

Tower Crane Selection and Positioning on Construction Sites

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Abstract : Cranes are a key element in construction projects as they are the primary lifting equipment and among the most expensive construction equipment. Thus, selecting cranes and locating them on-site is an important factor for a project's profitability. We focus on a site with supply and demand areas that have to be connected by tower cranes. There are several types of tower cranes differing in certain specifications such as costs or operating radius. The objective is to select cranes and determine their locations such that each demand area is connected to its supply area at minimum cost. We detail the problem setting and show how to obtain a discrete set of candidate locations for each crane type without losing optimality. This discretization allows us to reduce our problem to the classic set cover problem. Despite its NP-hardness, we achieve good results employing a standard solver and a greedy heuristic, respectively.

Keywords : positioning, selection, standard solver, tower cranes

Conference Title : ICCMSC 2018 : International Conference on Construction Methods and Scheduling

Conference Location : Paris, France

Conference Dates : June 25-26, 2018