

# CHAPTER 1

## INTRODUCTION

### 1.1. Background

Recently, the number of construction projects in Indonesia has been increasing. Especially construction in large buildings and multi-story buildings. The use of heavy equipment is also a necessity to support the construction process. Contractors need to choose the right heavy equipment according to construction needs. One of the heavy equipment used in multi-story building construction is a tower crane.

This tower crane's function is to deliver material from one point to another, both horizontally and vertically. The use of tower cranes in construction is beneficial because the material transporting becomes much easier and faster, especially for heavy material from the ground floor delivered to the higher floor above it.

However, in its implementation, contractors often face problems—high costs due to the tower crane's ineffectiveness. And most of it is caused by the improper placement location of the tower crane. Therefore, location planning is an essential aspect of reducing costs caused by tower cranes.

This research was conducted under the construction of the Smith Project, located in Alam Sutera. With a land area of  $\pm 4025 \text{ m}^2$  and 33 floors with three basements. In this study, only using one tower crane and later will be known which location is the effective location in placing the tower crane.

## **1.2. Research Question**

Based on background, this study has defined the following research questions:

1. Where is the most effective location for Tower Crane on the project site?
2. How much the cost differences among each location of tower crane in this study?

## **1.3. Research Limitation**

1. This study has been done in The Smith Project site plan. The object of this research is one tower crane to find the most effective location.
2. The demand located on 7th floor, because starting from this floor, the demand location is identical. Further cost calculations can be made more accessible.
3. The cost that calculated in this study is the cost that affected by travel work time of tower crane. Another cost due to foundation or installation duration are ignored.
4. The materials considered in this study are formwork and rebars, both supply and demand location are near, so the observation can be made accurately.
5. Other factors that might be an issue that affected the tower crane such as foundation installation of tower crane, mounting, mobility, material weight, tie in installation, and dismantling are ignored.

## **1.4. Research Objectives**

Finding out the effective location for tower crane placement when only one tower crane is assigned in the project site.