



ICC-ES Evaluation Report ESR-1271

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this report is subject to renewal July 2023.

DIVISION: 05 00 00—METALS
Section: 05 05 23—Metal Fastenings

REPORT HOLDER:

GRABBER CONSTRUCTION PRODUCTS, INC.

EVALUATION SUBJECT:

GRABBER SELF-DRILLING TAPPING SCREWS

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)
- 2013 *Abu Dhabi International Building Code* (ADIBC)[†]

[†]The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see [ESR-1271 LABC and LARC Supplement](#).

For evaluation for compliance with codes adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of State Architects (DSA), see [ESR-1271 CBC and CRC Supplement](#).

Property evaluated:

Structural

2.0 USES

The Grabber self-drilling tapping screws described in this report are used in engineered connections of cold-formed steel framing and of sheet steel sheathing connected to cold-formed steel framing. The screws may be used under the IRC when an engineered design is submitted to the code official for approval in accordance with IRC Section R301.1.3.

3.0 DESCRIPTION

3.1 Grabber Self-Drilling Tapping Screws:

Grabber self-drilling tapping screws are proprietary self-drilling tapping screws. The screws are manufactured from

carbon steel conforming to ASTM A510, Grades 1022 through 1026 and are heat treated and case hardened. The screws are coated with electrodeposited zinc with a coating designation of Fe/Zn 3A or 3C in accordance with ASTM F1941 or a proprietary coating designated as GrabberGard. Table 1 provides screw descriptions (size, tpi), point styles, head style and drive descriptions, head diameters, nominal shank diameters, drilling capacities, minimum required protrusion lengths and coating descriptions. Screws are supplied in boxes of loose screws or collated for use in automated screw installation systems. See Figures 1 through 7 for depictions of the screws.

3.2 Cold-Formed Steel:

Cold-formed steel framing and sheet steel material must comply with one of the ASTM specifications listed in Section A3.1 of the AISI North American Specification for Design of Cold-Formed Steel Structural Members (AISI S100) (Section A2.1 of AISI S100 for the 2015, 2012 and 2009 IBC) and must have the minimum applicable specified tensile strength shown in the tables of this report. Base steel thickness must comply with Section B7.1 of AISI S100 (Section A2.4 of AISI S100 for the 2015, 2012 and 2009 IBC) and this report.

4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 General: Selection of screw length must be based on the thickness of the fastened steel members plus the minimum required protrusion past the back of the supporting steel. Point selection must be based on the drilling capacity of the screw. See Table 1 for minimum required protrusion lengths and drilling capacities.

When tested for corrosion resistance in accordance with ASTM B117, the screws meet the minimum requirement listed in ASTM F1941, of no white corrosion after three hours and no red rust after 12 hours.

4.1.2 Engineered Design: Grabber self-drilling tapping screws may be used in engineered connections of cold-formed steel construction. Design of connections for use in Allowable Strength Design (ASD) must comply with Section J4 of AISI S100 (Section E4 of AISI S100 for the 2015, 2012 and 2009 IBC), using the tabulated values accompanying this report (Tables 2 through 5 or Tables 6 through 9 depending on fastener designation). The connection strength values are applicable to connections

where the connected steel elements are in direct contact with one another. Design provisions for tapping screw connections subjected to combined shear and tension loading are outside the scope of this report.

Under the 2021 IBC, for screws used in framing connections, in order for the screws to be considered fully effective, the minimum spacing between the fasteners must be 3 times the nominal screw diameter and the minimum edge distance must be 1.5 times the nominal screw diameter. Under the 2018, 2015, 2012 and 2009 IBC, for screws used in framing connections, in order for the screws to be considered fully effective, the minimum spacing between the fasteners and the minimum edge distance must be three times the nominal diameter of the screws, except when the edge is parallel to the direction of the applied force, the minimum edge distance must be 1.5 times the nominal screw diameter. When the spacing between screws is less than three times the nominal screw diameter, but at least two times the nominal screw diameter, the connection shear strength values in Table 3 must be reduced by 20 percent [Refer to Section B1.5.1.3 of AISI S240 (Section D1.5 of AISI S200 for the 2015, 2012 and 2009 IBC)].

For screws used in applications other than framing connections, the minimum spacing between the fasteners must be three times the nominal screw diameter and the minimum edge and end distance must be 1.5 times the nominal screw diameter. Additionally, under the 2009 IBC, when the distance to the end of the connected part is parallel to the line of the applied force, the allowable connection shear strength determined in accordance with Section E4.3.2 of Appendix A of AISI S100-07 must be considered.

Connected members must be checked for rupture in accordance with Section J6 of AISI S100 (Section E6 of AISI S100 for the 2015 IBC, Section E5 of AISI S100 for the 2012 and 2009 IBC).

4.2 Installation:

Installation of Grabber self-drilling tapping screws must be in accordance with the manufacturer's published installation instructions and this report. The manufacturer's published installation instructions must be available at the jobsite at all times during installation.

