

Mass Timber

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Britt, Peters & Associates

- Structural & Civil Engineers
- Office Locations:
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AC Hotel Spartanburg, Marriot.com



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Agenda

- What is Mass Timber?

- What do you do with it?

- And why?

Agenda



- **What is Mass Timber?**

- What do you do with it?

Mass Timber:

A category of framing styles often using large panelized solid wood construction for floor and wall framing.

- And why?

Mass Timber

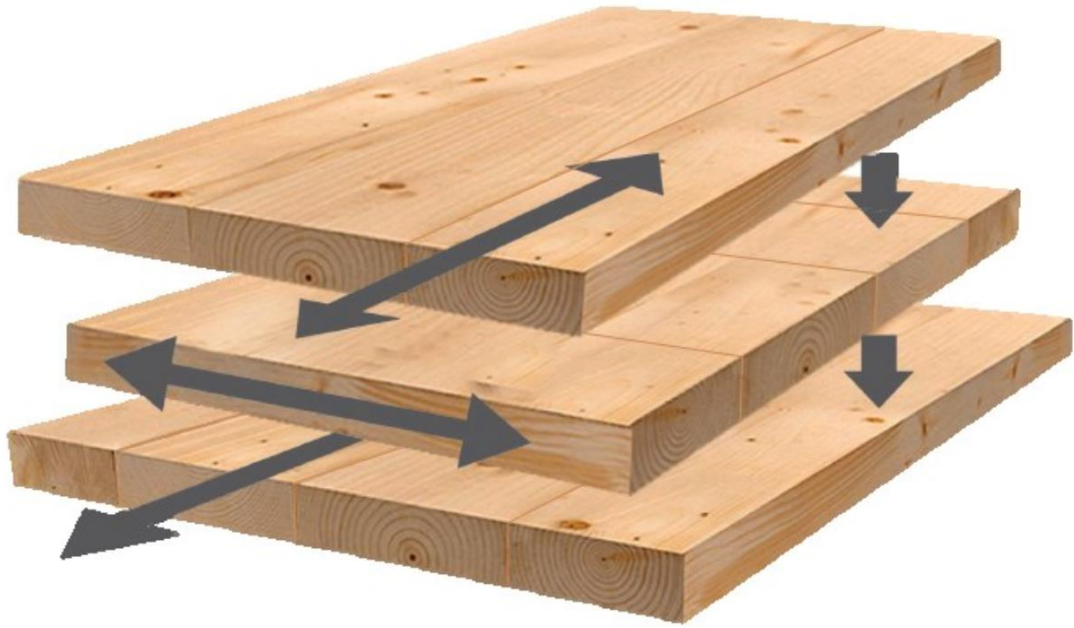
- Includes:

- CLT – Cross Laminated Timber
- NLT – Nail Laminated Timber
- DLT – Dowel Laminated Timber
- Glulam – Glue Laminated Timber

