

**DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES**  
**Section: 06 05 23—Wood, Plastic, and Composite Fastenings**

**REPORT HOLDER:**

MIDWEST FASTENER CORP.

**EVALUATION SUBJECT:**

SABERDRIVE PLATINUM™ SCREWS

**1.0 EVALUATION SCOPE****Compliance with the following codes:**

- 2018, 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2018, 2015, 2012 and 2009 *International Residential Code*® (IRC)

**Property evaluated:**

- Structural

**2.0 USES**

The SaberDrive Platinum™ screws described in this report are alternate dowel-type, multi-purpose screws used in engineered wood-to-wood connection applications. The screws may be used under the IRC when an engineered design is submitted in accordance with IRC Section R301.1.

**3.0 DESCRIPTION****3.1 General:**

The SaberDrive Platinum screws are proprietary, partially threaded dowel-type threaded fasteners. The lead threads are serrated. The screws have a proprietary coating consisting of multiple layers of protective materials. See Table 1 for designations and dimensions and Figure 1 for images of the screws.

**3.1.1 Construction Lag Screws:** These screws have a truss head with a star drive recess and a Type 17 point. These screws are available with either a tan or green coating.

**3.1.2 Construction Timber Screws:** These screws have a hex washer head with a taper under the head and a Type 17 point. These screws are available with either a tan or green coating.

**3.1.3 Ledger Board Screws:** These screws have a hex washer head with a taper under the head and a Type 17 point. These screws have a tan coating.

**3.1.4 Hex Head Construction Lag Screws:** These screws have a hex washer head with a taper under the head and a Type 17 point. These screws have a tan coating.

**3.1.5 Structural Screws:** These screws have a flat head with a proprietary star drive recess and a Type 17 point. These screws have a cutting thread between the threaded portion of the fastener and the smooth shank portion of the fastener. These screws have a black coating.

**3.2 Material:**

**3.2.1 SaberDrive Platinum Screws:** The screws are manufactured from carbon steel wire complying with grade 10B21, and are heat-treated to achieve case and core hardness in accordance with the manufacturer's specifications.

**3.2.2 Wood Members:** Wood members must be solid-sawn lumber having an assigned specific gravity of 0.42 or greater. Assigned specific gravity for solid-sawn lumber must be determined in accordance with Table 12.3.3A of the ANSI/AWC National Design Specification (NDS) for Wood Construction (Table 11.3.3A of the NDS for the 2012 IBC; Table 11.3.2A of the NDS for the 2009 IBC). The thickness of the wood main member must be equal to or greater than the screw length less the thickness of the side member.

**4.0 DESIGN AND INSTALLATION****4.1 Design:**

**4.1.1 General:** Allowable fastener strengths are given in Table 1. Reference withdrawal and head pull-through design values are given in Table 2. Reference lateral design values for wood-to-wood connections loaded parallel and perpendicular to the grain are given in Table 3. Reference design values are based on use of pilot holes in the main and side members with diameters of 70 percent of the root diameter of the screw.

**4.1.2 Governing Design Values:** The allowable load for a single-screw connection in which the screw is subject to tension is the least of: (a) the allowable screw tension strength given in Table 1; (b) the reference withdrawal design value given in Table 2, multiplied by the effective thread length in the main member and adjusted by all

applicable adjustment factors; and (c) the reference head pull-through design value given in Table 2, adjusted by all applicable adjustment factors.

The allowable load for a single-screw connection subject to lateral load is the lesser of: (a) the allowable screw shear strength given in Table 1; and (b) the reference lateral design value given in Table 3, adjusted by all applicable adjustment factors.

#### **4.1.3 Adjustments to Reference Design Values:**

Reference design values must be adjusted in accordance with the requirements for dowel-type fasteners in Section 11.3 of the NDS (Section 10.3 of the NDS for the 2012 and 2009 IBC). Use is limited to dry in-service conditions, such that the wet service factor, CM, is 1.0 in accordance with the NDS. The reference design values must also be adjusted in accordance with the requirements in Section 12.5 of the NDS (Section 11.5 of the NDS for the 2012 and 2009 IBC) applicable to screws.

**4.1.4 Connections with Multiple Screws:** Connections containing multiple screws must be designed in accordance with Sections 11.2.2 and 12.6 of the NDS (Sections 10.2.2 and 11.6 of the NDS for the 2012 and 2009 IBC).

