

5 steps to using mass timber in multifamily housing

A design-assist approach can provide the most effective delivery method for multifamily housing projects using mass timber as the primary building element.

<https://www.bdcnetwork.com/Mammone5tipsMassTimber>

BY TONY MAMMONE, MASS TIMBER SERVICES | NOVEMBER 2022



Terrace House condominiums, Vancouver, B.C., mass timber residences designed by Shigeru Ban Architects.

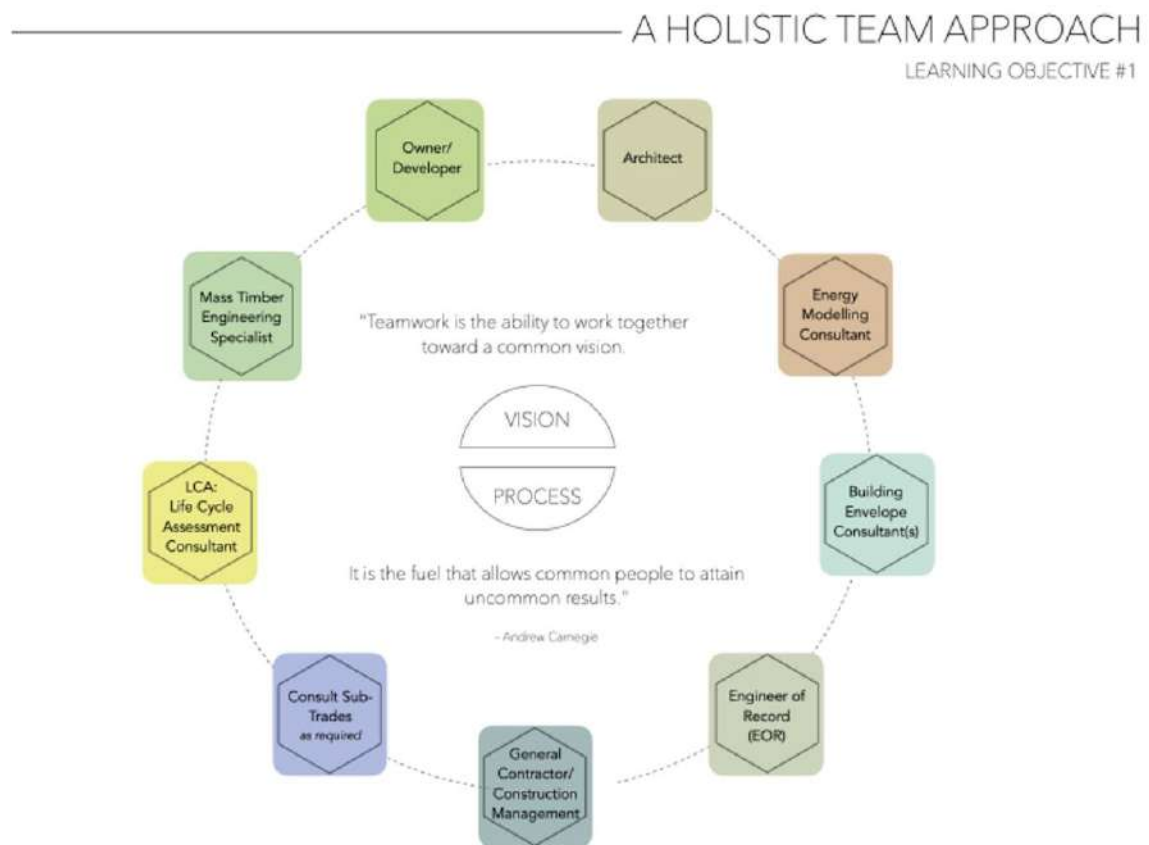
The use of mass timber, such as cross laminated timber (CLT) and glue laminated timber (GLT) panels, is gaining interest among architects, interior designers, contractors, structural engineers, and real estate developers in the U.S., Canada, Europe, and Asia. Mass timber is particularly appropriate for the multifamily sector: apartment and condominium residences, senior living, and student housing.

Multifamily project teams should consider adopting a 5-point design-assist approach as a way to achieve the aesthetic, budgetary, financial, and marketing goals of the developer.

1. Establish a holistic team to achieve the developer's budget goals.

The design-assist approach, such as the one we use at Mass Timber Services, brings together multiple trades and consultants early on in the preconstruction process. It's crucial for the entity leading the design-assist initiative to choose like-minded, passionate, dedicated AEC professionals from firms who share the greater mission: to use mass timber to reduce carbon emissions, save energy, and combat climate change, while achieving a beautiful, highly functional multifamily residences that meet the business needs of the developer and the "human" needs of the occupants.

