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Abstract
This paper analyzes the relations between the theory of Michell structures, which is one of the most important theories in structural optimization, and some remarkable engineering structures, including selected high-rise buildings, large-scale roof coverings and long-span bridges. The first part of this study briefly presents the development of Michell's theory, its basic concepts, assumptions, and examples and fundamental features of Michell structures. Then, several untypical engineering structures that make use of said concepts are presented, including skyscrapers proposed by the Polish structural designer W. Zalewski and the international architectural office of Skidmore, Owings and Merill (SOM). Next, large-scale roof coverings of "Spodek" arena in Poland as well as selected bridges are thoroughly analyzed in the context of similarity to Michell structures. The conducted
study reveals that considered structural forms of the analyzed structures follow some of the concepts known from Michell's theory and thus possess many features of the optimal structural designs.