HIGH-PERFORMANCE CONCRETE

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FINAL REPORT

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The primary goal of this research project was to evaluate PennDOT’s current concrete mixture designs for performance characteristics and provide specific recommendations on the effective use of concrete with high-performance characteristics. Highway concrete mixtures in Pennsylvania are largely designed for strengths between 23 and 31 MPa (3,300 and 4,500 psi) and for resistance to freezing and thawing. While strength and freeze-thaw resistance are important in Pennsylvania, other parameters impact the long-term performance of concrete in highway applications. Concrete can be developed to address economic considerations, as well as multiple combinations of strength, permeability, modulus, cracking tendency, abrasion resistance, freeze-thaw resistance, alkali-aggregate reaction, internal and external sulfate attack, workability, construction scheduling, traffic openings, or other criteria.

The report defines HPC in the context of the Pennsylvania Department of Transportation; describes the characteristics and benefits derived from the use of HPC; evaluates the current state of the practice in Pennsylvania; and identifies the performance criteria that benefit PennDOT bridges, structures, and concrete pavements. It also provides a series of recommendations for consideration for the Commonwealth of Pennsylvania.
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