- Wood version of precast concrete

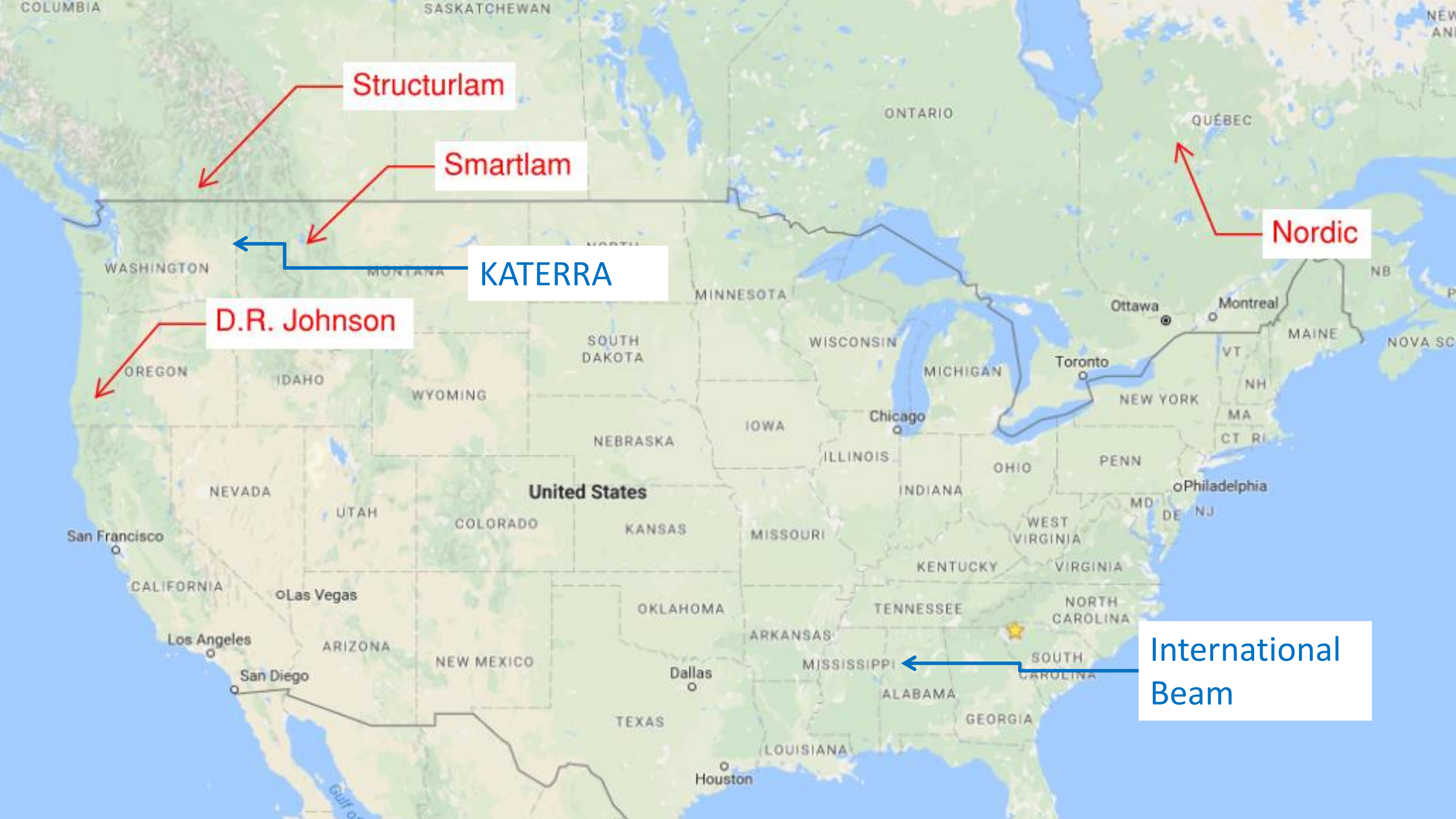


CLT - Cross Laminated Timber



Maria F. L. Mallos, MS Thesis, University of Minnesota, Minneapolis, MN, 2014





Structurlam

Smartlam

Nordic

KATERRA

D.R. Johnson

International Beam

Nail/Dowel Laminated Timber

Photos by Structure Craft

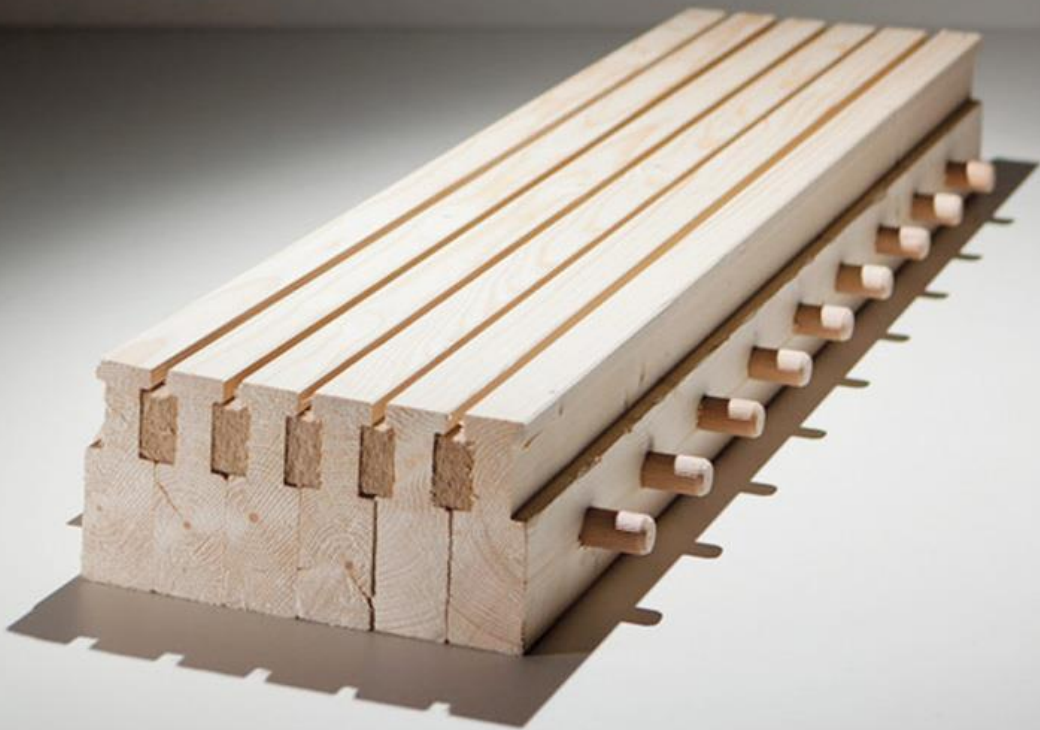




Figure 3.6: *Example of exposed wood structure at T3, Minneapolis, MN. Architecture: Michael Green Architecture. (Photo courtesy of Magnusson*

Agenda

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- **What do you do with it?**

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Load Bearing Systems: Calvary Chapel – Chattanooga, TN



