



**LAREDO SMART MANAGEMENT CO.
LTD. DBA HI-TECH TILT**
1205 E. Hillside Rd.
Laredo, TX 78041
(956) 724-8510
www.hi-techtilt.com

HI-TECH SHEAR TAB CONNECTORS

CSI Section:

03 40 05 Precast Composite Concrete Panels

1.0 RECOGNITION

The Hi-Tech Shear Tab Connectors recognized in this report have been evaluated for use only as a method of tensile connections between concrete elements and the supporting steel members. The structural performance of the Hi-Tech Shear Tab Connectors complies with the intent of the provisions of the following codes and regulations:

- 2018, 2015, and 2012 International Building Code® (IBC)

2.0 LIMITATIONS

Use of the Hi-Tech Shear Tab Connectors recognized in this report is subject to the following limitations:

2.1 The Hi-Tech Shear Tab Connectors shall be installed and constructed in accordance with the manufacturer's published installation instructions, and this report. In the event of a conflict between this report and the manufacturer's published installation instructions, this report governs.

2.2 When required, calculations and details showing that the shear tab connections are adequate to resist the applied loads shall be submitted to the building official for approval. The calculations and details shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

2.3 Use of the Hi-Tech Shear Tab Connectors in this report addresses only a method of tensile connections between concrete elements and the supporting steel members.

2.4 Use of the Hi-Tech Shear Tab Connectors as part of the lateral force resisting system (wind or seismic) has not been evaluated and is beyond the scope of this report.

2.5 Conformance with other aspects of the IBC, such as requirements for a complete structural system and fire-resistance ratings, is outside of the scope of this report.

2.6 The nominal load values for the Hi-Tech Shear Tab Connectors shown in Table 1 of this report, are not permitted to be increased for short-duration loads.

2.7 The Hi-Tech Shear Tab Connectors recognized in this report are produced by Laredo Smart Management Co. Ltd dba Hi-Tech Tilt in Laredo, TX.

3.0 PRODUCT USE

3.1 General: The Hi-Tech Shear Tab Connectors are used in tension connections between concrete elements and the supporting steel members.

3.2 Design: Table 1 of this report provides the nominal tensile capacity, T_n per shear tab connector (seven shear tabs per stud) and corresponding average slip.

3.3 Installation:

3.3.1 General Installation: The Hi-Tech Shear Tab Connectors shall be installed in accordance with this report, the manufacturer's published installation instructions and the approved constructions documents. A copy of this report, the manufacturer's published installation instructions and specifications shall be available at the jobsite for quality control purposes during installation.

The cold-formed steel studs described in Sections 4.2 through 4.4 of this report are cast to the concrete panels described in Section 4.5.3 of this report by the Hi-Tech Shear Tab Connectors, that are punched out of the side flange of the studs.

Before concrete placement, Five No. 4, Grade 60 reinforcing bars conforming to ASTM A615 are installed at 6 inches (152 mm) on center in each direction. The concrete panel reinforcement placement shall be installed outside the area of cone failure of the shear connection. The two studs with the seven shear tabs each are secured to the formwork with a ¼-inch thick spacer between them and fastened to the ¼-inch x 8-inch x 2.5 foot steel loading plate using four ⅝-inch diameter bolts.

The seven shear tab connectors per stud shall have a maximum edge and end distances of ⅝-inch (15.9 mm), spacing of 4 inches (102 mm) on center between each connector and an orientation of 90 degrees with alternate leg directions between the studs. Additional details are included in Figure 1 of this report.

4.0 PRODUCT DESCRIPTION

The Hi-Tech Shear Tab Connectors described in this report are made of cold-formed steel shear tabs at the interface of the concrete panel and the supporting steel member in three different configurations based on use.

The product described in this Uniform Evaluation Service (UES) Report has been evaluated as an alternative material, design or method of construction in order to satisfy and comply with the intent of the provision of the code, as noted in this report, and for at least equivalence to that prescribed in the code in quality, strength, effectiveness, fire resistance, durability and safety, as applicable, in accordance with IBC Section 104.11. This document shall only be reproduced in its entirety.

