## A Comparison of Sequential Quadratic Programming, Genetic Algorithm, Simulated Annealing, Particle Swarm Optimization for the Design and Optimization of a Beam Column

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**Abstract :** This paper describes an integrated optimization technique with concurrent use of sequential quadratic programming, genetic algorithm, and simulated annealing particle swarm optimization for the design and optimization of a beam column. In this research, the comparison between 4 different types of optimization methods. The comparison is done and it is found out that all the methods meet the required constraints and the lowest value of the objective function is achieved by SQP, which was also the fastest optimizer to produce the results. SQP is a gradient based optimizer hence its results are usually the same after every run. The only thing which affects the results is the initial conditions given. The initial conditions given in the various test run were very large as compared. Hence, the value converged at a different point. Rest of the methods is a heuristic method which provides different values for different runs even if every parameter is kept constant.

**Keywords :** beam column, genetic algorithm, particle swarm optimization, sequential quadratic programming, simulated annealing

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