

Long-Term Pavement Performance Monitoring and the Revision of Performance Criteria for High Modulus Asphalt in South Africa

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ABSTRACT:

Enrobé à Module Élevé (EME) technology, a High Modulus Asphalt (HiMA), was originally developed in France. The technology is primarily suitable for construction of heavily trafficked routes, airports and container terminals. The key performance characteristics of EME are high stiffness, high resistance to permanent deformation and fatigue cracking. EME is also designed to offer good moisture resistance and good workability. The EME technology has been successfully introduced to South Africa. The development of EME design guidelines in South Africa started in 2006. A major outcome was the publication of Sabita Manual 33: "Interim design procedure for high modulus asphalt in South Africa." The performance criteria/specifications stipulated in Manual 33 were based on limited data. Based on further work against French mix design and analysis of data collected in South Africa, a revised fatigue and stiffness specifications were adopted in July 2015. Implementation of EME technology in South Africa started in 2011, when a trial section consisting of an EME base layer was constructed on the heavily trafficked South Coast Road in Durban. The section is a major entry route for heavy vehicles travelling to the Durban harbour. Several attempts to rehabilitate the section using conventional asphalt mixes had failed as a result of premature rutting due to the heavy traffic volumes entering the Durban harbour. The heavy traffic volumes at the section offered an ideal setting for an experiment in Accelerated Pavement Testing (APT) without the use of a Heavy Vehicle Simulator (HVS), which enabled the accelerated validation of the South African EME design procedure. The objective of this paper is to present the outcomes of the Long-Term Pavement Performance (LTPP) monitoring programme that was undertaken to assess the field performance of EME, and discuss the development of the newly adopted South African EME performance specifications.