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Performance Improvement of SBR Polymer Concrete Used in Construction of Rigid Pavement Highway

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Abstract : There are some studies which have been conducted in resent years to investigate the possibility of producing high performance polymer concrete. However, despite the great important of this subject, very limited amount of literature is available about the strength and performance of this type of concrete in case using in rigid pavement highway. In this study, the possibility of producing high performance polymer concrete by using Styrene Butadiene Rubber (SBR) emulsion with various (SBR) percents of 5,10 ,15, and 20 % by weight of cement has been investigated. The compressive, splitting tensile and flexural strengths and dynamic modulus of elasticity tests were conducted after age of 7 and 28 days for control without polymer and SBR concretes. A total of (30) cubes, (30) cylinders and (30) prisms were prepared using different types of concrete mixes. The AASHTO guide-1993 method was used to determine slab concrete thickness of rigid pavement highway in case of using various SBR polymer concrete mixture types. The research results indicate that the use of 10% SBR by weight of cement leads to produce high performance concrete especially with regard to mechanical properties and structural relative to corresponding control concrete.

Keywords : rigid pavement highway, styrene–butadiene rubber (SBR) latex, compressive test, splitting tensile test, flexural test and dynamic modulus of elasticity test
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