Mass Timber Technology

Alejandro Fernandez
Senior Project Engineer

MARCH 16, 2022

WITH YOU TODAY…

Alejandro Fernandez

Senior Project Engineer

Structural Engineering

Chicago

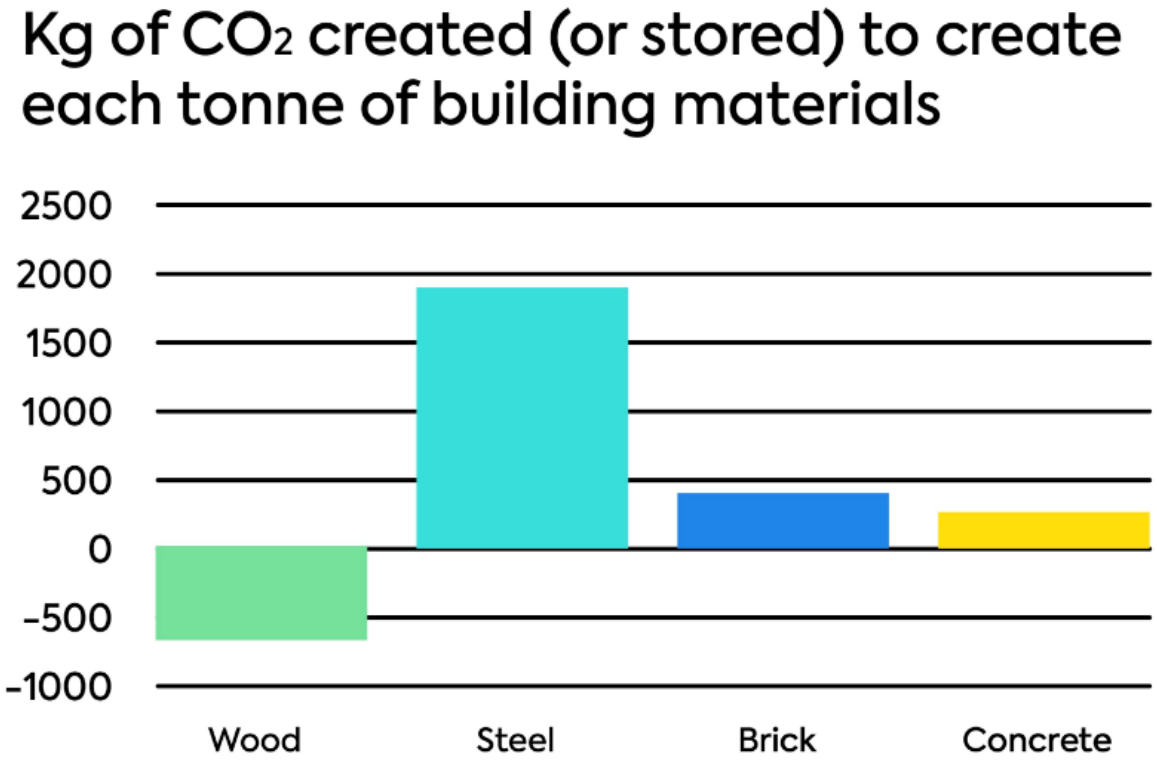
AGENDA

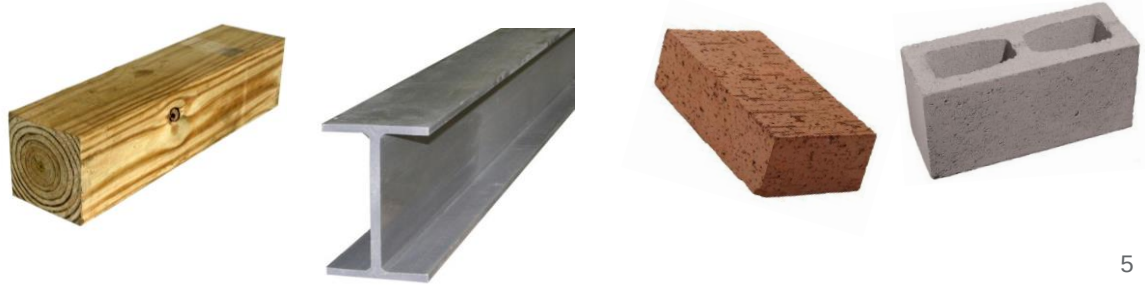
1. Introduction – Why Mass Timber?
2. Basics
3. River Beech
4. Ascent

AGENDA

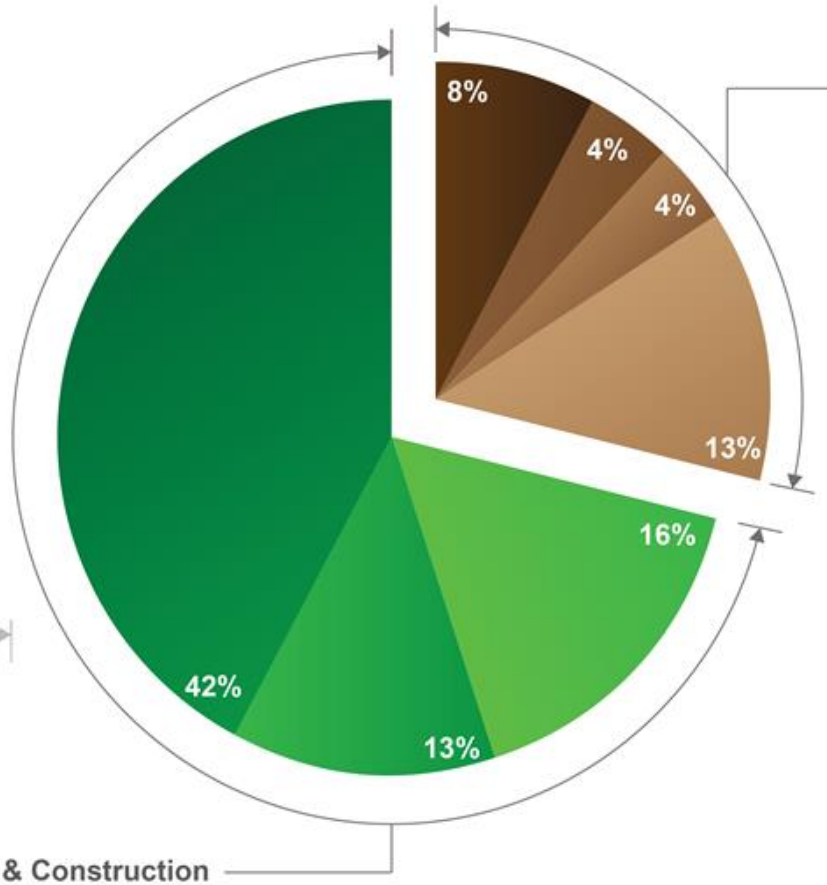
1. Introduction – Why Mass Timber?
2. Basics
3. Procurement and detailing
4. Ascent
5. Other concepts

WHY MASS TIMBER



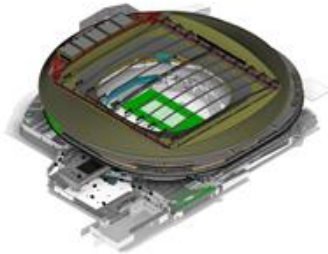


EMBODIED CARBON CONTRIBUTORS



29% Others

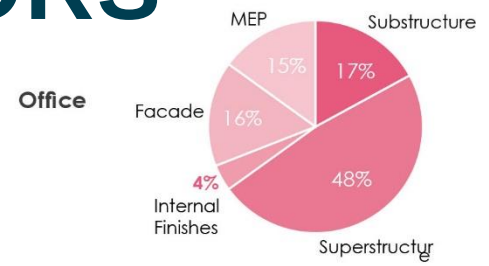
- 8% Finishes
- 4% Roof
- 4% Internal Planning
- 13% External Cladding

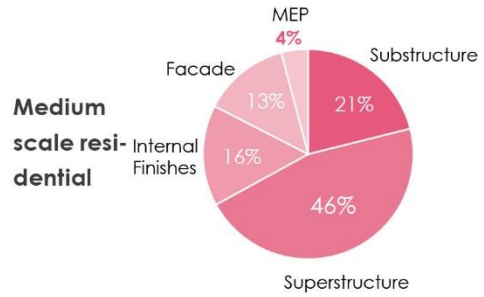


71% Structure & Construction

- 42% Superstructure
- 13% Substructure
- 16% Construction

Floors
Walls
Foundations
Columns
Framing





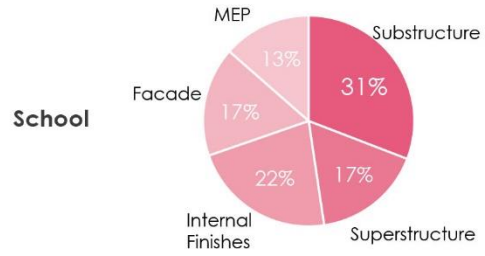


Figure 8.2 - Embodied carbon break-down per element (Cradle to Gate)

