Wood: Model Driven Design & Prefabrication
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BIM 4 PREFAB
Wood-frame Multifamily Model
ISC History of Multifamily BIM

• BIM Multifamily Wood 7 years ago
• Second iteration-first ACA-now Revit
• Truss integration is critical
• Others now “on the bus”
• Proven track record
• ROI X10
Coordinate, Prefabricate

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Build
Complicated Framing Coordination

- Wall Systems
- Floor Systems
- Patios
- Hardware
- Roof Framing
- Coordination
- No re-work required

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Roof Issues

• Roofs in Revit tough
• Truss import key to solution
• Mechanicals above parapet
• Valleys and crickets re-designed
• Added (6) roof drains
• Coordinated below foundation early
• Plumbing stacks clashed with truss
Rod HD System Coordination

• Rod system requires thickened footings
• Plumbing locations clashed with thickened footing
• Illustrated and solved via BIM coordination
• No issues on-site
Mechanical routing through framing

- Fire code required redundant posting
- HVAC system required coordination through framed wall systems
- Sub-components designed to accommodate
- No mechanical issues on-site
Plumbing Coordination

- Basic tub, toilet and shower drain coordination
- In-wall plumbing stack coordination with framing
- Conflicts with rod system footings
- In-roof systems
What to Prefab

- Framed wall systems
- Wall Sub-components
  - Doors
  - Windows
  - Framing sub-components
- Floor cassettes
- Roof Cassettes
- Patios
- In today’s market “anything you can”
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
- Eliminates errors
Prefab Subcomponents

- Pre-fab door components
- Pre-fab window components
- Prefab wall panel subcomponents
- Drives lean architectural process (all 2’10” doors?)
Coordinated Submittals

• BIM to coordinated submittals and deliverables a must

• Coordination only as good as can be used effectively in the field
Prefabricated Wall Panel Production

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

- Skilled workers unavailable today
- Trainable workers targeted
- Simplified framing with easy to understand deliverables
Prefabricated Floor Cassettes

- Less labor
- Better Quality
- More production
- Requires up-front work
- BIM enabled
Prefabricated Roof Cassettes

- Off-building assembly
- Huge safety benefits
- Faster (workers on ground not up/in trusses)
- Requires coordination
- Requires special effort from manufacturer
- BIM drives
Jobsite Technology

- Accurate Revit model 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

*We “take BIM to the field”*
BIM tames big jobs

• The bigger the better
• Repetition is easy with model driven pre-fab
• Figure it out once use it 500-600 times
• Revit groups and links made for multifamily
Questions?