CHAPTER I

INTRODUCTION

1.1. General Background

Indonesia is a growing nation that needs buildings to be built. In the big city, especially Jakarta, Bogor, Depok, Tangerang, and Bekasi, many people live and stay there, and each year the amount keeps increasing and the demands of buildings are high. Because of that high demand and also the increasing number of citizen that lives in Indonesia, the government and private company continuously build houses, apartments, high rise buildings, roads, and many other facilities.

In designing multi-story building, there are many factors that should be considered, including the function of the building, safety, strength, stiffness, stability, architectural consideration, and also economic consideration. The functions should be considered so that each building should be designed to fulfill the criteria of strong, safe, and can be built economically. From all aspects of the factors, this one factor should be highly considered. It is the safety of building. Lateral force and axial force should be considered so the structure has the strength to resist those forces. In the building structure planning, analysis is needed to be done for the reaction of each force that work in the building, therefore dynamic analysis is needed, especially for irregular building structures that have a certain behavior as a 3D structure. By doing 3D dynamic analysis, the behavior of the building can be predicted.

This final project structural design has been designed to resist gravity as well as lateral force. SNI 03 – 1726 – 2002 and SNI 03 – 2847 – 2002 will be used as a guideline to redesign and evaluate the irregularity building structure of Tangcity Mall building and also by using ETABS, building structure calculation program, to calculate the forces that have occurred in Tangcity Mall structures. This Tangcity Mall is located in Tangerang and the building construction uses reinforced concrete construction for most of the part and steel structure for the roof.

1.2. Problem Statement

According to the general background which is described previously, the problem in this final project is:

1. Designing the building with soft soil and earthquake zone 3 based on the actual condition in Tangerang in order to resist the loads including earthquake loading.
2. Designing the building using Special Moment Resisting Frame.

1.3. Problem Limitations

To simplify the problems, some limitations are taken as follows:

1. The data of structure is based on the construction drawing of “Tangcity Mall”, 9-story building with 3 basements.
2. The structural design of this final project include bored pile foundation, beam, column, slab, stairs, roof slab which use reinforced concrete.
3. Evaluation and design of irregularity building structure in accordance to SNI 03 - 1726 – 2002 and SNI 03 – 2847 – 2002.

4. Internal forces of irregularity building will be analyzed by using software Extended Three Dimension Analysis of Building System (ETABS) and the SAP2000 will be used for analyzing stairs.
5. The Building type of “Tangcity Mall” is Moment Resisting Frame.
6. Tangcity Mall is in the earthquake zone 3 with soft soil.
7. The building will be designed as Reinforced Concrete Special Moment Resisting Frame.
8. Dynamic analysis of building structure is carried out using Spectrum Response Analysis.
9. Specification of material:
   a. Reinforced Concrete with f_c’ = 30 MPa
   b. Reinforcement Bar with

      f_y = 240 MPa for diameter $\leq$ 12 mm (plain)

      f_y = 400 MPa for diameter > 12 mm (deformed)

1.4. Objective

The objectives of this final project are:

1. To understand the behavior of irregularity building structure.
2. To understand how to obtain dimensions and reinforcement of beam, column, slab, stairs and also foundation.
3. To understand how to analyze building structure in order to resist earthquake loading.

1.5. Function

The functions of this final project are:

1. To get experience and knowledge of designing a building.
2. To get a realization of all the knowledge of theory and structural design that was gotten from the university's lecturer against a real building data.