MASS TIMBER CONSTRUCTION MANAGEMENT

Planning
- Anatomy of a Mass Timber Package
- Procurement, Supply Chain, Schedule Drivers

Performance
- Site Planning
- Moisture Planning and Mitigation
- UV Planning and Mitigation

Workforce Training
- Strategic Partnerships
- Training/Education
- Resources
# Sample Procurement Strategies

<table>
<thead>
<tr>
<th>GC/CM Hires Turnkey Mass Timber Subcontractor</th>
<th>GC/CM Buys Material, Self-Performs Installation and Coordinates</th>
<th>GC/CM Buys Material, Subcontracts Labor and Coordinates</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Hiring experience</td>
<td>+ Hiring experience</td>
<td>+ Potential added mark-up</td>
</tr>
<tr>
<td>+ Single point of responsibility</td>
<td>+ Single point of responsibility</td>
<td></td>
</tr>
<tr>
<td></td>
<td>+ Financial security of strong GC/CM</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Prequalify capacity of subs</td>
<td>- Lack of familiarity with supply chain</td>
<td>- Multiple layers of coordination</td>
</tr>
<tr>
<td>- Potential added mark-up</td>
<td>- Steep learning curve for coordination</td>
<td>- Prequalify capacity of sub</td>
</tr>
</tbody>
</table>

**RISK SPECTRUM**

Source: Timberlab
Anatomy of a Turnkey Mass Timber Package

- Project Overhead: 7%
- Labor: 15%
- Material: 64%
- Equipment: 14%

Source: Swinerton
Material (Direct Cost)

Turnkey Mass Timber Package

Source: Swinerton
Mass Timber Package Costs

Panels are the biggest part of the biggest piece of the cost pie

Source: Swinerton
Labor (Direct Cost)

Turnkey Mass Timber Package

Source: Swinerton
Equipment (Direct Cost)

Turnkey Mass Timber Package

Source: Swinerton

Photo: Swinerton

Photo: Alex Schreyer
Project Overhead

- Turnkey Mass Timber Package: 64%
- Cost Analysis: 15%
- Design Refinement: 14%
- VD&C: 7%
- Detail Optimization: 7%
- System Integration: 7%
- Logistics Planning: 7%

Source: Swinerton

Photos: Swinerton
CONSIDERATIONS:
- Ceiling Treatment
- Floor Topping
- HVAC System & Route
- Foundation Size
- Material Savings
- Perimeter glazing
- Value of Time
- Completion Bonds/Insurance
Potential Cost Impacts: Design-Bid-Build Procurement
Alternate Procurement Option:
Trade Partner/Master Builder Approach
Procurement Strategy is Key to Success

5% Savings  Neutrality  10% Premium
Understand the Supply Chain
Understand Manufacturer’s Capabilities

Credit: Tanya Luthi, Entuitive
Understand Manufacturer’s Capabilities
Embrace the Prefab Advantage
Tolerances: Interface with Other Structural Materials
Schedule Drivers

Photo: Swinerton
Procurement Approach Determines Schedule
Procurement Logic for Scheduling

Shop drawings, Planning, Fabrication, Delivery

Mass Timber Installation

Source: Swinerton

Example 6 Story Type IIIA Project
Schedule Comparison

Image: Swinerton

Photo: WoodWorks
Overall Project Schedule Analysis: 12 Story Type IV-B

Source: Swinerton
Schedule Drivers
Schedule Impacts: Hybrid Structures
A large scale MT project can be up to 2% higher in direct costs, but a minimum of 20% lower in project overhead costs. The net result is cost-neutrality and higher value.

Source: Swinerton
Photo: Alex Schreyer
BIM/Digital Twins

Photos: Swinerton
Embracing BIM for Fabrication

Photos: Swinerton
Early Move-In for Rough-In Trades.

Photos: Swinerton
SITE PLANNING

Photo: Swinerton
Sequencing
# Tall Mass Timber Special Inspections

**TABLE 1705.5.3**  
**REQUIRED SPECIAL INSPECTIONS OF MASS TIMBER CONSTRUCTION**

<table>
<thead>
<tr>
<th>Type</th>
<th>Continuous Special Inspection</th>
<th>Periodic Special Inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Inspection of anchorage and connections of mass timber construction to timber deep foundation systems.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>2. Inspect erection of mass timber construction</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>3. Inspection of connections where installation methods are required to meet design loads.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1. Threaded fasteners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1.1. Verify use of proper installation equipment</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>3.1.2. Verify use of pre-drilled holes where required</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>3.1.3. Inspect screws, including diameter, length, head type, spacing, installation angle, and depth.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>3.2. Adhesive anchors installed in horizontal or upwardly inclined orientation to resist sustained tension loads</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>3.3. Adhesive anchors not defined in 3.2.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>3.4. Bolted connections</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>3.5. Concealed connections</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Table is only required for Type IV-A, IV-B, and IV-C

Source: International Building Code
Planning for Environmental Exposures

• Plan Early
• Risk Evaluation
• Develop Construction Phase Plan
• Execute the Design and Moisture Management Plan
• Monitor

RDH Moisture Management Guide 1st Ed
On Site Considerations
On Site Considerations
Onsite Considerations
Other Materials
Workforce Development
Training is the key to efficiency
Training takes time and money

Training versus Education

Resources available to all
MT Construction Manual
Installer Curriculum
Other WW Resources
CM Workshops
Previous recorded versions
Learning Management System
Mass Timber Construction Management Program

- Mass Timber Construction Manual
- 8- & 16-Hour Installer Training Package and Training Centers
- Community College and University CM Programs
- Virtual and/or In-Person Workshops
- Partnerships with Construction Associations
- Project Tours
- Engage with General Contractors across the US
Partner Training Centers

- Active University Program
- Active Training Center Program
- Negotiating Training Center Program
- Desired Training Center Program
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- Lateral System Design
- Alternate Means of Compliance
- Energy-Efficient Detailing
- Building Systems & Technologies

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Questions? Ask me anything.

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