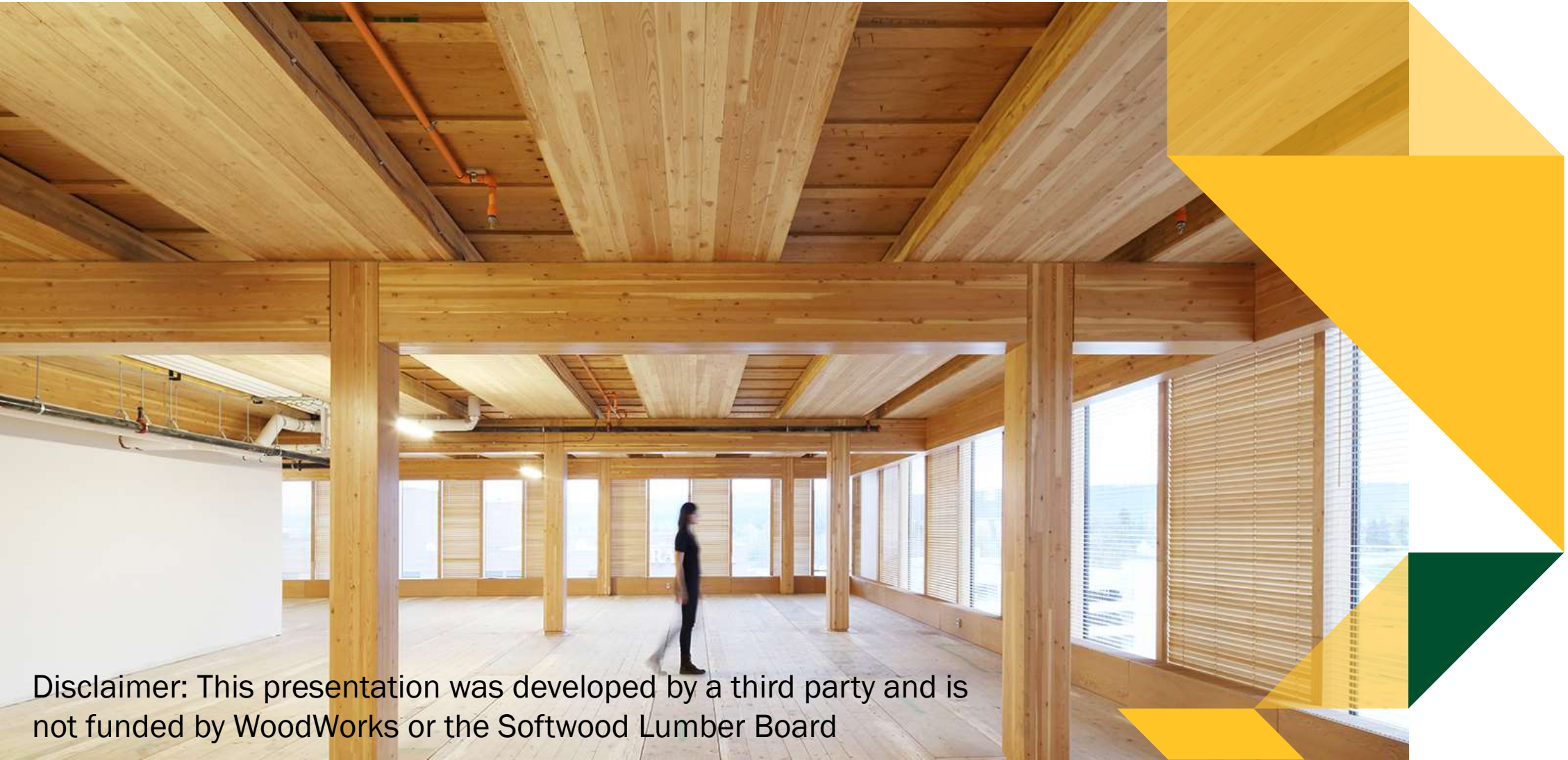
MASS TIMBER CONSTRUCTION MANAGEMENT

DESIGN ENGAGEMENT & SITE PLANNING



Disclaimer: This presentation was developed by a third party and is not funded by WoodWorks or the Softwood Lumber Board

Building the Team

Considerations:

- ❑ Procurement method
- ❑ Design phase
- ❑ Team experience with mass timber
- ❑ Understanding of current code
- ❑ Has a decision on the use of mass timber been made?

