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Bond Strength of Concrete Beams Reinforced with Steel Plates: Experimental Study

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Abstract : This paper presents an experimental study of the bond behaviour of confined concrete beams reinforced with a chequer steel plate or a deformed steel bar by using the beam-bending pullout test. A total of three beams of 225 mm width, 300 mm height, and 600 mm length were cast and tested. All the beams had the same details of compression reinforcement and stirrups; two plain steel bars of 10 mm diameter (R10) were used for the compression reinforcement, and plain steel bars (R10) at a distance of 80 mm centre to centre were used for the stirrups. The first beam was reinforced with a deformed steel bar while the remaining beams were reinforced with horizontal or vertical chequer steel plates. The results showed no significant difference in the bond force between the beams reinforced with a deformed steel bar or a horizontal steel plate. The beam reinforced with a vertical steel plate considerably presented a bond force higher than the beam reinforced with a horizontal steel plate.

Keywords : bond, pullout, reinforced concrete, steel plate
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