Influence of Nanoclay and Carbon Nano Tube on High Temperature Performance Grade and Rutting Performance of Asphalt Binder

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Abstract

The present study evaluated effects of nanoclay and Carbon Nano Tube (CNT) on high temperature Performance Grade (PG) and rutting performance of asphalt binder using Superpave rutting parameter and Multiple Stress Creep Recovery (MSCR) test. The Control binder (VG-10) was blended with 4% nanoclay and 0.75% CNT, and has been termed as Control+4%nanoclay, and Control+0.75%CNT binders in the study. The results showed that addition of both nanoclay and CNT increased stiffness and high temperature PG of Control binder. The results from MSCR test showed that Control binder after addition of nanoclay and CNT increased Recovery (%R) value and decreased non-recoverable creep compliance (J_{nr}). Stress sensitivity of Control binder did not change after addition of nanoclay and CNT. The results showed that addition of nanoclay and CNT may help in improving the rutting resistivity potential of asphalt binder.

Keywords: Asphalt binder, Nanoclay, Carbon Nano Tube (CNT), Rutting, Recovery, non-recoverable creep compliance (J_{nr}), Stress sensitivity.

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