Wood Podium Mixed Use Design
An Architectural Case Study

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Wood Podium Mixed Use Midrise Design
An Architectural Case Study

Mixed use urban buildings often combine parking and retail uses on the ground level with residential uses above. Wood construction can help maximize value to the community, the environment and the development team. This case study looks at a recently completed mixed use podium style building that utilizes wood Type VA Construction.

- The Story behind the Design
- Wood use Drivers
- Code analysis including opportunities and constraints
- Green/Sustainable benefits
- Structural constraints
- Design for management of wood for the long term


Learning Objectives
1. You will learn about the story behind the use of wood for this project, and when it may be appropriate to consider wood for your future podium style projects.
2. You will review the code analysis and approach, which will provide background to apply the code in similar applications.
3. You will get an overview of the opportunities and constraints in the use of wood for mixed use multistory structures, including the perspectives from the client, engineer, and community.
4. You will develop an understand of how durability and longevity considerations can be addressed when using wood in larger project applications.

Welcome to Galt ...
Design often begins with the place and a story. What is the story of Galt?

Most residents believed the ‘heart’ of Galt is at the intersection of Lincoln and C. Let’s examine that place…

Looking for the ‘Heart’ of Galt
We were drawn to the potential for new development at the “Historic center”
Downtown Galt seemed ideal as a location for a public/private partnership for a mixed use project including Senior Affordable Housing and retail/restaurant/commercial uses.

From the August 2007 General Plan workshop:
- Restore the Downtown
- High Quality Design that respects the image and character of Downtown
- Foster a Unique sense of PLACE

Site Selection
- "Guthmiller Auto Repair" : an ideal candidate for redevelopment and revitalization

A place ready for some heart

Design Geography
Ground Level Plan

A Downtown Pedestrian Streetscape

2007 Code: 1026.1
Basements and Sleeping Rooms below the fourth story above grade must have at least one exterior emergency escape and rescue opening. Each opening shall open directly into a public way or to a yard or court that opens to a public way.

Exceptions:
- Basements with less than 80 inches in height
- Atrium balcony
- High rise
- Where there is an exit door that opens into a public way, yard, court, or exterior exit balcony that provides access to a public way
- Non-habitable basements

2009 (CA2010) Code: Section 1029
Added an exception for sprinklered buildings (CA: limited to Types I, IIa, IIIa or IV) (Apartment sizes are unclear. 2012 Code: back to 2006 requirements?)

2nd and 3rd Levels

Specific layout allows for detailed feasibility investigations

The Real Price of Lumber is The Lowest in History, Thanks To Advanced Time-Saving Technology
Jan 26, 2009

Dr. Mark J. Perry

Included with permission of author

Lumber in the News
**Considering Wood**

$\cdot$ Value to environment: sustainability contribution
$\cdot$ Value to community: help achieve the social objective
$\cdot$ Value to development team: saving time and money
$\cdot$ Value to design team: contribute to project success

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**Considering a Conventional Code “Podium”**

**Will the parking work?**

509.7 Open parking below Group R
Height and area above the open parking garage per Section 503, height measured from grade plane including both the garage and the building above the garage.
Garage area / height per 406.3

Enclosed Garages: 406.6
Height and area as per Table 503 as modified by Sections 504, 506, and 507
Type V is OK for S2 Occupancy per Table 503
So Parking Garage is OK in Type V A construction as long as it is enclosed

For enclosed garage:
Ventilation must be provided as per the Mechanical Code

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**Enclosed Parking Garage**

### Ventilation Systems required for Enclosed Garages

- Mech Code: 403.8 Exhaust Ventilation for Enclosed Parking Garages. Exhaust airflow for enclosed parking garages shall be provided in accordance with the requirements in Table 4-4.

