

CHAPTER I

INTRODUCTION

1.1 Background

Library construction is one of the most essentials of construction development in Indonesia. It is because library becomes one of the main roles to increase the quality of human resources in Indonesia (Hairuni, 2022). However, building a library should be treated differently, especially if it is compared with hotel or apartment. It is because library has an academic urgency, supporting academical development, and that makes library has a possibility to have a lot of visitors.

During building construction, it is important to see the point of view from upper-structure, lower-structure, then finished with cost and time planning. Upper-structure and lower-structure has a significant connection to each other. When the result of the design is bigger as it should be, it will result a huge number of forces for lower-structure to be supported. It will affect the dimension of the foundation, the depth, and the possibility to be settled. Both of the structural result will also affect the planning of cost and time. If it's not efficient enough, the duration of the construction will be longer and the construction price will be higher. This is not a good condition to start a construction project, therefore, correlation between upper-structure, lower-structure, and planning of cost and time needs to be pointed out.

Therefore, to fulfill the requirements of bachelor degree in Universitas Atma Jaya Yogyakarta, writers propose the design process of library located in Yogyakarta, specifically in Jalan Kenari, Kecamatan Umbulharjo, Kota Yogyakarta, Daerah Istimewa Yogyakarta (see Figure 1.1 for layout of the construction). The writers will construction aspects, starting from upper-structure design planning, lower-structure design planning, then finalize with the planning of cost and time. In this report, dimension of upper and lower structure is expected to be obtained, then duration and price of the library construction will be determined in the end of the design.

From the background, writers propose Final Project Infrastructure Design report entitled "Redesign Planning Work Structures and Planning for Cost and Time

of Public Library and Co-Working Space in Yogyakarta” as a final assignment to fulfill the requirement of bachelor degree in Universitas Atma Jaya Yogyakarta.

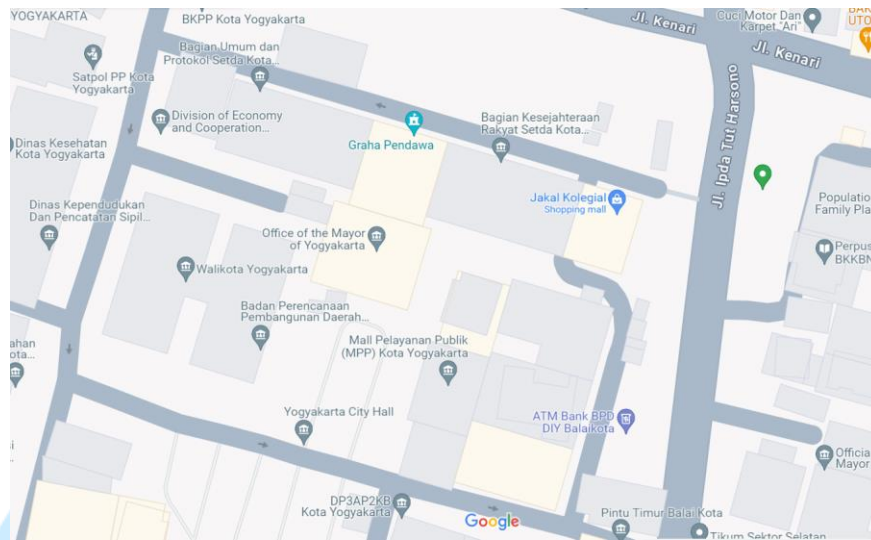


Figure 1.1 Layout of the Planning of The Library Construction

1.2 Problems Identification

The identification of problem during Public Library and Co-Working Space planning are:

1. What are all national codes required to plan the structural component in The Public Library and Co-Working Space in Yogyakarta?
2. What are structural dimensions, starting from beam, column, slab, stairs, and roof, that is required to build The Public Library and Co-Working Space in Yogyakarta?
3. What are all national codes required to plan the foundation in The Public Library and Co-Working Space in Yogyakarta?
4. What are foundation type and dimensions that is required to build The Public Library and Co-Working Space in Yogyakarta?
5. How to determine the price, duration, and S-Curve of The Public Library and Co-Working Space construction in Yogyakarta?

1.3 Objective

The purpose of the redesign of The Public Library and Co-Working Space, which are as follows:

1.3.1 Upper-Structure Planning

1. Writers will be able to plan the design of a building's upper structure based on SNI.
2. Writers will be able to calculate the amount of reinforcement required and design roofs, columns, beams, floor plates, and stairs.
3. Writers will be able to design the dimension of structural components, such as column, beam, slab, stairs, and steel roof.

1.3.2 Lower-Structure Planning

1. Writers will be able to plan the layout of a building's foundation based on SNI.
2. Writers will be able to calculate how much reinforcement is required when designing foundations.
3. Writers will be able to determine type and dimension of foundation that can support upper structure.

1.3.3 Cost and Time Planning

1. Writers will be able to understand the construction method that suitable with Public Library and Co-Working Space, then construct the Work Breakdown Structure as the guidance of planning.
2. Writers will be able to determine the work volume for all activities.
3. Writers will be able to determine the unit price for all activities, then determine the price of the project.
4. Writers will be able to schedule and overlap activities that going on during project.
5. Writers will be able to determine amount of resource needed for all activities.
6. Writers will be able to show the S-Curve of a project.

1.4 Research Methodology

The research methodology that was used for the report are as follows:

1. Examine the readings and materials the teaching lecturer gave as sources for this report.
2. Gather information and data in the form of primary data regarding buildings. MIDAS Gen software were used to process secondary data for use in modeling the structure as well as analyzing it.
3. Using the data that has been gathered, create a 3D model of the structure.
4. Analyze building structures using the output from the MIDAS Gen, which can be used to plan top structure and bottom structure dimensions and reinforcement.