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16. Abstract Hot Mix Asphalt (HMA) has been traditionally produced at a discharge temperature of between 280°F (138°C) and 320° F (160°C), resulting in high energy (fuel) costs and generation of greenhouse gases. The goal for Warm Mix Asphalt (WMA) is to use existing HMA plants and specifications to produce quality dense graded mixtures at significantly lower temperatures. Europeans are using WMA technologies that allow the mixture to be placed at temperatures as low as 250°F (121°C). It is reported that energy savings on the order of 30%, with a corresponding reduction in CO ₂ emissions of 30%, are realized when WMA is used compared to conventional HMA. Although numerous studies have been conducted on WMA, only limited laboratory experiments are available and most of the current WMA laboratory test results are inconsistent and not compatible with field performance. The main objectives of this study are: The main objectives of this study are: 1) review and synthesize information on the available WMA technologies; 2) measure the complex/dynamic modulus of WMA and the control mixtures (HMA) for comparison purpose and for use in mechanistic-empirical (ME) design comparison; 3) assess the rutting and fatigue potential of WMA mixtures; and 4) provide recommendation for the proper WMA for use in Michigan considering the aggregate, binder, and climatic factors. The testing results indicated that most of the WMA has higher fatigue life and TSR which indicated WMA has better fatigue cracking and moisture damage resistant; however, the rutting potential of most of the WMA tested were higher than the control HMA. In addition, the WMA design framework was developed based on the testing results, and presented in this study to allow contractors and state agencies to successfully design WMA around the state of Michigan.					
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