The screws must be installed perpendicular to the work surface, using a variable speed screw driving tool set to not exceed 2,500 rpm. The screw must penetrate through the supporting steel with a minimum of three exposed threads protruding past the back side of the supporting steel.

5.0 CONDITIONS OF USE

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

5.1 Fasteners must be installed 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, the more restrictive governs.

- 5.2** The utilization of the screws described in this evaluation report in cold-formed steel deck diaphragms is outside the scope of this report. Diaphragms constructed using the screws must be addressed in a current ICC-ES evaluation report.
- 5.3** For ASD, the allowable screw strength or screw connection strength is not to be increased for short-duration loads such as wind or earthquake loads.
- 5.4** Evaluation of screws subjected to cyclic or fatigue loading is outside the scope of this report. Applicable Seismic Design Categories shall be determined in accordance with the code for the entire assembly constructed with the screws.
- 5.5** Drawings and calculations verifying compliance with this report and the applicable code must be submitted to the code official for approval. The drawings and calculations must be prepared by a registered design professional when required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.6** The screws are manufactured under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Tapping Screw Fasteners Used in Steel-to-steel Connections (AC118), dated January 2018 (editorially revised December 2020).

7.0 IDENTIFICATION

- 7.1** The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-1271) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.
- 7.2** In addition, the heads of the Grabber self-drilling screws are marked (stamped) with a "G" or a special symbol as shown in Figure 1, and each container of fasteners has a label bearing the fastener description (size/diameter and length), model number, point type and coating.
- 7.3** The report holder's contact information is the following:

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TABLE 1—GRABBER SELF-DRILLING TAPPING SCREW DIMENSIONAL CHARACTERISTICS^{1,2,3,4}

SCREW DESIGNATION (Nom. Size - tpi, head type)	DESCRIPTION (nominal size x length)	GRABBER MODEL	COATING	POINT (No.)	HEAD DIAMETER (in.)	NOMINAL SHANK DIAMETERS (in.)		OVERALL LENGTH (in.)	MINIMUM REQUIRED PROTRUSION LENGTH (in.)	DRILLING CAPACITY (in.)	
						Minor	Major			Min.	Max.
#8-18 HWH	8 x 1/2"	08050H3	Clear Zinc	3	0.335	0.116	0.163	0.500	0.37	0.043	0.140
	8 x 5/8"	08058H3	Clear Zinc					0.625			
	8 x 3/4"	08075H3	Clear Zinc					0.750			
	8 x 1"	08100H3	Clear Zinc					1.000			
	8 x 1 1/4"	08125H3	Clear Zinc					1.250			
	8 x 2"	08200H3	Clear Zinc					2.000			
#8-18 HHWH	8 x 1/2"	H08050H3	Clear Zinc	3	0.335	0.116	0.163	0.500	0.37	0.043	0.140
	8 x 5/8"	H08058H3	Clear Zinc					0.625			
	8 x 3/4"	H08075H3	Clear Zinc					0.750			
	8 x 1"	H08100H3	Clear Zinc					1.000			
	8 x 1 1/2"	H08150H3	Clear Zinc					1.500			
#10-16 HWH	10 x 1/2"	10050H3	Clear Zinc	3	0.399	0.134	0.186	0.500	0.43	0.043	0.175
	10 x 5/8"	10058H3	Clear Zinc					0.625			
	10 x 3/4"	10075H3	Clear Zinc					0.750			
		10075H3(W)RG	GrabberGard								
	10 x 1"	10100H3	Clear Zinc					1.000			
		10100H3WRG	GrabberGard								
	10 x 1 1/4"	10125H3	Clear Zinc					1.250			
	10 x 1 1/2"	10150H3	Clear Zinc					1.500			
		10150H3(W)RG	GrabberGard								
	10 x 2"	10200H3	Clear Zinc					2.000			
10200H3WRG		GrabberGard									
10 x 3"	10300H3	Clear Zinc	3.000								
	10300H3WRG	Clear Zinc									
		GrabberGard									
#10-16 HHWH	10 x 1/2"	H10050H3	Clear Zinc	3	0.399	0.132	0.186	0.500	0.43	0.043	0.175
	10 x 3/4"	H10075H3	Clear Zinc					0.750			
	10 x 1"	H10100H3	Clear Zinc					1.000			
	10 x 1 1/4"	H10125H3	Clear Zinc					1.250			
	10 x 1 1/2"	H10150H3	Clear Zinc					1.500			
	10 x 2"	H10200H3	Clear Zinc					2.000			
#12-14 HWH	12 x 3/4"	12075H3	Clear Zinc	3	0.415	0.161	0.212	0.750	0.55	0.068	0.210
		12075H3(W)RG	GrabberGard								
	12 x 1"	12100H3	Clear Zinc					1.000			
		12100H3(W)RG	GrabberGard								
	12 x 1 1/4"	12125H3	Clear Zinc					1.250			
	12 x 1 1/2"	12150H3	Clear Zinc					1.500			
		12150H3(W)RG	GrabberGard								
	12 x 2"	12200H3	Clear Zinc					2.000			
		12200H3(W)RG	GrabberGard								
	12 x 2 1/2"	12250H3	Clear Zinc					2.500			
12250H3WRG		GrabberGard									
12 x 3"	12300H3	Clear Zinc	3.000								
12 x 3 1/2"	12350H3	Clear Zinc	3.500								
#12-14 HHWH	12 x 3/4"	H12075H3	Clear Zinc	3	0.415	0.161	0.212	0.750	0.55	0.068	0.210
	12 x 1"	H12100H3	Clear Zinc					1.000			
	12 x 1 1/4"	H12125H3	Clear Zinc					1.250			
	12 x 1 1/2"	H12150H3	Clear Zinc					1.500			
	12 x 2"	H12200H3	Clear Zinc					2.000			
	12 x 2 1/2"	H12250H3	Clear Zinc					2.500			
		H12250H3	Clear Zinc					2.500			
12 x 3"	H12300H3	Clear Zinc	3.000								

