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Cross section optimization of plane truss among different spans

Abstract

Cross sectional areas optimization is to be implemented to study the influence of the cross section shape on the optimum truss weight. By the aid of analysis and design engines with advanced finite element analysis that is the steel design software STAAD. Four rolled steel sections (angle, tube, channel, and pipe) which are used in industrial roof trusses are applied for comparison. Many previous studies, use the areas of cross sections as design variables without highlight to the shape of cross section at the start of the process, consequently the result area will be adequate if the designer choose the effective shape than others. Results of this research show that the chosen cross section shape has a significant impact on the optimum truss weight for same geometry of truss type under the same circumstances of loading and supports.

Keywords

Cross-Section shape; Mansard truss; Optimum weight