

# ICC-ES Evaluation Report

ESR-4223

Reissued July 2024


This report also contains:

Subject to renewal July 2025

- CBC Supplement
- FBC Supplement
- LABC Supplement

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<p><b>DIVISION: 05 00 00—METALS</b></p> <p><b>Section: 05 05 23—Metal Fastenings</b></p> <p><b>DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES</b></p> <p><b>Section: 06 05 23—Wood, Plastic, and Composite Fastenings</b></p> <p><b>Section: 06 16 00—Sheathing</b></p>	<p><b>REPORT HOLDER:</b></p> <p><b>GRABBER CONSTRUCTION PRODUCTS, INC.</b></p>	<p><b>EVALUATION SUBJECT:</b></p> <p><b>GRABBER FASTENERS FOR USG STRUCTURAL PANELS</b></p>	
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## 1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015, 2012, and 2009 [International Building Code® \(IBC\)](#)
- 2021, 2018, 2015, 2012, and 2009 [International Residential Code® \(IRC\)](#)

For evaluation for compliance with codes adopted by the [Los Angeles Department of Building and Safety \(LADBS\)](#), see [ESR-4223 LABC and LARC Supplement](#).

Property evaluated:

- Structural

## 2.0 USES

The Grabber fasteners described in this report are used to attach USG Structural Panels to cold-formed steel framing members for interior applications and roof applications protected by an approved roof covering. The fasteners may be used in structures regulated under the IRC when an engineered design is submitted in accordance with IRC Section R301.1.3.

## 3.0 DESCRIPTION

### 3.1 Grabber Fasteners for USG Structural Panels:

Grabber fasteners for attaching USG Structural Panels to cold-formed steel framing members are self-drilling tapping screws with a wafer or flat head. The heads have a recess for a LOX drive. The fasteners are manufactured from carbon steel conforming to ASTM A1040, Grades 1018 through 1022, and are heat-treated and case hardened. The fasteners are coated with electrodeposited zinc with an organic polymer topcoat. [Table 1](#) provides fastener designations and descriptions including dimensions, head style, point number, drilling capacity and minimum required protrusion length. The fasteners are available loose in boxes or in collated strips for use in automated fastener installation systems. See [Figures 1](#) and [2](#) for depictions of the fasteners.

**3.2 Steel Base Material:** The pull-out values in this report apply to installation into ASTM A653 Grade 33 steel for framing members with minimum thickness of 33 mils, or into ASTM A653 Grade 50 steel for framing members with minimum thickness of 54 mils.

**3.3 Structural Panels:** USG Structural Panels and the horizontal diaphragms constructed with USG Structural Panels and the Grabber fasteners described in this report are addressed in ESR-1792.

## 4.0 DESIGN AND INSTALLATION

### 4.1 Design:

**4.1.1 General:** Fastener length selection must be adequate to accommodate the thickness of the USG Structural Panel, the thickness of the cold-formed steel framing member and the minimum required protrusion past the back side of the supporting steel framing member. The minimum required protrusion dimensions are shown in [Table 1](#).

The fastener point style must be selected on the basis of the qualified drilling capacity shown in [Table 1](#). The drilling capacity shown is for the applicable thickness of the supporting steel, based on connection tests for 3/4-inch-thick USG Structural Panels.

The minimum structural panel edge distance is 1/2 inch (12.7 mm), the minimum end distance is 2 inches (51 mm) and the minimum spacing is 2 inches (51 mm). For the supporting cold-formed steel base material, fasteners must be spaced a minimum of three times the nominal diameter of the fastener and must be located not less than 1.5 times the diameter of the fastener from any end or edge of the cold-formed steel base material.

When tested for corrosion resistance in accordance with ASTM B117, the fasteners meet the minimum requirement listed in ASTM F1941, as required by ASTM C1513, with no white corrosion after three hours and no red rust after 12 hours.

**4.1.2 Engineered Design:** For use in engineered designs, the available fastener strengths are shown in [Table 2](#) and the available pull-out strengths in common thicknesses of cold-formed steel are shown in [Table 3](#). These values are intended to aid the designer in meeting the requirements of IBC Section 1604.2.

Determination of the suitability of a particular fastener addressed in this evaluation report for the specific application is the responsibility of the registered design professional and is outside the scope of this evaluation report.

The registered design professional is responsible for determining the available strengths for the connection, considering all applicable limit states such as pull-over or pull-through, tilting and bearing, etc., and for considering serviceability issues, such as fastener slip.