**4.1.5 Combined Loading:** When the screws are subjected to combined lateral and withdrawal loads, connections must be designed in accordance with Section 12.4.1 of the NDS (Section 11.4.1 of the NDS for the 2012 and 2009 IBC).

**4.1.6 Capacity Requirements for Wood Members:** When designing a connection, the structural members must be checked for load-carrying capacity in accordance with Section 11.1.2 of the NDS (Section 10.1.2 of the NDS for the 2012 and 2009 IBC), and local stresses within the connection must be checked against Appendix E in the NDS to ensure the capacity of the connection and fastener group.

#### **4.2 Installation:**

Screws must be installed in accordance with the report holder's published installation instructions and this report. Screws must be installed with the minimum spacing, end distances, and edge distances needed to prevent splitting of the wood or as noted in Table 4, whichever is more restrictive. Pilot holes must be used in accordance with Section 4.1.1. The screws must be installed by turning with the appropriate bit or socket, not by driving with a hammer.

### **5.0 CONDITIONS OF USE**

The SaberDrive Platinum 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** Installation must comply with this report, the report holder's published instructions and the applicable code. A copy of the report holder's published installation instructions must be available at the jobsite at all times during installation. In the event of a conflict between the report holder's published installation instructions and this report, this report governs.
- 5.2** Calculations and details demonstrating compliance with this report must be submitted to the code official. The calculations and details must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.3** When the capacity of a connection is controlled by fastener metal strength, rather than wood strength, the metal strength must not be multiplied by the adjustment factors specified in the NDS.
- 5.4** Use in wet-service conditions is outside the scope of this report.
- 5.5** Use of the screws in treated wood is outside the scope of this report.
- 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 Alternate Dowel-type Threaded Fasteners (AC233), dated October 2018.

### **7.0 IDENTIFICATION**

- 7.1** The screws are identified by the name "Saber" on the head of each screw. Packages of screws and screws sold individually are identified with the company name (Midwest Fastener) and address, the brand name (SaberDrive Platinum), the screw type and size (diameter and length) and the evaluation report number (ESR-4214).
- 7.2** The report holder's contact information is the following:

**MIDWEST FASTENER CORP.**  
**9031 SHAVER ROAD**  
**PORTAGE, MICHIGAN 49024**  
**(269) 327-6917**  
[www.fastenerconnection.com](http://www.fastenerconnection.com)

TABLE 1—SABERDRIVE PLATINUM SCREW SPECIFICATIONS AND STRENGTHS

SCREW TYPE	NOMINAL DIAMETER (inch)	OUTSIDE THREAD DIAMETER (inch)	SHANK DIAMETER (inch)	MINOR THREAD DIAMETER (inch)	HEAD DIAMETER (inch)	ACROSS FLATS (inch)	OVERALL LENGTH <sup>1</sup> (inches)	THREAD LENGTH <sup>2</sup> (inches)	NOMINAL BENDING YIELD STRENGTH <sup>3</sup> F <sub>yb</sub> (psi)	ALLOWABLE STEEL STRENGTH											
										Tensile (lbf)	Shear (lbf)										
Construction Lag	1/4	0.234	0.174	0.148	0.557	n/a	1 1/2	1 3/16	Note 4	1,140	1,105										
							2	1 3/16													
	5/16	0.276	0.197	0.167	0.620	n/a	2 1/2	1 1/2	231,100	1,275	1,285										
							3	2 3/8													
							3 1/2	2 3/8													
							4	2 3/8													
							5	2 3/4													
							6	2 3/4													
	3/8	0.315	0.227	0.203	0.827	n/a	8	3 3/4	210,700	1,910	1,550										
							6	3 1/8													
							8	3 1/8													
							10	3 1/8													
12							3 1/8														
14							3 1/8														
Construction Timber	1/4	0.276	0.197	0.167	0.484	5/16	1 1/2	1 3/16	Note 4	1,275	1,285										
							2	1 3/16													
							4	2 3/8													
							6	2 3/4													
							8	3 3/4													
	5/16	0.297	0.205	0.183	0.541	5/16	10	3 3/4	264,800	1,275	1,285										
							12	3 3/4													
							14	3 3/4													
							Ledger Board	3/8				0.315	0.228	0.203	0.618	5/16	3 5/8	2 3/8	210,700	1,910	1,550
																	4	2 3/8			
5	3 1/8																				
6	3 1/8																				
8	3 3/4																				
10	3 3/4																				
12	3 3/4																				
Hex Head Construction Lag	5/16	0.276	0.197	0.167	0.523	5/16	1 1/2	1 3/16	Note 4	1,275	1,285										
	3/8	0.315	0.228	0.203	0.618	5/16	2	1 3/16	210,700	1,910	1,550										
							2 1/2	1 1/2													
Structural	5/16	0.276	0.197	0.167	0.748	n/a	3	2 3/8	277,200	1,275	1,285										
							4 1/2	2 3/8													
							5	2 3/4													
							6	2 3/4													
							8	3 3/4													

