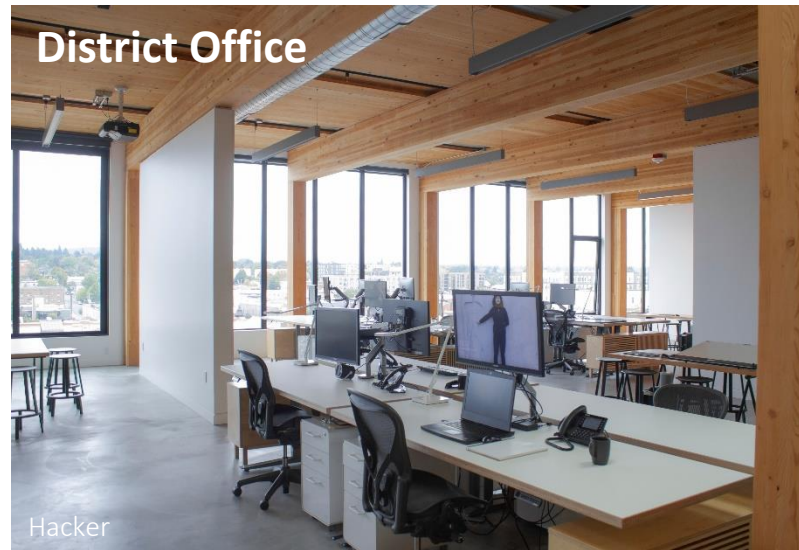
- Property Information
- Product Strategy
- Investment Highlights

Qualitative Discussion

- Challenges
- Lessons Learned
- Successes

Quantitative Overview

- Development Timeline
- Costs
- Rents
- Lease up



Comparative Return Analysis

	Market	Pro Forma	Realized
Yield on cost	6.25%	7.00%	7.35%
Cap rate	4.75%	4.50%	TBD
Value/rentable SF	\$550/ RSF	\$717/ RSF	TBD (\$800+/ RSF)
Leverage	65%	65%	N/A



Multifamily | Office | Industrial | Student Housing



Clay Creative
Image: Christian Columbres



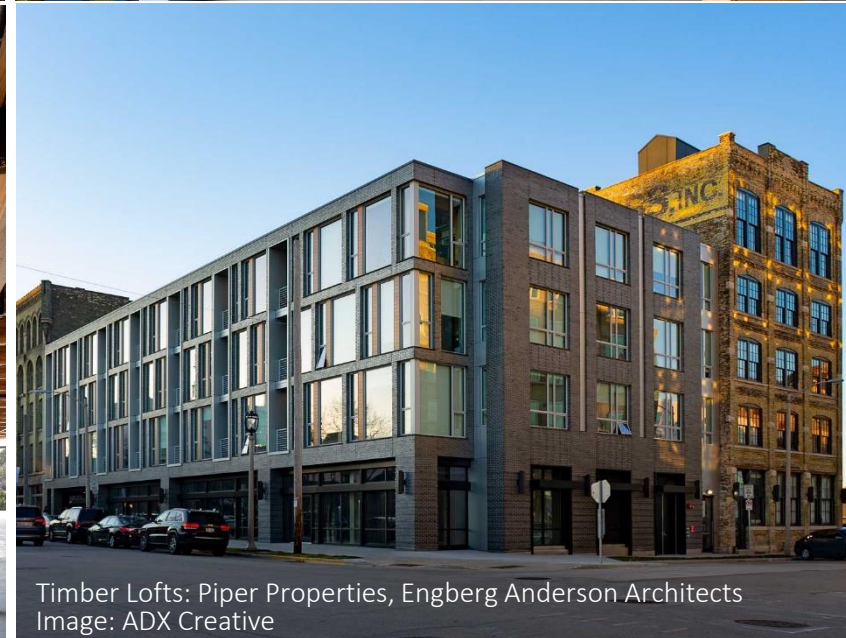
1 De Haro: SKS Partners, Perkins & Will
Image: David Wakely



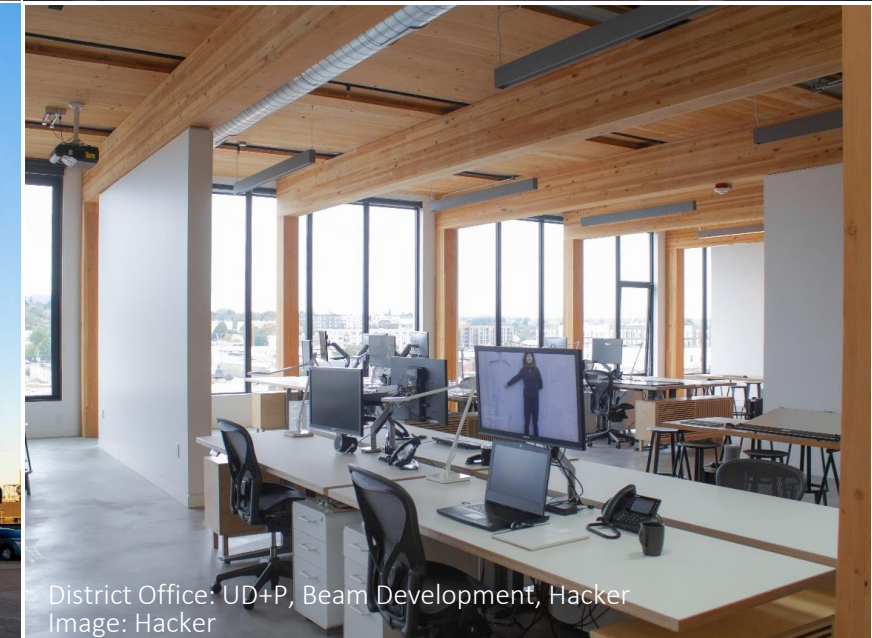
Platte Fifteen: Crescent Real Estate, Oz Architecture
Image: Arch Angle Media



