Pavements

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Frequently Asked RCC Questions

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What is the Solar Reflectance of Roller-Compacted Concrete?

Until recently, no testing had been performed to determine the solar reflectance index (SRI) of roller-compacted concrete (RCC) pavements. However, a recent report prepared by CTLGroup, Skokie, Ill. shows that the SRI of RCC pavements is similar to SRI of conventional concrete. Both conventional concrete and RCC pavements provide high solar reflectance, which help mitigate the urban heat island effects.

The SRI of conventional concrete pavements decreases with age from about 38 when new to about 30 at ages beyond 10 years. Whereas, the SRI of asphalt pavements increases with age from about 7 when new to about 20 at the age of 8 years. Asphalt surface layers are typically replaced with new materials every 6 to 9 years, which results in an SRI of 20 or less during the entire service life of an asphalt pavement.

To determine the SRIs of two RCC parking area pavements in Tennessee, three core specimens were obtained from each pavement. At the time of sampling, Pavement 1 and Pavement 2 were about 2 and 10 years old, respectively. Both RCC mixes contained #57 stone, manufactured limestone sand, 400 lbs/yd^3 portland cement, and about 125 lbs/yd^3 Class F fly ash. The cores surfaces were tested in accordance with ASTM C1549-04, *Standard Test Method for Determination of Solar Reflectance near Ambient Temperature Using a Portable Solar Reflectometer*. The SRI of each set of 3 specimens was calculated in accordance with ASTM E1980-01, *Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces*. The SRIs for Pavement 1 and Pavement 2 were 36 and 38, respectively, which are very similar to the SRI of new conventional concrete pavements.

Although the data is limited and additional SRI evaluations of RCC pavements covering different regions of the country and different applications are needed, it is believed that the SRI of all new RCC pavements would meet the minimum of 29 needed to earn a point toward the sustainable sites credit of the LEED rating system.

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