For SI: 1 inch = 25.4 mm; 1 psi = 6.9 kPa; 1 lbf = 4.4 N.

<sup>1</sup>The length of fasteners is measured from the underside of the head to bottom of the tip.

<sup>2</sup>Length of thread includes tip.

<sup>3</sup>Bending yield strength determined in accordance with ASTM F1575 using the minor thread diameter.

<sup>4</sup>Due to short fastener length, bending yield strength has not been determined. Strength is controlled on the basis of tensile strength.

TABLE 2—REFERENCE WITHDRAWAL (W) AND PULL-THROUGH (P) DESIGN VALUES<sup>1</sup>

SCREW TYPE	NOMINAL DIAMETER (inch)	MINIMUM THREAD LENGTH (inches)	W (lbf/in.) <sup>2</sup>		NOMINAL HEAD DIAMETER (inch)	P (lbf) <sup>3</sup>	
			For Specific Gravities of:			For Specific Gravities of:	
			0.42 ≤ G < 0.50	0.49 ≤ G		0.42 ≤ G < 0.50	0.49 ≤ G
Construction Lag	1/4	1 <sup>3</sup> / <sub>16</sub>	95	125	0.557	145	145
	5/16	1 <sup>1</sup> / <sub>2</sub>	120	140	0.620	165	165
	3/8	3 <sup>1</sup> / <sub>8</sub>	75	140	0.827	280	375
Construction Timber	1/4	2 <sup>3</sup> / <sub>8</sub>	120	140	0.484	190	255
	5/16	3 <sup>3</sup> / <sub>4</sub>	120	140	0.541	190	255
Ledger Board	3/8	2 <sup>3</sup> / <sub>8</sub>	140	185	0.618	155	155
Hex Head Construction Lag	5/16	1 <sup>1</sup> / <sub>2</sub>	120	140	0.523	190	255
	3/8	1 <sup>3</sup> / <sub>16</sub>	120	140	0.618	155	155
Structural	5/16	1 <sup>1</sup> / <sub>2</sub>	120	140	0.748	190	190

For SI: 1 inch = 25.4 mm; 1 lbf = 4.4 N.

<sup>1</sup>Values must be multiplied by all applicable adjustment factors, in accordance with the NDS.

<sup>2</sup>Tabulated reference withdrawal design values are in pounds per inch of thread penetration into the side grain of the main member, and must be multiplied by the thread length embedded in the member in order to determine the total withdrawal design value in pounds. Length of CEE threads must not be included in the withdrawal value determination.

<sup>3</sup>Tabulated pull-through design values are based on a minimum side member thickness of 3/4 inch.

TABLE 3—REFERENCE LATERAL DESIGN VALUES (Z) FOR SINGLE SHEAR (TWO-MEMBER) CONNECTIONS  
[For Sawn Lumber with Both Members of Identical Specific Gravity]<sup>1</sup>