Thornton Tomasetti

LONDON ENERGY TRANSFORMATION INITIATIVE

AGENDA

1. Introduction – Why Mass Timber?
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Mass Timber Products

CLT

GLULAM

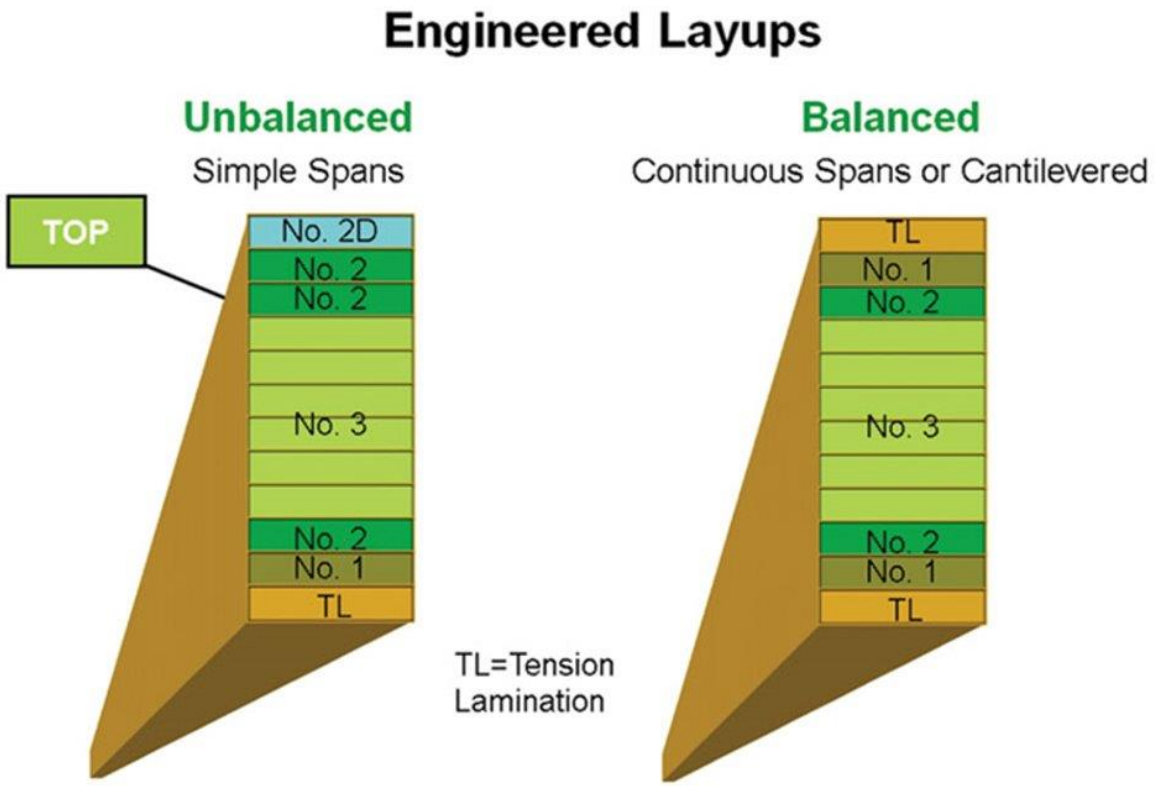
NLT

LVL

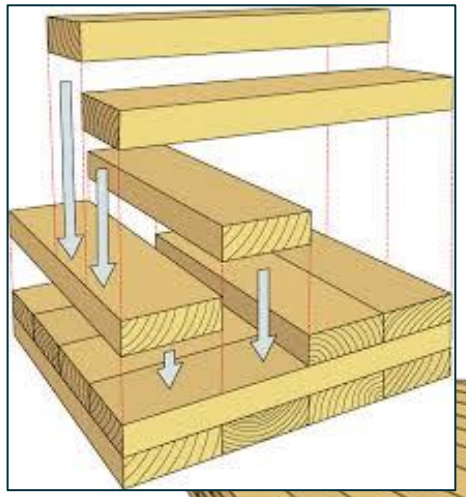
LSL

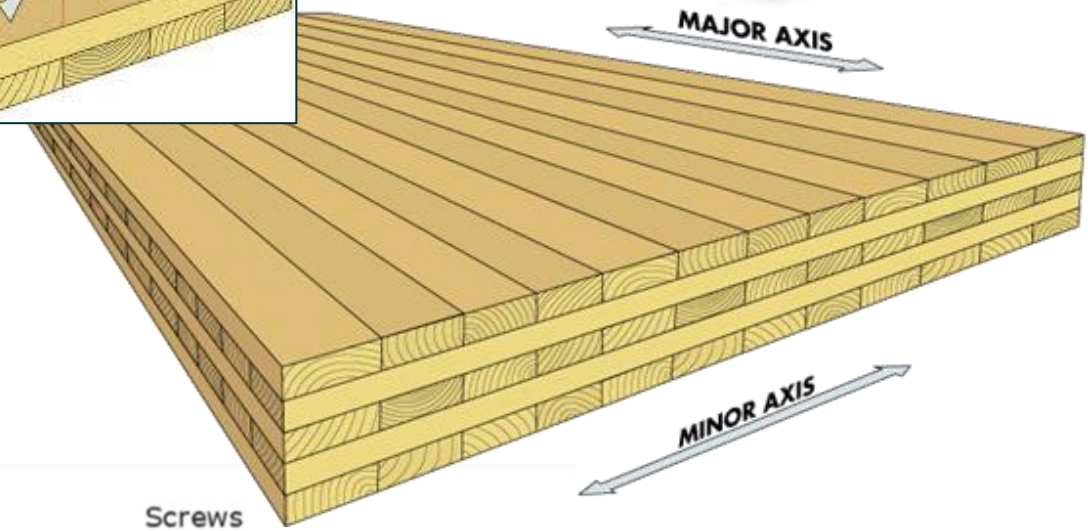
PSL

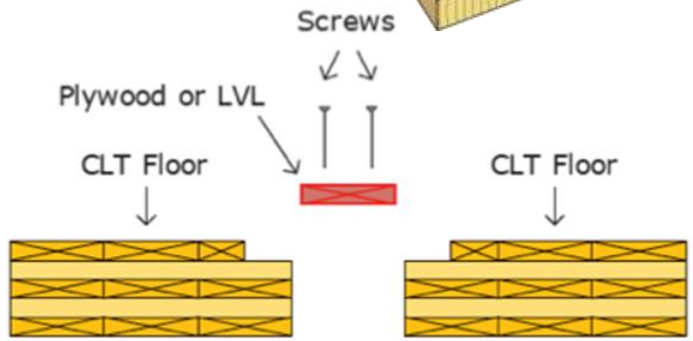
Glulam Beams / Columns



CLT Slabs







Non-homogeneous
Anisotropic material

- Post and Beam

Typical/Optimal Bay Sizes: 20' x 25’

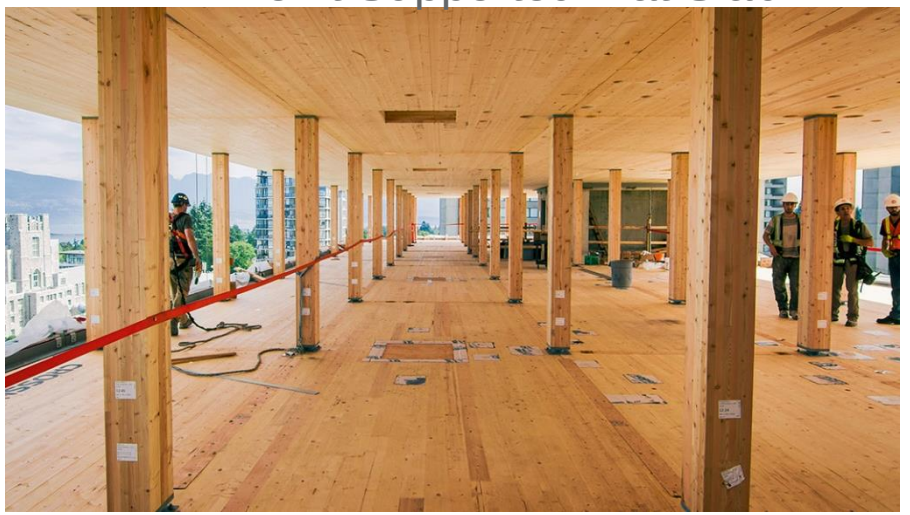
Depth: 24"-30" at beams
9" between beams

- Beams and Girders

Typical/Optimal Bay Sizes: 30' x 30’

Depth: 28"-36" at beams
6" between beams

- Point Supported Flat Slab



Typical/Optimal Bay Sizes: 10’ x 14’

Depth: 9" throughout

- CLT Bearing Wall and Slab

Typical/Optimal Bay Sizes: 17’ to 20’ deck span party wall to party wall

Depth: 9” between walls

- Hybrid Light Frame & CLT

Typical/Optimal Bay Sizes: 17’ to 20’ deck span party wall to party wall

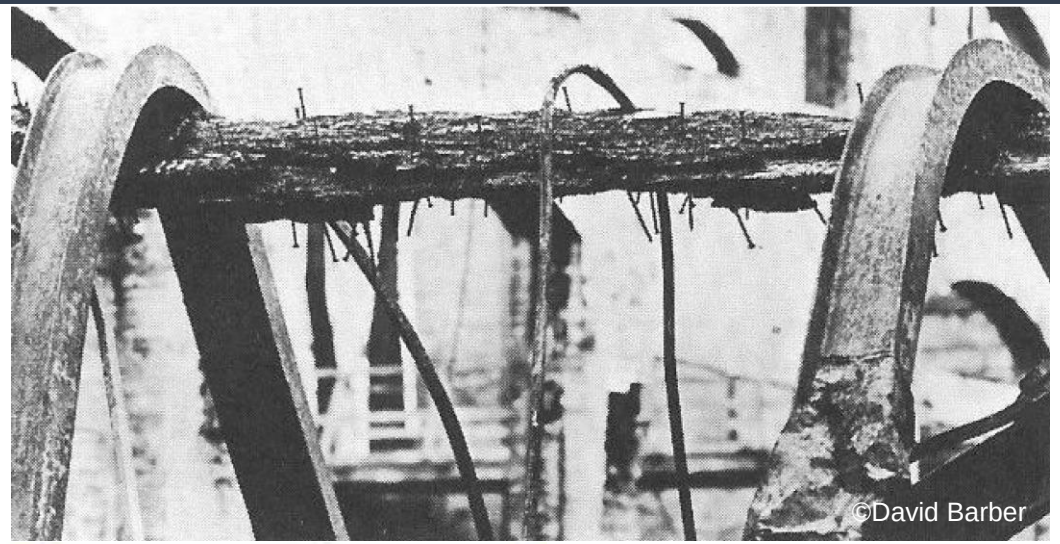
Depth: 9” between walls

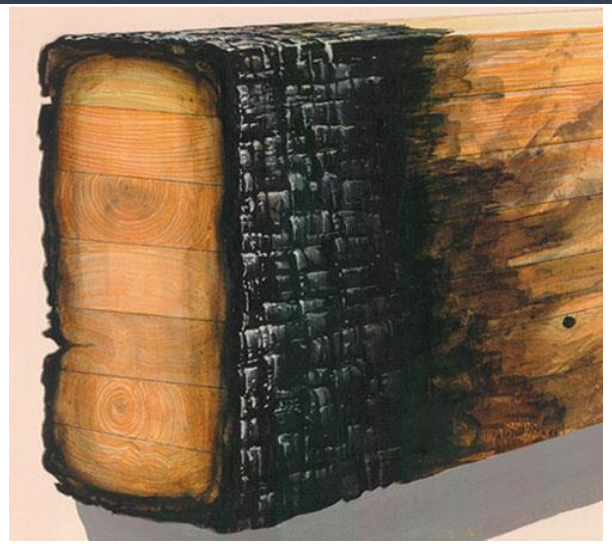
- Hybrid Steel Frame & CLT

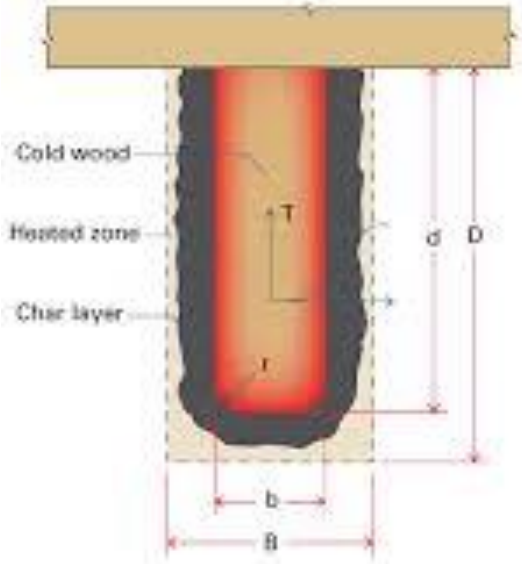
Typical/Optimal Bay Sizes: 30' x 30’

