

## RELATING THE CREEP RHEOLOGICAL PROPERTIES OF MASTICS TO THE CREEP PERFORMANCE OF ASPHALT CONCRETES

### **H.M. Zelelew\***

Project Engineer, ESC INC, FHWA Office of Pavement Technology, 1200 New Jersey Ave., SE, Washington, DC 20590, Phone: (202)-366-6606, Fax: (202) 493-2070, e-mail: habtamu.zelelew.ctr@dot.gov

### **A.T. Papagiannakis**

Zachry Professor and Chair, Department of Civil and Environmental Engineering, University of Texas at San Antonio, One UTSA Circle, San Antonio, TX 78249, Phone: (210)-458-7517, Fax: (210)-458-6475, e-mail: at.papagiannakis@utsa.edu

### *ABSTRACT*

In this paper, the effects of the creep rheological properties of asphalt mastics on the creep performance of asphalt concrete (AC) are presented. A total of nine AC cores were analyzed, by combining three different mix designs and three different aggregate types. Oscillatory tests on mastic samples were performed using a Dynamic Shear Rheometer (DSR) device. Experimental uniaxial creep tests were performed on the AC mixtures. The steady state region regression parameters, namely the slope and the intercept were used to characterize the permanent deformation resistance of mastics and ACs. It was found that the mastic specimens and ACs prepared with hard limestone exhibited better permanent deformation resistance potential followed by granite and soft limestone. Better correlation was found between the steady state regression parameters of the mastic and the ACs. In general, lower creep shear compliance of mastics provided better deformation resistance performance of ACs.

*KEY WORDS:* Mastics, Asphalt Concrettes, Creep, Permanent Deformation.