ABSTRACT

The development of highrise building is increase among the modern construction. For supporting the development of efficient and effective construction, especially in structural design analysis, there should be a study to learn about the system of the structure which is appropriate for highrise building. Today, the dominant structural systems used in highrise buildings in Indonesia is a wall frame structure with shearwall-corewall, which is relatively inefficient for the high structure, while the tubular system is an alternative for it. To get the information of this issue, this thesis will analyze the characteristics of the tubular structure through the relationship of various structural parameters based on the various configurations of frame tube structure.

By studying these tubular system analysis, this thesis will obtain the information regarding the main characteristics of the structural behavior, such as the relationship between the structural parameters which are important for the design, particularly due to the shear lag effect. Due to the shear lag effect when the tubular structure loaded laterally, the axial stress distribution along the flange column is not uniform and along the web panel is not linear. It needs to be well understood to facilitate the understanding for the design assumptions of frame tube structure in building applications.

The results of this study are summarized in the form of simple graphs which can be used as an initial reference for preliminary frame tube structure design through the relationship of several parameters. The parameters which are compared in the modeling analysis consist of the number of building storey and the distance between the perimeter columns. Those parameter effect will be studied to find the deflection, storey drift, and shear lag on the frame tube structure. In addition, as a complement to the analysis results, this thesis also discuss about the total stress and the design ratio of structural elements, so that the highrise structure design analysis will be more useful.

Keywords: shear lag, perimeter, deflection, storey drift, axial stress, ratio design