

Surface Temperature of Asphalt Pavements with Colored Cement-Based Grouting Materials Containing Ceramic Waste Powder and Zeolite

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Abstract : The heat island phenomenon and extremely hot summer climate are becoming environmental problems in Japan. Cool pavements reduce the surface temperature compared to conventional asphalt pavements in the hot summer climate and improve the thermal environment in the urban area. The authors have studied cement-based grouting materials poured into voids in porous asphalt pavements to reduce the road surface temperature. For the cement-based grouting material, cement, ceramic waste powder, and natural zeolite were used. This cement-based grouting material developed reduced the road surface temperature by 20 °C or more in the hot summer season. Considering the urban landscape, this study investigates the effect of surface temperature reduction of colored cement-based grouting materials containing pigments poured into voids in porous asphalt pavements by measuring the surface temperature of asphalt pavements outdoors. The yellow color performed the same as the original cement-based grouting material containing no pigment and was thermally better performance than the other color. However, all the tested cement-based grouting materials performed well for reducing the surface temperature and for creating the urban landscape.

Keywords : ceramic waste powder, natural zeolite, road surface temperature, asphalt pavement, urban landscape

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