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AFFECTING ASPECTS ON THE BEHAVIOR OF FRAME JOINTS

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STATEMENT

This dissertation is submitted to Ain Shams University, Cairo, Egypt, on September 2014 for the degree of Doctor of Philosophy in Civil Engineering (Structural).

The work included in this thesis was carried out by the author in the Department of Civil Engineering (Structural Division), Ain Shams University, from May 2009 to September 2014.

No part of this thesis has been submitted for a degree or qualification at any other University or Institution.

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Abstract of the PhD thesis submitted by
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ABSTRACT

The variation of reinforcement details, confinement and joints angle are considerable factors, which affect the ultimate limit moment of joints and joints efficiency. The variation of joint size is another factor that significantly affects the ultimate limit moment of joints and frame joints efficiency. These previous factors were not considered in design. Also the moment applied on joints may be closing moment or opening moment so two types of joints should be compared.

The presented thesis introduces an experimental and analytical study in order to investigate the effect of reinforcement details, confinement, joints size, joints angle on the frame joints efficiency and comparison between closing joints and opening joints. Experimentally, a total of eleven specimens were tested under vertical load. All specimens were tested up to failure and the behavior was fully monitored. Moreover, a nonlinear 3D-finite element analysis was established using ABAQUS program and verified with the experimental results in order to give design recommendations for those structural elements.

Key Words: Joints, opening joints, closing joints, joints details, joints confinement, joints size, joints angle, RC, reinforced details

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