

STANDOFF SCREWS USED IN COMPOSITE JOISTS

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(ABSTRACT)

The purpose of this study is to evaluate the performance of the 5/16 in. diameter Elco Grade 8 standoff screw as a mechanical shear connector in composite joists. Standoff screws are being investigated as an alternative to welded shear studs in short span composite joists. The data and results obtained from 106 pushout tests performed on the Elco Grade 8 standoff screw are presented. The test parameters include: standoff screw height, quantity of standoff screws per deck rib, standoff screw position, slab depth, base angle thickness, deck type, and amount of transverse reinforcement.

The test results from this study are compared to those obtained in previous research performed by Hankins (1994), and the applicability of Hankins' predictive equation for the shear strength of the Elco Grade 8 standoff screw is investigated. The influences of various test parameters on the shear strength of the standoff screw are evaluated and the effects of grouping the standoff screws in the deck ribs are examined. The performance of the standoff screw in solid slab applications is also investigated. Predictive equations for the shear strength of the Elco Grade 8 standoff screw, based on screw-related failure modes, concrete rib failures, and longitudinal splitting of solid concrete slabs, are presented.