

# ICC-ES Evaluation Report

ESR-3294

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This report also contains:

- [FL Supplement w/HVHZ](#)

- [City of LA 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>REPORT HOLDER:</b></p> <p><b>DEWALT</b></p>  | <p><b>EVALUATION SUBJECT:</b></p> <p><b>DRILIT® SELF-DRILLING STRUCTURAL SCREWS AND ARCHITECTURAL ROOF CLIP FASTENERS (DEWALT)</b></p> |  |
|--|---|--|---|

## 1.0 EVALUATION SCOPE

**Compliance with the following codes:**

- 2024, 2021, 2018 and 2015 [International Building Code® \(IBC\)](#)
- 2024, 2021, 2018 and 2015 [International Residential Code® \(IRC\)](#)

Section number references in this report are for the 2024 IBC and IRC and the standards referenced therein. Corresponding section numbers for earlier code editions are shown in Table 7 at the end of this report.

**Property evaluated:**

- Structural

## 2.0 USES

Drilit® Self-drilling Structural Screws and Architectural Roof Clip Fasteners are used to connect cold-formed steel members together, to connect cold-formed steel to hot-rolled steel plates and to connect sheet steel to cold-formed steel. The screws are used to resist shear and tension loads in engineered connections and are used in connections prescribed by the code for steel-to-steel connections.

## 3.0 DESCRIPTION

### 3.1 Fasteners:

The Drilit® Self-drilling Structural Screws and Architectural Roof Clip Fasteners are self-drilling tapping screws formed from carbon steel wire conforming to ASTM F2282, Grade 1018-1022, and case-hardened to 50 to 56 HRC. The screws are coated with a proprietary corrosion-resistant coating identified as Stalgard®, which is silver in color, or a 0.0002-inch-thick (5 µm) zinc plating in accordance with ASTM B633, SC1, Type III.:

[Table 1](#) provides screw descriptions including screw type, size, threads per inch (TPI), nominal diameter, head style, drive type/size, head diameter, point type, drilling capacity, minimum required protrusion length and coating. Select Drilit® Self-drilling Structural Screws are available with a bonded sealing washer, as indicated in [Table 1](#), and as shown in [Figure 11](#).

### 3.2 Standard Drill Screws:

**3.2.1 Type 1:** These #10 screws have coarse threads and a high hex washer head with an undercut. These screws comply with the thread design, material specifications and performance requirements of ASTM C1513.

**3.2.2 Types 2, 2A, 2B:** These #10 screws have coarse threads and a hex washer head or high hex washer head. These screws comply with ASTM C1513.

**3.2.3 Types 3, 4, 4A:** These #12 screws have coarse threads and a hex washer head. These screws comply with ASTM C1513.

**3.2.4 Types 5, 5A:** These 1/4-inch screws have coarse threads and a hex washer head which is smaller than that required by ASME B18.6.4. These screws comply with the thread design, material specifications and performance requirements of ASTM C1513.

**3.2.5 Types 6, 6A:** These 1/4-inch screws have coarse threads and a hex washer head. These screws comply with ASTM C1513.

**3.3 Extended Drilling Capacity Screws (Types 7, 7A, 8, 8A, 9, 9A):**

These #12 screws have fine threads and a hex washer head. These screws comply with ASTM C1513.

**3.4 Architectural Roof Clip Fasteners (Type 10):**

These #10 screws have coarse threads and a pancake-style head. These screws comply with ASTM C1513.

**3.5 Cold-formed Steel:**

Connected steel must comply with one of the specifications listed in Section A3.1 of AISI S100 and must have the minimum base-metal thickness and tensile strength shown in the tables in 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. For screws with a sealing washer, the maximum thickness of the connected material must be limited to the nominal screw length minus the required protrusion length and minus 0.075 inch (1.91 mm) to account for the sealing washer thickness. 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 met 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 Prescriptive Design:** Drilit® Self-drilling Structural Screws Types 1 through 6 (except for Types 5 and 5A) may be used where ASTM C1513 screws of the same size and head style/dimension are prescribed in the IRC and in the AISI Standards referenced in IBC Section 2206.