TABLE 1—GRABBER SELF-DRILLING TAPPING SCREW DIMENSIONAL CHARACTERISTICS (cont.)

SCREW DESIGNATION (Nom. Size - tpi, head type)	DESCRIPTION (nominal size x length)	GRABBER MODEL	COATING	POINT (No.)	HEAD DIAMETER (in.)	NOMINAL SHANK DIAMETERS (in.)		OVERALL LENGTH (in.)	MINIMUM REQUIRED PROTRUSION LENGTH (in.)	DRILLING CAPACITY (in.)	
						Minor	Major			Min.	Max.
#12-24 HWH	12 x 1 1/4"	1224125H5	Clear Zinc	5	0.415	0.161	0.212	1.25	0.65	0.068	0.375
	12 x 1 1/4"	1224125H5RG	E-coat					1.25			
#12-24 HWH with slotted shank	12 x 1 1/4"	1224125H5SL	Clear Zinc	5	0.415	0.161	0.212	1.25	0.65	0.068	0.375
	12 x 1 1/2"	1224150H5SL	Clear Zinc					1.50			
	12 x 1 1/2"	1224150H5RG	E-coat					1.50			
	12 x 2"	1224200H5SL	Clear Zinc					2.00			
	12 x 2"	1224200H5RG	E-coat					2.00			
	12 x 2 1/2"	1224250H5RG	E-coat					2.50			
#12-24 HWH	12 x 7/8"	122478H4	Clear Zinc	4	0.415	0.161	0.212	0.875	0.47	0.068	0.250
	12 x 7/8"	122478H4RG	E-coat					0.875			
	12 x 1-1/4"	1224125H4	Clear Zinc					1.25			
	12 x 1-1/2"	1224150H4	Clear Zinc					1.50			
	12 x 1-1/2"	1224150H4RG	E-coat					1.50			
	12 x 2"	1224200H4	Clear Zinc					2.00			
	12 x 2"	1224200H4RG	E-coat					2.00			
	12 x 3"	1224300H4RG	E-coat					3.00			
#14-14 HWH	14 x 3/4"	14075H3	Clear Zinc	3	0.500	0.183	0.243	0.750	0.58	0.068	0.220
		14075H3RG	GrabberGard					0.750			
	14 x 1"	14100H3	Clear Zinc					1.000			
		14100H3WRG	GrabberGard					1.000			
	14 x 1 1/4"	14125H3	Clear Zinc					1.250			
	14 x 1 1/2"	14150H3	Clear Zinc					1.500			
		14150H3WRG	GrabberGard					1.500			
	14 x 2"	14200H3	Clear Zinc					2.000			
		14200H3WRG	GrabberGard					2.000			
	14 x 2 1/2"	14250H3	Clear Zinc					2.500			
		14250H3WRG	GrabberGard					2.500			
	14 x 3"	14300H3	Clear Zinc					3.000			
		14300H3WRG	GrabberGard					3.000			
	14 x 3 1/2"	14350H3WRG	GrabberGard					3.500			
14 x 4"	14400H3	Clear Zinc	4.000								
	14400H3WRG	GrabberGard	4.000								
14 x 4"	14400H4	Clear Zinc	4.000								
14 x 5"	14500H4	Clear Zinc	5.000								
#14-20 HWH with Slotted Shank	14 x 1 1/2"	1420150H5RG	E-coat	5	0.500	0.183	0.245	1.50	0.65	0.068	0.375
#8-18 Pan	8 x 1/2"	20Z	Clear Zinc	3	0.314	0.116	0.163	0.500	0.37	0.043	0.175
#10-16 Pan	10 x 5/8"	10058P3	Clear Zinc	3	0.365	0.132	0.186	0.625	0.43	0.043	0.175
		10058P3RG	GrabberGard					0.625			
	10 x 3/4"	10075P3	Clear Zinc					0.750			
		10075P3RG	GrabberGard					0.750			

TABLE 1—GRABBER SELF-DRILLING TAPPING SCREW DIMENSIONAL CHARACTERISTICS (cont.)

