Disclaimer: This presentation was developed by a third party and is not funded by WoodWorks or the Softwood Lumber Board.
NORTH AMERICAN
CLT/nlt/dlt
MANUFACTURERS

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
CARBON 12 | PORTLAND, OR
T-3 | CONSTRUCTION TYPE

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
MASS TIMBER | ICC TYPE iv CLASSIFICATIONS 2021

**TYPE IV-A**
- 18 STORIES
- BUILDING HEIGHT: 37V'
- ALLOWABLE BUILDING AREA: 972,000 SF
- AVERAGE AREA PER STORY: 54,000 SF

**TYPE IV-B**
- 12 STORIES
- BUILDING HEIGHT: 180 FT
- ALLOWABLE BUILDING AREA: 648,000 SF
- AVERAGE AREA PER STORY: 54,000 SF

**TYPE IV-C**
- 9 STORIES
- BUILDING HEIGHT: 85'
- ALLOWABLE BUILDING AREA: 405,000 SF
- AVERAGE AREA PER STORY: 45,000 SF

**TYPE IV-HT**
- 6 STORIES MAXIMUM
- 85'-0" MAXIMUM BUILDING HEIGHT
- 324,000 SF MAXIMUM AREA

**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.*
TMBR | T-3 SECTION PERSPECTIVE
TMBR | STRUCTURAL GRID ROTATION
TMBR | FLAT SLAB SECTION – SOM

Typical Framing Section
“Flat Slab” Scheme

Notes:
1. Refer to current architectural plans for actual dimensions and locations.
TMBR | FLOOR PANELIZATION PLAN

GVLAM BEAM, GVLAM COLUMN, AND GVLAM BAND BEAMS CONSIST OF 25 PIECES PER FLOOR.

TYPICAL CLT FLOOR PANELS
49 PANELS PER FLOOR.

CLT BAND BEAMS
7 PANELS PER FLOOR.

CAST-IN-PLACE CONCRETE PATIO SLAB

CONCRETE CORE: 14" THICK WALLS TYPICAL, WITH LINK BEAMS AND FLAT PLATE FRAMING.
2'-6" THICK END WALL

COLUMN-LINE CLT PANELS
HAVE A CENTER LEAVE OUT, PLACED OVER SINGLE STORY COLUMNS

-- MAIN UNIT PANEL END BAY OFF CUT
DASHED LINE IS KATERRA MASTER PANEL, WHEN OFF CUTS ARE USED THE UTILIZATION RATE IS 98%

OFFSET FROM STANDARD CLT PANEL USED AT ENDS OF BUILDING TO REDUCE WASTE
Noise as measured in a lab. Transmission through framing, concrete and CLT plates.
## CLT ACOUSTIC PROPERTIES

<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</th>
<th>IIC</th>
<th>Source</th>
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<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>53² STC</td>
<td>45² IIC</td>
<td>72</td>
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<td></td>
<td></td>
<td></td>
<td>Carpet + Pad</td>
<td>49² AIC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LVT</td>
<td>49² AIC</td>
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<tr>
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<td>Maxxon Acousti-Mat® ¾</td>
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<td>49² ASTC</td>
<td>45² AIC</td>
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<td>Premium</td>
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<td>LVT</td>
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<td></td>
<td></td>
<td>LVT</td>
<td>49² AIC</td>
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<td>1-1/2&quot; Gyp-Crete®</td>
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<td></td>
<td></td>
<td>LVT</td>
<td>49² AIC</td>
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<td>LVT</td>
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<td></td>
<td>LVT</td>
<td>48⁰</td>
<td>47⁰</td>
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<td></td>
<td>LVT Plus</td>
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<td>49⁰</td>
<td>58</td>
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<td>Eng Wood</td>
<td>47⁰</td>
<td>47⁰</td>
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<tr>
<td>1-1/2&quot; Levelrock® Brand 2500</td>
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<td>Carpet + Pad</td>
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<td>LVT</td>
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<td>LVT Plus</td>
<td>48⁰</td>
<td>49⁰</td>
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</tbody>
</table>

Source: WoodWorks
TMBR | COMPOSITE SLAB ACOUSTIC PROPERTIES

Base Assembly:
1. 6.69” 5-Ply CLT
2. 2.36” Normal Weight Concrete w/ 5/8” Dia. Composite Screw Connector (24” Spacing)

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<td>CLT 5-ply (1.5”)</td>
<td>2-1/4” concrete</td>
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<td>None</td>
<td>49.1</td>
<td>22.1</td>
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</tbody>
</table>

Source: WoodWorks
TEST E: CARBON 12 MODIFIED ASSEMBLY

1. 6.60” 5-Ply CLT
2. 2.25” Normal Weight Concrete with 5/8” Dia. Composite Screw Connector (2’-6” Spacing)
3. 1” Fiberglass Insulation Board
4. 9/32” DensDeck Roof Board
5. (2) 6 Mil Polyethylene Film Layers
6. 1-1/2” Gypcrete
7. 3/8” GTSCU 4005 Sound Insulation Mat
8. 2” Engineered Wood Floor
Rationale for Increased Exposed Mass Timber Surfaces

Enhanced Fire Protection Features

1. Typical Composite Floor Detail

Timber-Concrete Deck System

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

2. Exterior Wall Section

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

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

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

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

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

2021 IBC Req’d Rating: 2hr
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 & BIM Details
- Online Calculators
- Span Tables
- Inventory of Fire Resistance-Tested Mass Timber Assemblies
- Inventory of Mass Timber Acoustic Assemblies

FUNDING PARTNERS
