

## Mechanical properties of concrete containing microwaved sewage sludge ash as partial cement replacement

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### ABSTRACT

The production of sewage sludge waste from waste water treatment plant is increased every year as it is also only dumped in selected dumping area without maximize the utilization of the waste. As we are towards the process of developing our country, the demand of cement in construction industry was also increased. The problem stated has spark the idea of this research is to study the mechanical properties of the concrete that using different percentage of Microwaved Sewage Sludge Ash (MSSA) as partial cement replacement. Other objectives of this research are to determine the optimum percentage of the replacement of the MSSA in the concrete. Microwave heating method with two different temperature which are Medium and Medium High temperature were used to study the effect of different burning temperature of the Microwaved Sewage Sludge Ash (MSSA) to the concrete. The content percentage of MSSA used was tested with 0%, 5%, 10% and 15% respectively. The MSSA concrete undergo curing day for 3, 7 and 28days were then test with Compressive Strength test, Flexural Strength test and Ultrasonic Pulse Velocity (UPV) test. Based on the result, MSSA concrete with 5% replacement and heated with Medium High Temperature shows the best in result which is 44.52 MPa, with 1.25% higher in compressive strength compared to normal concrete. The Flexural Strength test shows that the 5% MSSA-Medium High temperature concrete is higher than normal concrete which is 7.79 MPa. It is also shown that UPV value for 5% MSSA-Medium High Temperature had lower value than control sample, 4.640 km/s at the age of 28days curing. As conclusion, concrete that contains 5% of MSSA replacement and burned with Medium High temperature show the best result among other sample.

### KEYWORDS :

waste water; Microwaved Sewage Sludge Ash (MSSA); temperature