AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING
STRUCTURAL ENGINEERING DEPARTMENT

SHEAR BEHAVIOR OF SELF COMPACTING HIGH STRENGTH CONCRETE BEAMS

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A Thesis
Submitted in partial fulfillment for the requirements of the
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STATEMENT

This thesis is submitted to Ain Shams University, Cairo, Egypt, for the degree of Master of Science 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 June 2009 to September 2014.

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

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Abstract of the M.Sc. Thesis Submitted by

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Title of the thesis:

SHEAR BEHAVIOR OF SELF COMPACTING HIGH STRENGTH CONCRETE BEAMS

ABSTRACT

The shear behavior of self-compacting high strength reinforced concrete beams was experimentally and theoretically evaluated in this study. The main studied factors were the amount of web reinforcement in the beam, the shearing span to depth ratio (a/d) and the web width of the beam. Eight samples I-shaped of high strength self-compacting reinforced concrete beams with a span of 1.8m and with a cross-section that varied from 100x250 mm to 200x250 mm, while the flange width varied from 200 to 300 mm.

The results showed that tested beams without web reinforcement showed brittle failure and that the presence of web reinforcement, improved the type of failure and, increased the shear capacity of the section.

Increasing the shearing span to depth ratio decreased the shear capacity of the concrete beams without web reinforcement, accordingly failure of beam with high shearing span to depth ratio was sudden and accompanied by the formation of one failure crack, while failure of beams with smaller (a/d) ratios was more explosive due to failure in the compression strut formed between point of loading and the support. Increasing the shearing span to depth ratio led to a significant decrease in the failure load of the beam with web reinforcement.

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