Disclaimer: This presentation was developed by a third party and is not funded by WoodWorks or the Softwood Lumber Board.
TMBR | CLT STRUCTURAL – FLAT, P&B, HONEY

Source: WoodWorks
TMBR | CLT COMPOSITE SECTION

- Concrete Topping Slab
- Topping Slab Reinforcement
- CLT Floor Plank
- Self Tapping Csk Structural Screw
- CLT Composite Beam
- Composite Beam Shear Connector

3/8" DIAM, x 1 3/8" LONG NELSON SHEAR CONNECTOR WELDED TO 1/4" STEEL PLATE FASTENED TO CLT W/ SK SCREWS AT 3"x3"

#3 REBAR AT 6" ON CENTER IN DIRECTION OF SPAN, 12" ON CENTER PERPENDICULAR TO THE SPAN DIRECTION

CENTERLINE OF SUPPORT

4"  10'-0"  4"

2 1/4" TOPPING

6 3/4" CLT
CEDAR LAKE TRAIL
N 3rd AVE
MASS TIMBER | PROJECTS

TIMBER IS LOOKING UP

OVER 44 TALL WOOD BUILDINGS ARE UNDERWAY OR HAVE BEEN BUILT IN THE PAST 6 YEARS

What's next for Taller Wood? To find out, visit ThinkWood.com/TallerWood
1. STRUCTURE CRAFT, ABBOTSFORD, BC (nlt, dlt)
2. STRUCTURELAM, BC, CANADA
3. KATERRA, SPOKANE, WA
4. FRERES LUMBER CO, LYONS, OR
5. WESTERN STRUCTURES, VENETA, OR (glulam)
6. DR JOHNSON WOOD, RIDDLE, OR
7. TERRALAM CLT, LUFKIN, TX
8. NORDIC, MONTREAL, CANADA
9. Vaagan timbers, colville, wa
10. Smartlam, Galloway, b.c. | Columbia falls, mo | Dothan, al
324,000 SF
ALLOWABLE BUILDING AREA

54,000 SF
AVERAGE AREA PER STORY

6 STORIES MAXIMUM
85' - 0" MAXIMUM BUILDING HEIGHT
324,000 SF MAXIMUM AREA

TYPE IV- HT

IBC 2015
T-3 | CONSTRUCTION
MASS TIMBER | ICC TYPE iv CLASSIFICATIONS 2021

18 STORIES
BUILDING HEIGHT
27V'
ALLOWABLE BUILDING AREA
972,000 SF
AVERAGE AREA PER STORY
54,000 SF

12 STORIES
BUILDING HEIGHT
180 FT
ALLOWABLE BUILDING AREA
648,000 SF
AVERAGE AREA PER STORY
54,000 SF

9 STORIES
BUILDING HEIGHT
85'
ALLOWABLE BUILDING AREA
405,000 SF
AVERAGE AREA PER STORY
45,000 SF

6 STORIES MAXIMUM
85'-0" MAXIMUM BUILDING HEIGHT
324,000 SF MAXIMUM AREA

324,000 SF
ALLOWABLE BUILDING AREA
54,000 SF
AVERAGE AREA PER STORY

TYPE IV-A
TYPE IV-B
TYPE IV-C

IBC 2021

BUSINESS OCCUPANCY [GROUP B]

*BUILDING FLOOR-TO-FLOOR HEIGHTS ARE SHOWN AT 12'-0" FOR ALL EXAMPLES FOR CLARITY IN COMPARISON BETWEEN 2015 TO 2021 IBC CODES.
BROCK COMMONS | EXTERIOR / INTERIOR
ARBORA | CEILING TESTING
MGA | WOOD INNOVATION & DESIGN CENTER
MASS TIMBER PROJECTS | DESIGNED & CONSTRUCTED (dec 2019)

Considering mass timber for a project? Ask us anything.

