

Application of Simulation of Discrete Events in Resource Management of Massive Concreting

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Abstract : Project planning and control are one of the most critical issues in the management of construction projects. Traditional methods of project planning and control, such as the critical path method or Gantt chart, are not widely used for planning projects with discrete and repetitive activities, and one of the problems of project managers is planning the implementation process and optimal allocation of its resources. Massive concreting projects is also a project with discrete and repetitive activities. This study uses the concept of simulating discrete events to manage resources, which includes finding the optimal number of resources considering various limitations such as limitations of machinery, equipment, human resources and even technical, time and implementation limitations using analysis of resource consumption rate, project completion time and critical points analysis of the implementation process. For this purpose, the concept of discrete-event simulation has been used to model different stages of implementation. After reviewing the various scenarios, the optimal number of allocations for each resource is finally determined to reach the maximum utilization rate and also to reduce the project completion time or reduce its cost according to the existing constraints. The results showed that with the optimal allocation of resources, the project completion time could be reduced by 90%, and the resulting costs can be reduced by up to 49%. Thus, allocating the optimal number of project resources using this method will reduce its time and cost.

Keywords : simulation, massive concreting, discrete event simulation, resource management

Conference Title : ICCEM 2021 : International Conference on Construction Engineering Management

Conference Location : Barcelona, Spain

Conference Dates : May 24-25, 2021