Re: Allowable Loads for Simpson Strong-Tie® Carbon-Steel Titen HD® Anchoring into Top of Fully Grouted CMU Construction at a 3-inch Edge Distance

To Whom It May Concern:

Simpson Strong-Tie tested the 1/2-inch and 5/8-inch diameter carbon-steel Titen HD screw anchors (models THD50xxxH and THDB62xxxH) installed into the top of fully grouted concrete masonry units (CMU). All testing was performed in our IAS-accredited testing laboratory located in West Chicago, IL (Accreditation Number TL-28). Testing was performed in medium weight, fully grouted CMU walls in accordance with ICC-ES AC106, Acceptance Criteria for Predrilled Fasteners in Masonry. Refer to Table 1 and Figure 1 summarizing limitations and results of this test program.

The information in this letter is valid until 8/31/2020 when it will be re-evaluated by Simpson Strong-Tie. Please visit strongtie.com for additional information. If you have questions or need further assistance regarding this matter, please contact the Simpson Strong-Tie engineering department at 800.999.5099.

Sincerely,

SIMPSON STRONG-TIE COMPANY INC

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TABLE 1 - ALLOWABLE TENSION AND SHEAR LOADS FOR CARBON STEEL TITEN HD SCREW ANCHORS INSTALLED IN TOP OF GROUT-FILLED CMU MASONRY (f'c = 2,000 psi)\(^6,7\)

<table>
<thead>
<tr>
<th>Anchor Dia. (in)</th>
<th>Drill Bit Dia.(^2) (in)</th>
<th>Minimum Embed. Depth(^3) (in)</th>
<th>Minimum Edge Distance</th>
<th>Minimum End Distance</th>
<th>Minimum Spacing</th>
<th>Tension</th>
<th>Parallel to Edge of Masonry Wall</th>
<th>Perpendicular to Edge of Masonry Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>1/2</td>
<td>4(^\text{th})</td>
<td>3</td>
<td>12</td>
<td>12</td>
<td>1,160</td>
<td>1,500</td>
<td>550</td>
</tr>
<tr>
<td>5/8</td>
<td>5/8</td>
<td>4(^\text{th})</td>
<td>3</td>
<td>12</td>
<td>12</td>
<td>1,160</td>
<td>1,500</td>
<td>550</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 pound = 4.45 N, 1 psi = 6.89 kPa.

1Minimum edge and end distances are measured from the anchor centerline to the edge and end of the CMU masonry wall, respectively. Refer to Figure 1. Minimum spacing is measured from center-to-center of two anchors. Anchors installed in the mortared joint are outside the scope of this letter.

2The drill bit diameter must be equal to the nominal diameter of the anchor.

3Embedment depth is measured from the top surface of the masonry wall.

4Tabulated allowable loads are based on a safety factor of 5.0.

5For wind or earthquake loading conditions, allowable loads are not permitted to be increased.

6The specified compressive strength of masonry at the time of installation, f'\(_c\), at 28 days must be a minimum of 2,000 psi.

7Fully grouted masonry walls must be constructed from the following materials:

Concrete Masonry Units (CMUs): CMUs must be minimum Grade N, Type II, medium-weight, or normal-weight, closed-end, conforming to ASTM C90. The minimum allowable nominal size of the CMU must be 8 inches wide by 8 inches high by 16 inches long.

Grout: Grout must comply with IBC Section 2103 or IRC Section R606. Alternatively, the grout must have a minimum compressive strength when tested in accordance with ASTM C1019 equal to its specified strength, but not less than 2,000 psi.

Mortar: Mortar must be Type M or S in compliance with IBC Section 2103 or IRC Section R606.2.8.

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FIGURE 1 – EDGE AND END DISTANCES FOR THE CARBON STEEL TITEN HD SCREW ANCHOR INSTALLED IN THE TOP OF FULLY GROUTED CMU WALL CONSTRUCTION