Design-Assist Subcontractors:

- ❑ Mass timber supplier
- ❑ Mass timber erector
- ❑ MEP subcontractors

Structure Comparison

Concept Pricing Considerations:

- ❑ Construction type
- ❑ Fire resistance rating
- ❑ Floor-to-floor height
- ❑ Structural grid & column spacing
- ❑ Transfer slab/beams (i.e. U/G parking)
- ❑ Lateral resistance frame & shear walls
- ❑ Foundation sizing & type
- ❑ Interior finishes
- ❑ Core & shell vs. fully built-out
- ❑ LEED/sustainability requirements
- ❑ Construction duration

Impact of Construction Type

Location of Event Space	Rooftop	1st Floor
Construction Type	III-A	III-B
Assembly Group	A-3	A-3
Fire Resistive Rating	1-Hr	Not required
Connections	Concealed	Exposed
CLT Panel Thickness	5-Ply	3-Ply
Superstructure Cost/SF	**$65/SF**	**$53/SF**

Impact of Construction Type

	Office & Residential	Office Only
Floors	9-stories	8-stories
Building Height	92’-6”	80’-6”
Construction Type	IV-B	IV-C
Occupancy	B & R-2	B
Fire Resistive Rating	2-Hr	2-Hr
Exposed Ceilings	30%	100%
Connections	Concealed	Concealed
CLT Panel Thickness	5-Ply	3-Ply
Superstructure Cost/SF	**$77/SF**	**$62/SF**

Manufacturer Selection

- ❑ Domestic vs. International Sourcing
- ❑ Varying Panel Fabrication Size Limits
- ❑ Engineering Support
- ❑ Panel Width Shipping Constraints – Land vs. Sea
- ❑ Proximity to Jobsite / Shipping Costs
- ❑ Supplier Only vs. Turn-Key
- ❑ Sustainability – FSC vs. SFI Certification
- ❑ Aesthetic Considerations
- ❑ Wood Species & Stains

STRUCTURLAM MASS TIMBER CORPORATION
Intelligence In Wood

NORDIC STRUCTURES

binderholz

KLH

Freres LUMBER CO., INC.