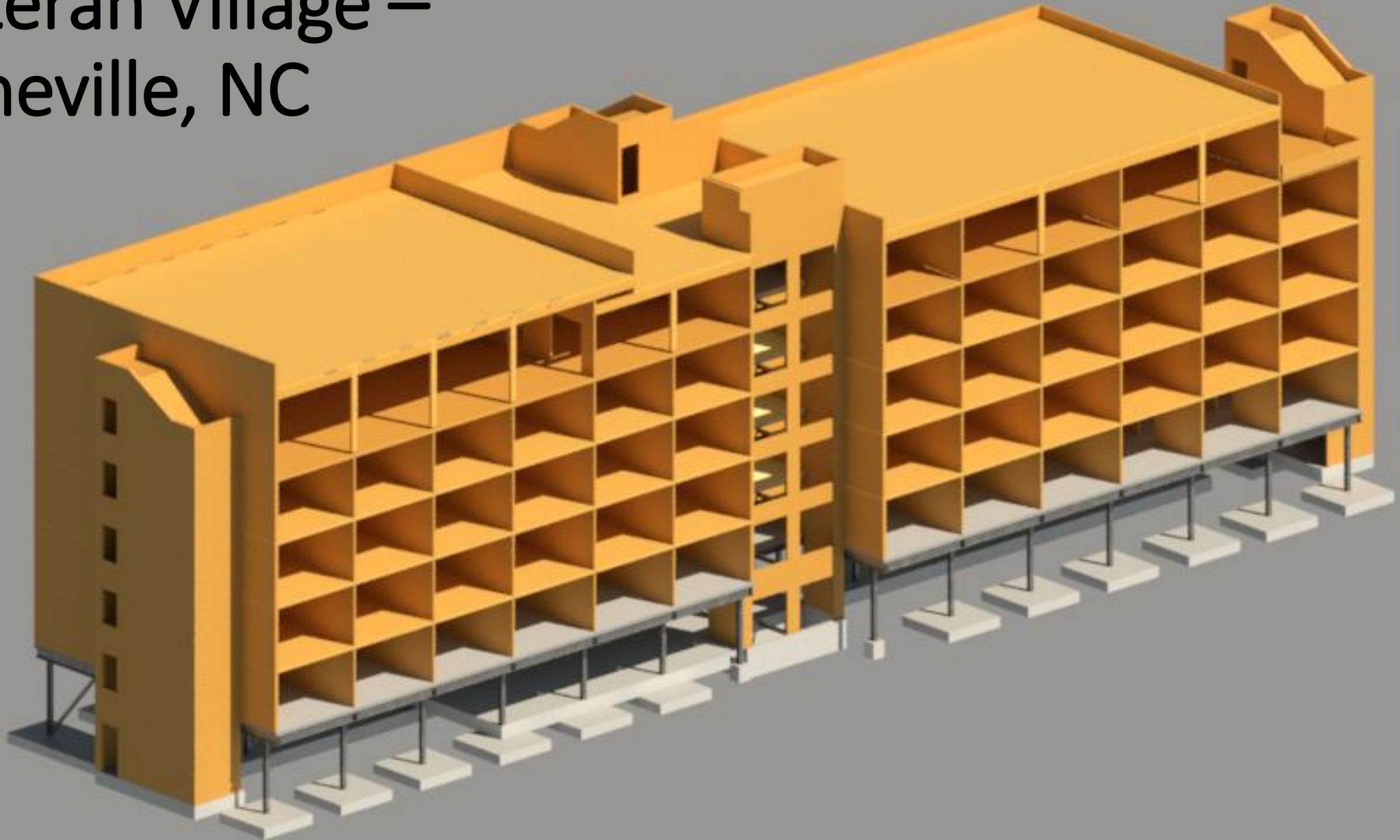








Veteran Village – Asheville, NC



Post and Beam

- Bullitt Center
- Seattle, WA
- Living Building Challenge



Six story wood framed Bullitt Center, Credit: John Stamets/Bullitt Center

Six story wood framed Bullitt Center, Credit: John Stamets/Bullitt Center



UBC – Brock Commons

-18 story – Vancouver, Canada
-174 ft, 404 students, LEED gold

UBC Brock Commons, Seagatestructures.ca





UBC Brock Commons, Seagatestructures.ca

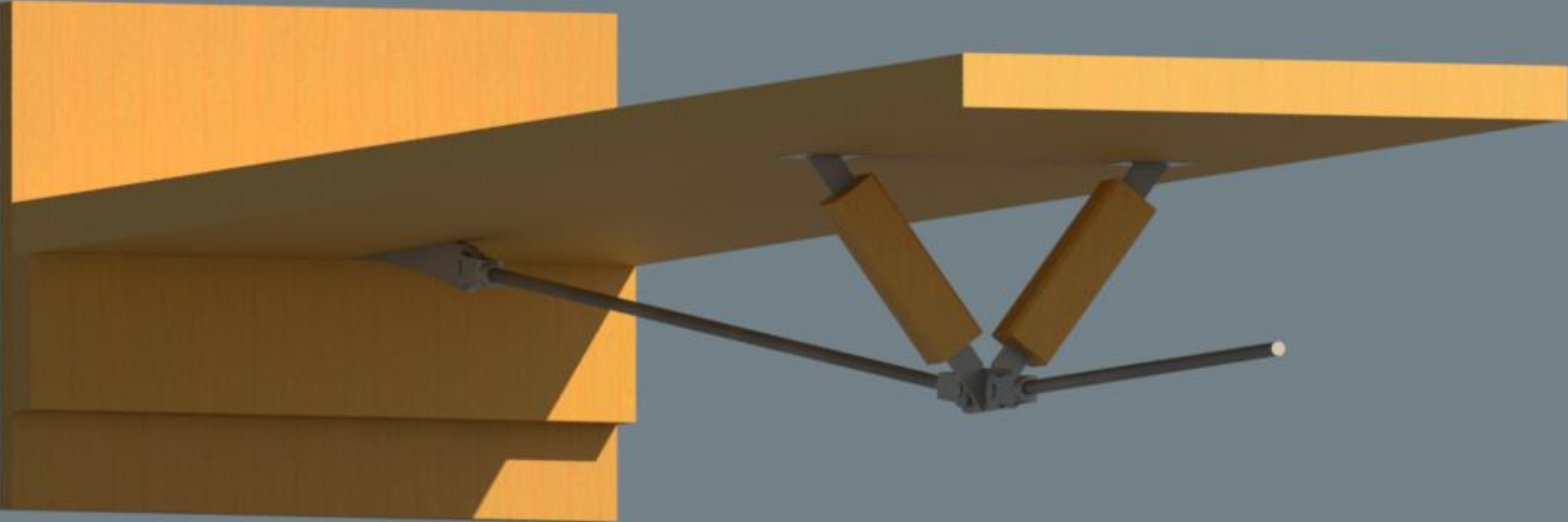


UBC Brock Commons, Seagatestructures.ca

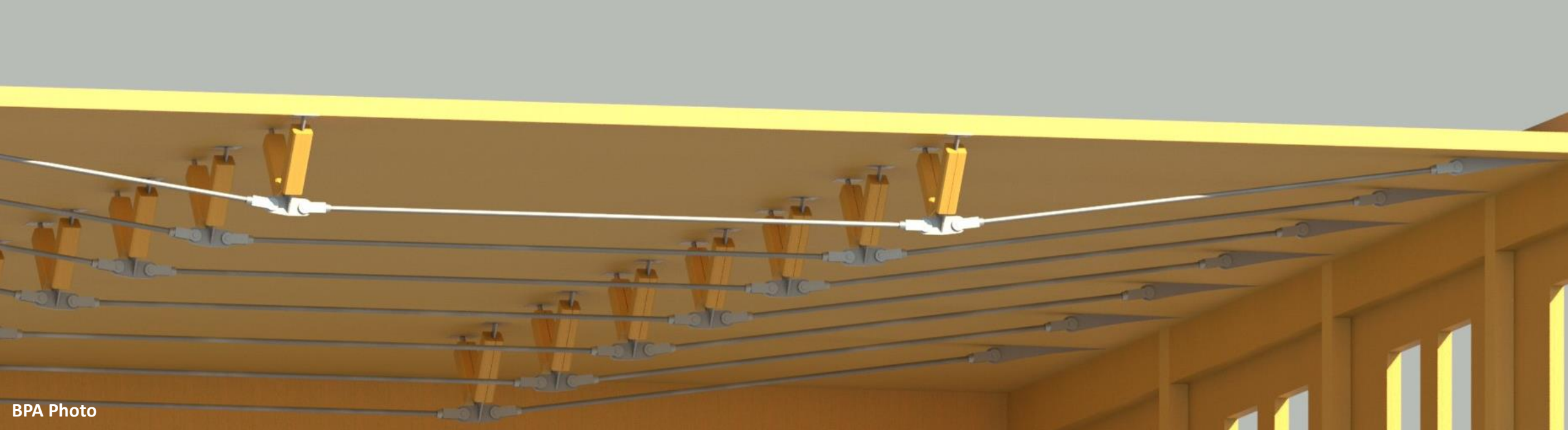


Veteran Village – Asheville, NC

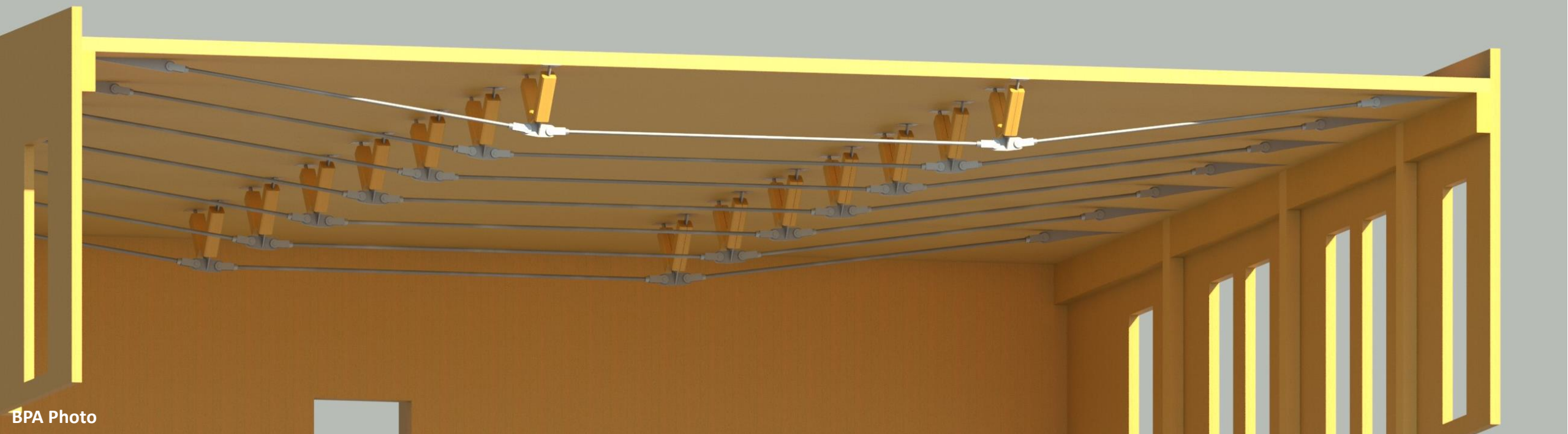
BPA Photo



BPA Photo



BPA Photo



BPA Photo





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- What is Mass Timber?

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Why?

- Speed
- Reduced Labor
