# UPPER STRUCTURE DESIGN OF COLLEGE BUILDING E6 AND E7 TWIN TOWER UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

Final report

as one of the requirements to obtain a Bachelor's degree from Universitas Atma Jaya Yogyakarta

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#### ABSTRACT

**UPPER STRUCTURE DESIGN OF COLLEGE BUILDING E6 AND E7 TWIN TOWER UNIVERSITAS ATMA JAYA YOGYAKARTA,** Maria Oktaviana Toring, Student Number 121314459, 2012, Specialization Field of Structural Engineering, Department of Civil Engineering International, Faculty of Engineering, Universitas Atma Jaya Yogyakarta.

All universities strive to provide quality in teaching with supporting facilities. Likewise with the Universitas Muhammadiyah Yogyakarta, this provides various facilities to support the teaching process for students in Universitas Muhammadiyah Yogyakarta. So University of Muhammadiyah Yogyakarta build a new building with the concept of twin buildings. In the case of a construction project engineers must uphold the security and safety of humans. (1) The problem of this final project is how to design building structure five floors with two basements covering planning dimensions of the structure, analysis structures, reinforcement beams, columns, plates, according with SNI 2847:2013 and SNI 1726:2012. The design of the structure of the upper structures. The structure above includes design of floor slabs, beams, columns using the structure reinforced concrete. (2) The structure of the building is designed with a number of level 5 floors plus 2basements. (3) The structure was designed using bearer Special Moment Frame (SMF). (4) The location of the building in the West Ring Road Yogyakarta to soil typeis the ground of being. (5) Analysis of lateral load (earthquake) using a static analysis of seismic load equivalent.

Plates roof and floor slabs are designed using a plate one-way and two-way. Thick roof plate of 120 mm, with reinforcement of staple P10 - 200 mm and reinforcement shrinkage P8 - 200 mm. Designed with a thick slab of 200 mm, base reinforcement P10 - 200 mm, and shrinkage reinforcement P10 - 300 mm.

IIA stairs with a height of 3.5 m using a staple reinforcement D13 - 250 mm on the stairs and landing, for shrinkage reinforcement used P10 - 300 mm. IIB stairs with a height of 4 m using a staple reinforcement D13 - 75 mm on the stairs and landing, for shrinkage reinforcement used P10 - 200 mm. Beam landing for all types of ladders used dimension  $400 \times 700$  mm<sup>2</sup>, Using longitudinal steel pedestal on 2D22, under 6D22, 4D22 longitudinal reinforcement upper field, under 4D22. Reinforcement transversal 2P10 - 100 mm in the staging area and 2P10 - 200 mm in field. Columns that are reviewed are the middle column on the ground floor with dimensions 800 x 800 mm as follows:

Longitudinal reinforcement using 24D25 ( $A_{st} = 6872.2339 \text{ mm}^2$ )

Transversal reinforcement is calculated by reviewing from 2 directions

So, High building needs design that is based on appropriates the applicable provisions, namely in terms of strength, stability, security, comfort and economic factors. Its has been shown in this final report how about strength if the design depent on SNI.

*Keywords:* design structure, analysis structure, planning dimensions, design reinforcement, earthquake analysis, special moment frame, static analysis.

