Schedule Management

Presented by Swinerton Mass Timber



Disclaimer: This presentation was developed by a third party and is not funded by WoodWorks or the Softwood Lumber Board.

Learning Objectives

Schedule

Design Completion

- Speed of design completion needs to consider time for constructability review and adjustments.
- Ideally, the project delivery method allows to bring on structural + MEPF trade partners prior to design completion
- If project delivery method does not allow for early constructability review, budget more time for RFIs and shop drawings
- Example of constructability feedback: Designing to accommodate tolerances of concrete/steel. Many times, a ½" gap between steel/concrete and CLT is acceptable for clearance reasons but we have had bearing issues in the past and giving an inch of play on each side should be our goal going forward.
- Basis of design must consider that Manufacture availability is ranging 3-10 months out, a sole source design could delay the project schedule
- Consider time for 3rd party fire / code review and adjustments

Trade Coordination

- Other structural trades must have shop drawings and corresponding 3D model approved / "locked" for fabrication before timber detailing starts or risk rework
- The MEPF model sign off procedure needs to be completed with a finish to finish relationship with mass timber shop drawing review, assuming "as late as possible"
- The goal is that coordination is occurring 3-6 months earlier in the project than conventional practice this is a big shift

Procurement

- AEC team should plan for a big push to get through shop drawing review
- · Lingering questions from shop drawing review could drag on for weeks or months if not addressed definitively
- Duration from shop drawings to production start varies by supplier
- Reconcile truck loading with construction sequence to reduce time for intermittent handling

Construction

- Logistics, laydown space, truck flow is critical to speed of installation. Tight sites and a lack of access to the crane dramatically decreases workflow and increases crew size. Space for crane and at minimum 1 truck in swing radius is needed.
- Best timing for construction is during dry months (varies by region) this timing is influenced by items 1, 2,3 above
- Advancing of permeant lateral system to stabilize frame as soon as possible and shorten duration of temporary bracing
- Prepare follow-on trades to take advantage of swift structure installation
- Install roof as quickly as possible

Scheduling Overview

Mass Timber scheduling must consider:



Example Project Schedule



DESIGN COMPLETION

How much time will it take to get from here to fabrication-level 3D model?

Trade Partner Integration

Ideally, the project delivery method allows for bringing on structural + MEPF trade partners prior to design completion





RFI Process



- If project delivery method does not allow for early constructability review, budget more time for RFIs and shop drawings
- Speed of design completion needs to consider time for constructability review and adjustments.
 - If involved early, you can provide constructability feedback as the design progresses
 - If not, plan for an extensive RFI period
- Basis of design must consider that Manufacturer availability is ranging 3-10 months out, a sole source design could delay the project schedule.

Constructability Feedback



Designing to accommodate tolerances of concrete/steel: Many times, a ½" gap between steel/concrete and CLT is acceptable for clearance reasons but we have had bearing issues in the past and giving an inch of play on each side should be our goal going forward.



Code Review Expectations



TRADE COORDINATION

What are the considerations for orchestrating multiple scopes in a VD&C process?

Early Award Trade Packages

- Coordination is occurring 3-6 months earlier in the project than conventional practice. This is a big shift.
- All factory penetrations must be finalized during the shop drawings process.



BIM Coordination Mandatory and Early



Fabrication-Level Models



Other structural trades must have shop drawings and corresponding 3D model approved / "locked" for fabrication before timber detailing starts – or risk rework

MEPF Coordination for Prefabrication



PROCUREMENT

How long will it take for materials to arrive on site?



ZYLSTRA SCHEDULE 37,000 SF Mass Timber Structure

Material Lead Time



- For small (<50,000 SF) projects, RFI and shop drawing process consumes the bulk of material lead time.
- For large (>100,000 SF) projects, production duration begins to exceed shop drawing duration.
- Material Lead Time is a function of how developed and detailed the drawings are
- Larger projects must be procured earlier, especially if there are production constraints. Plan to stockpile material.

Nov 11 Award Mass Timber Supplier



Shop Drawing Submittals

OFA Set Geometry Model Slab Edge Confirmation Member Sizing and Dimensions Accurate Includes major openings	Review		IFC Set Single Piece Shop Drawings Connection Detailing Penetration Confirmation
<u>Hiccups:</u> Consider exterior dimensions, such as wall assembly thickness. Consider shafts through non-rated or 1hr rated floors.			<u>Hiccups:</u> Are permits approved? Permit comments may affect procurement if design is not engineered correctly.
Nov 12 - Mar 12 Mass Timber Shop Drawing Submittals (OFA set) Mar 13 - Apr 1 Mass Timber Shop Drawing Review & Approval			

Mass Timber IFC Drawings Finalized

Shop Drawing Review



Review

- AEC team should plan for a big push to get through shop drawing review
- Lingering questions from shop drawing review could drag on for weeks or months if not addressed definitively

Project Phasing & Sequencing



CONSTRUCTION

How fast can we build?

Truck Flow



Logistics, laydown space, truck flow is critical to speed of installation.

Tight sites and a lack of access to the crane dramatically decreases workflow and increases crew size.

Space for crane and at minimum 1 truck in swing radius is needed.

Off-Site Storage



Temporary local storage and local delivery of materials

Proper protection of material

Proper documentation of hand off of material – BIM 360 Field Checklists

Piece Count

Productivity is based on piece count

More pieces = Longer Install Duration

Different suppliers manufacture panels of different lengths

A job may have 80 CLT panels with Supplier X, and 100 CLT panels with Supplier Y.

Fair-Weather Planning

 Best timing for construction is during dry months (varies by region) this timing is influenced by items 1, 2,3 above

Lateral System Construction

Advancing of permeant lateral system to stabilize frame as soon as possible and shorten duration of temporary bracing

Early Move-In for Follow-On Trades

• Prepare follow-on trades to take advantage of swift structure installation

Roof Installation

Install roof as quickly as possible

This concludes The American Institute of Architects Continuing Education Systems Course

Zach Brehm & Chris Evans

Swinerton Mass Timber

cevans@swinerton.com