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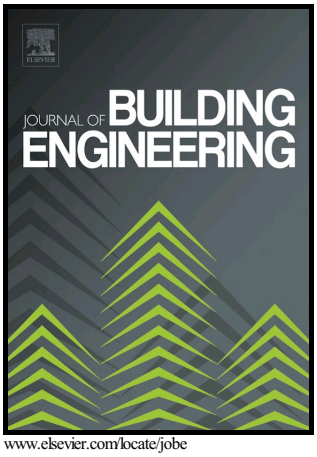

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ASSESSMENT OF THE SHEAR STRENGTH OF CONTINUOUS REINFORCED CONCRETE HAUNCHED BEAMS BASED UPON CYCLIC TESTING

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ABSTRACT

Research results, interpretations and findings of the testing of five prototype continuous reinforced concrete beams (four haunched and one prismatic) designed to develop a shear failure under cyclic loading are presented. Subject beams were tested with minimum shear reinforcement according to the reinforced concrete guidelines of Mexico´s Federal District Code. The studied haunched length is one-third the effective span of the beam. The considered angles of slope of haunch from horizontal varied from 0^0 (prismatic) to 10^0. Cyclic tests were displacement-controlled, and two cycles at the same displacement were set in the displacement history which considers a geometrical increment of target displacements. The parameters under study with respect to the shear-resisting mechanism are: (a) the angle of haunch from horizontal and its impact on the beams´ behavior, (b) the contribution of the inclined longitudinal steel reinforcement in shear, (c) the contribution of the transverse steel reinforcement in shear and, d) the angle of inclination of the main shear crack. Previously proposed design equations based upon the section approach were examined. It was found that haunched beams resist a similar or even higher effective shear force when compared to the reference prismatic beams, particularly for negative bending and as the haunched angle increases. The additional shear strength in haunched beams at a smaller volume of concrete is due to higher contributions of the inclined longitudinal steel reinforcement and the transverse steel shear reinforcement as the haunched angle increases. This fact is a direct consequence that the angle of inclination of the main shear crack diminishes as the haunched angle increases.

Keywords: haunched beams, shear strength, deformation capacity, cyclic testing