

# EFFECT OF PARTIAL REPLACEMENT OF CEMENT USING ANDESITE STONE POWDER AND ADDITION OF STEEL FIBER ON SELF-COMPACTING CONCRETE

by Slamet Widodo, Darmono, Faqih Ma'arif, Maris Setyo Nugroho

## ABSTRACT

*This study was conducted to determine the effect of partial substitution of cement with andesite stone ash and the addition of steel fiber on the value of 1) slump flow, 2) T500 slump flow, 3) visual stability index, 4) ultrasonic pulse velocity, 5) dynamic modulus of elasticity, 6) compressive strength, and 7) flexural strength of self compacting concrete. This research is quantitative experimental research. Partial substitution of cement using andesite stone ash by weight of cement at 0%; 10%; 20%; and 30%, while the addition of steel fiber by volume fraction ratio of concrete with fiber at 0%; 0.25%; and 0.50%. There are 12 variants of concrete mix combinations. Each variant consisted of five cylinders with 15 x 30 cm and five beams with 10 x 10 x 50 cm. Fresh concrete tests include 1) slump flow, 2) T500 slump flow, and 3) visual stability index (VSI). Non-destructive testing of concrete includes dynamic modulus of elasticity and ultrasonic pulse velocity. Destructive testing of concrete includes compressive strength and flexural strength. The results showed that cement substitution using andesite stone ash and the addition of steel fiber in fresh concrete testing decreased slump flow, increased T500 slump flow and VSI values. In non-destructive hardened concrete testing, there is a decrease in ultrasonic pulse velocity and dynamic modulus of elasticity in the variant without steel while there is an increase in ultrasonic pulse velocity and dynamic modulus of elasticity in the 0.25% and 0.50% steel fiber variants. In destructive hardened concrete testing, there is a decrease in compressive strength and flexural strength.*

Kata Kunci: *Andesit stone ash Compressive strength Flexural strength Self compacting concrete Steel fiber*