KALESNIKOFF

KATERRA

DR JOHNSON WOOD INNOVATIONS

VAAGEN TIMBERS

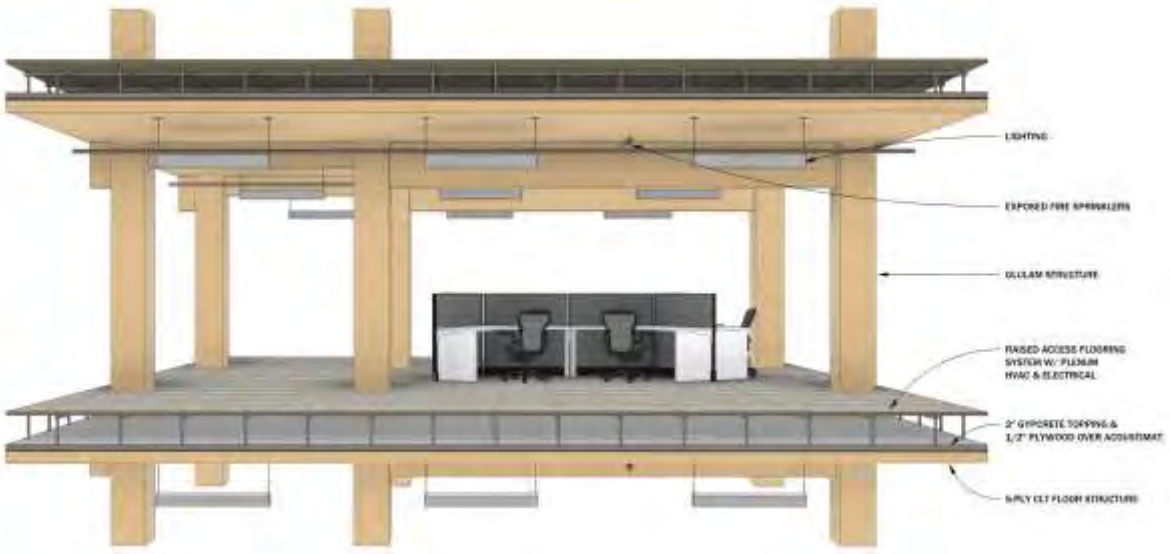
SMARTLAM

ELEMENTS

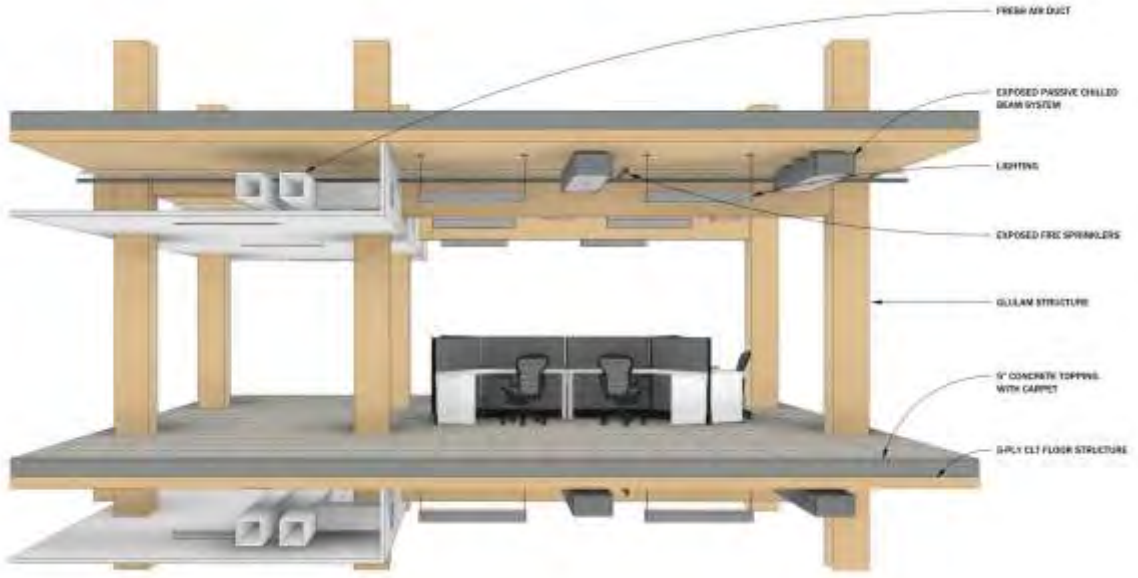
Procurement Best Practices

- ❑ Early Go/No-Go Decision on Mass Timber
- ❑ Design-assist involvement
- ❑ Early supplier selection vs. competitive bid
- ❑ Optimize structural grid with supplier input
- ❑ Maximize time for design coordination
  - ❑ Shop drawing release
  - ❑ MEP coordination
  - ❑ Fabrication lead time
  - ❑ Constructability reviews
- ❑ Transfer of Revit model to contractor

