

عنوان مقاله:

Effects of ground granulated blast furnace slag on the mechanical properties of pervious concrete

محل انتشار:

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نویسندگان:

Ali Akbar Ramezaniapour - *Department of Civil Engineering, Head of concrete technology and durability research center, Amirkabir University of Technology, Tehran, Iran*

Alireza Joshaghani - *M.Sc. Student of Construction Engineering and Management, Department of Civil Engineering, Amirkabir University of Technology, Tehran, Iran*

خلاصه مقاله:

Applying pervious concrete in pavements is fundamentally increasing for not having high road runoff. However, this kind of pavement cannot be implemented for heavy traffic due to a much voids amount and low compressive strength. Pervious concrete prepared from portland cement and various supplementary cementing materials has depicted desirable performance. The development of new binders, as an alternative of portland cement would be suitable. This study was undertaken to present the results of a study on the effect of ground granulated blast furnace slag (GGBSF) on the performance of pervious concrete mixtures. GGBSF was used in 15%, 25% and 35% weight percentages as a cement replacement and the results were compared to reference mixtures of 100% Portland cement. The variables were slag content, aggregate size and water to cement ratio and then sixteen cases of concrete mixtures were tested to study physical and mechanical properties of hardened concrete including porosity, permeability, compressive strength, tensile strength and flexural strength at various ages. Results indicated that mechanical properties of the pervious concrete marginally decreased with the higher content of GGBFS, when compared to the reference mixtures. Although at later ages the differences were small. GGBFS is got by used less energy than cement in manufacturing process and its production emits less greenhouse gasses. Sustainability in pervious concrete structures can be reached by using supplementary cementing materials which provide higher durability and saves energy. Recycling of industrial wastes could be more beneficial for cost reduction of waste treatment prior to disposal. The aim of this research was to obtain results to evaluate of the suitability of a particular binder system of pervious concrete based on mechanical characteristics.

کلمات کلیدی:

Pervious Concrete, Ground granulated blast furnace slag, Permeability, Strength

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