SCREW TYPE	NOMINAL DIAMETER AND MINIMUM LENGTH (inch)	SIDE MEMBER THICKNESS, t (inches)	MINIMUM FASTENER PENETRATION INTO MAIN MEMBER, p (inches)	REFERENCE LATERAL DESIGN VALUE, Z (lbf) FOR SPECIFIC GRAVITIES OF:	
				0.42 ≤ G < 0.49	0.49 ≤ G
				Parallel to Grain, Z <sub>  </sub>	Parallel to Grain, Z <sub>  </sub>
Construction Lag	1/4 x 2	3/4	1 <sup>1</sup> / <sub>4</sub>	135	160
	5/16 x 2 <sup>1</sup> / <sub>2</sub>				
	5/16 x 3				
	5/16 x 3 <sup>1</sup> / <sub>2</sub>	3/4	1 <sup>3</sup> / <sub>4</sub>	195	205
	5/16 x 4				
	5/16 x 5				
	5/16 x 6				
	5/16 x 8	3/4	5 <sup>1</sup> / <sub>4</sub>	230	230
	3/8 x 6				
	3/8 x 8				
3/8 x 10					
3/8 x 12					
3/8 x 14					
Construction Timber	1/4 x 4	3/4	3 <sup>1</sup> / <sub>4</sub>	165	185
	1/4 x 6				
	1/4 x 8				
	1/4 x 10				
	5/16 x 12	3/4	11 <sup>1</sup> / <sub>4</sub>	165	185
5/16 x 14					
Ledger Board	3/8 x 3 <sup>5</sup> / <sub>8</sub>	3/4	2 <sup>7</sup> / <sub>8</sub>	150	160
	3/8 x 4				
	3/8 x 5				
	3/8 x 6				
	3/8 x 8				
	3/8 x 10				
	3/8 x 12				
3/8 x 14					
Hex Head Construction Lag	3/8 x 2	3/4	1 <sup>3</sup> / <sub>4</sub>	150	160
	3/8 x 2 <sup>1</sup> / <sub>2</sub>				
	3/8 x 3				
Structural	5/16 x 2 <sup>7</sup> / <sub>8</sub>	3/4	2 <sup>1</sup> / <sub>8</sub>	225	260
	5/16 x 3 <sup>3</sup> / <sub>4</sub>				
	5/16 x 4 <sup>1</sup> / <sub>2</sub>				
	5/16 x 5				
	5/16 x 6				
5/16 x 8					

For SI: 1 inch = 25.4 mm ; 1 lbf = 4.4 N.

<sup>1</sup>Values must be multiplied by all applicable adjustment factors, in accordance with the NDS.

TABLE 4—CONNECTION GEOMETRY REQUIREMENTS

CONDITION		MINIMUM REQUIREMENT					
		Fastener Diameters	Dimension (inches)				
			Construction Lag, Ledger Board, Hex Head Construction Lag, Structural			Construction Timber	
			1/4	5/16	3/8	1/4	5/16
End distance	Loading toward end	15	3 1/2	4 1/4	4 3/4	4 1/4	4 1/2
	Loading away from end	10	2 3/8	2 3/4	3 1/4	2 3/4	3
	Loading perpendicular to grain	10	2 3/8	2 3/4	3 1/4	2 3/4	3
Edge distance	Any load direction	2.5	5/8	3/4	7/8	3/4	3/4
Spacing between fasteners in a row	Loading parallel to grain	15	3 1/2	4 1/4	4 3/4	4 1/4	4 1/2
	Loading perpendicular to grain	10	2 3/8	2 3/4	3 1/4	2 3/4	3
Spacing between rows	In-line rows	5	1 1/4	1 3/8	1 5/8	1 3/8	1 1/2
	Staggered rows <sup>2</sup>	2.5	5/8	3/4	7/8	3/4	3/4

For SI: 1 inch = 25.4 mm

<sup>1</sup>End distances, edge distances and fastener spacing must be sufficient to prevent splitting of the wood, or as required by this table, whichever is the more restrictive.

<sup>2</sup>Values for spacing between staggered rows apply where fasteners in adjacent rows are offset by half of the spacing between fasteners in a row.



Construction Lag Screw



Construction Timber Screw



Ledger Board Screw



Hex Head Construction Lag Screw



Structural Screw

FIGURE 1—SABERDRIVE PLATINUM SCREWS

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**REPORT HOLDER:**

MIDWEST FASTENER CORP.

**EVALUATION SUBJECT:**

SABERDRIVE PLATINUM™ SCREWS

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

The purpose of this evaluation report supplement is to indicate that SaberDrive Platinum screws, described in ICC-ES evaluation report [ESR-4214](#), have also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2019 *California Building Code* (CBC)
- 2019 *California Residential Code* (CRC)

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

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

The SaberDrive Platinum screws, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4214](#), comply with CBC Chapter 23, 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 Chapter 16, as applicable.

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

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

**2.2 CRC:**

The SaberDrive Platinum screws, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4214](#), comply with CRC Chapters 3, provided the design and installation are in accordance with the 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report.

This supplement expires concurrently with the evaluation report, reissued September 2020 and revised November 2020.