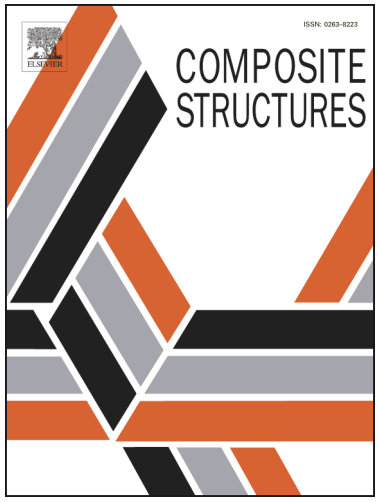

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Influence of Concrete Strength Combined with Fiber Content in the Residual Flexural Strengths of Fiber Reinforced Concrete

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Abstract

Recently, the design and construction of fiber reinforced concrete structures, such as floor slabs and precast tunnel linings, require using the actual values of the residual flexural strength instead of the average concept of the equivalent residual flexural strength ratio. An experimental study was performed to examine the direct residual flexural strengths of steel fiber reinforced concrete beams with various concrete strengths, 25, 35, and 45 MPa, and fiber volume factions, 0.25, 0.375, and 0.50%. The influence of the concrete strength and fiber content in the limit of proportionality, residual flexural strength, and energy absorption capacity were evaluated. The fiber reinforced concrete beams with a strength of 45 MPa showed a higher increase in the residual flexural strength immediately after concrete cracking, particularly for a fiber volume fraction of 0.5%. On the other hand, as concrete cracking propagated, the residual flexural strength and energy absorption capacity values rapidly decreased in the beams with a concrete strength of 45 MPa.

Keywords: Fiber-reinforced concrete, concrete strength, fiber volume fraction, limit of proportionality, residual flexural strength, energy absorption