MSU STEM Building CM Case Study & Mass Timber Education

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MSU STEM Building CM Case Study: Project Overview
MICHIGAN STATE UNIVERSITY: STEM

PROGRAM GOALS

1. Improve and enhance the undergraduate learning experience, support teaching and learning, attract more students in STEM disciplines, and better prepare them for professional careers in STEM fields.

2. Bring together outdated teaching laboratories and instructional support spaces; support changes in STEM curriculum and teaching methods.

3. Create a campus hub for teaching and learning across the sciences, arts and humanities.

BUILDING PROGRAM

• Undergraduate Teaching Laboratory space of approximately 120,000 GSF
• Modular, flexible active learning teaching labs
• Student breakout spaces, project labs in support of curriculum innovation
• STEM Gateway courses in:
  - Biology
  - Chemistry
  - Computer Science
  - Materials Science
  - Physics
MICHIGAN STATE UNIVERSITY: STEM

$110.1 MILLION BUDGET

SCHEDULE
COMPLETION DATE:
Spring 2021

120,000 Sq. Ft. new construction
40,000 Sq. Ft. renovation space
16,000 Sq. Ft. new classroom space
Mass Timber Construction Management: Unique Considerations for Success
Mass Timber Construction Management: Unique Considerations for Success
MSU STEM Building CM Case Study: Lessons Learned
Early Team Integration is Critical

» Timber design and fabrication
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» Timber design and fabrication

» Early transition to delegated design
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» Timber design and fabrication

» Early transition to delegated design

» Lean out process between engineer-mfg/fabricator-shipping for JIT delivery

Source: Granger Construction
Early Team Integration is Critical

» Timber design and fabrication

» Early transition to delegated design

» Lean out process between engineer-mfg/fabricator-shipping for JIT delivery

» Early implementation of VDC
Early Integration because Coring Locations Matter
Early Integration to Gain Schedule Compression

- **Foundations**: Potential for smaller Foundations
- **Mass Timber Structure**: Faster Erection (Prefabrication)
- **MEP**: MEP Coordination by level & Install Faster
- **Interior Finishes**: Less Finishes with Exposed Timber

**Overall Mass Timber Schedule**

Earlier Start for Trades Following Timber Structure

- Mass Timber Construction Management: Unique Considerations for Success
- **Potential Schedule Savings Mass Timber vs. Steel**

Source: Granger Construction
Insurance
Logistics

- Daily communications
- Material availability? Productivity gains
Trades Coordination

» Local coordination

» Faster turnover
  » Pull planning
  » Work pace
  » JIT delivery criticality
Steel Integration

» Delineate scope

» Color-coded drawings

» Phasing plan
Protect Work in Place

» Assigned to subcontractor work scopes

» Moisture management

» Physical protection

» Cleaning
Bottom Line

» Communications was critical – direct tie to integration

» Dedicated, documented planning systems

» Document the details – “buildings fail at the intersection of contracts”
Mass Timber Education

Source: MSU CM Program
Goals of Mass Timber CM Education

» Consistency with program accreditation
» Industry standard- and practice-based
» Blend of theory and practice with hands-on elements
» Case- and project-based learning
» Integrated concepts/systems-focused
» Create scalable, replicable, national model curriculum
Industry Standards: USDOL Competency Model Framework

» Add focused content at mid-upper levels

» Builds on core CM knowledge
Mass Timber Construction Management

Introduction and Overview

This paper provides an overview of best practices from the WoodWorks Mass Timber Construction Management Program, including key resources such as construction management education, installer training opportunities, the WoodWorks Innovation Network and the forthcoming Mass Timber Construction Manual.

- Construction Management Training
- Mass Timber Construction Manual
- Installer Training
- Find Your Team – WoodWorks Innovation Network

commercial and multi-family wood buildings. The traditional WoodWorks audience has been primarily architects and structural engineers. However, during our work with these groups, we identified a gap, specific to mass timber, between design firms and the contractors who would ultimately build these projects. In short, contractors experienced with concrete and steel had virtually no experience with mass timber. This resulted in skewed pricing of mass timber to cover the unknowns, including risk and perceived liabilities. As a result, projects that could have been built in mass timber were constructed in other materials.

To address critical gaps in knowledge and skills among contractors and installers, WoodWorks created the Mass Timber Construction Management Program as a pilot in 2019.
Mass Timber Construction Management: Unique Considerations for Success

Theory, Practice, and Hands-On

Source: George Berghorn
Mass Timber Construction Management: Unique Considerations for Success

Source: WoodWorks
Thank You!

Questions?

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