GENERAL APPROVAL - Reevaluation and Clerical Modification – Tru-Weld Punching Shear Resistor Studs (PSR)

DETAILS

The above assemblies and/or products are approved when in compliance with the use, description, design, installation, conditions of use, and identification of Evaluation Report No. ESR-2822, reissued April 1, 2017, revised May, 2017, of the ICC Evaluation Service, Incorporated. The report, in its entirety, is attached and made part of this general approval.

The parts of the Evaluation Report No. ESR-2822, which are excluded on the attached copy have been removed by the Los Angeles City Building Department as not being included in this approval.

The approval is subject to the following condition:

1. Approval of Tru-Weld PSR Studs for use as Shear Reinforcement Assemblies requires a separate Los Angeles City Research Report.
DISCUSSION

The clerical modification is to update the report to the 2017 Los Angeles City Building Code.

The report is in compliance with the 2017 Los Angeles City Building Code.

This general approval will remain effective provided the Evaluation Report is maintained valid and unrevised with the issuing organization. Any revisions to the report must be submitted to this Department, with appropriate fee, for review in order to continue the approval of the revised report.

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.

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.

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Section: 03 21 00—Reinforcing Steel

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EVALUATION SUBJECT:
TRU-WELD PUNCHING SHEAR RESISTOR STUDS

1.0 EVALUATION SCOPE

Compliance with the following code:


* ■ 2013 Abu Dhabi International Building Code (ADIBC)¹

¹The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections as the ADIBC.

Property evaluated:
Structural

2.0 USES

Tru-Weld punching shear resistor (PSR) studs are large-headed shear connectors that are welded to flat steel bars and used as shear reinforcement in flat concrete slabs to replace stirrups to resist the punching shear stress in the slabs.

3.0 DESCRIPTION

The PSR studs are provided in 5/8", 1/2", 5/8" and 3/4-inch (9.5, 12.7, 15.9 and 19.1 mm) diameters and comply with the material requirements and specifications of the American Welding Society's Structural Welding Code—Steel, AWS D1.1:2010. The studs are made from ASTM A29-05 Grades 1010 through 1020 steel satisfying the following physical requirements according to Table 7.1 of AWS D1.1:2010:

- Yield strength: 51,000 psi (350 MPa), minimum.
- Tensile strength: 65,000 psi (450 MPa), minimum.
- Elongation: 20 percent in 2 inches (51 mm), minimum.
- Reduction of area: 50 percent, minimum.

4.0 INSTALLATION

4.1 General:

Installation of the stud/bar assemblies used to resist punching shear stresses must comply with the Shear Reinforcement for Slab report ACI 421.1R-08, ACI 318-14 for the 2015 IBC (ACI 318-11 for the 2012 IBC and ACI 318-08 for the 2009 and 2006 IBC), a current ICC-ES evaluation report complying with AC395 and the approved plans.

4.2 Welding:

The studs must be welded in accordance with equipment and procedures recommended by the Tru-Weld Division of TFP Corporation. All welding must comply with requirements in Section 7 of AWS D1.1:2010.

5.0 CONDITIONS OF USE

The Tru-Weld Punching Shear Resistor Studs described in this report comply with, or are suitable alternatives to what is specified in, the code indicated in Section 1.0 of this report, subject to the following conditions:

5.1 The fabricated shear stud reinforcement bar assemblies manufactured using these studs must be welded by approved fabricators of structural steel components and structural steel welding as required by the provisions of the IBC, and Section 4.2 of this report.

5.2 The shear stud reinforcement bars must be used for assemblies that are recognized in a current ICC-ES evaluation report prepared in accordance with AC395 (the Acceptance Criteria for Headed Shear Stud Reinforcement Assemblies for Concrete Slabs or Footings).

6.0 EVIDENCE SUBMITTED

6.1 Material specifications and quality documentation in accordance with ASTM A1044.

6.2 Weld base qualification tests in accordance with AWS D1.1.

6.3 Quality documentation.

7.0 IDENTIFICATION

The label on the packages of Tru-Weld PSR studs includes the name and address of Tru-Weld Division,
TABLE 1—TRU-WELD PSR STUD DIMENSIONS

<table>
<thead>
<tr>
<th>STUD SHANK DIAMETER, D [inch (mm)]</th>
<th>HEAD DIAMETER, H [inch (mm)]</th>
<th>H/D</th>
<th>SHANK AREA, S_d [inch² (mm²)]</th>
<th>HEAD AREA, H_d [inch² (mm²)]</th>
<th>$\frac{H_d}{S_d}$</th>
<th>HEAD THICKNESS, T [inch (mm)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{3}{4}$ (9.5)</td>
<td>1.19 (30.1)</td>
<td>3.17</td>
<td>0.110 (71)</td>
<td>1.112 (712)</td>
<td>10.1</td>
<td>0.26 (6.6)</td>
</tr>
<tr>
<td>$\frac{1}{2}$ (12.7)</td>
<td>1.58 (40.2)</td>
<td>3.16</td>
<td>0.196 (127)</td>
<td>1.961 (1269)</td>
<td>10.0</td>
<td>0.33 (8.4)</td>
</tr>
<tr>
<td>$\frac{5}{8}$ (15.9)</td>
<td>1.98 (50.2)</td>
<td>3.17</td>
<td>0.307 (199)</td>
<td>3.079 (1979)</td>
<td>10.0</td>
<td>0.40 (10.2)</td>
</tr>
<tr>
<td>$\frac{3}{4}$ (19.1)</td>
<td>2.37 (60.2)</td>
<td>3.16</td>
<td>0.442 (287)</td>
<td>4.412 (2846)</td>
<td>10.0</td>
<td>0.42 (10.7)</td>
</tr>
</tbody>
</table>

FIGURE 1—PSR STUD CONFIGURATION

FIGURE 2—TRU-WELD LOGO

TFP Corporation; product name; size; ICC-ES evaluation report number (ESR-2822); and heat number. In addition, the PSR studs are identified by the Tru-Weld logo (see Figure 2) inscribed in an indented circle on the head of each connector.