Depth: 24"-33" at beams
6"- 9” between beams

Fire Resistance







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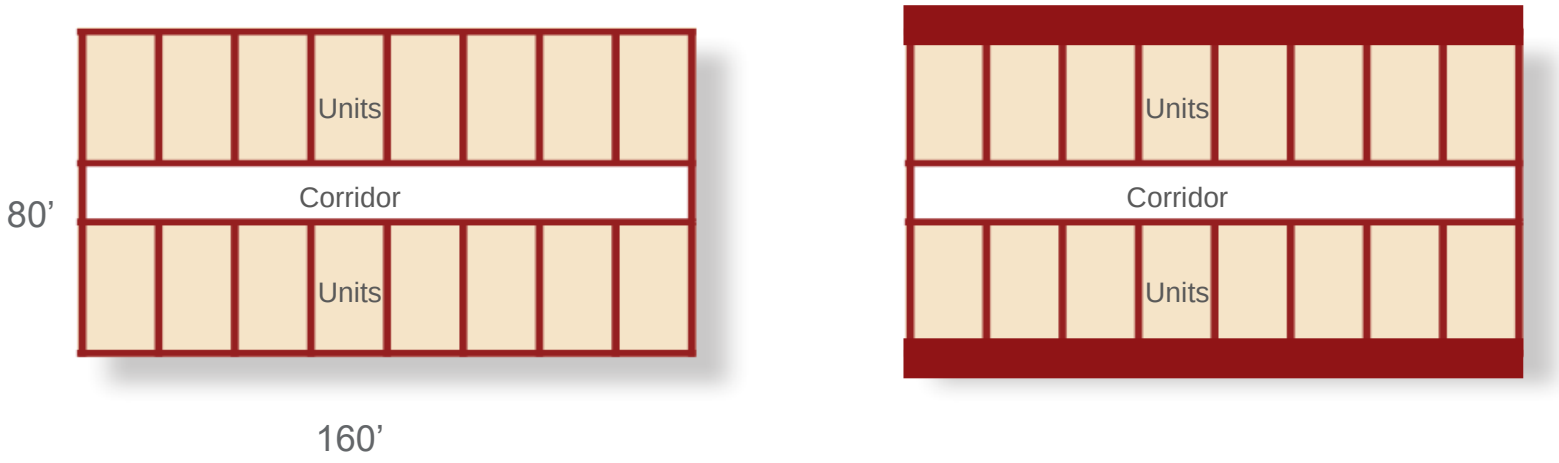
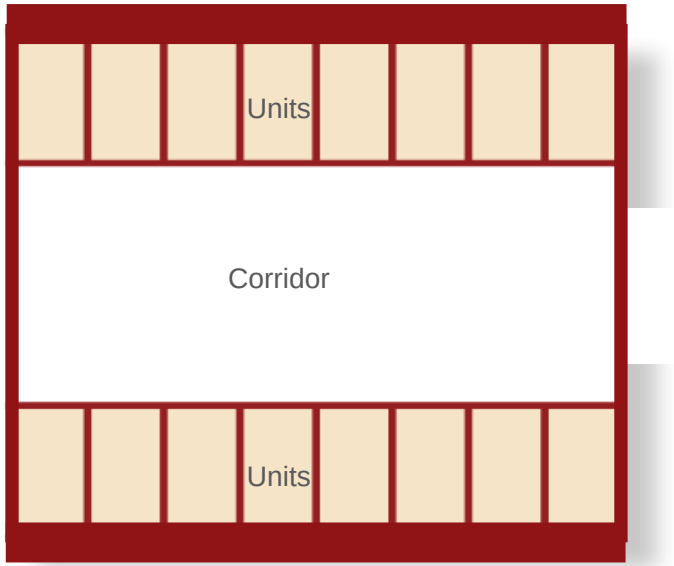
RIVER BEECH



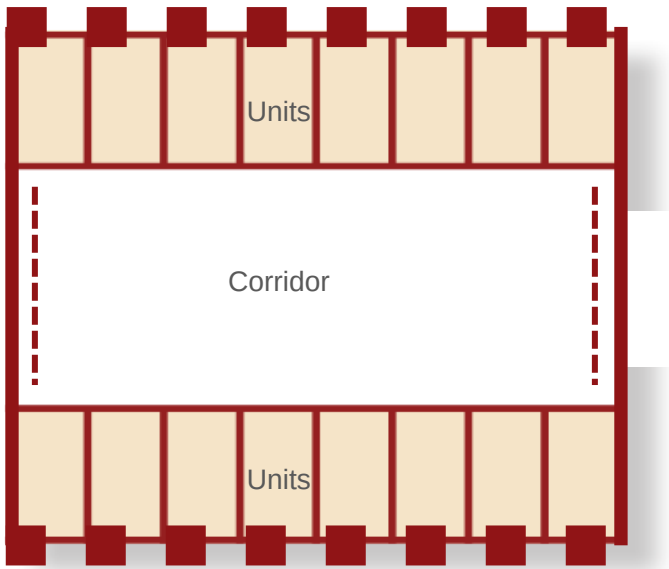
RIVER BEECH

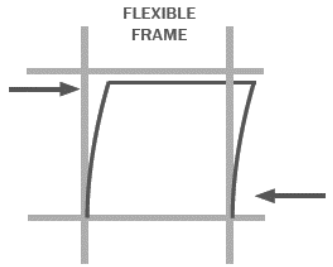

Units
Corridor
Units

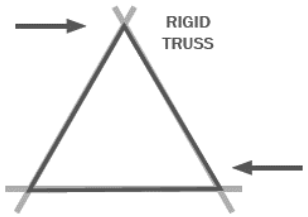

STRUCTURAL CORE RESISTING
LATERAL LOAD

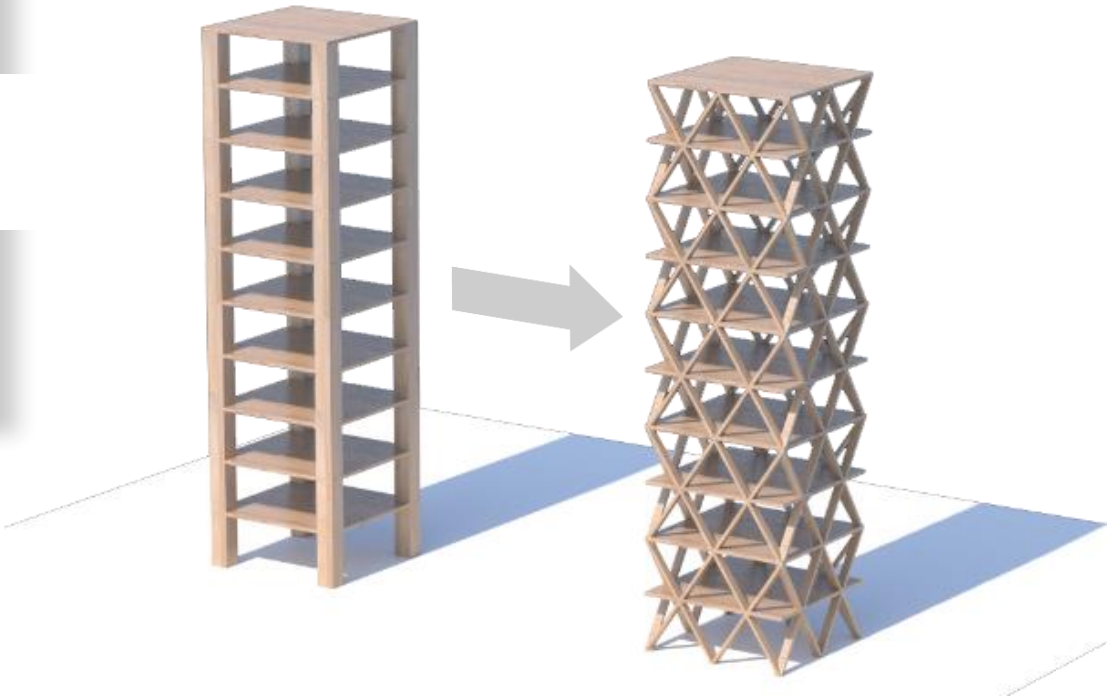

STRUCTURAL FACADE
STRUCTURAL FACADE

RIVER BEECH

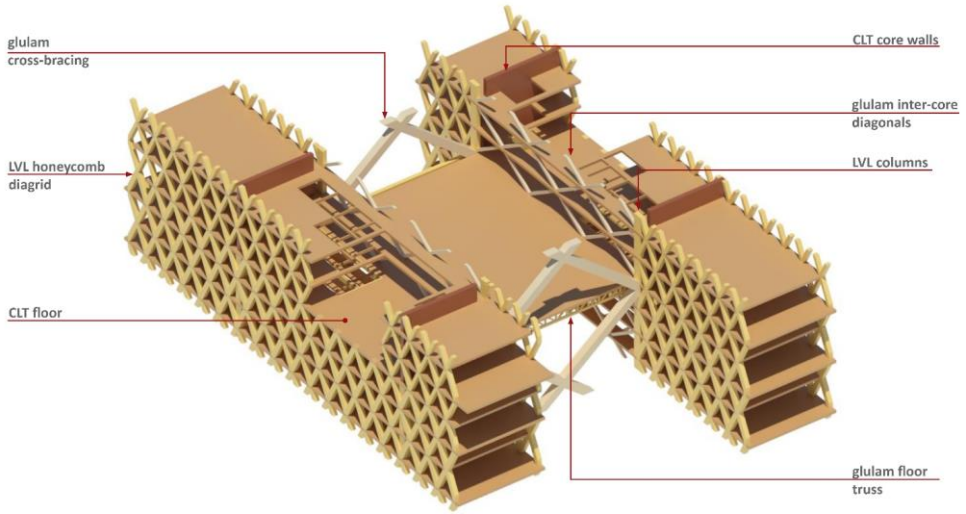


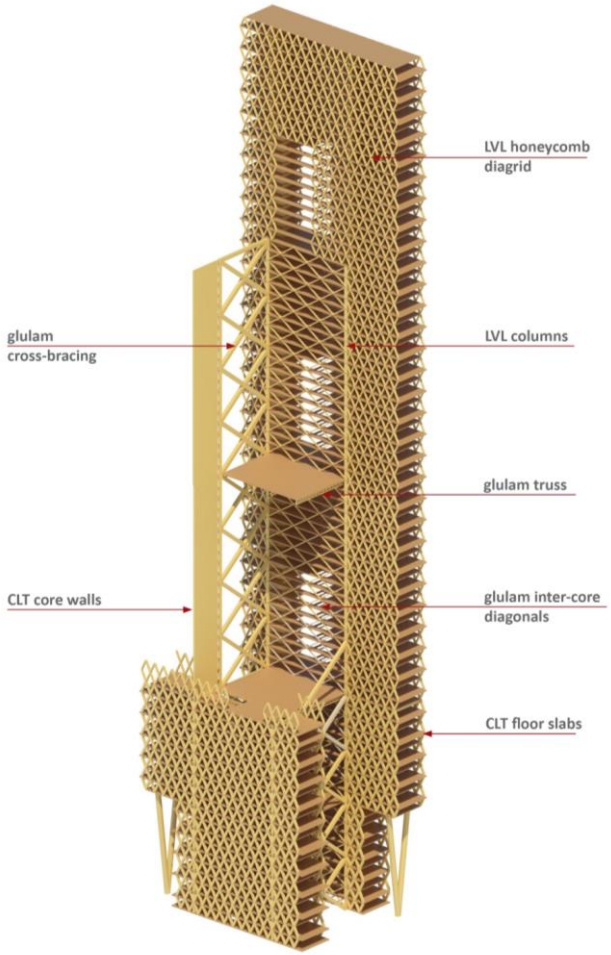






RIVER BEECH


glulam
cross-bracing
CLT core walls
glulam inter-core
diagonals
LVL columns
LVL honeycomb
diagrid
CLT floor
glulam floor
truss

