

The Effect of Addition of Steel Fibers on Compressive and Tensile Strengths of Structural Lightweight concretes

Mahmoud Khashaa Mohammed

This research studies the effect of adding steel fiber in two percentage (0.5% and 1% by volume) on plain structural lightweight concrete (SLWC) produced by using crushed bricks as coarse lightweight aggregates (LWA) in a lightweight concrete mix designed according to ACI committee 211-2-82 with mix proportion 1:1.12:3.35 by volume. The w/c was equal to 0.5 and cement content 550 kg/m³. Different tests were performed for fresh and hardened SLWC such slump test, fresh and hardened unit weight, compressive strength and two indirect tests of tensile strength (splitting tensile and flexural strength). The results demonstrated that the effect of addition of steel fiber was more pronounced on the tensile strength of SLWC than the compressive strength of such concrete. The maximum increase of compressive, splitting tensile and flexural strengths at 28-days were 38.8, 77.12 and 111.2 % in the SLWC containing 1% fiber. On the other hand the rate of strength gain between 3 and 28 days was constant on compressive strength of plain concrete and that containing steel fiber while this rate was clearly increase on tensile strength especially flexural strength.