- Interior Environment
- Sustainability
- Cost

**Type IV, Types of Construction for Discussion
Draft**

September 15, 2016

Type	Description	Fire Behavior	Encapsulation	FRR Columns/ walls	FRR floor	Examples
IV-A	No exposed combustibles	No significant charring or contribution	Fully encapsulated	3	2	18 story Brock Commons, Vancouver BC
IV-B	Limited exposed combustibles	Minimal firefighter suppression effort (After contents gone) and limited structure contribution	Majority of wood surfaces fully encapsulated (Establish criteria for area and features that can be left exposed)	2	2 (1.5 with exception similar to IBC 403.2.1)	Proposed projects: 10 Story in NYC; 12 story in Portland, OR; 8 story in Montreal under construction.
IV-C	Exposed combustible material (Except with FRR, per IBC 703)	Will burn if sprinklers fail with contribution to fuel load	No encapsulation of wood; fully exposed	2	1.5	
IV HT	Traditional HT; (Exposed combustible material; minimum sized elements	Will burn if sprinklers fail with much contribution	No encapsulation of wood; fully exposed	HT	HT	T3, others

TABLE 504.4 - ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE

Occupancy	NS=Nonsprinklered S= Sprinklered	Type IV-A (x2 IV-B)	Type IV-B (x1.0 I-B)	Type IV-C	Type IV-HT
A-1	NS	3	3	3	3
	S	12	6	4	4
A-2	NS	3	3	3	3
	S	24	12	6	4
A-3	NS	3	3	3	3
	S	24	12	6	4
A-4	NS	3	3	3	3
	S	24	12	6	4
A-5	NS	1	1	1	1
	S	UL	UL	UL	UL
B	NS	5	5	5	5
	S	24	12	9	6
E	NS	3	3	3	3
	S	12	6	4	4

TABLE 504.4 - ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE

Occupancy	NS=Nonsprinklered S= Sprinklered	Type IV-A (x2 IV-B)	Type IV-B (x1.0 I-B)	Type IV-C	Type IV-HT
I-2	NS	NP	NP	NP	NP
	S	10	5	1	1
I-3	NS	2	2	2	2
	S	10	5	3	3
I-4	NS	3	3	3	3
	S	12	6	4	4
M	NS	4	4	4	4
	S	24	12	5	5
R-1	NS	4	4	4	4
	S	24	12	9	5
R-2	NS	4	4	4	4
	S	24	12	9	5