

**A STUDY OF REINFORCED CONCRETE COLUMN STRUCTURE TO  
COMPARE OF STEEL COLUMN STRUCTURE  
(CASE STUDY ON INDONESIA EDUCATION MUSEUM BUILDING  
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**ABSTRACT**

Indonesia education museum building which consists of two floors has a unique architectural style and in the earthquake zone 3, its design is using a system of intermediate moment frame bearers (SRPMM) to carry the gravity and seismic loads. The frame of the building is quite unique, so the author is interested in reviewing of the structure. In this study is limited on reviewing the structures of the frame and the aims of the study: (1) Expenses of gravity and seismic loads, (2) Analyzing the strength and ductility of columns, and (3) Comparison the use of reinforced concrete columns and steel columns.

The design of the frame was using the 3D and analysis assuming the dimensions of each frame in according to the real building ground. The author used Etabs version 7.10 for earthquake load analysis based on SNI 03-1726-2002 the code of earthquake resistant building standards of assigning, analysis of concrete structures based on SNI 03-2847-2002 about regulation procedures for reinforced concrete structures, and SNI 03-1729-2002 about steel structure design procedures for structural design of steel columns.

Based on engineering drawing, obtained K1 column uses 400 mm x 400 mm using 8D16 for the longitudinal reinforcement, shear reinforcement P10-100 on the pedestal and P10-150 on the middle of the space area. K2 column uses 400 mm x 400 mm using 6D16 for the longitudinal reinforcement, shear reinforcement P10-100 on the pedestal and P10-150 on the middle of the space area. From the results shows of data analysis to K1 column uses 400 mm x 400 mm using 8D16 for the longitudinal reinforcement, shear reinforcement P10-120 on the pedestal and P10-200 on the middle of the space area. K2 column uses 400 mm x 400 mm using 6D16 for the longitudinal reinforcement and shear reinforcement P10-120 on the pedestal and P10-200 on the middle of the space area. For the design of steel columns was taken from the  $M_{nb}$  as  $M_r$  for column interaction diagram (MN) on its balance point. It was obtained I-profile steel 350mm x 350mm x 10mm x 16mm for the whole portal columns. Employment cost of reinforced concrete column total is Rp. 56,038,214.36 while total cost of the work of steel columns is Rp. 130,938,080.00.

***Key words: study columns, concrete, and steel.***