New Construction Technologies: Searching for the Magic Bullet

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• Michael Yarne, Co-Founder, Social Construct
Phoenix Supportive Housing, Oakland

Unit Count: 102
BOM: $xx Million
Production: March - June, 2018

Unit Count: 110
BOM: $xxx Million
Production: Sept - Nov, 2018
2019 ULI Housing The Bay Summit
San Francisco, CA

Friday, May 10, 2019
9:45 AM

New Construction Technologies:
Searching for the Magic Bullet
Modular Construction Beginning
Modular Options in 2011
Modular Options in 2011
Modular Options in 2011

Site-Built Construction

Type 3

Type 1 Podium

65’ tall

9’ ceilings

Modular Construction

Type 3 mods

Type 1 Podium

8’ ceilings

65’ tall

Ceiling-Floor Redundancy
Modular Options in 2011

- 30% Structural Redundancy
- Wood Prone to Mold
- Wood too Flexible – Cracks in Finish
- Tolerances sub-par (Fenestration Issues)
- Interior & Exterior Finishes Not Complete
- Temporary Waterproofing Not Acceptable
- No Cost Savings!
OUR SOLUTION

REINVENT MODULAR
RAD Bloc Modules

4-SIDED MODULES:
30% MATERIAL SAVINGS

“L” Shaped: Open side and open top eliminate all redundancies
RAD Bloc Modules

4-SIDED MODULES:
NO LOSS OF EFFICIENCY

“L” Shaped: Open side and open top eliminate all redundancies

Stacking
RAD Bloc Module Catalog

- Studio Unit: 30' x 13.5'
- Studio Unit Alt: 30' x 13.5'
- 1 Bedroom Unit: 40' x 13.5'
- 1 Bedroom Unit Alt: 40' x 13.5'
RAD Bloc Module Catalog

2 BED ROOM CORNER UNIT
LIVING ROOM AT CORNER
40' X (13.5' + 10.5')

2 BED ROOM UNIT
30' X (10.5' + 13.5' + 10.5')
Pilot Project - D1
Pilot Project - D1

Results:
Schedule – Par
Cost: 200%
Berkeley, CA – D2

AIA: National Citation award for innovation
AIA: California merit award for design
Berkeley, CA – D2

Results:
Schedule: 33% Reduction
Cost: 20% Reduction
Oakland, CA – D3
Oakland, CA – D3

Results:
Schedule: 28% Reduction
Cost: 24% Reduction
Oakland, CA – D4
620 Complete

402 In Production

2,000+ Backlog
D5
1433 Webster Street
Height: 160 feet
Gross Area: 151,125 sq ft
Construction: Type IA
2044 Franklin
Height: 260 feet
Gross Area: 311,696 sq ft
Construction: Type IA
INDUSTRY SUPPORT

Education & Collaboration
The Mass Timber Advantage

New Construction Technologies: Searching for the Magic Bullet

Jeff Morrow
ULI Housing the Bay Summit
May 10, 2019
VISION

TO CREATE THE BEST PLACES

VALUES
Respect
Collaboration
Integrity
Excellence
Innovation
Trust

"THE TIME IS NOT FAR OFF WHEN COMPANIES WILL HAVE TO JUSTIFY THEIR WORTH TO SOCIETY, WITH GREATER EMPHASIS BEING PLACED ON ENVIRONMENTAL AND SOCIAL IMPACT THAN STRAIGHT ECONOMICS."

Dick Dusseldorp
Lend Lease Founder, 1973
CLT Benefits

- Faster Construction
- Earlier Realized Revenue
- Less Skilled Labor
- DfMA Compatibility
- Increased Quality
- Enhanced Safety during Construction
- Lighter than Concrete
- Solid building performance
- Sustainability
- Lower Carbon Footprint
- Renewable Resource
<table>
<thead>
<tr>
<th>PAL PORTFOLIO</th>
<th>TYPICAL NEW PAL HOTEL (ACTUAL*)</th>
<th>REDSTONE ARSENAL (ACTUAL)</th>
<th>DIFFERENCE</th>
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</thead>
<tbody>
<tr>
<td>Gross SF</td>
<td>54,891</td>
<td>62,688</td>
<td>+14%</td>
</tr>
<tr>
<td>Average # of Employees</td>
<td>18 (Peak 26)</td>
<td>10 (Peak 11)</td>
<td>-43%</td>
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<tr>
<td>Structural Duration (Days)</td>
<td>123</td>
<td>78</td>
<td>-37%</td>
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<tr>
<td>Structural Man Hours</td>
<td>14,735</td>
<td>8,203</td>
<td>-44%</td>
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<tr>
<td>Structural Production Rate/Day (SF)</td>
<td>460 SF/day</td>
<td>803 SF/day</td>
<td>+75%</td>
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<tr>
<td>Overall Schedule</td>
<td>15 months</td>
<td>12 months</td>
<td>-20%</td>
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</tbody>
</table>

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* PAL New Build Hotel Historical Average w/ Light Gauge Metal
Complimentary Componentization
Assemblies
  MEP Racks
  Facades
  Bathroom Pods
  Mass Timber Structure
The Sweet Spot

CLT should be strongly considered when a project experiences 3 of these 5 conditions.
We are an SF-based startup re-designing the multifamily construction process to reduce hard costs up to 30%.

Our system eliminates wasted labor and sequencing time by radically simplifying and “productizing” interior and MEP systems.

Venture-backed & mission-driven, our goal is to enable the market to deliver middle class rental housing in labor-constrained cities.
Some hard (cost) facts:
The negative labor-shortage/affordability feedback loop

• For mid-rise/podium multifamily development, hard costs comprise ~60% of total project costs.

• Labor & mark-ups comprise ~60-65% of hard costs.

• Rising housing costs (caused by a shortage of new housing) are pushing the construction workforce away from the urban regions where shortages are most acute, compounding the hard cost problem.
Some hard (cost) facts: productivity continues a decades-long decline
Some hard (cost) facts: construction employment has not recovered to pre-Great Recession levels.
Some hard (cost) facts:
labor costs appreciated more than material costs in most expensive urban regions

Source: RS Means; FHFA; Zillow; analysis by BuildZoom
Notes: The construction cost appreciation ratio is reported for the named cities, whereas the housing prices reflect these cities’ entire metro area. See Data and Methodology section for details. The fitted line is $Y = \beta_0 + \beta_1 X$ with $R^2 = .32$ (standard errors in parentheses).
Project One
Oakland - Ground Breaking Q3 2019