### 4.2 Installation:

Installation of the Grabber fasteners must be in accordance with the requirements of the code, the manufacturer's published installation instructions and this evaluation report. The manufacturer's published installation instructions must be available at the jobsite at all times during installation.

The fasteners must be installed perpendicular to the work surface using a variable speed, high-torque screw driving tool set not to exceed 2,500 rpm.

## 5.0 CONDITIONS OF USE:

The Grabber fasteners described in this evaluation report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this evaluation report, subject to the following conditions:

- 5.1** The fasteners must be installed in accordance with the report holder's published installation instructions and this evaluation report. In the event of a conflict between this evaluation report and the manufacturer's published installation instructions, the more restrictive requirements govern.
- 5.2** The fasteners have only been evaluated for fastener strength, drilling capacity through the attached material and supporting steel, quality control and pull-out strength. Evaluation of other applicable limit states for connections of building materials to the cold-formed steel framing members is outside the scope of this evaluation report.
- 5.3** Design of the connection of attached material to the cold-formed steel base material, taking into account the properties of the attached material, must comply with the applicable requirements of the IBC and this evaluation report, and must be justified to the satisfaction of the code official.
- 5.4** The fasteners are manufactured under a quality control program with inspections by ICC-ES.

## 6.0 EVIDENCE SUBMITTED

Data in accordance with the [Acceptance Criteria for Self-drilling Tapping Screws Used to Attach Miscellaneous Building Materials to Steel Base Material \(AC500\)](#), dated October 2017 (editorially revised January 2021).

## 7.0 IDENTIFICATION

7.1 The Grabber fasteners are marked with a “G” on the top surface of the fastener heads, as shown in [Figures 1](#) and [2](#). Packages of the Grabber fasteners are labeled with the evaluation report holder’s name (Grabber Construction Products) and address, the fastener designation, and the evaluation report number (ESR-4223).

7.2 The report holder’s contact information is the following:

**GRABBER CONSTRUCTION PRODUCTS, INC.**

**5255 WEST 11000 NORTH**

**HIGHLAND, UTAH 84003**

**(801) 492-3880**

[www.grabberpro.com](http://www.grabberpro.com)

[info@grabberpro.com](mailto:info@grabberpro.com)

TABLE 1—GRABBER FASTENERS

FASTENER MODEL NUMBER	DESIGNATION (Size - TPI)	NOMINAL SHANK DIAMETER (inches)	HEAD STYLE	HEAD DIAMETER (inch)	NOMINAL FASTENER LENGTH (inches)	POINT (number)	DRILLING CAPACITY (inches)		MINIMUM REQUIRED PROTRUSION LENGTH (inch)	APPLICABLE FIGURE
							Min.	Max.		
CGH8158LG	#8-18	0.164	Wafer	0.372	1 <sup>5</sup> / <sub>8</sub>	Winged drill #3	0.033	0.102	9/16	<a href="#">1</a>
CGH8238LG	#8-18	0.164	Wafer	0.372	2 <sup>3</sup> / <sub>8</sub>	Winged drill #3	0.033	0.102	9/16	<a href="#">1</a>
CC12200LRG	#12-18	0.216	Flat	0.362	2	Winged drill #5	0.033	0.102	7/8	<a href="#">2</a>
CC12250LRG	#12-18	0.216	Flat	0.362	2 <sup>1</sup> / <sub>2</sub>	Winged drill #5	0.033	0.102	7/8	<a href="#">2</a>

For SI: 1 inch = 25.4 mm.

TABLE 2—GRABBER FASTENER STRENGTH (lbf)

FASTENER MODEL NUMBER	DESIGNATION (Size - TPI)	NOMINAL FASTENER STRENGTH		ALLOWABLE FASTENER STRENGTH (ASD)		DESIGN FASTENER STRENGTH (LRFD)	
		Shear, P <sub>ss</sub>	Tension, P <sub>ts</sub>	Shear, P <sub>ss</sub> /Ω	Tension, P <sub>ts</sub> /Ω	Shear, Φ*P <sub>ss</sub>	Tension, Φ*P <sub>ts</sub>
CGH8158LG	#8-18	1,565	2,350	520	785	785	1,175
CGH8238LG							
CC12200LRG	#12-18	2,535	4,165	845	1,390	1,270	2,085
CC12250LRG							

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N

TABLE 3—PULLOUT STRENGTH FOR GRABBER FASTENERS (lbf)

FASTENER MODEL NUMBER	DESIGNATION (Size - TPI)	PULLOUT STRENGTH FOR BASE STEEL THICKNESS OF (mils):		
		33	54	97
<b>Allowable Pullout Strength (ASD)</b>				
CGH8158LG	#8-18	57	190	430
CGH8238LG				
CC12200LRG	#12-18	48	146	348
CC12250LRG				
<b>Design Pullout Strength (LRFD)</b>				
CGH8158LG	#8-18	91	304	688
CGH8238LG				
CC12200LRG	#12-18	76	233	557
CC12250LRG				

For SI: 1 mil = 0.001 inch, 1 inch = 25.4 mm, 1 lbf = 4.45 N.