Copyright © 2023 by International Association of Plumbing and Mechanical Officials. All rights reserved. Printed in the United States. Ph: 1-877-4IESRPT • Fax: 909.472.4171
web: www.uniform-es.org • 4755 East Philadelphia Street, Ontario, California 91761-2816 – USA





4.1 Hi-Tech Shear Tab Connectors: The connectors are composed of dye formed hydraulic punches out of the flanges of steel conforming to ASTM A1003 Structural Grade 50 Type H (ST50H), with a Class G60 galvanized coating.

4.2 Configuration No.1: Configuration No.1 has a No. 16-gauge [minimum 0.0536 inch (1.36 mm) base metal thickness] steel stud having a 6-inch web with a 2-inch flange, available in lengths up to 36 inches (914 mm) and the shear tabs punched and casted into the concrete panel. Figure 2 of this report provides additional details.

4.3 Configuration No.2: Configuration No.2 has a 14-gauge [minimum 0.0670-inch (1.7 mm) base metal thickness] steel stud having a 6-inch web with a 2-inch flange, available in lengths up to 36 inches (914 mm) and shear tabs punched and casted into the concrete panel. Figure 3 of this report provides additional details.

4.4 Configuration No.3: Configuration No.3 has a 14-gauge [minimum 0.0670-inch (1.7 mm) base metal thickness] steel stud having an 8-inch web with a 2.5-inch flange, available in lengths up to 36 inches (914 mm) and shear tabs punched and casted into the concrete panel. Figure 4 of this report provides additional details.

4.5 Materials

4.5.1 Cold-Formed Steel Studs: The Cold-Formed Steel studs with shear tabs punched are made of steel conforming to, ASTM A1003 Structural Grade 50 Type H (ST50H) with a Class G60 galvanized coating.

4.5.2 Deformed Steel Reinforcing Bars (Rebar): The No.4, Grade 60 bars are at 6 inches (152 mm) on center and conform to ACI 318 specifications.

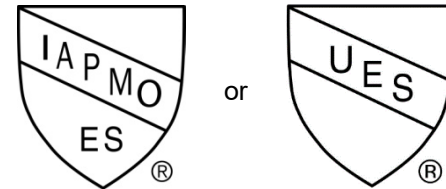
4.5.3 Concrete: The concrete panel consists of a nominal 3½-inch thick (88.9 mm), 28-inch-wide by 32-inch-long (711 mm by 813 mm) and shall conform with Chapter 19 of the IBC and ACI 318 specifications. The normal weight concrete shall have a compressive strength, f'_c , between 5,300 psi (36.5 MPa) to 6,400 psi (44.1 MPa) and a specific dry unit weight of 151.6 pcf (2,428 kg/m³).

4.5.4 Steel Loading Plate: The ¼-inch x 8-inch x 2.5 foot steel loading plate shall be made of steel conforming to ASTM A529, Grade 50.

4.5.5 Bolts: The ⅝-inch diameter bolts shall conform to ASTM A325.

5.0 IDENTIFICATION

The Hi-Tech Shear Tab Connectors are packaged to include brand name and model number, nominal connector size (number, fraction, or decimal equivalent), nominal connector embedment length, shape, gage or thickness, the manufacturer's name (Hi-Tech Tilt), the evaluation report number (ER-515). The identification includes the IAPMO Uniform Evaluation Service Mark of Conformity. Either Mark of Conformity may be used as shown below:



IAPMO UES ER-515

6.0 SUBSTANTIATING DATA

6.1 Data in accordance with the IAPMO Uniform Evaluation Services EC 033-2018, Evaluation Criteria for Cold-Formed Steel Shear Tab Connection at the Steel-Concrete Interface of Composite and Non-Composite Members.

