

Development of Marshall-RT Test for Evaluating Rutting Resistance of Plant-Produced Asphalt Mixes

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WED., FEB. 14 | 10:30– 11:45 A.M. (CT)

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ABSTRACT

Characterization of the rutting potential of asphalt mixtures during the design stage is important to pavement performance and service life. In this webinar, a new simple monotonic Marshall rutting test (Marshall-RT) will be introduced to the audience. This test has been developed to evaluate the rutting resistance of asphalt mixtures. The Marshall-RT test setup combines the Marshall fixture (at the bottom), and the IDT fixture (at the top). Nine plant-produced asphalt mixtures having different types of binders (unmodified, crumb rubber modified binder (CRMB)), and polymer modified binder (PMB)) and gradations having different nominal maximum aggregate sizes (NMAS) were evaluated. The Marshall-RT test parameters (i.e. Pmax and WPmax) have shown a strong correlation with fundamental (i.e. Flow Number (FN)), simulative (i.e. Hamburg wheel tracking test (HWTT)), and simple monotonic (i.e. Ideal rutting (IDEAL-RT)) tests. For high traffic levels (i.e. 100 MSA (Million Standard Axle)), at 50°C preliminary minimum threshold criteria were proposed for Marshall-RT (Pmax and WPmax), and IDEAL-RT (RTIndex) as 5 kN, 14 kN-mm, and 90, respectively, to avoid premature rutting failure. The newly developed monotonic Marshall-RT test can be used as a surrogate simple performance test to estimate the rutting potential of asphalt mixtures during the mix design and plant production phases as a quality control (QC)/quality assurance (QA) test.

BIO

Dr. Dharamveer Singh is an Professor at Department of Civil Engineering at Indian Institute of Technology (IIT) Bombay in India. Prof. Singh's field of specialization is in Pavement Engineering, focusing on recycling, stabilization, new and innovative technology for road construction, pavement design, and maintenance and preservation of pavements, forensic investigation. Prof. Singh is closely associated with industry and highway fraternity on various fronts including pavement design, construction, training, and implementation of new technologies. Prof. Singh has been conferred with Pt. Jawaharlal Nehru Birth Centenary Award- 2018" by Indian Roads Congress Nov. 2019. Prof. Singh has published over 100 papers in international journal and conferences. Prof. Singh is an Associate Editor for International Journal, Innovative Infrastructure solutions, Springer Publisher, and Editorial Board Member of International Journal of Pavement Research and Technology, and International Journal of Road Materials and Pavement Design.

