

Akarawit Suvannajan 2011: Simulating Resource Arrangement Patterns for Repetitive Construction: A Case of Roadway Construction. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Assistant Professor Suneerat Kusalsai, Ph.D. 80 pages.

Managing a construction project is complicated, especially a project with repetitive activities. Work scheduling and resource arrangement are crucial steps leading to project success, project finishing in time and cost under budget. Today there are various scheduling and resource arrangement methods available. In choosing one, an engineer must consider how the result would affect project duration and project cost.

This research aims to apply a simulation model, STROBOSCOPE, to compare two resource arrangement patterns, Dedicated Resource Assignment and Pooled Resource Assignment, having the construction of asphalt concrete roadway as a case study. The research begins with interviewing engineers at site regarding construction processes, activity durations, and types and the number of machines used in each activity. Then, given the numbers of machines from the interviews, the construction operations are modeled with two different resource arrangement patterns, Dedicated Resource Assignment and Pooled Resource Assignment. The result shows that, without the consideration of learning effect, Pooled Resource Assignment provides shorter project durations and lower machine costs than those with Dedicated Resource Assignment. Moreover, the study shows that simulation can be used to find an appropriate set of machines that result in shortest project time and/or cost.

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