6.2 Test reports are from laboratories in compliance with ISO/IEC 17025.

7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research completed by IAPMO Uniform Evaluation Service on Hi-Tech Shear Tab Connectors to assess conformance to the codes shown in Section 1.0 of this report and serves as documentation of the product certification. Hi-Tech Shear Tab Connectors are manufactured at the location noted in Section 2.7 of this report under a quality control program with periodic inspection under the supervision of IAPMO UES.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org

TABLE 1: Tensile Capacity of Hi-Tech Shear Tab Connectors

Configuration	Cold-Formed Steel Studs	Nominal Tensile Strength, T_n (lbf) _{1,2}	Average Slip (inch)
No.1	6-in x 2-inch x No. 16 Gauge (0.0536 inch) Studs	472	0.047
No.2	6-in x 2-inch x No. 14 Gauge (0.0670 inch) Studs	606	0.045
No.3	8-in x 2.5-inch x No. 14 Gauge (0.0670 inch) Studs	570	0.070

1 inch=25.4 mm; 1 lbf= 4.448 N

1. The nominal tensile capacity, T_n , is the average peak strength of the pull-out strength per shear tab connector (7 shear tabs per stud).
2. The nominal load values are not permitted to be increased for short duration loads.

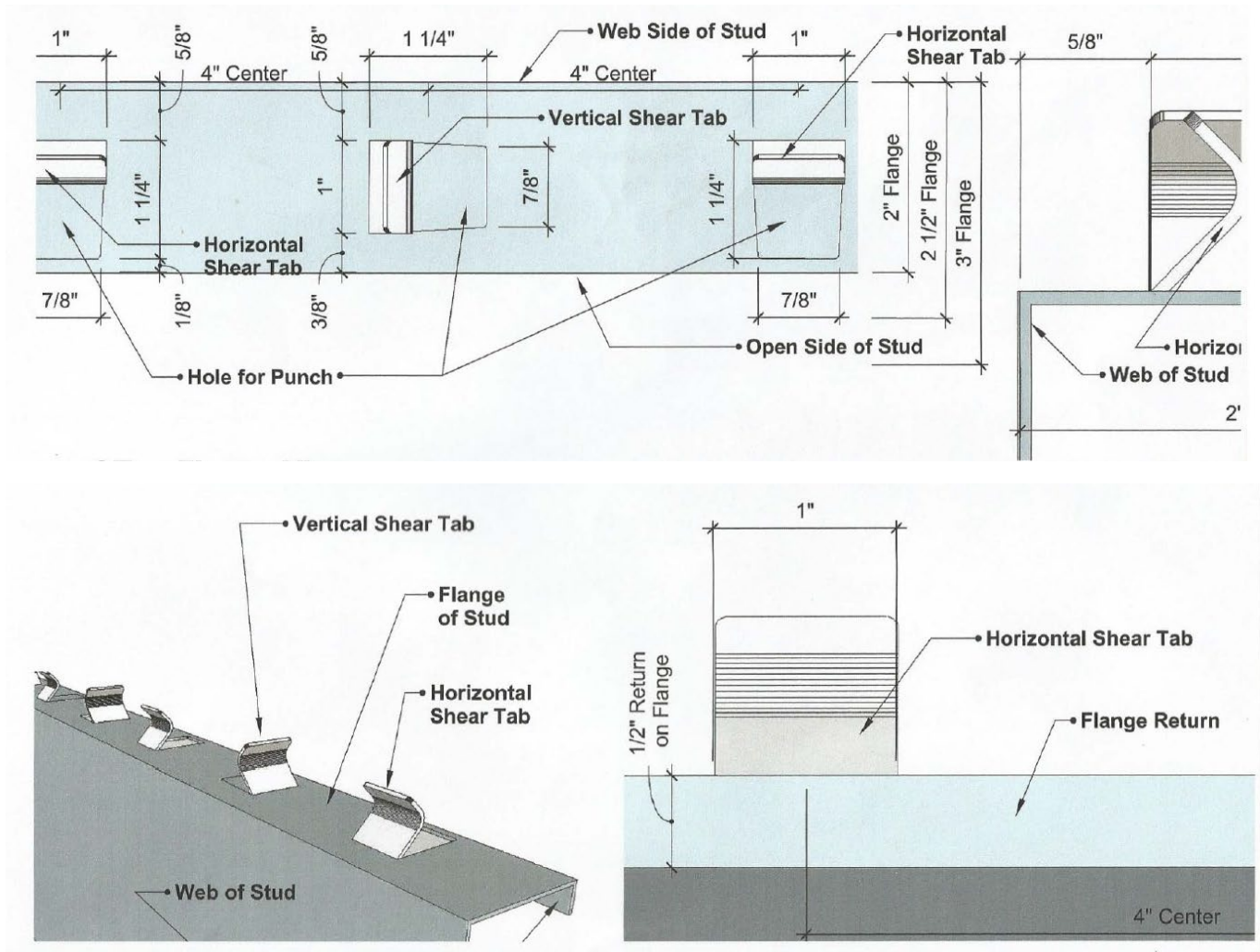


FIGURE 1: Hi-Tech Shear Tab Connector Details



SECTION NOTE:
 THE SUPPLEMENTAL PANEL
 REINFORCEMENT SHALL BE INSTALLED
 OUTSIDE THE AREA OF CONE FAILURE
 OF THE SHEAR CONNECTION.

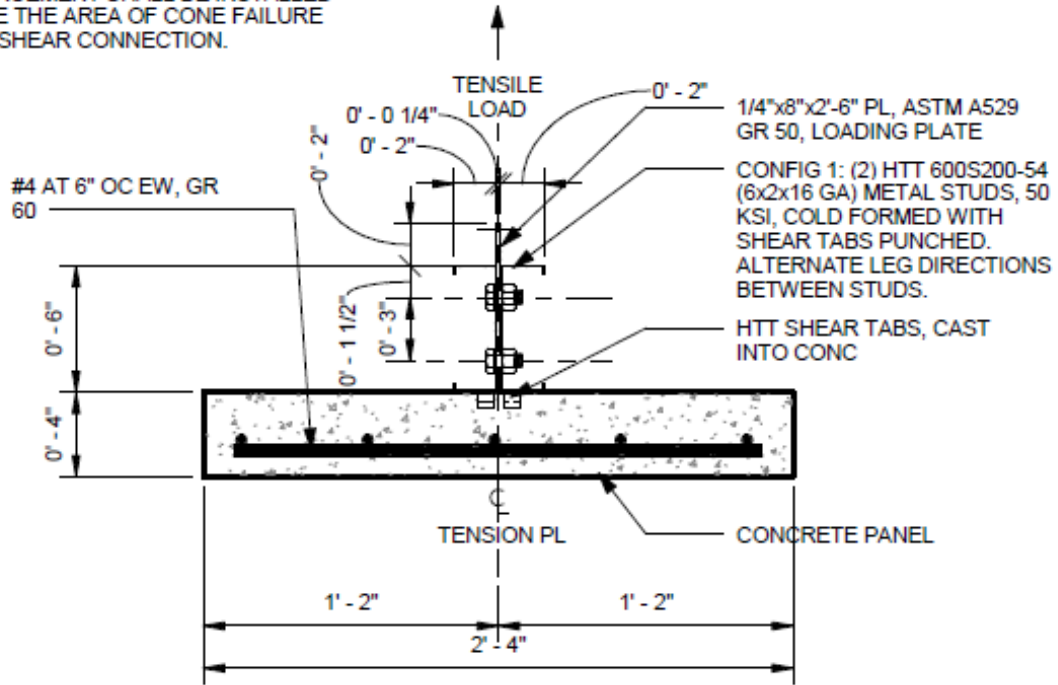


FIGURE 2: Hi-Tech Shear Tab – Configuration 1

SECTION NOTE:

THE SUPPLEMENTAL PANEL REINFORCEMENT SHALL BE INSTALLED OUTSIDE THE AREA OF CONE FAILURE OF THE SHEAR CONNECTION.