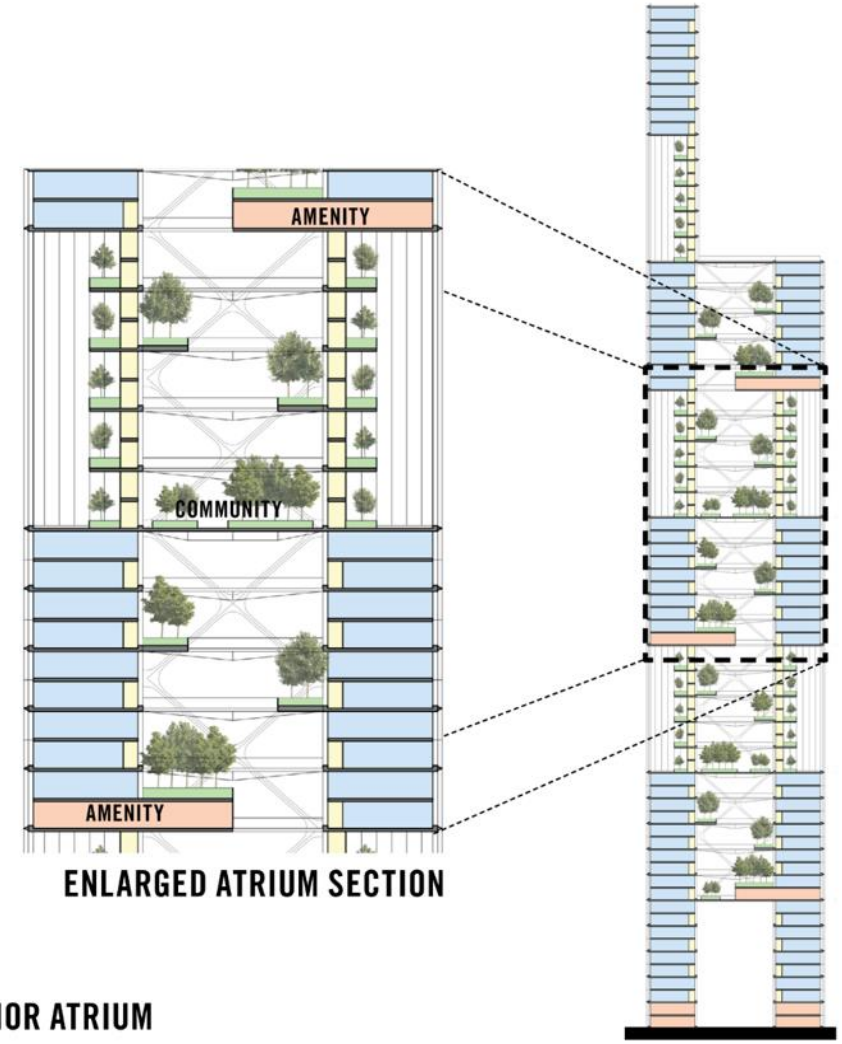

LVL honeycomb
diagrid
glulam
cross-bracing
LVL columns
glulam truss
CLT core walls
glulam inter-core
diagonals
CLT floor slabs

RIVER BEECH

RIVER BEECH

RIVER BEECH

INTERIOR ATRIUM



ENLARGED ATRIUM SECTION

RIVER BEECH

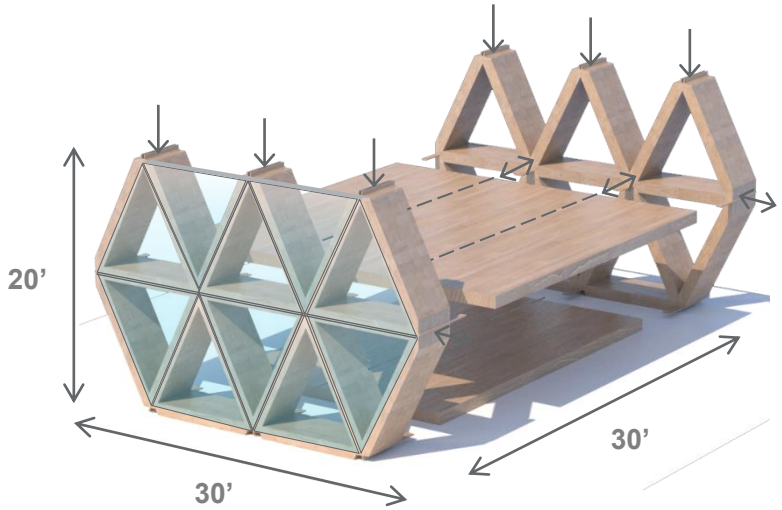
RIVER BEECH

DUPLEX UNIT - LOWER LEVEL

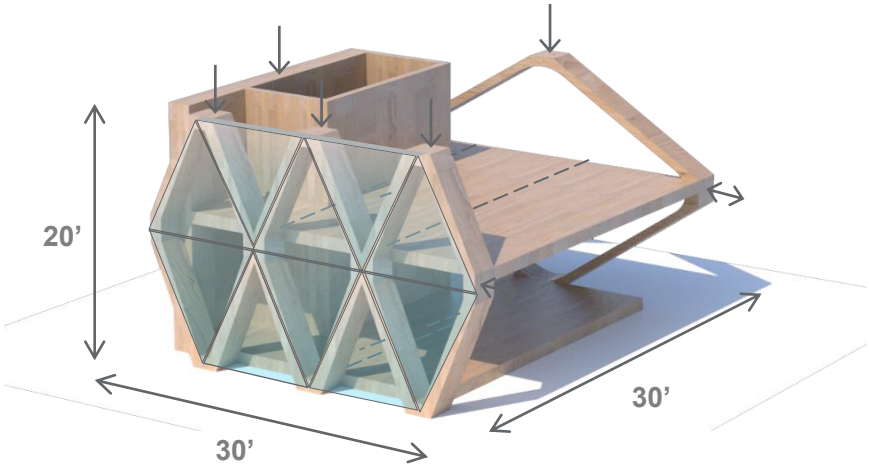
DUPLEX UNIT - UPPER LEVEL

RIVER BEECH

RIVER BEECH



PREFAB MODULE A -
TYPICAL



PREFAB MODULE B -
SHEAR

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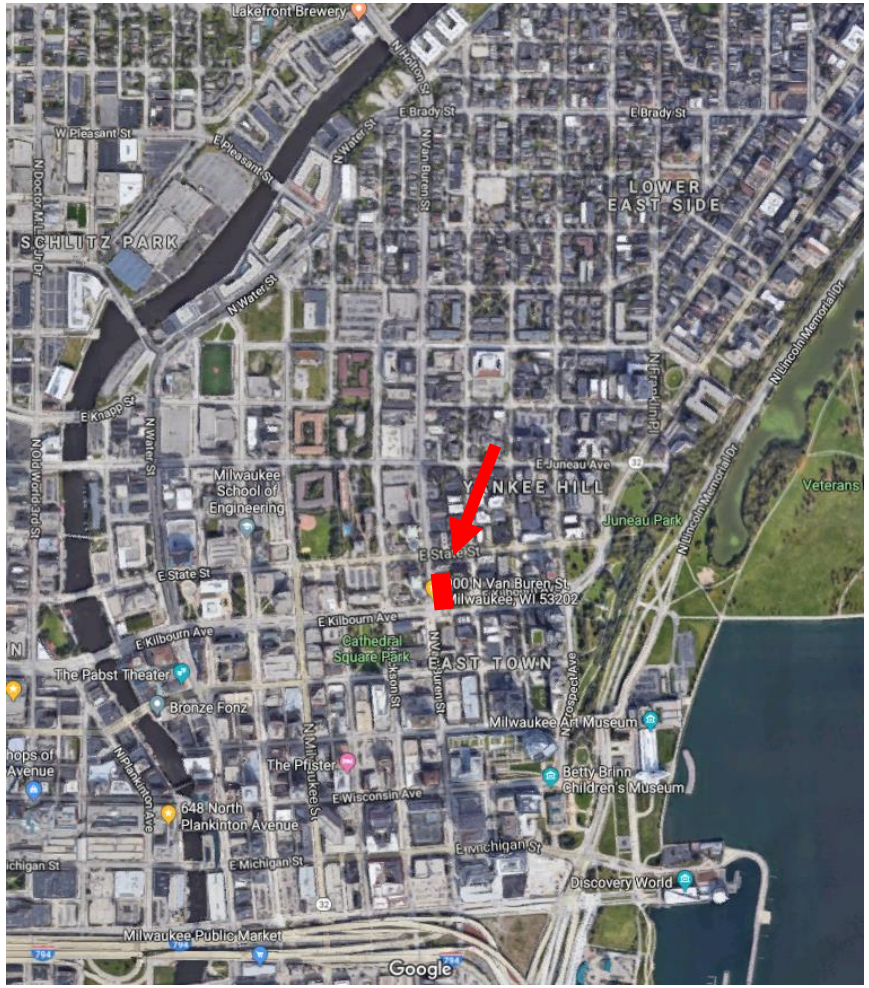
River Beech

Chicago

ASCENT


Lakefront Brewery
E Brady St
W Pleasant St
E Pleasant St
N Water St
N Van Buren St
LOWER EAST SIDE
SCHLITZ PARK
N Water St
E Knapp St
Milwaukee School of Engineering
E Juneau Ave
YANKEE HILL
Juneau Park
Veterans
E State St
E Kilbourn Ave
Cathedral Square Park
EAST TOWN
The Pabst Theater
Bronze Fonz
Milwaukee Art Museum
The Pfister
Betty Brinn Children's Museum
E Wisconsin Ave
648 North Plankinton Avenue
E Michigan St
Discovery World
Milwaukee Public Market
Google

