

PERFORMANCE OF POLYMER AND CRUMB RUBBER MODIFIED ASPHALT BINDERS SUBJECTED TO HIGH STRESSES IN MULTIPLE STRESS CREEP RECOVERY TEST

Aniket V. Kataware

Ph.D. Student, Department of Civil Engineering, Indian Institute of
Technology, Bombay, India

Dharamveer Singh

Assistant Professor, Department of Civil Engineering, Indian Institute of
Technology, Bombay, India

ABSTRACT

The present study was undertaken to evaluate performance of polymer and crumb rubber modified binders subjected to higher stress levels ranging from 0.1 kPa to 25.6 kPa at 76°C in multiple stress creep recovery test (MSCR). It was found that the elastic recovery of both the binders decreases with an increase in stress level. Both the binders show negligible elastic recovery at high stress levels. The polymer modified binder was found to be more elastic compared to crumb rubber modified binder. The rate of change of elastic recovery with stress level was higher for crumb rubber binder as compared to polymer modified binder, indicating that crumb rubber binder is more stress sensitive. The J_{nr} value of polymer modified binder increases rapidly compared to crumb rubber binder with increase in stress level; this indicates crumb rubber binder is stiffer. Both the binders were found to be suitable for standard traffic loading at 3.2 kPa, however, their rank degraded when tested at high stress levels. This change in grading for PMB40 and CRMB 60 shows that high stress level will certainly help to better evaluate rutting properties and applicability of the binders. Overall, at tested temperature crumb rubber modified binder seems to be beneficial compared to polymer modified binder as far as high stresses are concerned.