

Methodology of Construction Equipment Optimization for Earthwork

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Abstract : Earthwork is one of the critical civil construction operations that require large-quantities of resources due to its intensive dependency upon construction equipment. Therefore, efficient construction equipment management can highly contribute to productivity improvements and cost savings. Earthwork operation utilizes various combinations of construction equipment in order to meet project requirements such as time and cost. Identification of site condition and construction methods should be performed in advance in order to develop a proper execution plan. The factors to be considered include capacity of equipment assigned, the method of construction, the size of the site, and the surrounding condition. In addition, optimal combination of various construction equipment should be selected. However, in real world practice, equipment utilization plan is performed based on experience and intuition of management. The researchers evaluated the efficiency of various alternatives of construction equipment combinations by utilizing the process simulation model, validated the model from a case study project, and presented a methodology to find optimized plan among alternatives.

Keywords : earthwork operation, construction equipment, process simulation, optimization

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