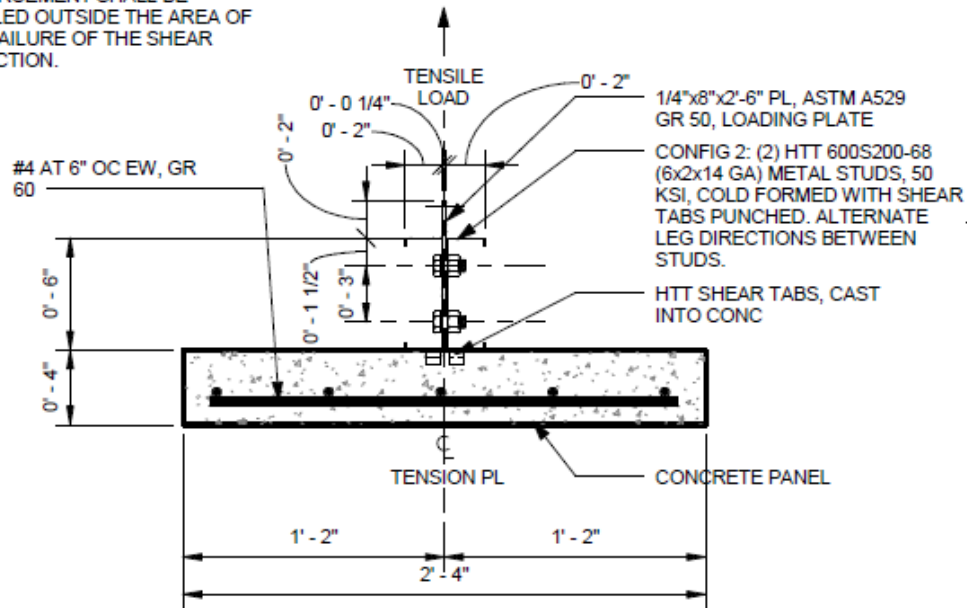


FIGURE 3: Hi-Tech Shear Tab – Configuration 2

SECTION NOTES:

THE SUPPLEMENTAL PANEL REINFORCEMENT SHALL BE INSTALLED OUTSIDE THE AREA OF CONE FAILURE OF THE SHEAR CONNECTION.

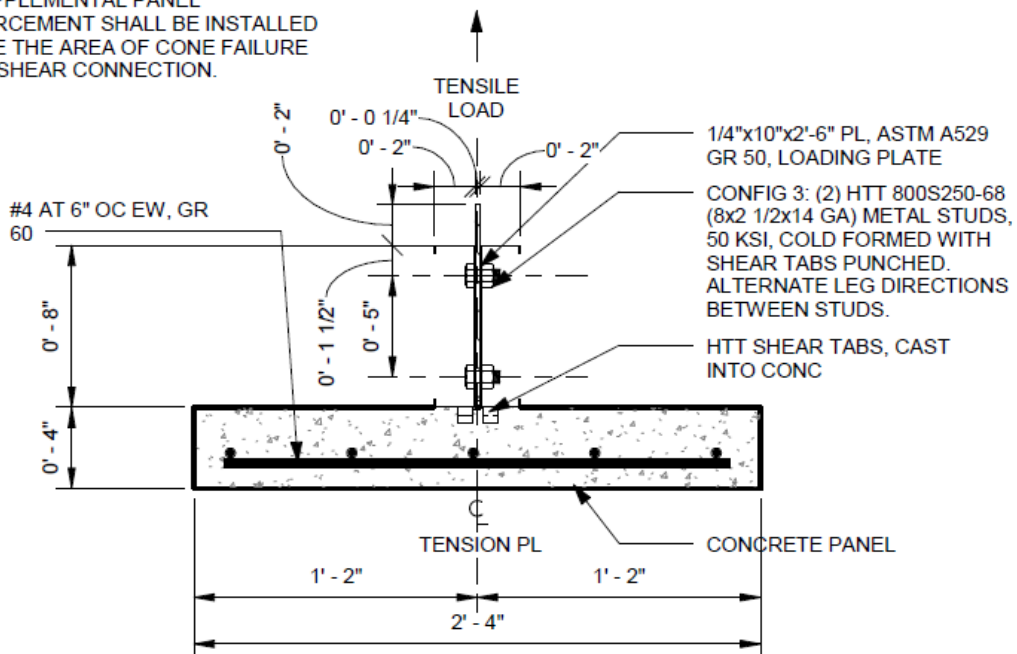


FIGURE 4: Hi-Tech Shear Tab – Configuration 3