**4.1.3 Engineered Steel-to-steel Connection Design:** The screws (Types 1 through 10) have been evaluated for use in engineered steel-to-steel connections. Design of cold-formed steel connections and connections of cold-formed steel to hot rolled steel must comply with Section J4 of AISI S100, using the nominal and allowable fastener tension and shear strengths for the screws as shown in [Table 2](#). Alternatively, available connection shear strengths may be determined using [Tables 3A](#) and [3B](#), available pull-out connection strengths may be determined using [Tables 4A](#) and [4B](#), and available pull-over connection strengths may be determined using [Tables 5A](#) and [5B](#). The available connection shear strengths are for 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 2024 and 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 and 2015 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 3 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 3 times the nominal screw diameter, but at least 2 times the screw diameter, the connection shear strength values in [Tables 3A](#) and [3B](#) must be reduced by 20 percent (Refer to Section B1.5.1.3 of AISI S240). See [Table 6](#) for applicable spacing and edge distance dimensions for each screw size.

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.

Connected members must be checked for rupture in accordance with Section J6 of AISI S100.

## 4.2 Installation:

Installation of Drilit® Self-drilling Structural Screws and Architectural Roof Clip Fasteners 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 screw driving tool incorporating a depth-sensitive or torque-limiting nose piece. The installation speed for the Extended Drilling Capacity screws and for all 1/4-inch diameter screws should not exceed 1,800 rpm. The installation speed of all other screws should not exceed 2,500 rpm. The screw must penetrate through the supporting steel with a minimum of three threads protruding past the back side of the supporting steel.

## 5.0 CONDITIONS OF USE:


The 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 The fasteners must be installed in accordance with the manufacturer's published installation instructions and this report. If there is a conflict between the manufacturer's published installation instructions and this report, this report governs.
- 5.2 The allowable connection capacities (ASD) specified in Section 4.1 are not to be increased when the fasteners are used to resist wind or seismic forces.
- 5.3 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.
- 5.4 The use of the screws in engineered steel deck diaphragms has not been evaluated and is outside the scope of this evaluation report.
- 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 are to 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 February 2024).

## 7.0 IDENTIFICATION

- 7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-3294) along with the name, registered trademark, or registered logo of the report holder and/or listee must be included in the product label.
- 7.2 In addition, the heads of the screws are marked with “” as shown in [Figures 1](#) through [11](#), and each box of the fasteners has a label bearing the product name, part number, size, lot number and finish (zinc or Stalgard®).
- 7.3 The report holder's contact information is the following:

**DEWALT**  
**701 EAST JOPPA ROAD**  
**TOWSON, MARYLAND 21286**  
**(800) 524-3244**  
[www.DEWALT.com](http://www.DEWALT.com)  
[anchors@DEWALT.com](mailto:anchors@DEWALT.com)

