

PAVEMENTS CAN LAST LONGER

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ABSTRACT

Scientific studies and experimental investigations are lately oriented in the field of long service life of hot mix asphalt pavements, regarding the increase of the useful life of their layers, through a less time-consuming and less costly procedure of rehabilitation and maintenance. In such a direction appears the idea of long lasting pavements. According to this concept, the expected pavement life reaches 50 years, and requires a periodical removal/replacement of the surface layer. It is important that this is achieved through a procedure completely environmentally friendly as it permits the recycling of the material of the old pavement and its placement again in the new pavement.

The Perpetual Pavement offers engineers the ability to design for specific modes of distress in the HMA materials. Resistance to bottom-up fatigue cracking is provided by the lowest asphalt layer having a higher binder content or by the total thickness of pavement reducing the tensile strains in this layer to an insignificant level. The intermediate layer provides rutting resistance through stone-on-stone contact and the durability is imparted by the proper selection of materials. The uppermost structural layer resists rutting, weathering, thermal cracking, and wear.

An effort has been made to study and understand the technical behavior of a standard four-layered pavement, under specific loading conditions, as well as the effect of the variability of these conditions on pavement's longevity. In the frame of such tests the PerRoad software has been used. Reduction of damage per million equivalent single axle loads and increase in expected service-life has been achieved with increase of moduli and thicknesses of different layers.

KEY WORDS: Perpetual pavement, design, empirical-mechanics