For free project support, contact: help@woodworks.org
woodworks.org/project-assistance
TMBR | T-3 SECTION PERSPECTIVE
Noise as measured in a lab: Transmission through Framing, Concrete, and CLT plates.
<table>
<thead>
<tr>
<th>CLT Panel</th>
<th>Concrete/Gypsum Topping</th>
<th>Acoustical Mat Product Between CLT and Topping</th>
<th>Finish Floor</th>
<th>STC$^3$</th>
<th>IIC$^3$</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLT 3-ply (3.5&quot;)</td>
<td>3&quot; concrete</td>
<td>Maxxon Acousti-Mat® 3/4</td>
<td>None</td>
<td>53$^3$</td>
<td>45$^3$</td>
<td>72</td>
</tr>
<tr>
<td>1-1/2&quot; Gyp-Crete®</td>
<td></td>
<td>Maxxon Acousti-Mat® 3/4</td>
<td>None</td>
<td>47$^3$</td>
<td>47$^3$</td>
<td>1</td>
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<td></td>
<td></td>
<td>Maxxon Acousti-Mat® ¾ Premium</td>
<td>LVT</td>
<td>48$^3$</td>
<td>48$^3$</td>
<td>15</td>
</tr>
<tr>
<td>CLT 5-ply (6.875&quot;)</td>
<td></td>
<td>USG SAM N25 Ultra</td>
<td>None</td>
<td>45$^3$</td>
<td>39$^3$</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soprema® Insonomat</td>
<td>LVT</td>
<td>48$^3$</td>
<td>44$^3$</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>USG SAM N75 Ultra</td>
<td>LVT Plus</td>
<td>48$^3$</td>
<td>47$^3$</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Eng Wood</td>
<td>47$^3$</td>
<td>47$^3$</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ceramic Tile</td>
<td>50$^3$</td>
<td>46$^3$</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Carpet + Pad</td>
<td>45$^3$</td>
<td>47$^3$</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ceramic Tile</td>
<td>50$^3$</td>
<td>46$^3$</td>
<td>61</td>
</tr>
</tbody>
</table>

Source: WoodWorks
## COMPOSITE SLAB ACOUSTIC PROPERTIES

**BASE ASSEMBLY**
- 6.60' 5-PLY CLT
- 2.29' NORMAL WEIGHT CONCRETE W/ 3/8" DIA. COMPOSITE SCREW CONNECTOR (2'-6" SPACING)

<table>
<thead>
<tr>
<th>CLT Panel</th>
<th>Concrete/Gypsum Topping</th>
<th>Acoustical Mat Product Between CLT and Topping</th>
<th>Finish Floor</th>
<th>STC $^4$</th>
<th>IIC $^4$</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLT 5-ply (3.5')</td>
<td>2-1/4&quot; concrete</td>
<td>Acoustical Mat Product Between CLT and Topping</td>
<td>None</td>
<td>46 $^2$ ASTC</td>
<td>32 $^2$ F1IC</td>
<td>72</td>
</tr>
</tbody>
</table>

Source: WoodWorks
TEST H: SLEEPER SHALLOW SAND ASSEMBLY

1. 6.60" 5-Ply CLT
2. 2.25" Normal Weight Concrete w/ 3/16" Dia. Composite Screw Connector (2"-6" Spacing)
3. 17mm PLITEQ GENIEMAT FF17
4. Wood 2x2 Wood Sleepers w/ Sand (1.5")
5. 5/8" OSB Sheathing
6. 3/8" QTSCU 4005 Sound Insulation Mat
7. 3/4" Engineered Wood Floor
TMBR | MOISTURE DIAGRAM

FIELD APPLIED SURFACE COATING (PROTECT FROM SCREED TOPPING MOISTURE)

FACTORY APPLIED EDGE COATING

MOVE TO TECHNICAL NEW DIAGRAM WITH HOW TMBR ACTUALLY WORKS
TYPICAL SLAB EDGE SECTION DETAIL
1. SLAB BEARING CONNECTION

- Provide over continuous slab edge bars.
- 3'-6" long #9 rebar w/ standard hooks @ 18" O.C. center.
- W/ 1/2" dia. rebar to washers.
- Top of CLT shall be protected with shop-applied coating system and a finish coat of coating material to be specified by architect prior to concrete placement.
- 5/8" ply of cross-laminated timber deck.
- 5/8" dia. composite screw connector placed in shop.
- Pour stop fasteners.
TMBR | ALTERNATE CODE – 20% VS 40%