SCREW DESIGNATION (Nom. Size - tpi, head type)	DESCRIPTION (nominal size x length)	GRABBER MODEL	COATING	POINT (No.)	HEAD DIAMETER (in.)	NOMINAL SHANK DIAMETERS (in.)		OVERALL LENGTH (in.)	MINIMUM REQUIRED PROTRUSION LENGTH (in.)	DRILLING CAPACITY (in.)	
						Minor	Major			Min.	Max.
#8-18 MTH (Small)	8 x 1/2"	C34DZ	Clear Zinc	3	0.364	0.114	0.163	0.500	0.37	0.043	0.140
#8-18 MTH	8 x 1/2"	34Z, 234Z	Clear Zinc	3	0.447	0.114	0.163	0.500	0.37	0.043	0.140
		34RG, 234RG	GrabberGard								
	8 x 1"	35Z, 235Z	Clear Zinc					1.000			
		35RG	GrabberGard								
	8 x 1 1/4"	36Z, 236Z	Clear Zinc					1.250			
		36RG	GrabberGard								
	8 x 1 5/8"	37Z, 237Z	Clear Zinc					1.625			
		37RG	GrabberGard								
8 x 2"	376Z	Clear Zinc	2.000								
8 x 2 1/2"	238Z	Clear Zinc	2.500								
8 x 3"	39Z	Clear Zinc	3.000								
#10-16 MTH	10 x 3/4"	234Z10CW	Clear Zinc	3	0.447	0.132	0.186	0.750	0.43	0.043	0.175
		23410CW RG	GrabberGard								
	10 x 1"	35Z10CW	Clear Zinc					1.000			
	10 x 1 1/4"	236Z10CW	Clear Zinc					1.250			
	10 x 1 1/2"	37Z10CW	Clear Zinc					1.500			
		240Z	Clear Zinc					3.500			
	10 x 3 1/2"	240G	GrabberGard								
		241Z	Clear Zinc					4.000			
10 x 4"	241G	GrabberGard									
	242Z	Clear Zinc	5.000								
10 x 5"	242G	GrabberGard									
#8-18 Dome	8 x 1/2"	234FZ	Clear Zinc	3	0.417	0.116	0.163	0.500	0.37	0.043	0.175
	8 x 3/4"	834FZ3	Clear Zinc					0.750			
#10-18 Flat Pan	10 x 5/8"	CFP101858JBWZ	Clear Zinc	3	0.364	0.137	0.185	0.625	0.41	0.043	0.102
		FP101875LYZ, CFP101875LYZ	Yellow Zinc								
	10 x 3/4"	FP101875JBWZ, CFP101875JBWZ	Clear Zinc					0.750			
		FP101875JBWRG, CFP101875JBWRG	GrabberGard								
#10-22 Flat Pan	10 x 3/4"	FP102275LYZ, CFP102275LYZ	Yellow Zinc	3.5	0.364	0.137	0.183	0.750	0.53	0.043	0.102
#12-18 Flat Pan	12 x 3/4"	FP121875LYZ, CFP121875LYZ	Yellow Zinc	3.5	0.364	0.156	0.211	0.750	0.48	0.043	0.102
		CFP121875L2Z	Clear Zinc								
	12 x 7/8"	FP121878JBWZ, CFP121878JBWZ	Clear Zinc					0.878			
		CFP121878LRG	GrabberGard								

For SI: 1 inch = 25.4 mm, 1 tpi = 0.03937 thread per mm.

¹Head types: HWH = Hex Washer Head; HHWH = High Hex Washer Head; MTH = Modified Truss Head

²A "C" at the beginning of the model number designates collated screws

³The drilling capacity of a screw refers to minimum and maximum thickness of the steel that the screw is designed to drill through.

⁴Maximum load bearing length can be calculated by subtracting the minimum required protrusion length from the nominal length of the screws.

TABLE 2A—ALLOWABLE TENSILE PULL-OUT STRENGTH (P_{NOT}/Ω), lbf^{1,2}

Applied Factor of Safety, $\Omega = 3.0$						
Screw Designation	Nominal Screw Shank Major Diameter (inch)	Steel Tensile Strength				
		$F_u = 45$ ksi		$F_u = 65$ ksi		
		Design Thickness of Member Not in Contact with the Screw Head (gage, inch)				
		20	18	16	14	12
		0.0346	0.0451	0.0566	0.0713	0.1017
#8-18	0.163	66	94	170	225	326
#10-16	0.186	80	109	218	273	404
#12-14	0.212	73	112	217	284	448
#14-14	0.243	85	119	213	293	497

For **SI**: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1ksi = 6.89 MPa.

¹For tension connections, the least of the allowable pull-out, pull-over, and fastener tension strength found in Tables 2A, 3A, and 5, respectively must be used for design.

