CHAPTER I

PRELIMINARY

A. Background

Surakarta city located on the southern island of Java, Central Java Province, Indonesia. Surakarta city become tourist attraction for foreign and national to visit. These conditions will grow especially on the perspective of business. Infrastructure needs in the city of Surakarta will increase the coming of the tourists or people who have a purpose in coming different. The supporting infrastructure is need like the construction site hotel.

The concept of vertical building is the main solution to overcome the limitations of land by using air space above. This concept could be residential building in number of units that many with limited land area.

Indonesia is known as location frequent earthquakes. This happens because Indonesia is between the Australian plate (moving to the north), the Pacific plate (moving towards the North-West) and the Eurasian plate. Therefore, the planning and building in Indonesia should be planned with excellent in safety. Allah SWT says, *"Indeed, Allah loves those who fight in His cause in a row as though they are a (single) structure joined firmly"* (QS.as-Saff:4). From this verse that structure will be solid in sustain all load, when supported by a regular structure, system and regular system is a system whose structure is planned in a careful, measured, valid and meets basic benefits meet the principle of efficient and as planned. From problems that have been described above, so the final project will be planned a building structure hotel building in the city of Surakarta. Design of building structure will be planned using Intermediate Moment Resisting Frame (IRMF) as the main structure that restrain gravity and lateral load. Intermediate Moment Resisting Frame (IRMF) is a system a structure with ductility medium consisting of beam and column that jointed use the rigid connection or connection moment restrain.

Planning structure in the final project building planning to use the Indonesia National Standard as *Beban Minimum Untuk Perancangan Bangunan Gedung Dan Struktur Lain (SNI-1727:2013), Persyaratan Beton Struktural Untuk Bangunan Gedung (SNI-2847:2013), Tata Cara Perencanaan Ketahanan Gempa Untuk Struktur Gedung dan Non-Gedung (SNI-1726:2012), Tata Cara Perencanaan Struktur Baja Untuk Bangunan Gedung (SNI-1729:2002).*

B. Discussion of the problem

According to background above, so the discussion problems that can be taken is how plan structure the hotel building 7 (seven) floors and 1 (one) basement using Intermediate Moment Resisting Frame (IRMF) in Surakarta that efficient in accordance with the latest Indonesia National Standard ?

C. Objectives and benefits design

1. Planning Objectives

Building structure design of the Sunan hotel 7 (seven) floors and 1(one) basement using Intermediate Moment Resisting Frame (IRMF) in Surakarta have porpose to get the design planning structure buildings safe and resistant to earthquake often happens in indonesia. Calculation of structures that produce specifications and design drawings must also can be accounted safety and strength based on the regulation apply in Indonesia.

2. Planning Benefits

Benefit obtained from the author of the final project is knowing more about the science of the structure, especially desingn prosses in good building to earthquake resistant and efficient, mechanics analysis to design concrete reinforced. This final project can also be used as a reference for readers in planning earthquake resistant building structures efficiently as needed.

D. Scope of Problem

In the preparation of this final project building structure design of the Sunan hotel 7 (seven) floors and 1 (one) basement using Intermediate Moment Resisting Frame (IRMF) in Surakarta, the problem is limited to the scope of the planning of the structure to prevent the expansion of the discussion, then in this final project is given the limitations as follows :

Calculation and discussion in the final project as follows :

a). The structure will be planned using Intermedite Moment Resisting Frame (IMRF)

b). Calculation structure was about calculation analysis structure , calculation design plates and the walls of basement. The design stairs , calculation design beam , calculation design column and calculation design foundation

c). Column height of the ground floor (basement) is -3.5 m, while the height of the floor to the 1st floor is + 5 m and to 2nd until 7th is + 3.5 m.

d). Specification material used is as follows :

- Concrete quality f'_c = 25 MPa.
- Steel quality f_{yt} = 390 MPa (BJTS main reinforcement).
- Steel quality f_{yt} = 240 MPa (BJTP shear reinforcement).

e). The dimensions of the starting is :

- Beam `= 300/600 mm
- Joist beam = 300/400 mm
- Column = 550/550 mm
- Sloof = 400/700 mm
- Slab thickness on the floors = 120 mm
- Slab thickness on the roof = 100 mm

f). The Foundation types used are pile foundation.

g). Construction lift is not planned.

Requlations use in the final project as follows :

a). SNI-1727:2013, Beban Minimum Untuk Perancangan Bangunan Gedung Dan Struktur Lain.

b). *SNI-2847:2013, Persyaratan Beton Struktural Untuk Bangunan Gedung.*

c). *SNI-1726:2012, Tata Cara Perencanaan Ketahanan Gempa Untuk Struktur Gedung dan Non-Gedung.*

d). *SNI-1729:2002, Tata Cara Perencanaan Struktur Baja Untuk Bangunan Gedung.*

E. Originality of Final Project

Before the final project is structured, there have been several previous final project that have the same discussion, namely the structural design of buildings. In this final project will be discussed on the structural design of the hotel building seven floors and one basement with partial ductile principle in Surakarta. This final project refers to the final before with the title : *"Perencanaan Struktur Apartemen 5 Lantai + 1 Basement Dengan Sistem Rangka Pemikul Momen Menengah (SRPMM) Di Sukoharjo" (Muhammad Burhanudin Hanafi, 2015).*

The final project difference with previous final project is as follows:

1. Regulations relating to the structural design of buildings and other references.
2. The design of the building, function and location development.
3. Specification materials used.
4. The method of analysis of the mechanics of the building structure.