

CHAPTER I

INTRODUCTION

1.1. General Background

The need accommodating resident in the big city is important. Because the land is limited, we can not build in the horizontal direction so constructing the high rise buildings are one of the solutions.

To achieve a strong, safe, and economical building, it is very important to understand. 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. However, it is very important to apply the theories in designing a building in order to get more experiences in the Civil engineering field.

Building that will be designed is PPM Building. The functions of the building are for class room, canteen, lounge, office administration, and multifunction room. The structure will be designed based on Indonesian Building Codes. 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

PPM building and also by using ETABS, building structure calculation program, to calculate the forces that have occurred in PPM structures. This building is located in Menteng Raya Street, Central Jakarta and the building construction uses reinforced concrete construction.

1.2. Problem Statement

The problem statement of this final project is how to design structural element of high rise building according to Indonesia building codes. The building to be designed is reinforced concrete building. This building is located in Menteng Raya Street, Central Jakarta. Therefore it lies in the earthquake zone 3. The building will be designed as Intermediate Moment Resisting Frame (IMRF). That conform Indonesia earthquake code and Indonesia Concrete Code. In this Final Projects the writer observation the planning of reinforced concrete structure element including dimension of slab, beam and column.

1.3. Problem Limitations

Problem limitations in this final project are:

1. Structure is modeled as three dimensional building.
2. The building consists of 9 stories, and one roof plate.
3. The structure will be designed according to “SNI 03-1726-2002 Tata Cara Perencanaan Ketahanan Gempa untuk Bangunan Gedung” and “SNI 03-2847-2002 Tata Cara Perhitungan Struktur Beton untuk Bangunan Gedung”

4. The loading applied on building is based on “Peraturan Pembebanan Indonesia untuk Gedung 1983”.
5. In addition to earthquake static analysis, dynamic analysis will be performed.
6. The structural elements will be designed as Intermediate Moment Resisting Frame (IMRF)
7. The structural members that will be designed are Upper Structure; consist of slab, column, and beam.
8. The program used for the structural analysis is ETABS Non Linear version 9.7.
9. The material specification :
 - a. Concrete with $f'_c = 25$ MPa
 - b. Reinforcement with:
 $f_y = 240$ MPa for diameter ≤ 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.