

CHAPTER I

INTRODUCTION

1.1 Background

Building is an object that consist of roof and wall structure. Building may have many purposes such as hospital, school, or housing. Nowadays, building become oneof the main needs to improve the quality of human life. A good building will producea better life quality. In order to build a good building, it required knowledges about building design and structure called as civil engineering.

As a developing country, Indonesia is required to meet the needs of the people incities throughout its region. As a country that believes in God Almighty, Indonesia fulfills the worship needs of the community, one of which is the construction of placesof worship. The large number of people in Indonesia who adhere to religions requiresa greater number of places of worship.

One of the universities that provides civil engineering is Universitas Atma Jaya Yogyakarta. Universitas Atma Jaya Yogyakarta known as one of the top 5 private universities in Indonesia. In order to improve the quality of civil engineer, UniversitasAtma Jaya Yogyakarta make a major change to the curriculum. Final design project is one of the subjects that been modified.

In the new curriculum, final design project mainly discussed about the combination of building design, road practice design, water building design, and costand time practice. Students is given a project that required to be designed either frombuilding analysis, road pathway, water distribution, and cost and time management of the project. By implement all the theory knowledge, students need todesign and calculate the project as close as possible with the real condition.

By using the concept of designing based on real condition, students will havea real overview based on the real-world project. Using the new final design projectcourse, it can create a better civil engineer fresh graduate which will be easier toadapt to the world in the future. If civil

engineer has a good knowledge, then they can build a good building which may lead to the improvement of human life quality. In this design final assignment, the author will design an Indonesian Christian Church located in Muntilan. The design is carried out using reference to SNI 1726:2019, Procedures for planning earthquake resistance for buildings and non-buildings, SNI 1727:2020 Minimum design loads and related criteria for buildings, SNI 1729:2020, Specifications for structural steel buildings, and SNI 2847 :2019

Structural Concrete Requirements for Buildings.

1.2 Project Overview

The Indonesian Christian Church which is located in Muntilan is a church building which has a building area of 1840 m² and has four floors and has two buildings, namely the worship building and the management building. The planning work of the Muntilan Christian Church, especially for the components of the structural work using steel materials for the portal structure (plates, beams and columns). The foundation structure uses reinforced concrete sloof beams and pile foundations.

1.3 Statement of Problems

The problem studied in this Final Infrastructure Design Project is how to build a level 4 church so that the building can stand firm and withstand earthquake loads of less than magnitude 7 which is located in Muntilan with sandy loam soil conditions. The Indonesian Christian Church was built in a location close to the main road so that the access road to the church is easy. The road lane is wide enough for heavy equipment to pass, but because the church is located right in the middle of a settlement, the speed with which the project runs is also very important so it doesn't disturb the surrounding environment.

1.4 Purpose

The purpose of this Infrastructure Design Final Project report is how the author designs a building, namely the Muntilan Indonesian Christian Church so that it is safe from a structural and geotechnical perspective, and can calculate the cost and duration of the work through the standards set currently in SNI (Indonesian National Standard).

The purpose of this paper is to summarize all the practices that have been carried out, such as building design practices, road design practices, water construction practices, and time cost management practices. In addition, this paper will provide an overview of all the practices that have been carried out. As a result of the summary of this paper will be submitted in recognition of a bachelor's degree.

1.5 Research Methods

The research method used in the Infrastructure Design of the Indonesian Christian Church is the Literary and Quantitative Study Method. The literature study and quantitative research methods were chosen because the authors conducted a literature study through literature sources, in this case the latest version of SNI issued by BSN and PBI as a guide in the preparation and design of the Muntilan Indonesian Christian Church. The design stages of the Indonesian Christian Church start from understanding architectural drawings, analyzing soil conditions, determining live loads, dead loads, earthquake loads and wind loads acting on structures, determining dimensions and modeling structures, designing reinforcing structural elements, and making design drawings, as well as calculations project cost budget.

1.6 Final Project Systematics

Systematics of Infrastructure Design Final Assignment is to design a building that already has an architectural design and has been determined in advance through the teaching lecturers in the class. This final project has 5 chapters.

The first chapter is an introduction which contains background, project overview, problem formulation, objectives, research methods and final project systematics. The second chapter is the structural design which contains the design of roofs, stairs, slabs, beams and columns. The third chapter is the geotechnical design which contains the design of foundations and retaining walls. The fourth chapter is a construction management plan that contains planning costs and duration of project work. The fifth chapter is the closing which contains the final conclusion of the entire contents of the thesis.

