

# CHAPTER I

## INTRODUCTION

### **1.1 Background**

The need for education is increasing over time. Human resources of high quality required to compete in the era of globalization. One way in improving the quality of human resources is to improve the quality of education. Universitas Muhammadiyah Yogyakarta and is one city that is quite densely populated, is caused by many immigrants from outside the city who want the school or college and settled.

Therefore, all universities strive to provide quality in teaching with supporting facilities. Likewise with the Universitas Muhammadiyah Yogyakarta, this provides various facilities to support the teaching process for students in Universitas Muhammadiyah Yogyakarta. The infrastructure and facilities in a campus should be supported to improve the quality of students. Therefore, considering the many registries in UMY and to further advance the quality of its students, the University of Muhammadiyah Yogyakarta build a new building with the concept of twin buildings.

High building needs design that is based on appropriate the applicable provisions, namely in terms of strength, stability, security, comfort and economic factors. In the case of a construction project engineers must uphold the security and safety of humans. The security of a building can be seen from the building's ability in resisting the forces that would be acceptable.

In this case the design of the structure refers to the new regulations, in example the structural concrete requirements of SNI 2847:2013 and design of earthquake resistant SNI 1726:2012. By using the correct rules then losses caused by disasters can be reduced in terms of both mental and material.

### **1.2 Problem Statement**

The problem of this final project is how to design building structure five floors with two basements covering planning dimensions of the structure, analysis structures, reinforcement beams, columns, plates, according with SNI 2847:2013 and SNI 1726:2012.

### **1.3 Problems Limitation**

1. The design of the structure of the upper structures. The structure above includes design of floor slabs, beams, columns using the structure reinforced concrete.
2. The structure of the building is designed with a number of level 5 floors plus 2basements.
3. The structure was designed using bearer Special Moment Frame (SMF).
4. The location of the building in the West Ring Road Yogyakarta to soil typeis the ground of being.
5. Analysis of lateral load (earthquake) using a static analysis of seismic load equivalent.

#### **1.4 Specification**

1. The design of concrete structures refers to SNI 2847:2013 and analysis earthquake resistance planning refers to the SNI 1726:2012.
2. Analysis of the structure is done with the help of ETABS program.
3. Imposition of using a dead load and live load in accordance with SNI 2847:2013.
4. Specification of the material used

Reinforced concrete  $f'_c = 25$  MPa

Rebars with:

$f_y = 240$  MPa ( BJTP ) for diameters  $\leq 13$  mm ,

$f_y = 400$  MPa ( BJTD ) for diameters  $> 13$  mm

#### **1.5 Originality**

Based on observation, checking that has been done with the author, title The structure of the final project design in western Ring Road University of Muhammadiyah Yogyakarta, yet ever done.

#### **1.6 Objective and benefits**

The purpose and benefits of this final project are:

1. In order to gain experience and knowledge to design structures building.
2. To design of upper structure by using SNI 1726:2012 and SNI 2847:2013.