

Estimation of the Mechanical Behavior and Durability of Old Concrete by Numerical Calculation

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Abstract:

Estimating the mechanical behavior of aged concrete correlated with potential durability is an important topic in the field of rehabilitation of civil engineering structures. The aim of this research is to propose numerical correlation models to estimate the mechanical behavior and durability of aged concrete compared to the results of new concrete. The study begins with the design of several types of new concrete and of concretes with accelerated artificial degradation, the class of the concretes varying from 25 to 35 MPa, in two aggregate variants, continuous and discontinuous granularity. On the basis of several samples characterized in the laboratory and in-situ by non-destructive tests, a numerical correlation is proposed for the direct estimation of the mechanical behavior of old concretes linked to durability class. The results obtained show the reliability of the proposed models, and provide a more realistic approach to knowledge of the overall condition of old concrete.

Keywords:

Durability, mechanical behavior, numerical model, Old concrete.