²To calculate LRFD values, multiply values in the table by the ASD safety factor of 3.0 and multiply again with the LRFD Φ factor of 0.5.

TABLE 2B—PULL-OUT STRENGTH FOR FLAT PAN HEAD SCREWS, lbf^{1,2}

SCREW DESIGNATION	NOMINAL SCREW SHANK MAJOR DIAMETER (inch)	PULL-OUT STRENGTH FOR STEEL TENSILE STRENGTH, $F_u = 45$ ksi				
		Design Thickness of Member Not in Contact with the Screw Head (gage, inch)				
		20	18	16	14	12
		0.0346	0.0451	0.0566	0.0713	0.1017
Allowable Pull-out Strength (ASD)						
#10-18 Flat Pan	0.185	52	87	145	211	334
#10-22 Flat Pan	0.183	86	120	149	221	299
#12-18 Flat Pan	0.211	93	130	168	221	392
Design Pull-out Strength (LRFD)						
#10-18 Flat Pan	0.185	78	139	233	338	535
#10-22 Flat Pan	0.183	138	192	239	470	149
#12-18 Flat Pan	0.211	149	208	270	354	627

For **SI**: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1ksi = 6.89 MPa.

¹For tension connections, the least of the allowable pull-out, pull-over, and fastener tension strength found in Tables 2B, 3B, and 5, respectively must be used for design.

²The allowable pull-out capacity for other member thicknesses can be determined by interpolation within the table.

TABLE 3A—ALLOWABLE TENSILE PULL-OVER STRENGTH (P_{NOV}/Ω), lbf^{1,2,3}

Applied Factor of Safety, $\Omega = 3.0$							
Screw Designation	Nominal Screw Shank Major Diameter (inch)	Screw Head Diameter (inch)	Steel Tensile Strength				
			$F_u = 45$ ksi		$F_u = 65$ ksi		
			Design Thickness of Member in Contact with the Screw Head (gage, inch)				
			20	18	16	14	12
			0.0346	0.0451	0.0566	0.0713	0.1017
#8-18 HWH & HHWH	0.163	0.335	314	391	523	590	568
#10-16 HWH & HHWH	0.186	0.399	396	536	778	847	861
#12-14 HWH & HHWH	0.212	0.415	336	370	522	753	856
#14-14 HWH	0.243	0.500	398	546	891	1,155	1,114
#8-18 Pan	0.163	0.314	233	321	437	513	513
#10-16 Pan	0.186	0.365	280	367	706	850	896
#8-18 MTH (Small)	0.163	0.364	389	493	726	744	744
#8-18 MTH	0.163	0.447	446	499	726	744	744
#10-16 MTH	0.186	0.447	380	528	546	667	537
#8-18 Dome	0.163	0.417	314	627	721	768	775

For **SI**: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1ksi = 6.89 MPa.

¹For tension connections, the lower of the allowable pull-out, pull-over, and fastener tension strength found in Tables 2A, 3A, and 5, respectively, must be used for design.

²The allowable pull-over capacity for other member thicknesses can be determined by interpolation within the table for the values that have the same steel tensile strength, F_u .

³To calculate LRFD values, multiply values in the table by the ASD safety factor of 3.0 and multiply again with the LRFD Φ factor of 0.5.

TABLE 3B—PULL-OVER STRENGTH FOR FLAT PAN HEAD SCREWS, lbf^{1,2}

SCREW DESIGNATION	NOMINAL SCREW SHANK MAJOR DIAMETER (inch)	SCREW HEAD DIAMETER (inch)	PULL-OVER STRENGTH FOR STEEL TENSILE STRENGTH, $F_u = 45$ ksi				
			Design Thickness of Member in Contact with the Screw Head (gage, inch)				
			20	18	16	14	12
			0.0346	0.0451	0.0566	0.0713	0.1017
Allowable Pull-over Strength (ASD)							
#10-18 Flat Pan	0.185	0.364	462	475	645	660	675
#10-22 Flat Pan	0.183	0.364	360	375	422	600	661
#12-18 Flat Pan	0.211	0.364	307	426	584	759	1,045
Design Pull-over Strength (LRFD)							
#10-18 Flat Pan	0.185	0.364	700	712	1,033	1,115	1,198
#10-22 Flat Pan	0.183	0.364	550	562	633	901	1,173
#12-18 Flat Pan	0.211	0.364	544	681	1,037	1,346	1,853

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1ksi = 6.89 MPa.

¹For tension connections, the lower of the allowable pull-out, pull-over, and fastener tension strength found in Tables 2B, 3B, and 5, respectively, must be used for design.

²The allowable pull-over capacity for other member thicknesses can be determined by interpolation within the table.