ASCENT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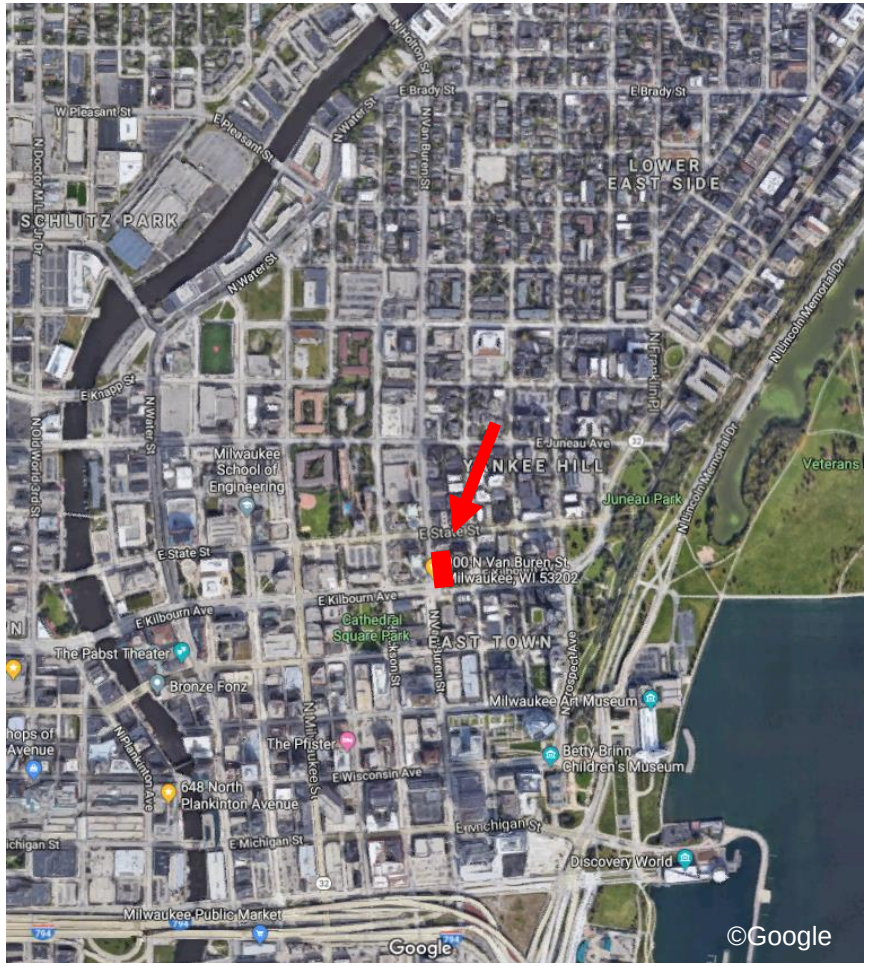
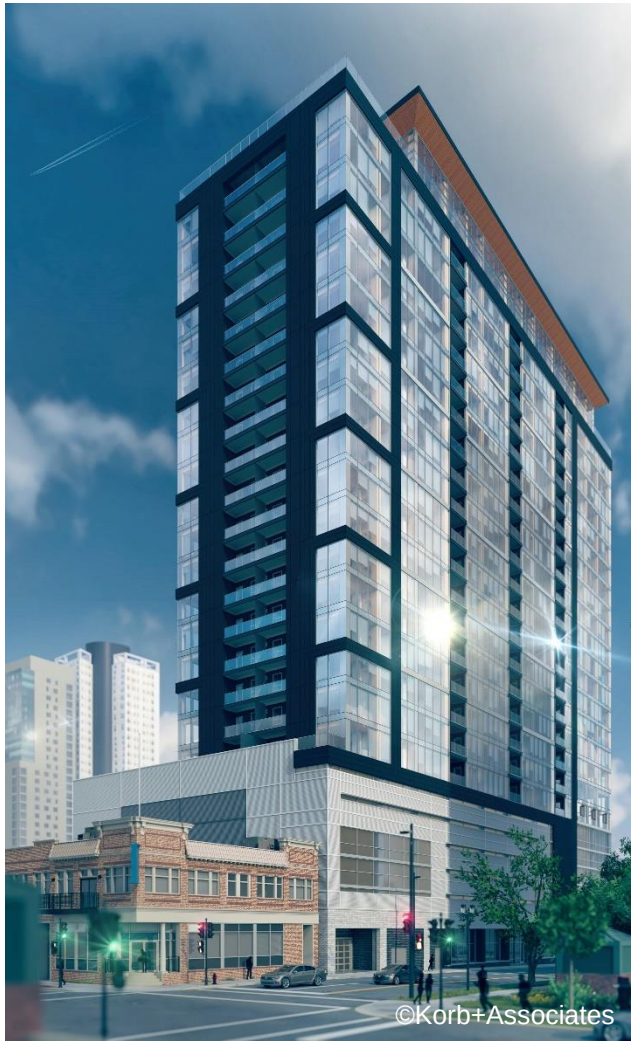
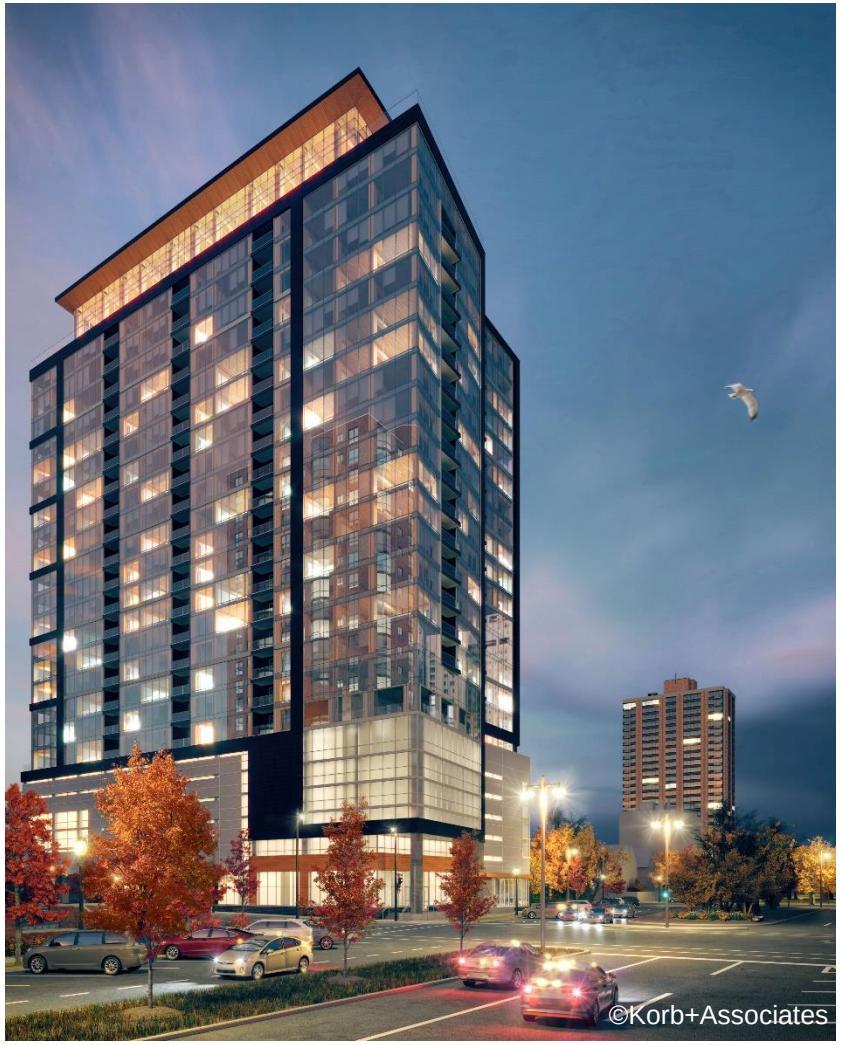
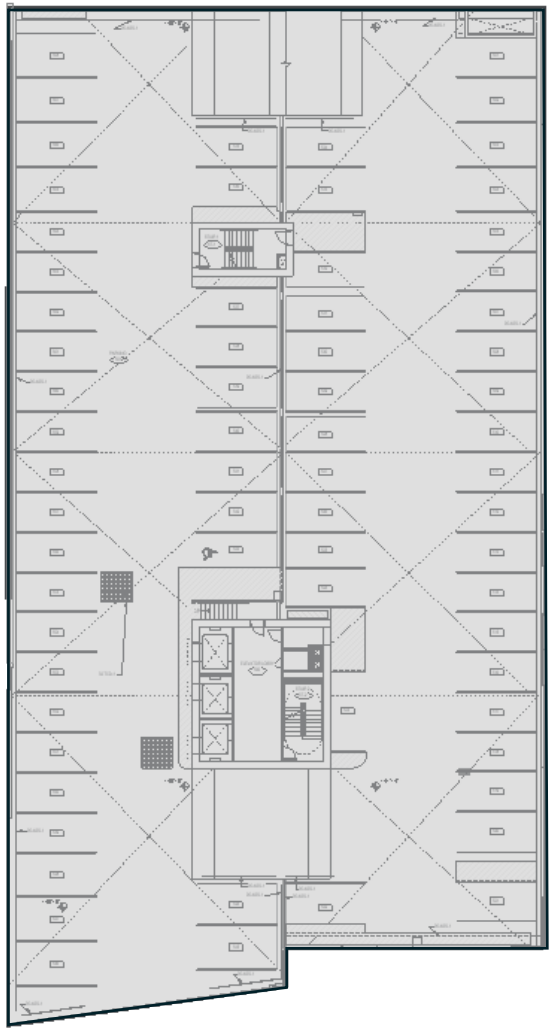

W Pleasant St
E Pleasant St
N Water St
E Brady St
N Van Buren St
LOWER EAST SIDE
SCHLITZ PARK
N Water St
E Knapp St
N Old World 3rd St
Milwaukee School of Engineering
E Juneau Ave
YANKEE HILL
Juneau Park
Veterans
E State St
E Kilbourn Ave
Cathedral Square Park
EAST TOWN
The Pabst Theater
Bronze Fonz
Milwaukee Art Museum
The Pfister
Betty Brinn Children's Museum
E Wisconsin Ave
648 North Plankinton Avenue
E Michigan St
Discovery World
Milwaukee Public Market
Google
©Google

