

# The Feasibility and Performance of Self Compacting Concrete on Various Size and Proportion of Locally Coarse Aggregate

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# The Feasibility and Performance of Self Compacting Concrete on Various Size and Proportion of Locally Coarse Aggregate

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**Abstract.** Self-compacting concrete (SCC) is an innovation concrete technology which can spread grout of concrete into the formwork without the need of vibrator. The objective of this research was to evaluate the performance of SCC using locally available coarse aggregate sizes, proportion from total aggregate weight and chemical admixtures in producing of SCC. Two various sizes and percentages of coarse aggregates from total aggregate weight were investigated. The influence of coarse aggregate size and proportion is determined in terms of fresh concrete and compressive strength under constant dosage of superplasticizer. Result of the research indicated that increasing the size of coarse aggregate in SCC mixtures from size of 10 mm to 12.5 mm can produce poor fairly mixtures in terms passing ability for both of specimens using 40% and 50% of coarse aggregate content in the SCC mixtures. Moreover, the augment of the volume content of coarse aggregate from 40% to 50% of total aggregate weight can improve the concrete compressive strength and the adding of superplasticizer in the mixtures can avoid segregation among aggregate particles. The result of experimental phase indicated that the equation from ACI 209R-92 can be utilized to predict the compressive strength of SCC mixtures at different ages

## 1. Introduction

### 1.1. Research Context

Concrete technology has been developing rapidly in the last decades. The difficulty of construction for special structures triggers researchers to continuously investigate new method of concrete technology. The durability of concrete becomes the main focus on the research for solving the problem. The special construction such as mass concrete and limited space of reinforcements bring the new problems in terms of heavy compaction, need a vibrator, and higher costs. One of the solutions for diminishing this problem can be solved by using self-compacting concrete (SCC) which has flowability and no need of compaction characteristics [1-2]. In 1980, Self-compacting concrete method was known in Japan [3]. The newest technology of concrete which can achieve the high performance of concrete. The SCC has the ability to spread into formwork without the need of vibrator. Last, the reduction of external vibration in the construction method of concrete causes a relieve of workers and enhance the speed of construction.

The constituent materials of SCC mixtures are similar to the conventional concrete which need a vibration, except the content of aggregate is less than the conventional one. According to [4], the



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