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An Increase in The Safety of Civil Buildings During Operation in The Harsh Conditions of the Subarctic Zone of The Russian Federation

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Abstract

Buildings have a limited-service life, depending on the type of building material and the quality of its production. However, the aggressive nature of the operating environment significantly reduces this life span. Additionally, changes in climate conditions, wind exposure, humidity, and temperature can also affect the durability and safety of civil buildings. This paper provides an analysis of the challenges faced during the operation of civil buildings in the harsh subarctic climate of the Russian Federation, based on field research.

One of the solutions to improve the safety of civil buildings is the use of overhead facade systems. Facade systems that cover the building's supporting structures protect them from the negative effects of the urban environment. At the same time, each facade has its own service life, during which its performance characteristics remain stable and do not change under the influence of various factors. These systems are repairable. This feature allows for the quick replacement of structures that affect the durability and appearance of buildings.

In their study, the authors present not only real problems leading to a decrease in the safety of civil buildings, but also optimal design solutions for overhead facade systems, the stability and reliability of which have been confirmed by experimental research.

Keywords: Safety, Operation, Subarctic Zone, Facade Systems