

Tall Mass Timber Present and Future – 2 Case Studies

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1 Abstract

According to the 2018 UN Global Status Report, "buildings construction and operations accounted for 36% of global final energy use and nearly 40% of energy-related carbon dioxide (CO₂) emissions in 2017". [1] In a society leaning towards sustainable practices and efficiency, the improved structural properties of mass timber compared to traditional wood construction present a unique opportunity to add a sustainable material to the designer's palette. This paper will focus on three subject areas:

- Current code challenges and developments related to the IBC
- Ascent, a 21-story mass timber tower currently underway in Milwaukee, WI. Upon completion, Ascent would be the tallest timber building in the Western Hemisphere. In addition to discussing the structural engineering principals behind the tower design, the team will elaborate on the current challenges associated with a project of this magnitude.
- River Beech, a research project centered on an 80-story all timber tower that pushes the limits of mass timber construction to pinpoint technical challenges that require future research. River Beech incorporates a high level of prefabrication and modularization, and utilizes a high degree of automation common to the mass timber construction fabrication process.

The authors, based on their experience during the design of the case studies referenced above, will present an innovative technology capable of addressing the urban challenges related to building in a 21st century metropolis, while incorporating a sustainable and accessible material.

Keywords: Mass Timber, CLT, Glulam, Tall Timber, IBC

2 Introduction

As city densification intensifies, resources become scarcer and sustainable concepts are pushed to the forefront of the public consciousness; particularly considering that "CO₂ emissions resulting from material use in buildings account for 28% of the world annual buildings-related CO₂ emissions" [1]

2.1 Mass Timber Singular Properties

Mass timber is slowly but surely entering the market as a sustainable construction option. Capable of competing with traditional steel and concrete, mass timber provides a unique option to the designer's palette, providing the following advantages, not commonly found in the building industry: