

عنوان مقاله:

Designing Steel Gabled Structures by ASD and LRFD Methods and Proposing Formulas for Estimating Base Shear and Total Weight

محل انتشار:

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خلاصه مقاله:

The evaluation and comparison of ASD and LRFD design methods for Steel Gabled Structures (SGSs) have received insignificant attention for a number of reasons including limited resources as well as the complexity of modeling and designing these structures in 3D. Therefore, choosing a method that can ensure design economics is considered one of the best and most effective decisions for reducing the weight of SGSs. Moreover, considering that SGSs are considered as lightweight structures, their lateral loading is often done only for wind load, while most engineers ignore earthquake loads. However, upon an increase in the bay and height of SGSs, structural mass increases and as a result, earthquake loads might become more critical than wind loads. Accordingly, it is necessary to examine wind and earthquake lateral loads on different bays and heights of these structures. Therefore, this paper aims to analyze 18 3D models of SGSs using ASD and LRFD design methods and design them economically in compliance with all the required codes. In addition, the issues such as the Demand to Capacity Ratio (DCR), Governing Load Combinations (GLCs), structural weight, and base shear are discussed. Finally, certain formulas are proposed to calculate the total weight and base shear of SGSs and they can be quite conducive to making the initial decision on the design of these types of structures.

کلمات کلیدی:

SGSs, ASD, LRFD, Structure Weight, Base Shear, Proposed Formula

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