TABLE 4A—ALLOWABLE SHEAR (BEARING) OF SCREW CONNECTION OF COLD FORMED STEEL (P_{Ns}/Ω), lbf^{1,2,3}

Applied Factor of Safety, $\Omega = 3.0$							
Screw Designation	Nominal Screw Shank Major Diameter (inch)	Screw Head Diameter (inch)	Steel Tensile Strength				
			$F_u = 45$ ksi		$F_u = 65$ ksi		
			Design Thickness of Thinner Member (gage, inch)				
			20	18	16	14	12
			0.0346	0.0451	0.0566	0.0713	0.1017
#8-18 HWH & HHWH	0.163	0.335	152	235	337	355	330
#10-16 HWH & HHWH	0.186	0.399	164	253	510	593	526
#12-14 HWH & HHWH	0.212	0.415	175	262	544	731	753
#14-14 HWH	0.243	0.500	181	287	554	797	826
#8-18 Pan	0.163	0.314	152	232	293	349	349
#10-18 Pan	0.186	0.365	164	252	485	554	586
#8-18 MTH (Small)	0.163	0.364	152	234	413	417	413
#8-18 MTH	0.163	0.447	152	234	413	417	413
#10-16 MTH	0.186	0.447	164	252	509	592	537
#8-18 Dome	0.163	0.417	152	232	293	349	349

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1ksi = 6.89 MPa.

¹For shear connections, the lower of the allowable connection shear and fastener shear strength found in Tables 4A and 5, respectively, must be used for design.

²The allowable connection shear capacity for other member thicknesses can be determined by interpolation within the table for the values that have the same steel tensile strength, F_u .

³To calculate LRFD values, multiply values in the table by the ASD safety factor of 3.0 and multiply again with the LRFD Φ factor of 0.5.

TABLE 4B—SHEAR (BEARING) STRENGTH OF FLAT PAN HEAD SCREWS, lbf^{1,2}

SCREW DESIGNATION	NOMINAL SCREW SHANK MAJOR DIAMETER (inch)	SCREW HEAD DIAMETER (inch)	SHEAR (BEARING) STRENGTH FOR STEEL TENSILE STRENGTH, $F_u = 45$ ksi				
			Design Thickness of Thinner Member (gage, inch)				
			20	18	16	14	12
			0.0346	0.0451	0.0566	0.0713	0.1017
Allowable Shear (Bearing) Strength (ASD)							
#10-18 Flat Pan	0.185	0.364	186	290	391	483	521
#10-22 Flat Pan	0.183	0.364	178	294	406	499	583
#12-18 Flat Pan	0.211	0.364	187	321	450	611	795
Design Shear (Bearing) Strength (LRFD)							
#10-18 Flat Pan	0.185	0.364	298	464	626	772	834
#10-22 Flat Pan	0.183	0.364	285	470	649	798	932
#12-18 Flat Pan	0.211	0.364	299	513	721	977	1272

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1ksi = 6.89 MPa.

¹For shear connections, the lower of the allowable connection shear and fastener shear strength found in Tables 4B and 5, respectively, must be used for design.

²The allowable connection shear capacity for other member thicknesses can be determined by interpolation within the table.

TABLE 5—FASTENER STRENGTHS, lbf^{1,2,3,4}

SCREW DESIGNATION	NOMINAL SCREW SHANK MAJOR DIAMETER (inch)	NOMINAL FASTENER STRENGTH (tested)		ALLOWABLE FASTENER STRENGTH	
		Tension, P _{ts}	Shear, P _{ss}	Tension, (P _{ts} /Ω)	Shear, (P _{ss} /Ω)
#8-18 HWH & HHWH	0.163	1894	873	631	291
#10-16 HWH & HHWH	0.186	2278	1662	759	554
#12-14 HWH & HHWH	0.212	2534	2306	845	769
#14-14 HWH	0.243	3658	2869	1219	956
#8-18 Pan	0.163	1775	964	592	321
#10-16 Pan	0.186	2765	1474	922	491
#8-18 MTH and MTH (Small)	0.163	1509	1158	503	386
#10-16 MTH	0.186	2373	1506	791	502
#8-18 Dome	0.163	2018	1119	673	373
#10-18 Flat Pan	0.185	2802	2179	934	726
#10-22 Flat Pan	0.183	2432	2086	811	695
#12-18 Flat Pan	0.211	3126	2411	1042	804

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1ksi = 6.89 MPa.

¹For tension connections, the lower of the allowable pull-out, pull-over, and fastener tension strength found in Tables 2A or 2B, 3A or 3B, and 5, respectively, must be used for design.

²For shear connections, the lower of the allowable connection shear and fastener shear strength found in Tables 4A or 4B and 5, respectively, must be used for design.

³To calculate LRFD values, multiply the Nominal Fastener Strength values in the table by the LRFD Φ factor of 0.5.

⁴See Section 4.1.2 for fastener spacing and end distance requirements.

The following figures are for use with Tables 2 through 5.