ICE Blocks: Heller Pacific, RMW Architecture & Interiors
Image: Bernard André Photography



Timber Lofts: Piper Properties, Engberg Anderson Architects
Image: ADX Creative



District Office: UD+P, Beam Development, Hacker
Image: Hacker

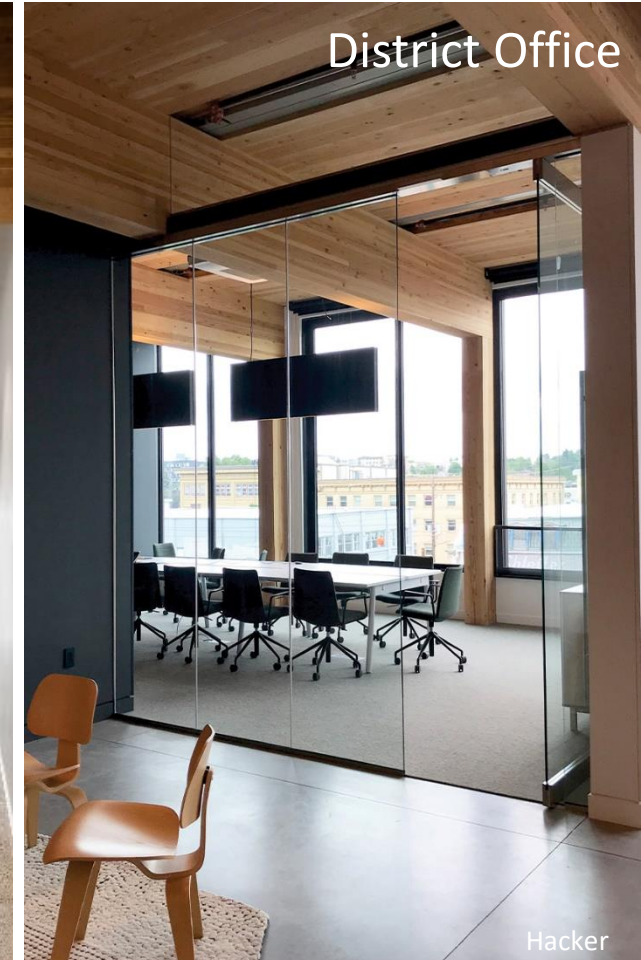


Mass Timber Business Case Studies
December 2022

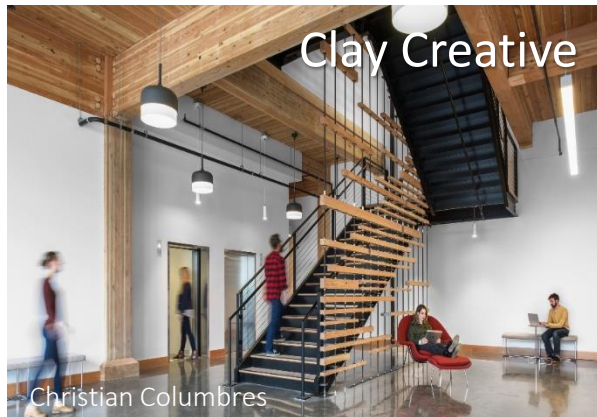
Initial Findings: Office

Firms Attracted for Myriad Reasons

- Most tenants are "creditworthy"
- Desire intangible stakeholder benefits
 - Workforce Desires
 - Regulatory Perceptions
 - Brand Position
- Tend to see impressive pre-leasing
 - Enables better construction debt
 - Sets perceptions of desirable development
- Seeing sustained occupancy via subleasing
 - Tested by COVID disruptions



Mass Timber Business Case Studies: Value Creation Analysis



Scan to download



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WOOD PRODUCTS COUNCIL

CONRAD
INVESTMENT MANAGEMENT

Timber Offices: Attract Talent & Align with Company Values

QScale Data Centre



R&D Specialty Warehouses

Sweden Investing in Data Center R&D

- EcoData Center in Falun
- Boden Type Facility

www.datacenterdynamics.com/en/analysis/plant-based-buildings/

DCD

> Channels

> Media Center

> Live Events

> Academy

SUMITOMO ELECTRIC LIGHTWAVE

Next Generation Data Center Thinking

SEL@OFC

BOOTH 5801

HOME > FEATURES > EUROPE

Plant-based data centers

Concrete creates huge carbon emissions. Why can't data center builders turn that around, and use biological material that stores carbon instead?

March 17, 2022 By: Peter Judge Be the first to comment

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EcoDataCenter

Questions?

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This concludes The American
Institute of Architects Continuing
Education Systems Course



Erika Brown Edwards/ courtesy TimberLab

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