ASCENT

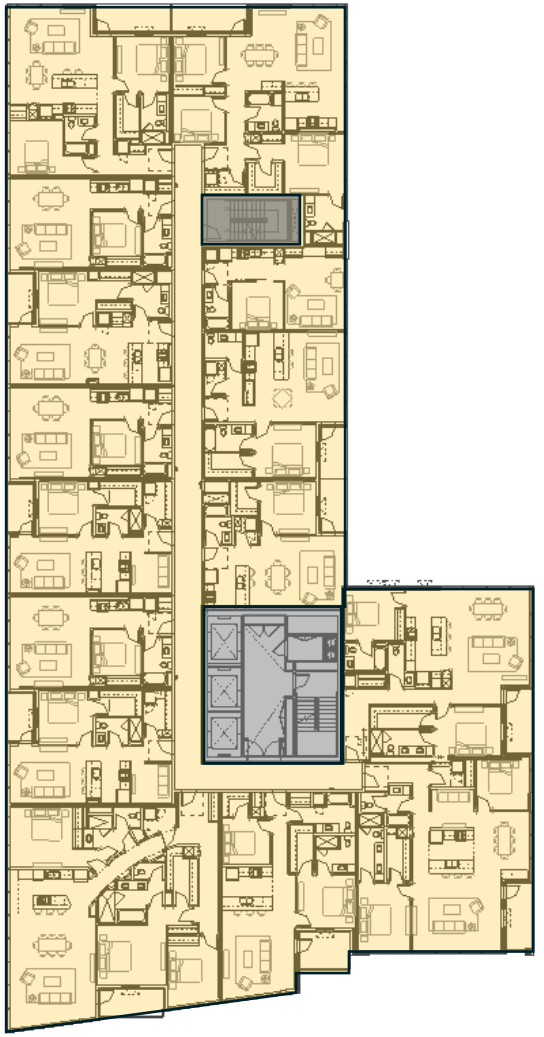




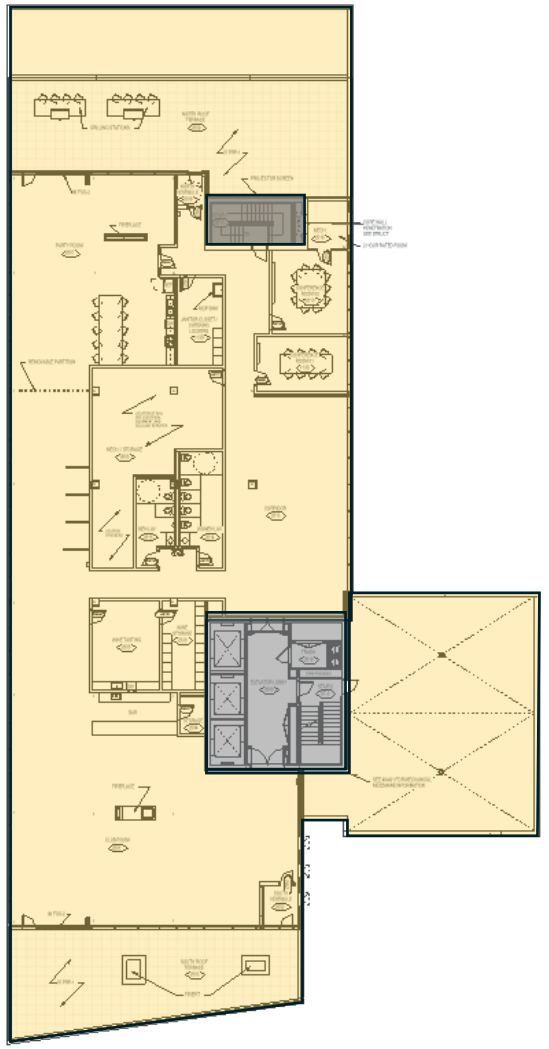
TYPICAL FLOOR PLANS



TYPICAL PARKING LEVEL

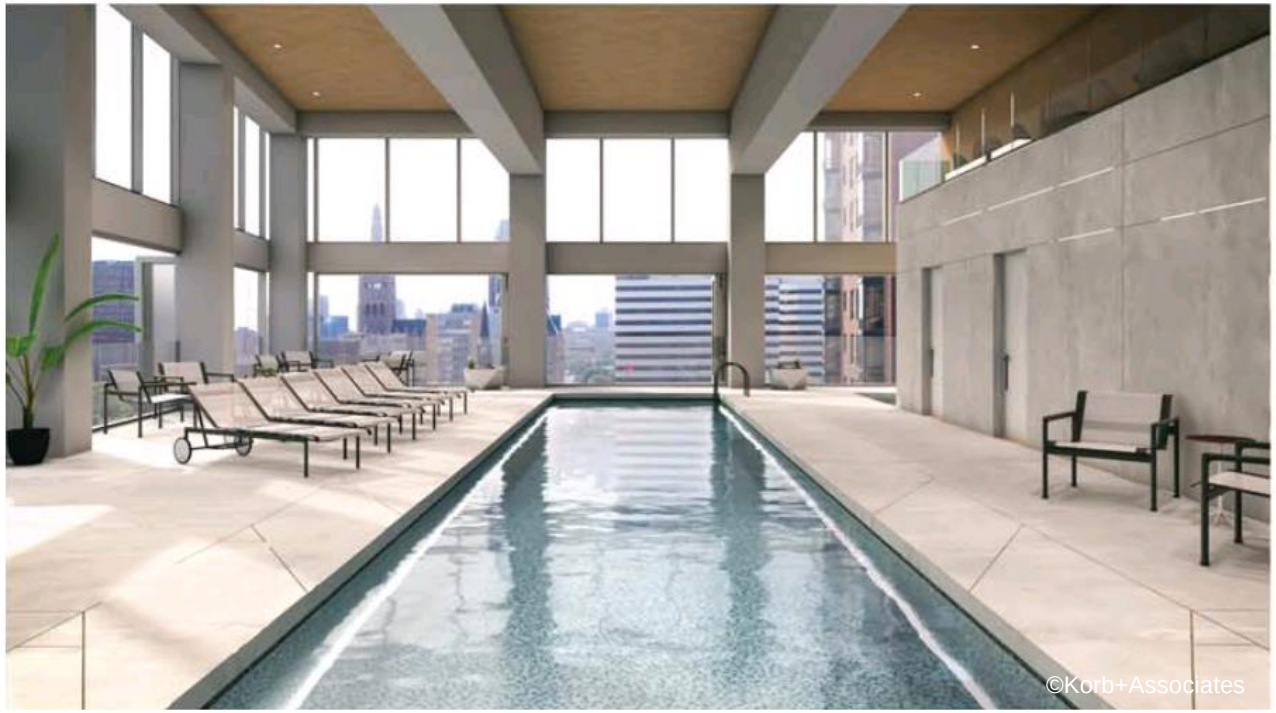


TYPICAL RESIDENTIAL LEVEL



AMENITIES LEVEL (L25)

ASCENT



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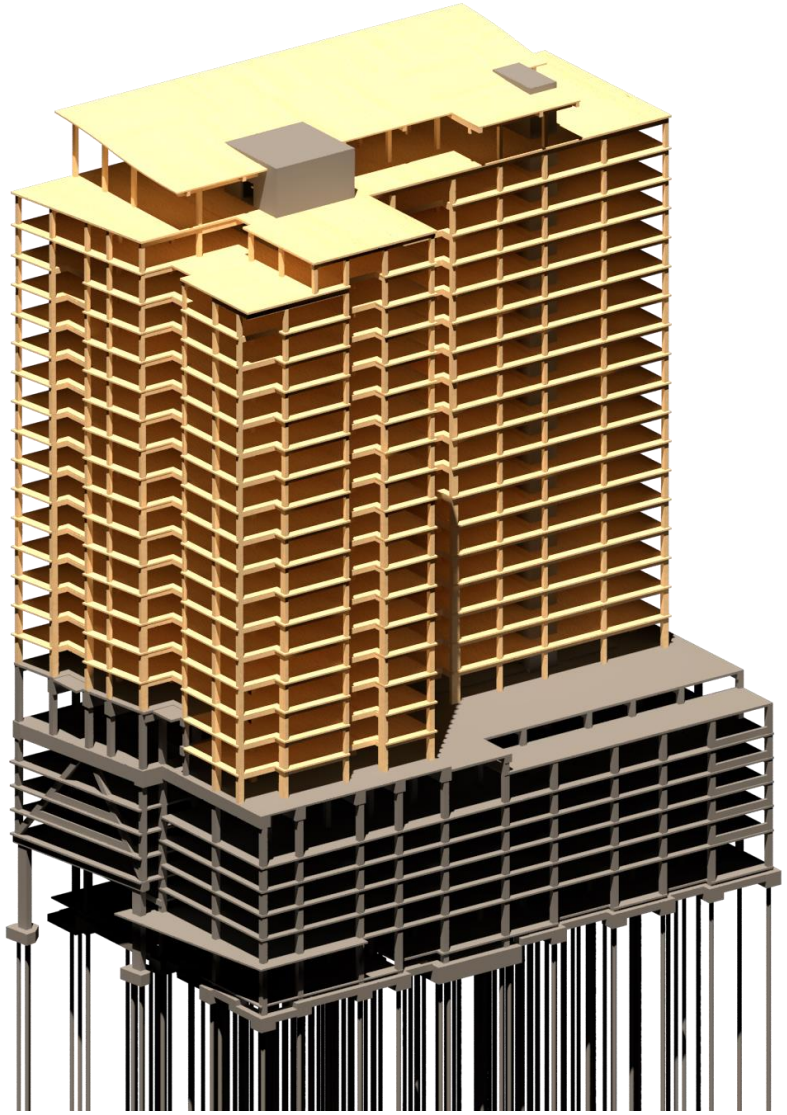
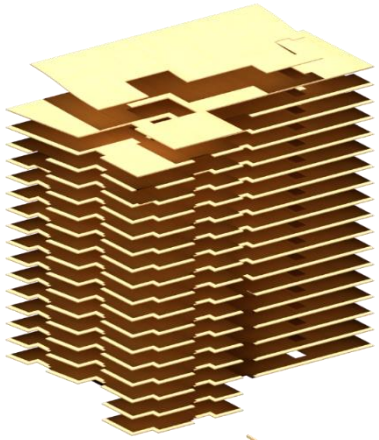
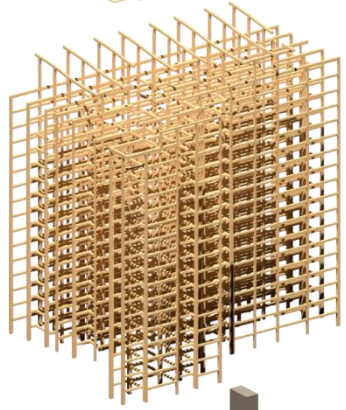
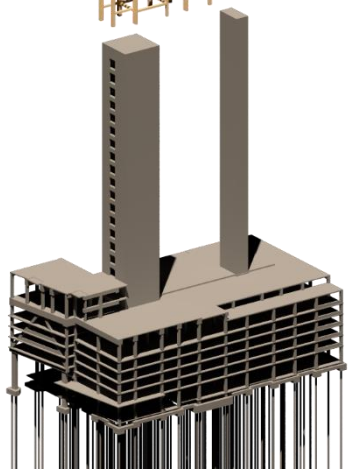




SLABS (CLT)



BEAMS + COLUMNS (GLULAM)



PODIUM (CONCRETE)

