BEHAVIOR AND STRENGTH OF WELDED STUD SHEAR CONNECTORS

by
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(ABSTRACT)

The behavior and strength of welded shear studs are subjects of ongoing study. In recent years, research has shown that the American Institute of Steel Construction (AISC) specification equations for shear stud strength are unconservative for studs placed in deck with ribs transverse to the steel beam. Twenty-four solid slab push-out tests, 93 composite slab push-out tests, and bare stud tests were performed to study the effects on stud strength of friction, normal load, position of studs in the ribs of steel deck, concrete strength, and stud properties. Stud diameters ranged from 3/8 in. to 7/8 in., deck heights ranged from 2 in. to 6 in., and both single and pairs of studs were tested. The push-out test results from this study were combined with other studies to propose a new stud strength prediction model. Three new beam tests were performed to study the effect of the stud position in the ribs of the steel deck. The results of these tests, along with 61 other beam tests, were used to verify the new stud strength prediction model. A reliability study was performed to determine resistance factors for stud strength and beam strength.
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