MODERN SOLUTIONS FOR STRENGTHENING FLAT SLABS, VALIDATED THROUGH NUMERICAL, PROBABILISTIC AND EXPERIMENTAL RESEARCH

Goal of the project

The goal of the project is to identify and validate modern and viable solutions for strengthening of deficient slab-column connections of reinforced concrete flat slabs. Another important objective, given the high applicability of the results, is represented by the enhancement of knowledge in the field and efficient dissemination and transfer of know-how towards third parties and industry.

Short description of the project

The study proposes solutions for enhanced punching shear capacity of reinforced concrete flat slabs.

Implementation period

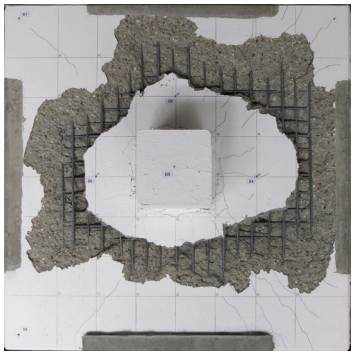
01.02.2019 - 31.07.2020

Budget

47.600 RON (10000 EUR)

Main activities

- The main activity of the project resided in the experimental program that consisted of four tests performed on full-scale specimens reproducing slab-columns connections inside reinforced concrete flat slabs. The tests aimed to reveal the behavior of such specimens and to validate the proposed strengthening solutions.



- The theoretical research approached methods used in order to numerically simulate the non-linear behavior of such slabs. Probabilistic methods were enabled in order to identify the parameters that impact the performance of the system and that of proposed strengthening solutions.

Results

- The capacity enhancement provided by the technique that uses high-performance fiber reinforced mortar is considered a very important result, as this technique is extremely technologically feasible. This facility of application is in contract to the most existing techniques which have been proven to be applied in a cumbersome manner.
- The very good agreement between tests and numerical models proves that a stable solution for simulating the behavior of such structural elements was achieved. The numerical parametric study also gave vital information on the effectiveness of strengthening techniques.

Applicability and transferability of the results:

As flat slabs are quite in-fashion with civil engineers for newly designed multi-storey structures and the design and execution flaws are becoming relatively common, the results of the research are highly applicable for both designers and constructors worldwide. The industry will benefit by publishing of research results in highly visible scientific publications and professional meetings.

Research team

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