

Parichat Chooborjai 2014: Analyzing Tunneling Operations of a Subway Construction Project using Simulation. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Assistant Professor Suneerat Kusalasai, Ph.D. 213 pages.

A subway construction project contains high levels of unmanageability because of technical complexity and uncertainty as well as its extensive construction duration. Besides underground construction includes cutting edge technology and needs special supervision to make sure that the processes are performed with safe and sound. The construction of tunnel linking two adjacent stations and invention shafts is considered to be critical because the construction teams of tunnel and subway stations/invention shafts need to coordinate so that the construction of diaphragm walls is completed before the arrival of TBM. In fact, it is not always the case since there are, however, various factors affecting the working rates of TBM and the construction of diaphragm wall. This research aims at analyzing the factors causing delays in tunnel and diaphragm wall construction of a subway project using a case study of MRT Blue Line (Extension) project. Both the frequencies and the durations of delay are recorded and analyzed. The result shows that the main reasons causing delay during the tunnel construction are changes in working shifts and heavy rain whereas delays due to machine setup and supporting system inspection are found the most frequent. During the construction of diaphragm wall, machine breakdown In addition, given the construction sequences and actual work durations, simulation models of both tunnel construction and diaphragm wall construction had been developed. After validating that the construction times from the two models are close to those of the actual ones, a combined model was developed to provide a recommendation of the starting point of TBM so that the construction team can be 95% confident that the construction of diaphragm wall is complete before the arrival of TBM.

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