Lessons Learned from USA Steel-Timber Projects

Ricky McLain, Senior Technical Director, WoodWorks
Jennifer Hardy, Senior Associate, Payette
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Ricky McLain, PE, SE, WoodWorks
Jennifer Hardy, AIA, LEED AP BD+C, Payette
901 East Sixth, Austin, TX

Three Thirty Three The Gulch, Nashville, TN

5 stories | 128,000 SF | Type IIIA

5 stories | 82,000 SF | Type IIIB
Brown University Wellness Center and Residence
Providence, RI

5 stories | 96,000 SF | Type IIIB

Rhode Island School of Design
North Hall
Providence, RI

6 stories | 41,000 SF | Type IIIB
Brentwood Public Library
Brentwood, CA

2 stories | 20,700 SF | Type VB

Beaverton Public Safety
Beaverton, OR

3 stories | 72,000 SF | Type VB
Stamford Media Village
Stamford, CT
5 stories (2 story vertical addition)
135,000 SF  |  Type VB

Houston Endowment Headquarters
Houston, TX
2 stories | 40,000 SF  |  Type VB
Pros & Cons of Hybrid Construction

Should be discussed in context: Compared to what?
Timber-Steel Hybrid vs. all Steel

Pros
• Aesthetics
• Speed of construction, crew size, noise
• Sustainability
• Biophilia
• Lower weight
• Fire-resistance

Cons
• Dual fabricators to coordinate
• Sequencing install & logistics
• Moisture & rust staining
• Careful handling of materials
Timber-Steel Hybrid vs. all Timber

Pros
• Span to depth ratios
• Impacts on MEP, head height
• Minimal material movement
• Creativity, particularly in fixed connections & cantilevers

Cons
• Dual fabricators to coordinate
• Sequencing install & logistics
• Moisture & rust staining
• Fire-resistance
• Connections
Timber-Steel Hybrid Lessons Learned

Connections & Material Interfaces are Critical
- Careful coordination during design & shop drawings
- Differences in tolerances
- Differences in material movements (vertically and horizontally)
- Seek to minimize or eliminate on site welding

CLT SLAB EDGE SPLICe AT STEEL BEAM

Credit: LeMessurier

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Timber-Steel Hybrid Lessons Learned

Handle with Care
- Timber is exposed, finish surface
- Moisture impacts, staining, rust
- Steel may have a primer or fire coating
Logistics are Key
- Ideal to have same installer for timber & steel
- Delivery & install sequencing – keep tight schedules, may need additional material storage on site
- Don’t slow down one material’s install speed due to the nature of the other
- MEP
A Toolbox for all Scales of Making

Building as a teaching tool

Aspirational design elements

High visibility of energy efficiency

Innovation in construction technology

Real-life engineering problems
Wood Palette

History of Making

• Heavy timber industrial mill buildings with large open interior floor plans

• Industrial use of wood for durability & fire protection

Targeted Embodied Carbon Reduction

Health & Wellness of Occupants

Biophilic Benefits

Beauty
(Why?) Hybrid Structure

High Bay: REINFORCED CMU & STEEL FRAMING

Roof: STEEL DECK & FRAMING

Levels 1, 2, 3, 4: 5 PLY CLT DECK ON STEEL FRAMING

Basement: CONCRETE FOUNDATION
Connections & Cantilevers

![Diagram of Connections & Cantilevers](image)

![Image of Connections & Cantilevers](image)
Coordination of Trades
Intersections & Infills
Questions?

Jennifer Hardy, AIA, LEED AP BD+C
Senior Associate
Payette
jhardy@payette.com
617-895-1077

Ricky McLain, PE, SE
Senior Technical Director
WoodWorks
Ricky.mclain@woodworks.org
802.498.3310
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