AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING

ANALYSIS AND BEHAVIOR OF SINGULAR STEEL ANCHORAGES IN R/C STRUCTURES

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Abstract

This thesis discusses the behaviour of steel teeth connectors in concrete to highlight the different possibilities of applying vertical and horizontal teeth connectors and investigates their structural behaviour experimentally.

In this research, five reinforced concrete slabs 1200 x 1200 mm, with rigid horizontal and vertical teeth connectors, were casted and tested to examine different parameters such as teeth arrangement, geometry (height and number) and the effect of presence of headed shear studs.

In the analytical study, a finite element program "Straus7 Release 2.2.3" was applied to all the tested specimens, to get the most reasonable STM to simulate the structural behaviour of tested specimens, comparisons were performed between strut and tie models and FE models results to verify that they are correctly according to the stress trajectories obtained from FE modeling.

Abstract

Comparisons between strut and tie models and experimental results were performed to ensure the accuracy of the proposed models in predicting specimens' behaviour, as well as deformations and strains in both concrete and steel reinforcement.

From these comparisons, some conclusions are predicted, which will help in the design of this type of steel anchorages.

Keywords: anchorage; shear connectors; strut and tie method; strut and tie model; teeth; reinforced concrete slabs.

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