SCIENCESPRINGDAY

FCT FACULDADE DE CIÊNCIAS E TECNOLOGIA UNIVERSIDADE NOVA DE LISBOA

Civil Engineering Department

PUNCHING OF RC/PC FLAT SLABS

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Invited Assistant Professor

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Objectives

The researcher is part of a Research Team led by Profs. Válter Lúcio and António Ramos whose main objective is to study and improve the knowledge on the punching and post-punching behaviour of RC and PC flat slabs:

•Development of suitable strengthening techniques such as the introduction of new reinforcement (Fig 1), new concrete overlay (Fig. 2) and of active techniques, namely, using post-tensioning with anchorages by bonding (Fig. 3);

•Study of punching of high strength concrete (HSC) and fibre reinforced concrete (FRC) slabs (Fig. 4);

•Study of cyclic behaviour of flat slabs (Fig. 5);

•Numerical analysis of punching (Fig. 6).


Fig. 1


Fig. 2

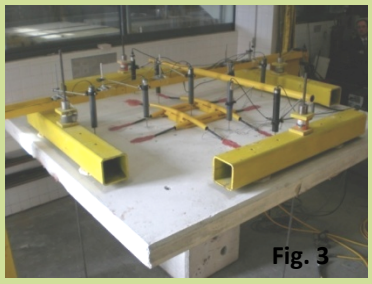
Fig. 3

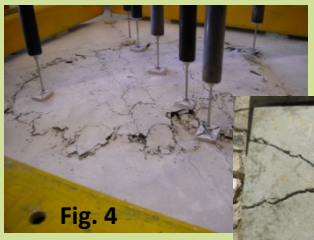

Fig. 4

Methodology

The works described above are mainly experimental, that is, real models are tested in the Structures Laboratory of Civil Engineering Department.

Develop and build testing schemes;

Development and building the strengthening techniques that we propose.

Monitoring of steel strains, elements displacements and applied loads using specific equipment.

Study and develop new concrete mixes, namely, those concering HSC and FRC.

Expected Results

We were able to show that the studied strengthening techniques were capable of increasing considerably the load capacity of the slabs;

When using HSC and FRC it is possible to replace tradicional specific reinforcement, which enables a reductions of costs and construction errors;

The numerical studies that we have carried out can be used to study further strengthening techiques schemes and study the applicability of the HSC and FRC to further situations that otherwise would be time consuming and costly to perform in laboratory.

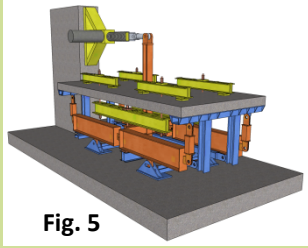
Fig. 5

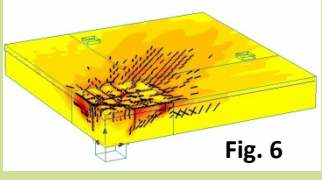
Fig. 6

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