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Long-term research of the influence of service load, temperature changes and material aging on the strains of reinforced concrete construction

Abstract

A piece of research described in the paper concerns monitoring of the state of the floor of an aircraft hangar. The hangar was built as a shelter for light fighters 70 years ago. Recently it was re-built in order to be used for servicing passenger aircrafts. Therefore its new floor was made in such a way as to bear the load of planes mainly of Airbus A320 type. The floor consists of several reinforced concrete slabs, in the mass of the main one three strain-gauge rosettes were installed. The rosettes were situated in the spots for which the maximum load was predicted – i.e. under the wheels of the landing gears of the planes. They were connected with automatic meters-data loggers, creating a system for periodically measuring and recording the slab strains. The obtained during 5 years of the system functioning data makes it possible to determine how various agents like service load, temperature changes and material aging affect the main slab strain. It is obvious, that for safe hangar exploiting, service load is the most important agent. Therefore special attention was payed for observing the main slab strains appearing when the planes were driven into and withdrawn from the hangar.