RCP: SECOND FLOOR DESIRED

RCP: SECOND FLOOR REQUIRED (20% EXPOSED)
Rationale for Increased Exposed Mass Timber Surfaces

Enhanced Fire Protection Features

- **Exposed CLT Deck**
  - Encapsulation: None
  - Tested Rating: 2hrs
  - Calculated Rating: 2 to 2.5hrs

- **Encapsulated Areas / Corridors**
  - Encapsulation: 80 mins
  - Tested Rating: 2hrs
  - Calculated Rating: 3 to 3.5hrs

- **Concrete Terrace Deck**
  - Non-Combustible
  - Tested Rating: 3.0hrs

- **Glulam Framing**
  - Encapsulation: None / 80 mins
  - Tested Rating: 2hrs
  - Calculated Rating: 2.5 to 3.5hrs

Notes:
1. All steel connectors are concealed
2. Concrete topping creates continuous non-combustible barrier between levels
3. Fire-stopping at concrete slabs

2021 IBC Req'd Rating: 2hr
Rationale for Increased Exposed Mass Timber Surfaces

Enhanced Fire Protection Features

Exit Stair Systems
- Non-combustible materials or encapsulated shaft surfaces
- Non-combustible attachments

Exterior Wall System
- Non-combustible materials
- Support and attachments of system are non-combustible

Elevator Shafts
- Non-combustible materials or encapsulated shaft surfaces
- Non-combustible attachments

Notes:
1. Concrete topping slabs are extended to support exterior wall and create non-combustible barrier between levels
TMBR | CHARRING
Design & Tools
This section highlights building code and structural system opportunities related to the design of non-residential and multi-family wood buildings, and provides links to additional resources. For assistance with a project, email help@woodworks.org or contact the Regional Director nearest you.

BUILDING TYPES
- Multi-Family/Mixed-Use
- Educational
- Office
- Commercial Low-Rise
- Industrial
- Civic/Recreational
- Institutional/Healthcare

BUILDING SYSTEMS
- Wood-Frame
- Mass Timber/Composite Systems
- Panelized Roofs
- Timber-Frame

DESIGN TOPICS
- Structural Design
- Fire and Life Safety

DESIGN TOOLS
- Design Guides & Standards
- Design Software
- CAD & REVIT Details
- Online Calculators
- Span Tables
- Inventory of Fire Resistance-Tested Mass Timber Assemblies
- Inventory of Mass Timber Acoustic Assemblies

FUNDING PARTNERS
TMBR | INSURANCE COMPARISON TO ELEVEN
CARBON12'S PIONEERING MASS TIMBER CONSTRUCTION, THE TALLEST IN THE UNITED STATES AT 85 FEET, WILL BE A PRECEDENT, INSPIRATION, AND CATALYST FOR BUILDERS AND ARCHITECTS IN THE UNITED STATES.

THE INCREASED DEMAND FOR THESE WOOD PRODUCTS WILL IN TURN LEAD TO A RESURGENCE OF THE SUSTAINABLE TIMBER INDUSTRY IN THE US, MEANING MORE TREES PLANTED, MORE JOBS CREATED, AND MORE ATMOSPHERIC CO2 SEQUESTERED IN OUR LIVING CITIES.

ENGINEERED WOOD PRODUCTS, SUCH AS GLT STRUCTURAL PANELS ARE THE NEXT BIG REVOLUTION IN CONSTRUCTION. STRONG AS STEEL, LIGHTER THAN CONCRETE, WITH ASSEMBLY TIMES A BARE FRACTION OF OTHER CONSTRUCTION METHODS, AND INCREDIBLY RESILIENT TO SEISMIC FORCES. MODERN MASS TIMBER WILL FOREVER CHANGE THE WAY WE BUILD.

TREES NATURALLY SEQUESTER ATMOSPHERIC CO2 AS THEY GROW. WHEN THEY DECOMPOSE OR BURN, THAT CARBON IS RELEASED BACK INTO THE ATMOSPHERE. WHEN HARVESTED FOR TIMBER, THE CARBON IS FOREVER LOCKED AWAY INTO THE WOOD.