Initial meetings must clearly identify the scope of the project and determine trade-specific details needed to ensure the right product with the right amenities is being built for the market.



Source: Mass Timber Services

Don't rush to pick your team members. It's much more important to pick the right ones than it is to pick them quickly, as the information exchange between the trades and consultants impacts each of them. Cross-trade communication and strategic planning optimize timelines and can ultimately save money.

For mass timber design-assist multifamily projects, it is important to choose a facilitator firm with a track record in the use of mass timber – one that understands the manufacturing, engineering, design, and construction management aspects of such a project and has a global perspective on sourcing the right mass timber materials for the specific job.

2. Use a preconstruction approach to estimate construction costs and analyze your building system.

Integrating mass timber building systems is an intelligent process. Preconstruction proposals are prepared after concept development and engineering modeling, to provide cost and schedule certainty for the projects. Both the ultimate purpose of the residential building and building codes need to be considered when determining best building materials, building strategy, and building systems.

In the initial stages of the project, multifamily developers will typically use their data from previous development projects, attempting to account for similarities and differences in their estimate. However, due to constantly changing economic factors, it can be difficult to determine an exact budget, at least at first. Each specialty project team member on the project must provide the most accurate, current market pricing which aligns everyone toward an agreed upon budget.

Preconstruction proposals include the detailed quantity take off, engineering review, preparation of building specifications, duration for erections of the structure, logistical planning suggestions, and schedules.

The following chart provides a schematic visualization of a full-service design and product offering.

Services: Design-Assist Phase and Construction Phase



Design-assist and construction phase services. Source: Mass Timber Services

3. Employ automation in design for cost efficiency.

The automation process in mass timber design speeds up delivery of the entire building and provides top-quality materials, allowing prefabrication at the highest levels of quality and accuracy.

Flat pack standardization and modular thinking reduce costs by taking advantage of CNC programming and the factory-automated environment. Materials are first harvested and dried in the kiln before the lamination process. In the fabrication phase, detailed shop and production drawings, defining sizing and materials, are converted to machine language. The building arrives in containers with components mapped for just-in-time installation and connector assembly on site.



Fabrication of mass timber components and preinstalled connectors. Angle cuts require top-level equipment to get them right. Source: Mass Timber Services

Delivering the panels to the job site requires skill, knowledge, and experience. Be sure to use a mass timber supplier with a proven record of logistical excellence.



CLT panels have predrilled holes for easy and accurate connection on site. Timber beams are protected with peel-and-stick layers to keep out moisture. Just-in-time delivery is crucial, since crane time for lifting the panels into place can be costly. Source: Mass Timber Services

4. Consider the multipurpose use of engineered wood panel products.

The use of prefabricated mass timber walls, floors, roofs, and shear walls and interior wood panels purposes the materials for dual structural and decorative uses. Interior walls, partitions, and ceiling softwood (solid core) multi-ply panels – which are 3-layer version of CLT – can replace drywall on walls, which eliminates the need for mudding, sanding, and multiple paint applications.

Known as Nano CLT, these laminated panels range in cost from \$3-10 per square foot depending on wood species selected. Used as encapsulation material for less appealing structural surfaces, this product can enhance the "face" or "look" of a building – in a lobby, as an accent wall, in a lounge area, in an apartment or condominium unit, or in an external soffit.



Nano CLT comes in 3-ply and 5-ply configurations and in panel sizes up to 6X15 feet. The panels can replace drywall in multifamily projects, saving time and making for a cleaner job. Source: Mass Timber Services

Adding finishing touches through the use of decorative engineered wood enhances the biophilic benefits of a multifamily residential, thereby increasing the value of the space.

New MTS NANO CLT Solid Core Structural Panels



- **Areas of application**

- Load-bearing roof, ceiling and wall elements
- Effective acoustic panels
- Flame spread ratings
- Prices start at \$3 Cdn/ sq ft
 - vs \$16/sq ft for CLT installed

- **Properties**

- Large Standard formats 2 x 6 m
- Thicknesses from 20 to 75 mm
- Various Wood Species
- Natural building material, climate-friendly
- Visually attractive surfaces

Nano CLT solid core structural panels can be used for load-bearing elements or as acoustical or aesthetic touches. Source: Mass Timber Services

5. Incorporate biophilic architecture into your mass timber project.

Biophilia is emerging as an essential element in new builds, exalting high-performance design into the forefront of 21st-century building.

Architectural opportunities now center nature in design with human-made environments where occupants experience improvements in stress levels, productivity, creativity, and overall wellness.