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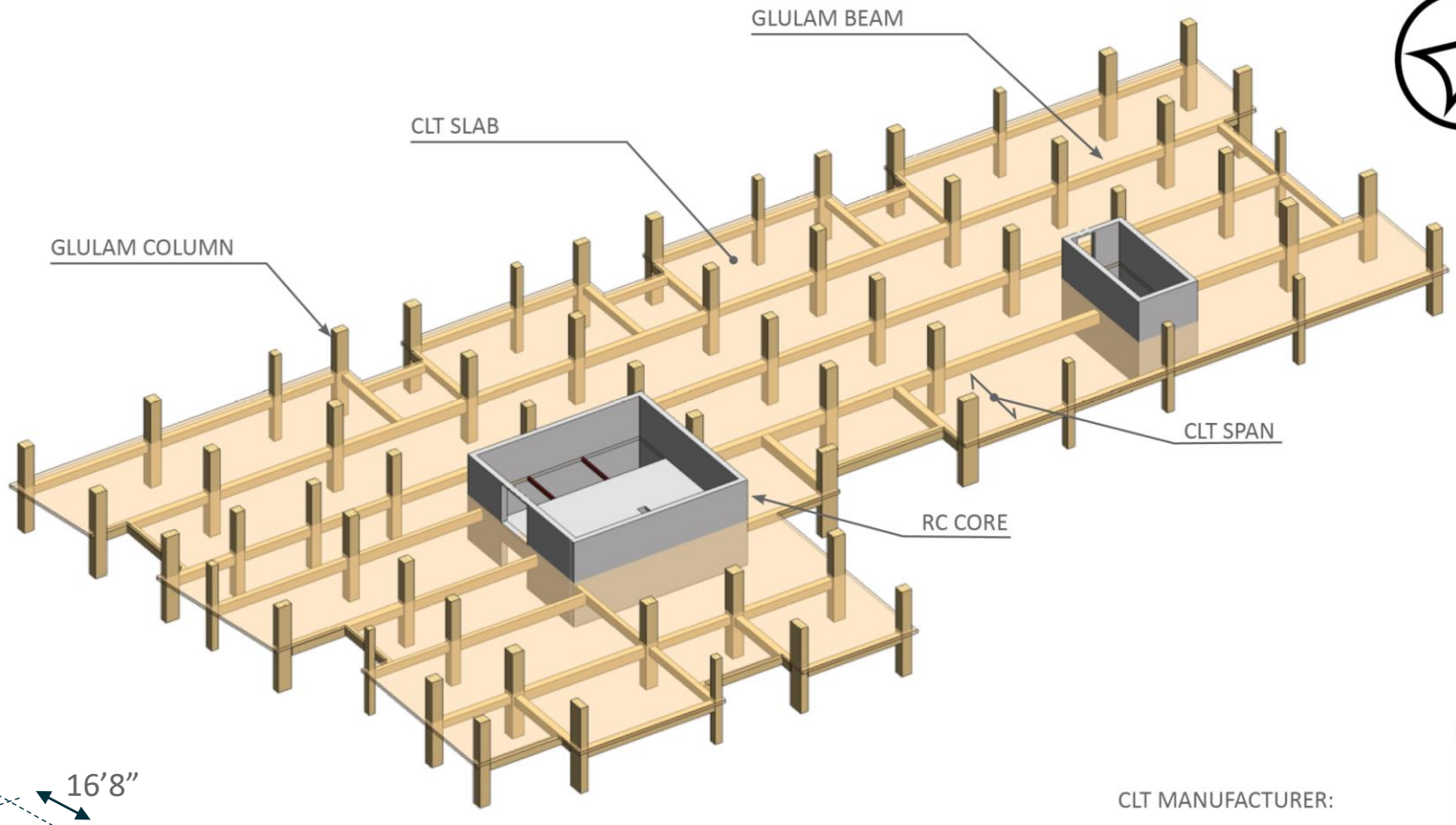
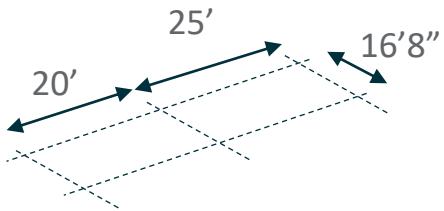
ASCENT

