

Reliability of Cores Test Result at Elevated Temperature in Case of High Strength Concrete (HSC)

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Abstract : Concrete is broadly used as a structural material in the construction of buildings. When the concrete is exposed to elevated temperature, its strength evaluation is very necessary in the existing structure. In this study, the effect of temperature and the reliability of the core test has been evaluated. For this purpose, the cylindrical cores were extracted from High strength concrete (HSC) specimens that were exposed to the temperature ranging from 300 °C to 900 °C with a constant duration of 4 hr. This study compares the difference between the standard heated cylinders and the cores taken from them after curing of 90 days. The difference of cylindrical control and binary mix samples and extracted cores revealed that there is 12.19 and 12.38% difference at 300°C, while this difference was found to increase up to 12.89%, 13.03% at 500 °C. Furthermore, this value is recorded as 12.99%, 13.57% and 14.40%, 14.38% at 700 °C and 900 °C, respectively. A total of four equations were developed through a regression model for the prediction of the strength of concrete for both standard cylinders and extracted cores whose R square values were 0.9733, 0.9627 and 0.9473, 0.9452, respectively.

Keywords : high strength, temperature, core, reliability

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