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Abstract: An experimental study on the bond behavior of steel bar in air-entrained recycled coarse aggregate concrete (RCAC) in fresh water and sea water under the action of fast freeze-thaw (F-T) cycles was carried out. A total of 63 center pull-out specimens, including 9 unfreezed specimens and 54 freezed specimens which suffered from 25, 50 or 75 cycles of fast F-T according to standard GB/T 50082-2009, were constructed and tested to investigate the effect of the following parameters: (a) number of fast F-T cycles, (b) solution, (c) diameter of steel bar on the bond behavior of steel bar in air-entrained RCAC. The experimental results were compared with bond behavior of steel bar in RCAC conducted by the author. By comparison, the bond behavior is found to be improved greatly through mixed air-entraining agent into RCAC. A calculation expression of bond strength of steel bar in air-entrained RCAC considering number of fast F-T cycles is proposed based on the experimental results obtained in this paper.

Key words: Center pull-out test; Bond strength; Air-entrained recycled coarse aggregate concrete; Fast freeze-thaw cycles; Bond strength model

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