ABSTRACT

Indonesia as developing country trying to pursue a better economic life for it is citizen. One of the programs is Subsidized housing which provides cheap credits for the citizen to get livable housing, especially low-income people. In the development, developers of subsidized housing face problems in planning and controlling projects, especially in construction scheduling. The scheduling was mostly in rough estimation and narrow analysis that impacted project delay. Moreover, Construction projects are closely related to human resource procurement and management. The scheduling of human resources in construction totally impacted the project's target completion. PT.Cahaya Amal Taqwa is one of the housing developers that focus on subsidized housing, this company experienced 9 months delay on their first construction project at D'Talago Green View. This delay happened because of the construction process is not well defined and lack of work control.

This research intended to design a comprehensive work and worker scheduling on the construction process as the new work standard for the next project at D'Puti Green View.The method use are Critical Path Method (CPM) and resource leveling. The methodology starts by collecting the data and processing it through the Critical Path Method (CPM) to obtain the work schedule. Then, analysis of the implication from CPM to define the change and action taken related to the additional resource. The worker's scheduling is constrained based on CPM implication and will be solved with the Resource Leveling method by a heuristic algorithm that will be built in this research.

The application result shows that CPM optimizes the duration from 69 days to 50 days to complete the construction with 19 critical activities and 8 non-critical activities. The schedule is visualized through a Gantt chart and network diagram. The CPM needs additional workers to apply the schedule. The heuristic algorithm successfully constructed for resource leveling and obtained worker scheduling for the additional work that the company only needs 10 people after resource-leveling while before leveling it is needed 16 people. Resource leveling success maintains

longer work continuity that originally only 5 days and 13 days become 8 days and 23 days. The worker scheduling is visualized through a Gantt chart and the guidance is in the form of a work order for the worker.

The scheduling design can determine the critical activities with the shortest duration that will prevent the construction delay at D'Puti Green View. The detailed schedule of work and workers can be a new standard for the company to control the construction process. Worker scheduling helps the company to obtain the least number of workers needed, maintain work continuity, and reasonable procurement costs. The implementation needs strict control to meet the target of the work completion time and all parties that will be the users of this schedule need to understand how it works. Moreover, this research will provide an easy-to-understand schedule design This research consists of a systematic process of calculation and a heuristic algorithm that can help the company later to do updates and adjustments related to the scheduling. This design is open for improvement for future research, generating requirement planning is recommended

Keywords: Subsidized Housing, Critical Path Method, Resource Leveling, Scheduling