LABORATORY PERFORMANCE EVALUATION OF CEMENT STABILIZED RECYCLED CRUSHED CONCRETE

F. Lancieri
Full Professor, University of Pisa, IT
A. Marradi *
Senior Researcher, University of Pisa, IT
S. Mannucci
PhD, University of Pisa, IT
* University of Pisa, Department of Civil Engineering, Road and Transportation Division, 56126 Pisa, Italy, a.marradi@ing.unipi.it

ABSTRACT
The use of mixtures for road pavement construction constituted by granular materials recycled from demolition wastes is becoming increasingly widespread, due to the well known economic and environmental advantages.

The present research was conducted within this sector of studies in order to assess the performance of recycled concrete mixtures stabilized with different cement contents and designed for pavement base layers in terms of unconfined compressive strength, indirect diametrical tensile strength and elastic modulus.

The influence of two different compaction methods, Proctor compaction and gyratory compaction, on resistance characteristics was evaluated. In particular, using the gyratory compactor, which more successfully simulates the passing of rollers, the degree to which the period of time intervening between humidification of the mixture and its compaction (workability period) influences maximum dry density and resistance parameters was investigated.

Finally, the performances were evaluated by the fatigue test, also as a means of comparing the durability of crushed concrete mixtures stabilized with cement to that of traditional cement stabilized aggregate mixtures, indicated in the current technical literature. Based on the analysis of laboratory test results, it is possible to state that the performance of the crushed concrete stabilized mixtures is comparable to that of natural aggregate mixtures, even at relatively low percentages (2 %) of added cement.

KEY WORDS: Crushed concrete, gyratory compactor, workability, fatigue test