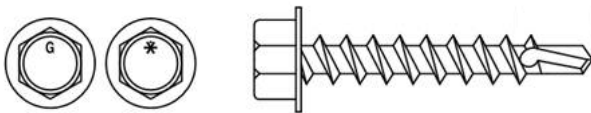


FIGURE 1—HEX WASHER HEAD SCREW



FIGURE 2—PAN HEAD SCREW



FIGURE 3—MTH HEAD SCREW (MTH Small similar)



FIGURE 4—DOME HEAD SCREW

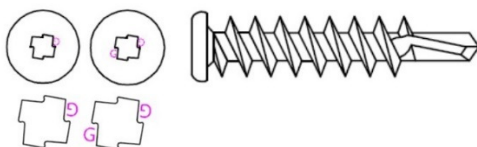


FIGURE 5—FLAT PAN HEAD SCREW

TABLE 6—ALLOWABLE TENSILE PULL-OUT STRENGTH (P_{NOT}/Ω), lbf^{1,2}

Applied Factor of Safety, $\Omega = 3.0$					
Screw Designation	Nominal Screw Shank Major Diameter (inch)	Steel Tensile Strength			
		$F_u = 50$ ksi			
		Design Thickness of Member Not in Contact with the Screw Head (inch)			
		0.1017	0.125	0.188	0.250
#12-24 HWH (drill point 4)	0.212	341	482	705	946
#12-24 HWH (drill point 5)	0.212	300	396	753	1090
#12-24 HWH (drill point 5 with slotted shank)	0.212	317	416	620	829
#14-20 HWH (drill point 5 with slotted shank)	0.243	333	456	562	697

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1 ksi = 6.89 MPa.

¹For tension connections, the least of the allowable pull-out, pull-over, and fastener tension strength found in Table 6, 7, and 9, respectively must be used for design.

²To calculate LRFD values, multiply values in the table by the ASD safety factor of 3.0 and multiply again with the LRFD Φ factor of 0.5.

TABLE 7—ALLOWABLE TENSILE PULL-OVER STRENGTH (P_{NOV}/Ω), lbf^{1,2,3}

Applied Factor of Safety, $\Omega = 3.0$						
Screw Designation	Nominal Screw Shank Major Diameter (inch)	Screw Head Diameter (inch)	Steel Tensile Strength			
			$F_u = 50$ ksi			
			Design Thickness of Member in Contact with the Screw Head (inch)			
			0.1017	0.125	0.188	0.250
#12-24 HWH drill point 4 or 5 with or without slotted shanks	0.212	0.415	1006	1297	1951	2594
#14-20 HWH drill point 5 with slotted shank	0.243	0.500	1213	1563	2350	3125

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1 ksi = 6.89 MPa.

¹For tension connections, the least of the allowable pull-out, pull-over, and fastener tension strength found in Tables 6, 7, and 9, respectively, must be used for design.

²The allowable pull-over capacity for other member thicknesses can be determined by interpolation within the table for the values that have the same steel tensile strength, F_u .

³To calculate LRFD values, multiply values in the table by the ASD safety factor of 3.0 and multiply again with the LRFD Φ factor of 0.5.

TABLE 8—ALLOWABLE SHEAR (BEARING) OF SCREW CONNECTION OF COLD FORMED STEEL (P_{NS}/Ω), lbf^{1,2,3}

Applied Factor of Safety, $\Omega = 3.0$						
Screw Designation	Nominal Screw Shank Major Diameter (inch)	Screw Head Diameter (inch)	Steel Tensile Strength			
			$F_u = 50$ ksi			
			Design Thickness of Thinner Member (inch)			
			0.1017	0.125	0.188	0.250
#12-24 HWH drill point 4 or 5, with or without slotted shanks	0.216	0.415	943	1215	1827	2430
#14-20 HWH drill point 5 with slotted shank	0.243	0.500	1040	1361	2047	2723

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1 ksi = 6.89 MPa.

¹For shear connections, the lower of the allowable connection shear and fastener shear strength found in Tables 8 and 9, respectively, must be used for design.

²The allowable connection shear capacity for other member thicknesses can be determined by interpolation within the table for the values that have the same steel tensile strength, F_u .

³To calculate LRFD values, multiply values in the table by the ASD safety factor of 3.0 and multiply again with the LRFD Φ factor of 0.5.

TABLE 9—FASTENER STRENGTHS, lbf^{1,2,3}

SCREW DESIGNATION	NOMINAL SCREW SHANK MAJOR DIAMETER (inch)	NOMINAL FASTENER STRENGTH (tested)		ALLOWABLE FASTENER STRENGTH	
		Tension, P _{ts}	Shear, P _{ss}	Tension, (P _{ts} /Ω)	Shear, (P _{ss} /Ω)
#12-24 HWH drill point 4 or 5 without slotted shank	0.212	4424	2157	1474	719
#12-24 HWH drill point 4 or 5 with slotted shank	0.212	4103	2154	1368	718
#14-20 HWH drill point 5 with slotted shank	0.243	4265	2349	1422	783

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

¹For tension connections, the least of the allowable pull-out, pull-over, and fastener tension strength found in Tables 6, 7, 9, respectively, must be used for design.

