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RESEARCH REPORT: RR 25095  
(CSI #03150)

Expires: September 1, 2012

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Code: 2008 LABC

**GENERAL APPROVAL** – Renewal-Elco Dril-Flex and Hilti Kwik-Flex Structural Fasteners for Cold-Formed Steel and Aluminum.

## DETAILS

Elco Dril-Flex and Kwik-Flex structural fasteners used for connecting cold-formed steel or aluminum members. The steel screws have a dual heat treatment and electroplated zinc coating. The fasteners are available as self-drilling/tapping metal screws without pre-drilling holes in the receiving member of the connection and as self-tapping metal screws for installation in pre-drilled holes.

The Elco Dril-Flex and Hilti Kwik-Flex structural fasteners are identical in design and manufacture except for product name identification.

The Self-drilling/tapping metal screws are installed without pre-drilling holes in the receiving member of the connection. The self-drilling function of the fastener is achieved by the lead threads of the fastener engaging the metal accomplishing a pre-drilled clearance hole in the component being connected to the receiving member. Clearance holes shall be 13/64, 15/64, 17/64, and 21/64-inch in diameter for No. 10-gage, No. 12-gage, 1/4-inch, and 5/16-inch diameter fasteners, respectively. Fasteners must be installed with a 1,800 to 2,500 rpm screw gun incorporating a depth sensitive or torque limiting nose piece. The installed fasteners must protrude through the attached members, with the high-hardness drill point and lead threads extending beyond the attached members.

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Self Tapping fasteners must be installed in 0.290-inch diameter pre-drilled hole in connecting and receiving members for the 5/16-inch diameter fasteners. The fasteners must be installed with a screw gun with a depth-sensitive or torque limiting nose piece. The installed fasteners shall protrude through the attached members with the high-hardness lead threads extending beyond the attached members.

**The approval is subject to the following conditions:**

1. The applied tension and shear service (allowable strength design) loads shall not exceed the allowable nominal tension and shear strengths for fasteners as tabulated in Table 1 and Table 2 as shown on the attached sheet.
2. The minimum spacing and edge distance for fasteners shall comply with Table 3 shown on the attached sheet.
3. Calculations demonstrating the applied loads are less than the allowable loads prepared by a California licensed civil or structural engineer or architect must be submitted to the structural plan check section.
4. The allowable loads shall not be increased for wind or seismic forces.
5. Calculations shall be in accordance with the Cold Formed Steel Design Manual, AISI NAS-2001 with 2004 supplement. Calculations shall consider all loading conditions acting on the connected assembly. Connections with combined shear and tension shall be checked using the interaction equation;

$$(P_t / P_{ts}) + (P_s / P_{ss}) \leq 1.0,$$

Where,  
 $P_t$  = Applied Tension Service Load  
 $P_s$  = Applied Shear Service Load  
 $P_{ts}$  = Allowable Nominal Tension Service Load  
 $P_{ss}$  = Allowable Nominal Shear Service Load

7. Steel members shall have a minimum ultimate tensile strength of 58-ksi.
6. The nominal strength values contained in this report are not approved for the design of cold-formed steel diaphragms.
8. Fasteners are to be installed in accordance with the manufacturer's published installation instructions and this report.
9. The screws are identified with a raised circle around a "flag" logo on top of the fastener head.

Elco Construction Products

RE: Elco Drill-Flex and Hilti Kwik-Flex Structural Fasteners for Cold-Formed Steel and Aluminum.

## **DICUSSION**

The report is in compliance with the 2008 Los Angeles City Building Code.

The approval was based on tests in accordance with ICC-ES Acceptance Criteria for Tapping Screw Fasteners (AC118), dated June 2008.

Addressee to whom this Research Report is issued is responsible for providing copies of it, complete with any attachments indicated, to architects, engineers and builders using items approved herein in design or construction which must be approved by Department of Building and Safety Engineers and Inspectors.

This general approval of an equivalent alternate to the Code is only valid where an engineer and/or inspector of this Department has determined that all conditions of this approval have been met in the project in which it is to be used.

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Attachment: 1-page: Table of Allowable Tension and Shear Service Loads and Minimum Spacing and Edge Distance.