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**Study of the Destruction Mechanism of Reinforced Concrete Hollow Slabs Under Fire Conditions**

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**Abstract**

The paper presents the results of computational experiments of the behavior of a reinforced concrete hollow core slab under the temperature impact of a fire using the finite element method. The purpose of this work is to conduct a research to determine the regularities of the mechanisms of destruction of reinforced concrete hollow core slabs under the temperature impact of a fire. To accomplish the set scientific tasks, there were created mathematical models of reinforced concrete and reinforcement with thermal and mechanical properties according to the recommendations of the Eurocode 2. The scientific novelty of this article is to reveal the mechanism of destruction of reinforced concrete hollow core slabs under the temperature impact of a fire. The computational experiments consist of an initial stage, which involves the acceptance of the mechanical load by the studied structure under normal conditions, and the second stage which involves the exposure to elevated temperatures from a fire. Currently, there is no description of the methodology for calculating the fire resistance of reinforced concrete slabs by loss of integrity, while the appearance of a through crack occurs after a certain period of time before the onset of the boundary state of the loss of bearing capacity, which poses a threat to human life and health in case of a fire. Based on the results of our studies, we obtained the results of crack distribution in the concrete of fragments of reinforced concrete hollow core slabs. This result is important for the study of the mechanism of formation of through cracks in the studied structures under the influence of high-temperature heating during a fire, especially for developing a method for assessing fire resistance by the loss of integrity of reinforced concrete slabs.

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