

**FATIGUE CHARACTERISATION OF FULL-SCALE  
PAVEMENTS USING VISCOELASTIC CONTINUUM DAMAGE  
APPROACH FOR QATAR**

**H. Sadek**

University of Liverpool, Liverpool, UK; Qatar University, Doha, Qatar

**E. Masad**

Texas A&M University at Qatar, Doha, Qatar

**H. Al-Khalid**

University of Liverpool, Liverpool, UK

**O. Sirin**

Qatar University, Doha, Qatar

*ABSTRACT*

The population and economy in Qatar have been expanding significantly in the past six years. Accordingly, Qatar is encountering huge development in infrastructure. The existing mix design methods have been developed in the past to protect against rutting given the high temperatures in Qatar. However, these mixtures might be susceptible to fatigue damage. During the last three years, a comprehensive study was conducted for the evaluation of performance of full-scale trial sections. These sections involve the use of six different asphalt mixtures in the base course. The aim of this work is to conduct fatigue tests and to use the Viscoelastic Continuum Damage (VECD) approach in order to characterise the resistance of the sections against fatigue cracking. Results revealed that the use of VECD approach has major advantages; however, the uncertainty associated with fatigue tests as well as models and their parameters have substantial influence on the predicted fatigue life.