MEP Coordination

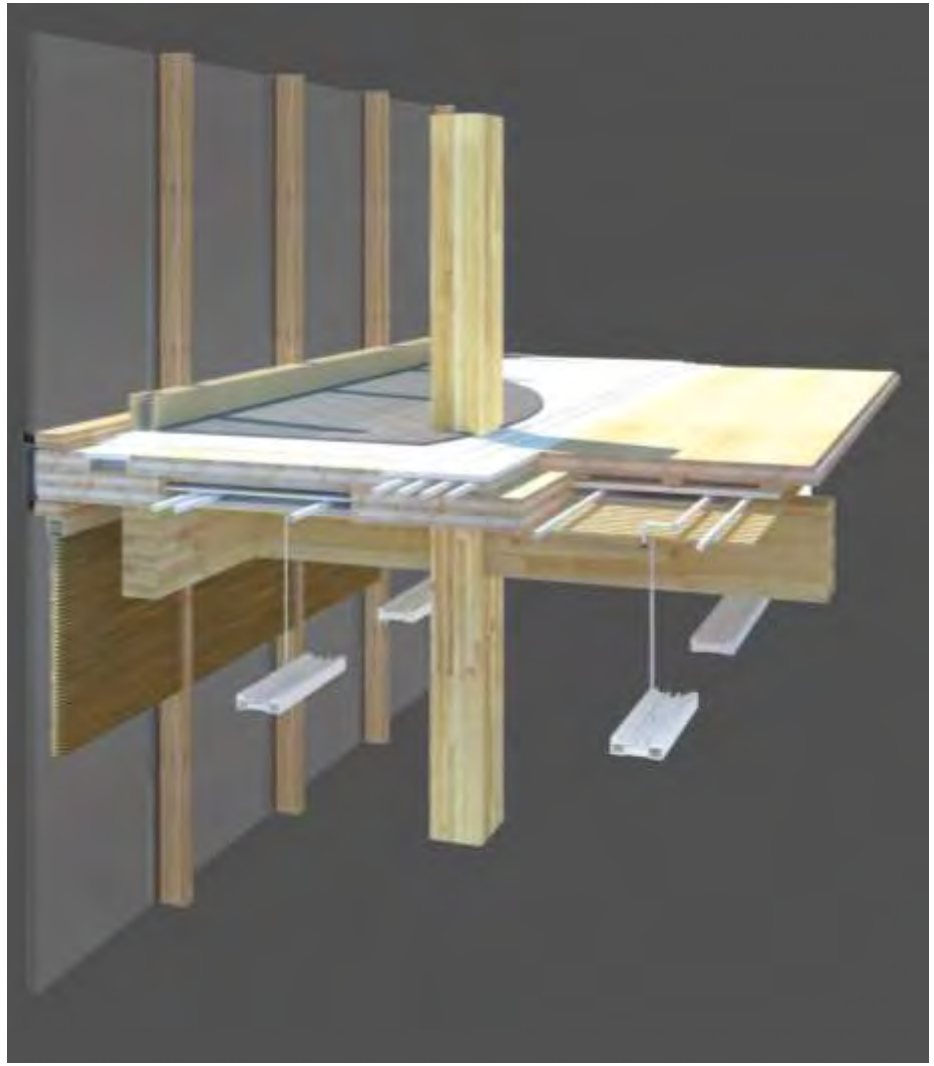


Raised Access Flooring



Overhead Routing w/ Soffits

Case Study: Wood Innovation & Design Center

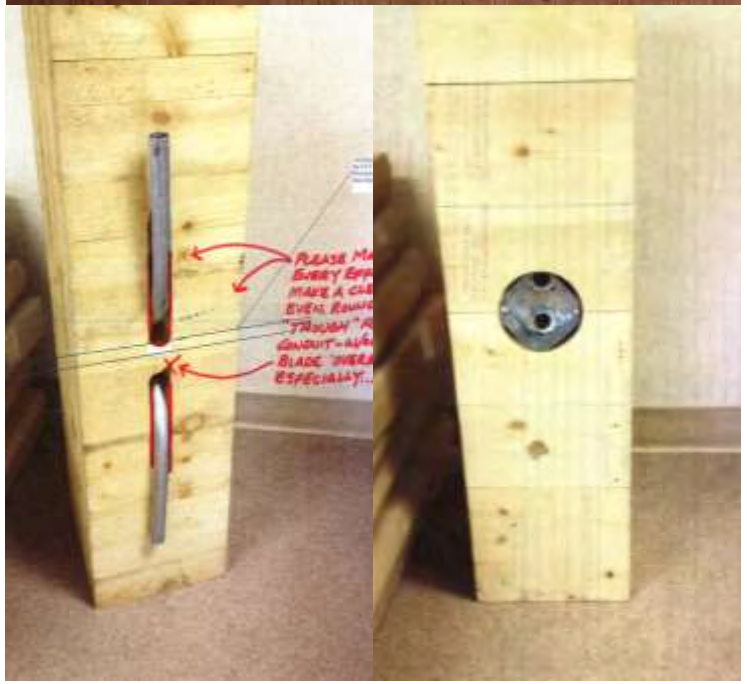


Case Study: CSU Pavilion at Laurel Village

1st CLT project in Colorado (2014)

LEED Platinum certification

- ❑No topping slabs at floor assembly
- ❑Rigid insulation at roof assembly
- ❑Long span, exposed ceilings
- ❑Extensive use of mockups



Case Study: DU Burwell Center

Challenge: No exposed conduit!

- ❑ Well defined space programming
- ❑ Originally explored access flooring
- ❑ 3” topping slabs at floor & roof assembly
- ❑ 3D model ALL conduit
- ❑ Penetration overlay with CLT shop drawings
- ❑ Strategic placement of soffits & ceilings
- ❑ Topping slab reinforcing

MEP Coordination: Best Practices

- ❑ Identify aesthetic MEP routing goals early
- ❑ Determine extent of flexibility required
- ❑ Early transfer of REVIT model
- ❑ Prioritize MEP penetration coordination
- ❑ Consolidate MEP in soffits/ceilings
- ❑ Maximize shop penetrations made with CNC machine in factory
- ❑ Minimize field penetrations

Critical Early Design Decisions

- ❑ Structure type
- ❑ Structural grid
- ❑ Select mass timber supplier
- ❑ Building height
- ❑ Construction type
- ❑ Fire Resistance Rating
- ❑ Occupancy Classification
- ❑ MEP systems
- ❑ MEP routing goals
- ❑ Floor-to-floor height

Construction Tolerances

Dissimilar structural material tolerances

- Allowable tolerances – ACI, AISC
- Steel: +/- 1/2”
- Concrete: 1/4” in 10 ft., up to 1’
- Mass Timber: 1/16”

Quality Control

- Build tolerance into the interface detail
- Base plate layout & verification
- Overlay field scan with 3D model

Erection Sequence

- Shear wall bracing plan
- Early establishment of diaphragm – lock the building in
- Coordination w/ Just-in-Time material delivery
- Ensure erection sequence aligns with details

Site Logistics

Targeted Goals:

- Pick CLT panels directly off the trailer
- Eliminate double-handling
- Eliminate onsite storage of material

Best Practices

- Align erection and fabrication sequence
- Optimize lay down area & crane placement
- Onsite vs. Offsite Marshalling Yard

Thank you!

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