TYPICAL TIMBER LEVEL



NORTH

TYPCAL GRID



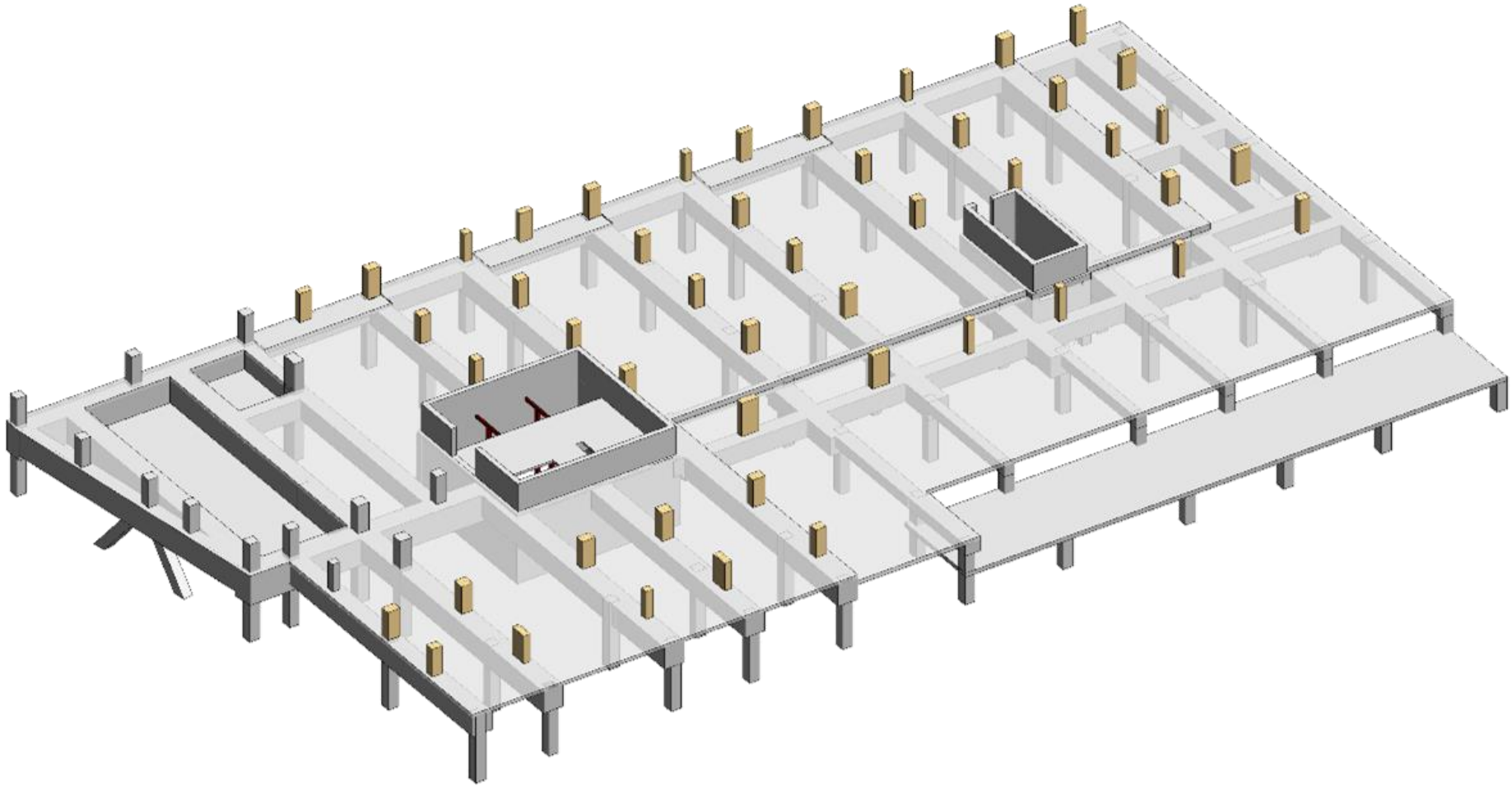
CLT MANUFACTURER: KLH

GLULAM MANUFACTURER: WIEHAG TIMBER CONSTRUCTION

Thor

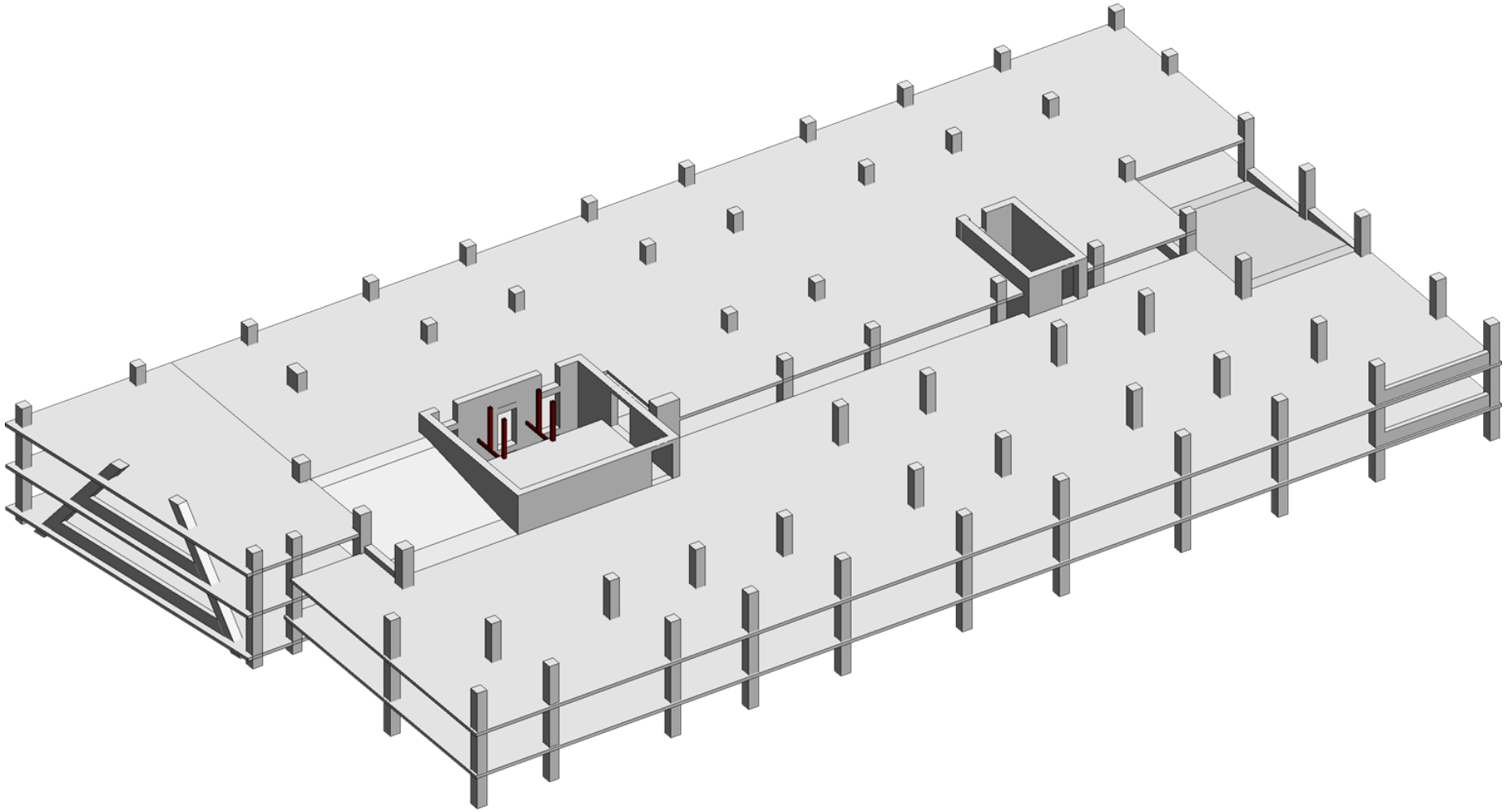
ASCENT

TRANSFER LEVEL



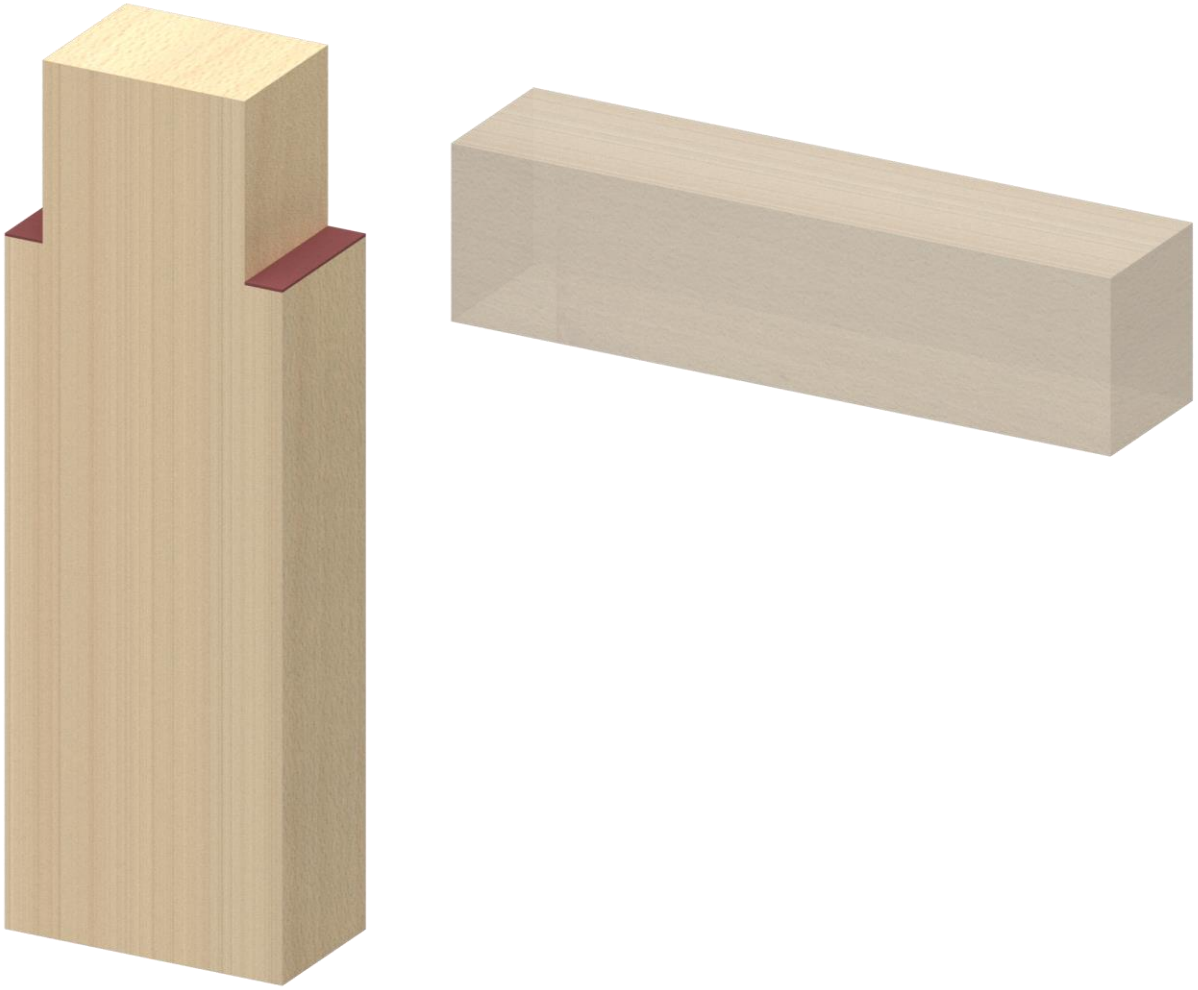
ASCENT

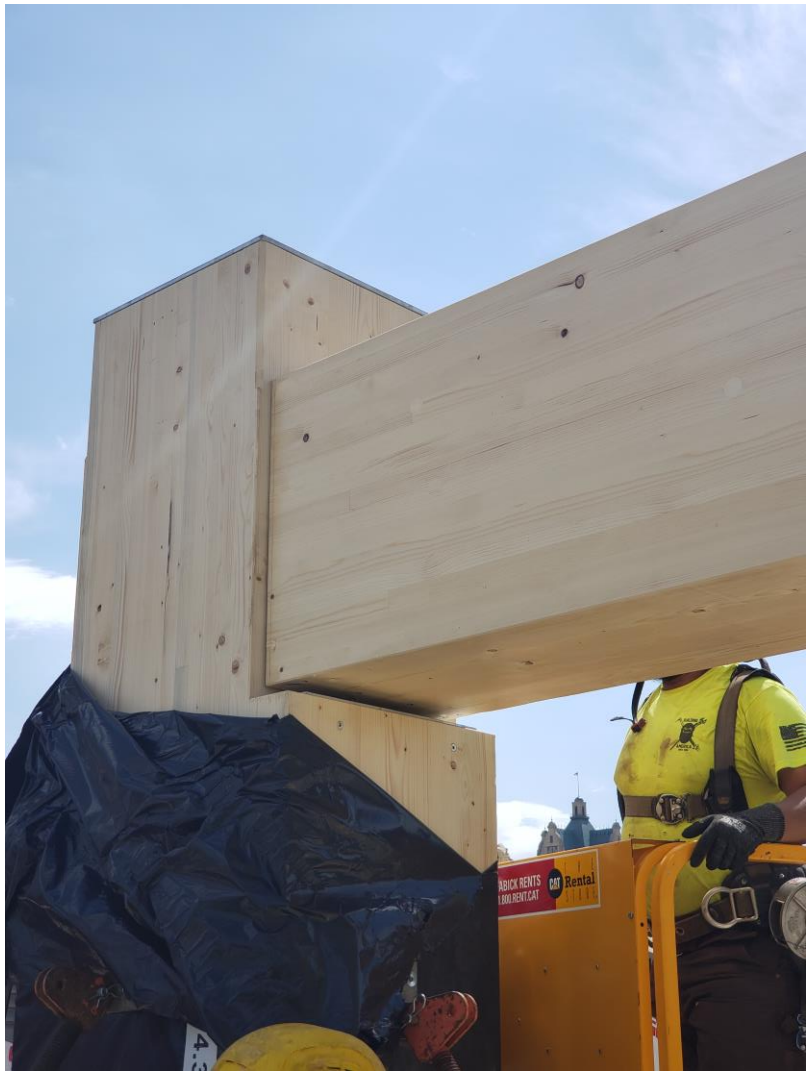
TYPICAL PARKING LEVEL



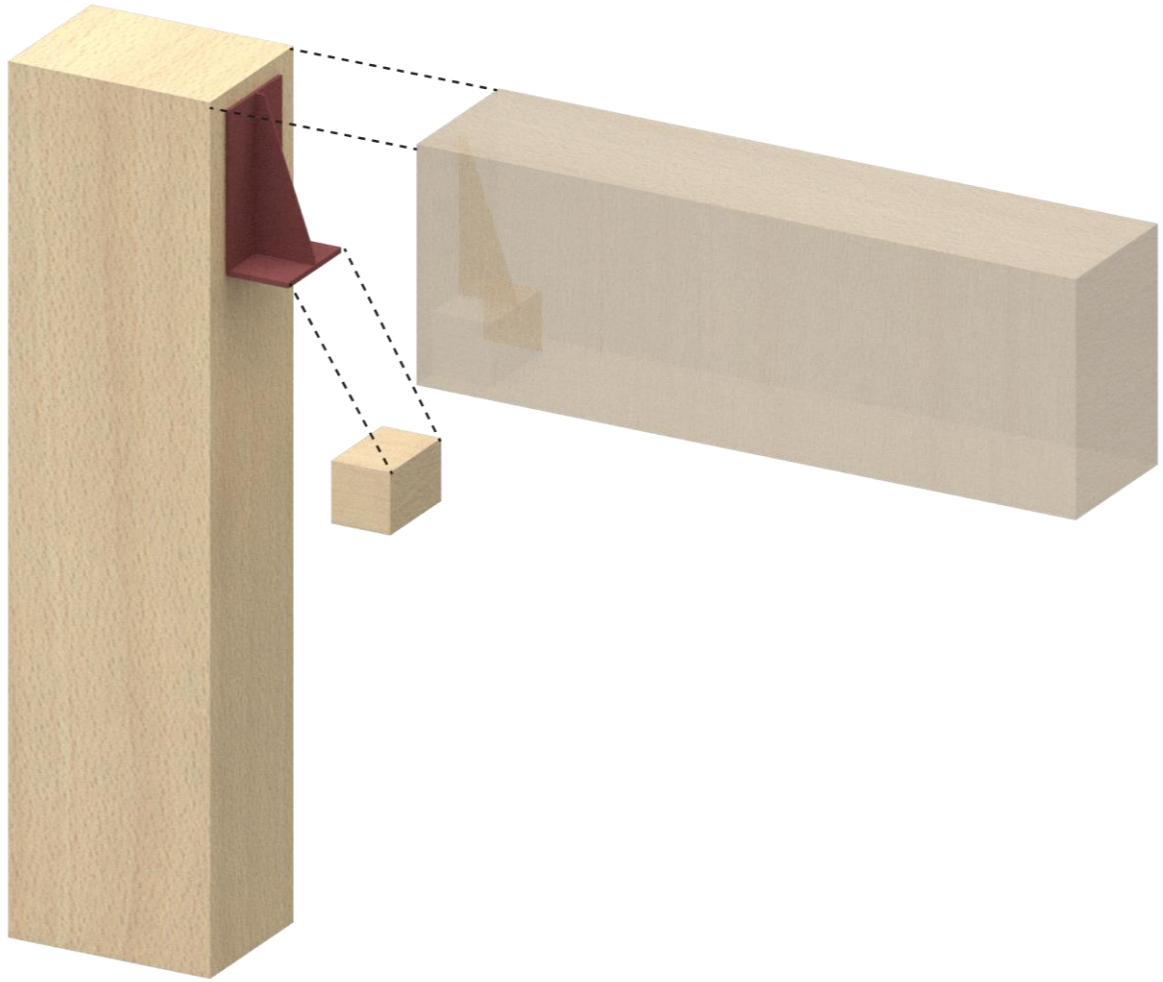
CONSTRUCTION SEQUENCE

CONNECTIONS

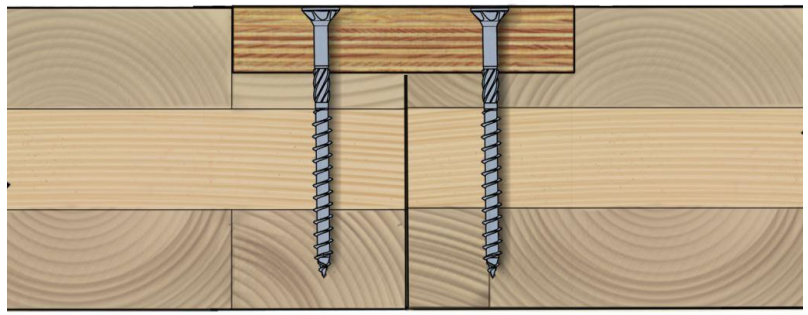




CONNECTIONS



CONNECTIONS




@CD Smith


usbank
HOLE
@Thornton Tomasetti


COMING
SUMMER 2022
AscentMKE.com
SUSTAINABLE LUXURY AT
BEGIN YOUR ASCE


CATALYST CD SMITH

QUESTIONS?

Contact info

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