**Table 4-4**

<table>
<thead>
<tr>
<th>Parking Garages</th>
<th>0.75 cfm / sq ft</th>
</tr>
</thead>
</table>

- 403.8.2 Alternative Exhaust Ventilation for Enclosed Parking Garages. Mechanical ventilation systems used for enclosed parking garages shall be permitted to operate automatically upon detection of vehicle operation or the presence of occupants by approved automatic detection devices.
- Part natural and part mechanical ventilation permitted by code
- Final result: 10,000 cfm system ...cost $10K

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**Code Area Analysis**
Area: probably includes what is bound by outside face of exterior walls. Include open areas covered by roof ... but ok to exclude ‘vent shafts and courts’ per definition in 502.1
Looking at the Big Picture:

What does Success look like?

- **Functional** success: Safe, comfortable, and attractive affordable housing for active seniors
- **Commercial** success: the numbers work
- **Social** success: a return on public investment. Streetfront vitality; revitalization of the area; rediscovery by citizens of Galt’s heart
- **Management** success: long term vitality and viability of uses including commercial at street edge
- **Inspire** more improvements: a spreading “good” in contrast to spreading “blight”
Why Wood?

Value

- Value to environment: sustainability contribution
- Value to community: help achieve the social objective
- Value to development team: saving time and money
- Value to design team: contribute to project success

Carbon Stocks in Forests are Stable or Increasing

Galt Place is a great example of Smart Growth

- Mixed Use
- Infill and Urban
- Encourages transportation choice - car, bus, walk, bicycle
- High in Resource Efficiency: low energy and land use, support existing infrastructure
- Quality Design that creates a sense of place
Looking at the Numbers

• Over 13,000 +/- sq feet of ground level retail, restaurant, commercial and lobby / residential multipurpose spaces
• 64 - 1 bedroom apartments of 550 sq ft +/-
• 17 - 2 bedroom apartments of 790 sq ft +/-
• 81 total apartments (includes one on-site manager unit)
• Rents from approximately $329 to $849 per month
• 70 parking spaces on site - consistent with local standards for the uses.

CFY makes a 55 year Project Commitment for an Affordable Housing Development

ProForma Drivers

Public/Private Partnership can put the numbers in a different perspective

• In this case: income from the users does not carry the project proforma alone. Some uses (commercial) discounted; and the residential use is ‘cash flow’ neutral.
• Lowering Construction Cost decreases subsidy needed and/or increases the number of units/public benefit.
Wood impact on flexibility and job work flow

Multiple subcontractors work at the same time on a wood-framed project.

Working through the technical details can be simpler with wood.

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Jason Rikard - Project Superintendent

John James - City of Galt: Safety is the Primary Code Concern

Challenges: Fire

- Fire
  - Biggest exposure is during construction
  - Getting a sprinkler system progressively installed and activated during the course of construction can be important. Floor by floor system activation while construction continues
Durability

- Durability of the wood
  - Protect it from water
    - Easiest approach: keep it under roof
  - Make it easy to monitor the condition of wood
    - Remember that water can also come from plumbing leaks!
  - One of the advantages of leaving major members visible
  - Curbs at walls to keep wood separated
  - Flashing at joints and edges to keep it dry
  - Consider water soluble borate treatment: Timbor

Challenges

- Finding Weak Links in the Chain
  - Impact: protect key structural elements
    - Parking area columns
    - Shear walls: wheel stops
  - Assemblies for fire and sound: considering type IV
  - Higher? Larger?
    - Code limits: four stories no problem with type VA
      - Could go five stories or more with other construction types such as type 3 or 4
    - Areas of 100,000 sq ft and more: depends on uses and site
    - Engineering limits: more than three stories requires more coordination and/or hybrid systems

The Public Side

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>Partnership Equity</td>
<td>$13.4</td>
</tr>
<tr>
<td>Mortgage 1st TD</td>
<td>$3.4</td>
</tr>
<tr>
<td>City RDA Loan 2nd TD</td>
<td>$2.5</td>
</tr>
</tbody>
</table>

Private Sector

Public Sector

Jason Behrmann
City Manager
Change Orders

Resources

• Building Codes Illustrated (Winkel/Ching)
• Ara4help.com (Courtesy of Ara Sargsyan)
• Woodworks.org: using wood in large structures

• Mike Baker structural
  – mikeb@bakerguptil.com
• Lincoln Mortensen architect
  – office@appliedarts.net
Questions?
This concludes The American Institute of Architects Continuing Education Systems Course

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