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Incorporating Phase Change Materials in Concrete Pavement to Melt Snow and Ice

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ABSTRACT

This paper discusses the use of phase change materials (PCM) in concrete pavement as a method to store energy which can be used as a heat source during cooling events to melt ice/snow. The experimental program includes: (1) use of low-temperature differential scanning calorimetry to evaluate thermal properties of PCM, and (2) use of large-scale concrete slabs containing PCM to evaluate the ability of the PCM concrete to melt snow on the surface of the concrete pavement. The temperature in the concrete slabs and the snow melting rate were monitored as quantitative measurements of the efficiency of the PCM in the concrete. In addition, time-lapse images were taken. Two approaches were used to incorporate PCM in concrete:

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