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Performance Characterization of Reacted and Activated Rubber Modified Gap-Graded Asphalt Mixtures

Satyajit Kumar^a, Veena Venudharan^b, Krishna Prapoorna Biligiri^c, and Jorge B. Sousa^d

^aGraduate Engineer, Civil Practice – Transportation, Engineering, Design and Project Management, Global Design Centre, Gurgaon, Haryana 122001, India; Email: satyajit.k19@gmail.com

^bManager (R&D), Transportation Infrastructure IC, Larsen and Toubro Construction, Mumbai, Maharashtra 400093, India; Email: veena.venudharan@gmail.com

^cAssociate Professor, Department of Civil Engineering, Indian Institute of Technology Tirupati, Andhra Pradesh 517506, India; Email: bkp@iittp.ac.in

^dFounder & Managing Partner, CONSULPAV International, Milharado – Mafra 2665-305, Portugal-USA; Email: jmbsousa@aol.com

ABSTRACT: The objective of this research study was to evaluate the performance of Reacted and Activated Rubber (RAR) modified gap-graded asphalt mixtures, and compare the results with gap-graded asphalt mixtures modified with crumb rubber prepared through the dry mixing process. Further, the performance characteristics were compared with those of the RAR dense-graded asphalt mixtures. The scope of the study included conducting performance tests on RAR gap-graded mixtures, namely: resilient modulus test at various temperature-frequency combinations for initial stiffness evaluation; Indirect Tensile Fatigue Test for fatigue characterization; and Tensile Strength Ratio test for moisture sensitivity. Based on this research study, it was understood that RAR is a promising modifier for use in asphalt mixtures, which not only improves the strength properties, but also enhances the elastic behavior of the modified mixtures. Further, RAR content of 3% by weight of the total mixture is recommended as the optimum RAR dosage with gap aggregate gradation. It is envisioned that this study will help provide essential understanding towards the application of RAR gap-graded asphalt mixtures as superior performing pavements that are anticipated to outperform dense-graded asphalt mixtures, including, RAR dense mix.

KEYWORDS: Reacted and Activated Rubber, Gap-graded, Dry process, Initial stiffness, Fatigue cracking
