WEBINAR

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Mid-rise Wood Frame Coordination

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Introduction

Steve Bumbalough

• 30 Years in Fabrication and Design
• Alpine, a Division of ITW
• ITW’s Vision: Empower the Engineer
• Engineered Framing and Trusses
What is Light Frame Construction?

- Framing is the fitting together of pieces to give a structure support and shape.
- Framing materials are usually wood, engineered wood, or structural steel.
Two Broad Categories of Framing

• Heavy-frame construction where vertical supports are few and heavy such as in timber framing, pole building framing, or steel framing.

• Light-frame construction many smaller supports include balloon framing, platform and light-steel framing.
What is Light Frame Construction?

Standardized *dimensional lumber* dominates in North America and Australia because of its economy.
Light Frame Construction

- Complexity levels are increasing
- Lots of moving pieces
- Most Trades follow framing
- Coordination is tough
LOD Example

LOD 100

LOD 200

LOD 350
MEP Coordination
MEP Coordination

- When available, use a BIM capable MEP contractor
- If not, MEP modeled by GC team
- Field personnel must buy in
Typical Unit Coordination Process

Each color represents trade comments

25 Coordination Issues in (1) Unit
BIM Integrated with Vendor Software and Equipment

- Cut to length
- Inkjet Marked
- Holes routed in floor system
BIM Direct to I-Joist Cutting and Marking
Integrated Foundation Modeling

- Slab/Post Tension
- Rebar & PT Cables
- Embeds & Anchors
- Plumbing Inserts
Forming/Anchor Bolt Placement

- Exact dimensions
- Embeds dimensioned from framed models
- Critical Path for Pre-fab
- Allows for easy use of tie-down rod systems
BIM to Fabrication

- BIM drives pre-fabrication
- BIM model transfers data to automated equipment
- Automated CNC saws (wall plate and truss component)
- Automated CNC jigging equipment (Components and truss)
- Eliminates waste & errors
Pre-fabricated Openings

- BIM Driven
- Produced Off-site
- Doors and Windows
- Drives better quality
- Increased production

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Offsite Wall Panel Production

- Better Quality
- Less Waste
- Less Manpower
- Just In Time Inventory On-Site
- Fully coordinated Using BIM
Simplified Framing

- Skilled workers shortage
- Trainable workers targeted
- Simplified framing with easy to understand deliverables
Automated Manufacturing Lines-Randek

Automated house production for wall panels
Automated house production for wall panels
Automated Manufacturing Lines-Weinmann

WEB 060 Velocity

Fully-automated processing: routing of openings for windows and doors
Jobsite Technology

- Accurate AutoCAD drawings downloaded into Trimble LM80 Layout Manager
- Trimble 710 Robotic Total Station used to accurately layout foundation, anchor bolts, critical path plumbing dimensions and framing control lines.
- Foundations shot at layout, form and as built.
- Eliminates need for surveyor to come back and shoot job several times.
- Improved accuracy eliminates problems in the field
Summary

• Communication/Cooperation between owners, design principals, construction trades, suppliers
• Podium penetrations
• Eliminate framing problems, implement “best practices”
• Coordination of Structural Framing and all MEP systems
• Rod/Holdown system clash with Foundation elements
• Roof truss design/coordination with mechanicals and rooftop units
Prefabricated Floor Cassettes

- Less labor
- Better Quality
- More production
- Requires up-front work
- BIM enabled
Coordinated Submittals

- BIM to coordinated submittals and deliverables a must
- Coordination only as good as can be used effectively in the field
Integrated Process

• Floor system: Floor trusses, I-Joist and dimensional floor system modeling
• Roof trusses and conventional roof system design and modeling
• Hardware design (ATS Rod Holdown systems/shearwall strap and bracket modeling)