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THE INFLUENCE OF THE SCALE EFFECT AND HIGH TEMPERATURES ON THE STRENGTH AND STRAINS OF HIGH PERFORMANCE CONCRETE

The most effective way to reduce the structure mass, labor input and expenses for its construction is to use modern high-performance concrete of the classes С50/60…С90/105, which possess high physical and mathematic characteristics. One of the constraints for their implementation in mass construction in Ukraine is that in design standards there are no experimental data on the physical and mathematical properties of concrete of the classes more than C50/60. Also there are no exact statements on calculating reinforced concrete structures made of high-performance concretes.

The authors present the results of experimental research of the scale effect and short-term and long-term heating up to +200 °C influence on temperature and shrinkage strain, on strength and strain characteristics under compression and tensioning of high-strength modified concrete of class C70/85.

The application of high performance concretes is challenging in the process of constructing buildings aimed at operating in high technological temperatures: smoke pipes, coolers, basins, nuclear power plants’ protective shells, etc. Reducing cross-sections can lead to reducing temperature drops and thermal stresses in the structures.

Key words: high performance concrete, deformations, scale effect, strength, thermal effects, shrinkage, modified concrete.

References

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