

Session ID: RES-5

Title

BUILDING FASTER: ADVANCES IN MODULAR CONSTRUCTION FOR HIGH SEISMIC REGIONS

Convenors

E. Fischer ¹, A. Barbosa ¹

Description

The architecture, engineering, and construction (AEC) sector is one of the largest in the world economy. However, the AEC sector has seen the slowest growth rates in productivity and innovation. Economic sectors such as retail and manufacturing have embraced the digital age and transformed their efficiency. However, productivity in the AEC sector has barely increased since 1945. New investments in the AEC sector aim to increase cost efficiency and disrupt the status quo such that today the AEC industry is on the cusp of a significant disruption that will change the way buildings are manufactured, assembled, and designed. With streamlining of building manufacturing, assembling, and design, architects and engineers need to leverage three opportunities in designing for enhanced: constructability, manufacturing, and whole building life cycle, considering future modifications, maintenance, and easily replaceable building parts. Modular construction explores these three opportunities and can address labor and housing shortages and allow for rapid construction methods for post-disaster reconstruction and construction of patient care facilities in post-disaster situations (e.g., post-earthquake, pandemic). However, there are large gaps in knowledge to apply modular construction to high-seismic regions, particularly on how the modules are connected to resist lateral force demands (seismic, wind). Moreover, the current AEC industry is utilizing low-rise modular construction to solve many issues within cities, such as affordable housing. With the emergence of mass timber products and a cross-laminated timber revolution, this session will host speakers from around the world working on modular construction in a variety of different materials (mass timber, steel) that have resulted in innovative building technologies to enable modular construction to break into the market, transform the AEC sector, and provide innovative solutions to some of the issues our cities face today.

Invited Speakers

C. Amaddeo ², J. Branco ³, M. Fretz ⁴, M. Little ⁵, S. Ehlert ⁵, E. McDonnell ⁶

Affiliations

¹ Oregon State University, Corvallis, USA, ² Linnaeus University, Växjö, Sweden, ³ University of Minho, Braga, Portugal, ⁴ University of Oregon, Eugene, USA, ⁵ Fabric Workshop, Truckee, USA, ⁶ Holmes Structures, Portland, USA