Mass Timber Construction
Case Study on: Site Logistics and Field Considerations

Shawmut Design and Construction
Presented by:
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TOGETHER. LET’S BUILD.

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

AGENDA
1.0 Case Study Project Context
2.0 Preconstruction Considerations
   Influence Design to Optimize Field Operations
   Field Logistics and Sequencing
3.0 Execution
4.0 Lessons Learned
5.0 Final Thoughts
PROJECT CONTEXT
Key Project Challenges

• Schedule and Speed
• Aggressive Institution Wide Sustainability Goals
• Adjacent Concrete Flat Plate Dormitories
• Design Goal to Create Artist Loft Experience
• Interest in Mass Timber
Project Schedule
Integrated Project Delivery
Choosing by Advantages
PRECONSTRUCTION CONSIDERATIONS
Typical Cross-Section

Source: NAADA Architects
Hybrid Steel – CLT Construction

FEATURES

• Steel Frame with CLT Slabs
• One-way CLT Panels – Entire Building Width
• Construction Type
  • Type 1B Construction – Below Lvl 2
  • Type 3B Construction – Above Lvl 2
• Exposed CLT Ceilings
• Topping slab and Acoustic Isolation Mat for Sound Isolation
Floor Assembly – Acoustic Preparation

IBC 2015 SOUND TRANSMISSION (1207)

- Sound Transmission Class \( \geq 50 \)
- Impact Insulation Class \( \geq 50 \)

FINAL ASSEMBLY (USG PRODUCTS):

- USG Levelrock SAM-N25 Ultra – Sound Attenuation Mat
- USG Levelrock Sound Reduction Board
- USG Levelrock 3500 Floor Underlayment (2” min thickness)
Panel Layout Optimization
CLT SURFACE SPLINE CONNECTION IN SHEAR

SCALE: 1 1/2" = 1'-0"
2" GYPCRETE TOPPING
APPROX. 1" ACOUSTIC MAT
PRODUCT, SEE ARCH. DWGS.

5-PLY CLT FLOOR PANEL

WF STEEL BEAM

SELF-TAPPING SCREWS
THROUGH WF BEAM TOP
FLANGE INTO CLT. SCREWS SIZE
AND SPACING TO BE DESIGNED
BY CLT DESIGNER (PROVIDE 2
SCREWS AT 12" O.C. MAX)

TYPICAL CLT FLOOR ASSEMBLY DETAIL

① DETAIL
SCALE: 1 1/2" = 1'-0"
BRICK VENEER WITH COLD-FORMED STEEL FRAMING BACKUP WALL (DEIGNED BY OTHERS), SEE ARCH. DWGS.

DETAIL HAS BEEN REVISED DURING SUBMITTAL REVIEW PROCESS. SEE STEEL FABRICATION DRAWINGS ISSUED FOR FIELD USE.

CLT FLOOR SLAB ASSEMBLY, SEE TYP. CLT FLOOR ASSEMBLY DETAIL.

WF STEEL BEAM, TYP.

SEE TYPICAL BRICK RELIEVING ANGLE DETAIL, TYP.

LEVEL 3
140' - 9"
MEP Coordination

Early steel release (10/18), all utilities exposed in corridors with no ceilings, > 400 beam penetrations, **0 penetrations added in the field.**

Utilities include sprinklers, refrigerant lines (3-pipe VRF), condensate lines, supply and exhaust ducts (ERV), roof drains and overflows, domestic plumbing and sewerage, lighting and electrical, IT with conduit and cable trays, etc.
MEP Coordination
FIELD EXECUTION
Key Issues

• Mix of Trades – Wood and Steel Erector
• Fasteners Chosen for Speed
• Most Holes Field Drilled – Simplifies Coordination
• Diaphragm Design Using Spline Connectors
• No Welded Connection
• Laydown / Trucking Plan
• Lay Down Strategies
• Decoupling delivery from jobsite Demand
• Critical Artery for University / Community (Off Hour Delivery)
• Street and Sidewalk Closures
• Crane Position and Obstructions
• No-fly Zones
All Field Connections Bolted
Weak Axis Column Bracing at Floors
Unframed Openings in Floors
Moisture Management Plan Summary

- Expectations
- Sealers
- Stain Prevention
- Moisture Control
LESSONS LEARNED
Early coordination of penetrations

Edge of wall tolerance of CLT vs firesafing detail and track overhang.

Through bolt anchors for roof davits (exposed ceilings)

Width of walls at columns to conceal column penetration firesafing.

Rigging Points

Exposed ceilings require additional acoustic isolation at the floor

Coordination of spline nailing pattern between Nordic shops before buying Install.
FINAL THOUGHTS
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