

ABSTRACT

DESIGNING LIGHTWEIGHT CONCRETE BEAM PROFILE FOR EFFECTIVE FLOOR INSTALLATION IN MULTI-STAGES BUILDINGS

By

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This research was based on the concern on rapid deforestation or forest loss that is caused by the use of wood for concrete casting formwork in multi-stages building floor. Researchers have done various attempts by offering a range of alternative products such as ceiling brick and porous concrete block. However, those existing products come with high price. This research aims to pursue more effective new method in concrete casting. It offered lightweight concrete beam that has specifically been designed and arranged to lock each other when installed. Strength analysis has been done by numerical method. The model and loading material was referred to the Indonesian load code for building (SNI 03-2847-2002). On the tip of the beam, safety factor for the steel reinforcement was 31,616 and for concrete was 5,874. In the middle of the beam, safety factor for the steel reinforcement was 39,702 and concrete was 1.547. If the analysis is done to the assembled concrete, the factor will raise. For instance, in the middle of the beam, safety factor for concrete increase to 2.126 for seven beams. This beam profile is categorized as lightweight (less than 25kg/m). Therefore, it is effective for floor installation and can minimize the use of wood.

Keywords: deforestation, concrete beam, multi-stages building floor, numerical method.