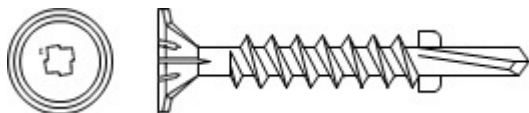


FIGURE 1—GRABBER WAFER HEAD CGH8158LG FASTENER FOR USG PANELS (CGH8238LG similar)

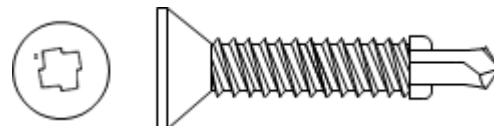


FIGURE 2—GRABBER FLAT HEAD CC12250LRG FASTENER FOR USG PANELS (CC12200LRG similar)

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Section: 06 05 23—Wood, Plastic, and Composite Fastenings

Section: 06 16 00—Sheathing

**REPORT HOLDER:**

GRABBER CONSTRUCTION PRODUCTS, INC.

**EVALUATION SUBJECT:**

GRABBER FASTENERS FOR USG STRUCTURAL PANELS

**1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that the Grabber Fasteners for USG Structural Panels, described in ICC-ES evaluation report [ESR-4223](#), have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

**Applicable code editions:**

- 2020 *City of Los Angeles Building Code* (LABC)
- 2020 *City of Los Angeles Residential Code* (LARC)

**2.0 CONCLUSIONS**

The Grabber Fasteners for USG Structural Panels, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4223](#), comply with the LABC Chapter 22 and the LARC, and are subject to the conditions of use described in this supplement.

**3.0 CONDITIONS OF USE**

The Grabber Fasteners for USG Structural Panels described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-4223](#).
- The design, installation, conditions of use and identification of the Grabber Fasteners for USG Structural Panels are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-4223](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.

This supplement expires concurrently with the evaluation report, reissued July 2024.

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**REPORT HOLDER:**

GRABBER CONSTRUCTION PRODUCTS, INC.

**EVALUATION SUBJECT:**

GRABBER FASTENERS FOR USG STRUCTURAL PANELS

**1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that Grabber Fasteners for USG Structural Panels, described in ICC-ES evaluation report ESR-4223, have also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2019 *California Building Code (CBC)*

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2019 *California Residential Code (CRC)*

**2.0 CONCLUSIONS****2.1 CBC:**

The Grabber Fasteners for USG Structural Panels, described in Sections 2.0 through 7.0 of the evaluation report ESR-4223 comply with CBC Chapter 22, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16 and 17, as applicable.

**2.1.1 OSHPD:** The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

**2.1.2 DSA:** The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

**2.2 CRC:**

The Grabber Fasteners for USG Structural Panels, described in Sections 2.0 through 7.0 of the evaluation report ESR-4223, comply with the CRC, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of the CBC Chapters 16 and 17, as applicable.

This supplement expires concurrently with the evaluation report, reissued July 2024.

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**1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that the Grabber Fasteners for USG Structural Panels, described in ICC-ES evaluation report ESR-4223, have also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2020 Florida Building Code—Building
- 2020 Florida Building Code—Residential

**2.0 CONCLUSIONS**

The Grabber Fasteners for USG Structural Panels, described in Sections 2.0 through 7.0 of the evaluation report ESR-4223, comply with the *Florida Building Code—Building* and the *Florida Building Code—Residential*. The design requirements must be determined in accordance with the *Florida Building Code—Building* and the *Florida Building Code—Residential*. The installation requirements noted in ICC-ES evaluation report ESR-4223 for the 2018 *International Building Code*® and *International Residential Code*® meet the requirements of the *Florida Building Code—Building* and the *Florida Building Code—Residential*, as applicable.

Use of the Grabber Fasteners for USG Structural Panels for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential* has not been evaluated, and is outside the scope of this supplemental report.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality-assurance program is audited by a quality-assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official, when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report, reissued July 2024.