

STUDY OF MINERAL FILLER EFFECT ON ASPHALT MIXTURES PROPERTIES

E. Remisova

Faculty of Civil Engineering, University of Zilina, Slovakia

ABSTRACT

The mineral filler in asphalt mixture is an important component of the mixture as it plays an important role in stiffening and toughening an asphalt binder. In addition to affecting the mechanical properties of asphalts, mineral fillers are also important with respect to stripping or moisture damage. The paper presents mechanical properties of asphalt concrete AC 11 with paving grade bitumen 50/70 and polymer modified bitumen Sealoflex with two mineral limestone fillers according to empirical requirements. The produced and compacted mixtures were tested to determine voids characteristics (V_m , V_{FB}), water sensitivity (ITSR) and resistance to permanent deformation (WTS_{AIR} , PRD_{AIR}). The certain amount of filler in asphalt concrete was also substituted with hydrated lime. Laboratory research results support the benefit of adding hydrated lime to asphalt mixtures. Hydrated lime as an active mineral filler better moisture sensitivity and rutting resistance that contribute to extending the life cycle of asphalt pavement. The properties of the filler determine its interaction with bitumen and its contribution to the mixture's performance. The paper presents the positive effect of hydrated lime on affinity between bitumen and aggregate and the stiffening effect when it is mixed with bitumen.