Decision Support System to Select the Optimum Steel Portal Frame Coverage System

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Abstract

Portal frame systems are widely used as coverage system in industrial projects. Selecting the proper portal frame system for a certain project depends on many technical, financial and logistical factors such as estimated cost, construction duration, availability of materials, equipment and skilled labor, besides environmental factors such as recycling and durability. The aim of this research is to create a Decision Support System (DSS) to decide the optimal portal frame system considering all these factors. The proposed (DSS) depends on integrating the Value Engineering (VE) concept with the Analytical Hierarchy Process (AHP) technique to identify the optimum system. The considered systems in this research are conventional portal made of hot rolled section, pre-engineered built-up portal frame, trussed frames and portal Frame truss. The developed (DSS) was tuned for the current Egyptian market conditions in 2019 and successfully verified using four selected projects with different height to span ratio.

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