²For shear connections, the lower of the allowable connection shear and fastener shear strength found in Tables 8 and 9, respectively, must be used for design.

³To calculate LRFD values, multiply the Nominal Fastener Strength values in the table by the LRFD Φ factor of 0.5.

The following figures are for use with Tables 6 through 9.

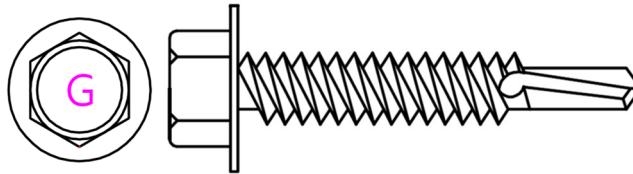


Figure 6 – HWH (Hex Washer Head)

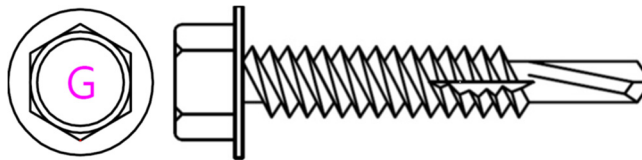


Figure 7 – HWH with Slotted Shank

DIVISION: 05 00 00—METALS**Section: 05 05 23—Metal Fastenings****REPORT HOLDER:****GRABBER CONSTRUCTION PRODUCTS, INC.****EVALUATION SUBJECT:****GRABBER SELF-DRILLING TAPPING SCREWS****1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that the Grabber self-drilling tapping screws, described in ICC-ES evaluation report [ESR-1271](#), 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:

- 2023 *City of Los Angeles Building Code* (LABC)
- 2023 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The Grabber self-drilling tapping screws, described in Sections 2.0 through 7.0 of the evaluation report [ESR-1271](#), 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 self-drilling tapping screws described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-1271](#).
- The design, installation, conditions of use and identification of the Grabber self-drilling tapping screws are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-1271](#).
- 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 2022, revised May 2023.

DIVISION: 05 00 00—METALS**Section: 05 05 23—Metal Fastenings****REPORT HOLDER:****GRABBER CONSTRUCTION PRODUCTS, INC.****EVALUATION SUBJECT:****GRABBER SELF-DRILLING TAPPING SCREWS****1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that Grabber self-drilling tapping screws, described in ICC-ES evaluation report ESR-1271, have also been evaluated for compliance with the codes noted below.

Applicable code editions:**■ 2022 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.

■ 2022 California Residential Code (CRC)**2.0 CONCLUSIONS****2.1 CBC:**

The Grabber self-drilling tapping screws, described in Sections 2.0 through 7.0 of the evaluation report ESR-1271, comply with CBC Chapter 22, provided the design and installation are in accordance with the 2021 *International Building Code*® provisions noted in the evaluation report and the additional requirements of the CBC Chapters 16 and 17, as applicable.

2.1.1 OSHPD:

The Grabber self-drilling tapping screws, described in Sections 2.0 through 7.0 of the evaluation report ESR-1271, comply with CBC amended Chapter 22 and Chapter 22A, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapter 16 and amendments [OSHPD 1R, 2, 3 and 5], Chapter 16A [OSHPD 1 and 4], amended Chapter 17 [OSHPD 1R, 2 and 5], Chapter 17A [OSHPD 1 and 4], amended Chapter 22 [OSHPD 1R, 2 and 5] and Chapter 22A [OSHPED 1 and 4], as applicable.

2.1.2 DSA:

The Grabber self-drilling tapping screws, described in Sections 2.0 through 7.0 of the evaluation report ESR-1271, comply with CBC amended Chapter 22 and Chapter 22A, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC amended Chapter 16 [DSA-SS/CC], Chapter 16A [DSA/SS], Chapter 17A [DSA-SS and DSA-SS/CC], Chapter 22 [DSA-SS/CC] and Chapter 22A [DSA-SS], as applicable.

2.2 CRC:

The Grabber self-drilling tapping screws, described in Sections 2.0 through 7.0 of the evaluation report ESR-1271, comply with the CRC, provided the design and installation are in accordance with the 2021 *International Residential Code*® provisions noted in the evaluation report.

This supplement expires concurrently with the evaluation report, reissued July 2022, revised May 2023.

DIVISION: 05 00 00—METALS**Section: 05 05 23—Metal Fastenings****REPORT HOLDER:****GRABBER CONSTRUCTION PRODUCTS, INC.****EVALUATION SUBJECT:****GRABBER SELF-DRILLING TAPPING SCREWS****1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that the Grabber self-drilling tapping screws, addressed in ICC-ES evaluation report ESR-1271, 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 self-drilling tapping screws, described in Sections 2.0 through 7.0 of the evaluation report ESR-1271, comply with the *Florida Building Code—Building* and the *Florida Building Code—Residential*, provided the design is in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in the ICC-ES evaluation report ESR-1271 for the 2018 *International Building Code*® meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the Grabber self-drilling tapping screws has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential*.

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 2022, revised May 2023.