

USE OF STABILIZED BLAST FURNACE SLAG IN ASPHALT MIXTURES

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ABSTRACT

As a part of a recent research study, blast furnace slag (BFS) was used as an alternative substitute of natural crushed aggregate. In general slag is defined as a by-product mainly of iron and steel production and it has been used in transport engineering for many years in the Czech Republic, but mainly as aggregate for unbound layers or as an additive for hydraulically bound layers. Slags are still often being deposited in landfills, although they could substitute a natural crushed aggregate and because of their characteristics they improve strength and anti-skid properties. In this paper there are presented data of a research that used crushed and sorted slag aggregates were used in asphalt mixtures production. The data covers the replacement of selected aggregate fraction as well as full replacement of natural aggregate by blast furnace slag. A number of tests was performed on the control and alternative asphalt mixtures to verify the effect of this alternative aggregate on the asphalt mixture properties. Performed tests include determination of stiffness modulus, resistance to permanent deformation, moisture susceptibility determination, fracture toughness (SCB-test) in low temperature range and others. The test results show that the use of blast furnace slag aggregates in asphalt mixtures does not influence the quality or durability of the mixture, on the contrary in some cases the BFS can even improve the properties. The best results were achieved by the asphalt mixture variant with substitution of 4/8 mm BFS. The results were comparable to the mixture with natural aggregates.