

***STUDY OF CONCRETE COMPRESSIVE STRENGTH AGAINST
CEMENT SUBSTITUTION USING GROUND GRANULATED
BLAST FURNACE SLAG (GGBFS) K-300***

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ABSRTACT

The use of Portland cement as the main binding material in concrete contributes to high carbon emissions, creating the need for more environmentally friendly alternative materials. One alternative is Ground Granulated Blast Furnace Slag (GGBFS), which can be used as a partial replacement for cement. This study aimed to analyze the effect of GGBFS as a partial cement replacement on the slump value and compressive strength of K-350 concrete.

This research employed an experimental laboratory method using GGBFS replacement levels of 0%, 5%, and 10% by the weight of cement. A total of 27 cube specimens measuring 15 cm × 15 cm × 15 cm were prepared. The tests included material characterization, slump test, and compressive strength test at the ages of 7, 28, and 56 days.

The results showed that the fine and coarse aggregates met the requirements of the Indonesian National Standard (SNI). The use of GGBFS affected both the slump value and the compressive strength of concrete. The 5% GGBFS replacement produced the optimum compressive strength, while the 10% replacement resulted in lower compressive strength. However, none of the concrete mixtures achieved the target strength of K-350 concrete. Therefore, a 5% GGBFS replacement is considered the most effective proportion in this study.

Keywords: compressive strength, concrete, Ground Granulated Blast Furnace Slag (GGBFS), partial cement replacement, slump.