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Evaluation of connection systems in modular constructions

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Modular buildings are developed as an alternative to conventional on-site construction because of more predictable focts and faster construction. While the use of modular buildings is increasing rapidly and this construction system is becoming more popular, research activities on structural components and materials used in modules, analysis and design methods and connection systems in the modular building are needed and are continuing. Modular construction aims to optimize the use of materials, while forming spaces comparable in size to conventional construction and to offer benefits of installation speed. The modules act as the primary structural system of the building, while another stabilization system such as stair or elevation core can be used as well. Modules transfer gravity loads and resist lateral loads through the module-to-module connections. Therefore, the connections must be strong enough and have inherent ductility to transfer loads from one module to another and accommodate building deformation under gravity and lateral loads. The presentation will introduce commonly used connection systems in several types of modular construction. As modular systems are seldom used in high-rise building construction and because of limitations of structural and module-to-module connection systems, they are rather used in shorter than 7-8 stories. The presentation will explore the nature of these limitations and offer suggestion for improved structural-connection systems that provide desirable levels of strength, stiffness and ductility. In particular, the presentation discusses the possibility of using distributed isolation system as one option in such solution schemes.

Biography

Merve Sagiroglu is an Assistant Professor at Erzurum Technical University, Turkey. She received her PhD in Civil Engineering in 2013, from Atatürk University in Turkey. Currently, she is pursuing Post-doctoral studies in the Architectural Engineering Department at Penn State University in the United States. She is supported by the Scientific and Technological Research Council of Turkiye, in the framework of Post-doctoral Research Scholarship Program.

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