

# **CHAPTER I**

## **INTRODUCTION**

### **A. Civil Engineering Condition**

Surakarta is a city that has been growing, the general population there were civil servants, businessmen, bank employees and others. Generally workspace bank building does not move because it is equipped with supporting facilities like space for the archives, meeting rooms, lunch rooms and other supporting activities. So that the safety and comfort need to be considered. Designing a bank building with 10 floors and 1 basement was made because of the development of increasingly rapid Surakarta city and followed by a number of investors who entered both domestically and from abroad. And so we need adequate work space, while it will need more work space that is not matched with the available land in the city of Surakarta, thus resulting in the need for the planned layout of work space vertically in order to carry out activities of economic activity in the city of Surakarta.

### **B. Problem Criteria**

Based on the problems described in the background section, it can be a formula of how to design a bank building by using the principle of partial ductile SNI-03-2847-2002 in earthquake prone areas.

### **C. Object Designing**

Object designing to be achieved in the preparation of this Final Project is to get the count of ten floor bank building structure with one basement withstand earthquakes located in Surakarta in accordance with the principle of partial ductile according to the rules of SNI-03-2847-2002.

### **D. Benefit Designing**

Stead designing in this plan there are 2 kinds, namely stead theoretically and practically, with the following explanation :

1. Theoretically, designing the building is expected to increase knowledge in the field of structural design, especially in the design of earthquake-resistant reinforced concrete structures with partial ductile principle based on SNI-03-2847-2002.
2. In practical terms, this building design is expected to be used as one reference on earthquake resistant structural design system in a building, especially in Surakarta.

### **E. Designing Criteria**

Avoid widening the discussion, in the preparation of this thesis is limited to the following issues :

1. The discussion includes the calculation of the roof structure (steel frame) and reinforced concrete structures (plate floors, stairs, beams, columns and foundations).
2. The designing building is a ten floors bank building with one basement in Surakarta using partial ductile system with ductility factor  $\mu = 2,5$  and a reduction factor of  $R = 4,0$ .
3. Quality of concrete  $f'_c = 25$  MPa and quality steel for division reinforcement  $f_y = 240$  MPa as well as to longitudinal reinforcement  $f_y = 300$  MPa.
4. In this use design regulations as follows :
  - a. Peraturan Pembebanan Indonesia Untuk Gedung, 1983.
  - b. Peraturan Beton Bertulang Indonesia (PBI) 1971.
  - c. Pedoman Perencanaan Ketahanan Gempa Untuk Rumah dan Gedung (PPKGURG-1987).
  - d. Standar Perencanaan Ketahanan Gempa Untuk Struktur Bangunan Gedung (SNI 03-1726-2002).
  - e. Tata Cara Perhitungan Struktur Beton Untuk Bangunan Gedung (SNI 03-2847-2002).
  - f. Tata Cara Perencanaan Struktur Baja Untuk Bangunan Gedung (SNI 03-1729-2002).