How to take Volumetric Modular to the Next Level in Multi Unit Construction

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CTO / Co-Founder - Autovol
About the speaker

Curtis Fletcher

- 35+ Years in Product Development & Mfg
- Last 20 Years in Multi-Unit Modular
- Revit Based Companies
- Revit User Since 2002
- Navisworks & Other Software
Learning Objectives

Exploring industry practice and workflows

Objective 1 - Foundational requirements of modular design
Objective 2 - Developing a plan for implementing best practices in your firm
Objective 3 - Understand how standardized design benefits modular manufacturing
Objective 4 - Obtaining design lock prior to construction using BIM and VR technologies
Market Value

Construction Values (Billions)

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<thead>
<tr>
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<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
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<tbody>
<tr>
<td>Market Value</td>
<td>174</td>
<td>244.5</td>
<td>246</td>
<td>243</td>
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<tr>
<td>PMC Project Value</td>
<td>3.7</td>
<td>6</td>
<td>7.2</td>
<td>9</td>
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PMC = Permanent Modular Construction
Statistics courtesy of Modular Building Institute (MBI)
Why Modular is so Important

The U.S. under-produced 7.3 million units of housing between the years 2000 to 2016.
Types of Modular Construction

VOLUMETRIC

PANELIZED

POD
Foundational Requirements

Manufacturing Supply Chain

- Between 1908 and 1940, Sears sold about 70,000 kit homes in 48 states
- RV Industry was well established by the 1920’s
- Manufactured Housing started 30’s with first standards established in the 50’s
- Multi-Unit Housing
- Hospitality
Foundational Requirements

Project Site
1. Is the site suitable for modular
   a. Crane Access
   b. Module staging and pick locations
   c. Transportation & distance from freeway

Building Requirements
1. Height restrictions
2. Building & Unit Configuration
3. Impact of modular assemblies on building

Timeline for Design & Construction
1. Stage of current design
2. Schedule

Motivation
1. What is the motivation for using modular?
   a. Cost
   b. Speed
   c. Labor Issues
Foundational Requirements

Commit to Modular
1. Commit Early
2. Get Team Buy-in

Make Decisions Early
1. Specifications
2. Scope of Work

Get Experts On-Board
1. Don’t go it alone
2. Take advantage of lessons learned

Staging & Craning
1. Available space on or near the project site
2. Traffic patterns & requirements
3. Work hours
4. Crane size and location
Example Job Site

- Tight Locations & Traffic
- Crane Placement
- Lay-down Space
Best Practices

Grid Alignment
Volumetric Install Video

https://www.youtube.com/watch?v=_S3L6GJItWE
Best Practices

Sections
Best Practices

Water Protection
Modular Today
Standard Products

1 Bedroom - Corridor Unit
Standard Products
Install and Interior Finishes
BIM • BIM is critical to manufacturing
• Framing & MEP
• Purchasing & Logistics

VR • Utilizing VR prior to manufacturing
• Seeing in 1 to 1 scale for approval
• Visualizing conflicts before manufacturing
• Training GC & Sub-Trades