TABLE 1—DRILIT® SELF-DRILLING STRUCTURAL SCREWS AND ARCHITECTURAL ROOF CLIP FASTENERS

| SCREW TYPE                                       | SIZE | TPI | NOMINAL DIAMETER (inch) | HEAD STYLE <sup>1</sup> | HEX DRIVE SIZE (inch) / PHILLIPS DRIVE SIZE (No.) | NOMINAL HEAD DIAMETER (inch) | POINT TYPE | DRILLING CAPACITY <sup>2</sup> (inch) |       | MINIMUM REQUIRED PROTRUSION (inch) | COATING          |
|--|------|-----|-------------------------|-------------------------|---|------------------------------|------------|---------------------------------------|-------|------------------------------------|------------------|
|  |      |     |                         |                         |   |                              |            | Min.                                  | Max.  |                                    |                  |
| <b>Drilit® Standard Drill Screws</b>             |      |     |                         |                         |   |                              |            |                                       |       |                                    |                  |
| 1  | 10   | 16  | 0.190                   | HHWH                    | 5/16  | 0.399                        | #1         | 0.030                                 | 0.095 | 0.563                              | Stalgard         |
| 2  | 10   | 16  | 0.190                   | HWH/HHWH                | 5/16  | 0.399                        | #3         | 0.030                                 | 0.175 | 0.500                              | Stalgard or Zinc |
| 2A <sup>(3)</sup>                                | 10   | 16  | 0.190                   | HWH/HHWH                | 5/16  | 0.500                        |            |                                       |       |                                    | Stalgard or Zinc |
| 2B   | 10   | 16  | 0.190                   | HHWH                    | 5/16  | 0.399                        | #2         | 0.030                                 | 0.110 | 0.406                              | Stalgard         |
| 3  | 12   | 14  | 0.216                   | HWH                     | 5/16  | 0.415                        | #1         | 0.030                                 | 0.095 | 0.563                              | Stalgard         |
| 4  | 12   | 14  | 0.216                   | HWH                     | 5/16  | 0.415                        | #3         | 0.030                                 | 0.210 | 0.563                              | Stalgard or Zinc |
| 4A <sup>(3)</sup>                                | 12   | 14  | 0.216                   | HWH                     | 5/16  | 0.563                        |            |                                       |       |                                    | Stalgard or Zinc |
| 5  | 1/4  | 14  | 0.250                   | HWH                     | 5/16  | 0.415                        | #1         | 0.030                                 | 0.095 | 0.563                              | Stalgard         |
| 5A <sup>(3)</sup>                                | 1/4  | 14  | 0.250                   | HWH                     | 5/16  | 0.563                        |            |                                       |       |                                    | Stalgard         |
| 6  | 1/4  | 14  | 0.250                   | HWH                     | 3/8   | 0.500                        | #3         | 0.030                                 | 0.210 | 0.625                              | Stalgard or Zinc |
| 6A <sup>(3)</sup>                                | 1/4  | 14  | 0.250                   | HWH                     | 3/8   | 0.630                        |            |                                       |       |                                    | Stalgard or Zinc |
| <b>Drilit® Extended Drilling Capacity Screws</b> |      |     |                         |                         |   |                              |            |                                       |       |                                    |                  |
| 7  | 12   | 24  | 0.216                   | HWH                     | 5/16  | 0.415                        | #4         | 0.125                                 | 0.312 | 0.625                              | Stalgard         |
| 7A <sup>(3)</sup>                                | 12   | 24  | 0.216                   | HWH                     | 5/16  | 0.563                        |            |                                       |       |                                    | Stalgard         |
| 8  | 12   | 24  | 0.216                   | HWH                     | 5/16  | 0.415                        | #4.5       | 0.125                                 | 0.375 | 0.750                              | Stalgard         |
| 8A <sup>(3)</sup>                                | 12   | 24  | 0.216                   | HWH                     | 5/16  | 0.563                        |            |                                       |       |                                    | Stalgard         |
| 9  | 12   | 24  | 0.216                   | HWH                     | 5/16  | 0.415                        | #5         | 0.125                                 | 0.500 | 0.906                              | Stalgard         |
| 9A <sup>(3)</sup>                                | 12   | 24  | 0.216                   | HWH                     | 5/16  | 0.563                        |            |                                       |       |                                    | Stalgard         |
| <b>Architectural Roof Clip Fasteners</b>         |      |     |                         |                         |   |                              |            |                                       |       |                                    |                  |
| 10   | 10   | 16  | 0.190                   | Pancake                 | 2   | 0.437                        | #3         | 0.048                                 | 0.175 | 0.500                              | Stalgard         |

For SI: 1 inch = 25.4 mm.

<sup>1</sup>Head styles: HWH = Hex Washer Head; HHWH = High Hex Washer Head

<sup>2</sup>The drilling capacity of a fastener refers to the minimum and maximum thickness of the steel that the fastener is designed to drill through.

<sup>3</sup>Screw has a bonded sealing washer, as shown in [Figure 11](#). Nominal head diameter refers to the nominal diameter of the bonded sealing washer.

TABLE 2— SELF-DRILLING SCREWS SHEAR AND TENSION FASTENER STRENGTH (lbf)

| DESIGNATION                                      | NOMINAL STRENGTH      |                         | ALLOWABLE STRENGTH (ASD) |                            | DESIGN STRENGTH (LRFD) |                          |
|--|-----------------------|-------------------------|--------------------------|----------------------------|------------------------|--------------------------|
|  | Shear: P <sub>s</sub> | Tension: P <sub>t</sub> | Shear: P <sub>s</sub> /Ω | Tension: P <sub>t</sub> /Ω | Shear: ΦP <sub>s</sub> | Tension: ΦP <sub>t</sub> |
| <b>Drilit® Standard Drill Screws</b>             |                       |                         |                          |                            |                        |                          |
| #10-16   | 1679                  | 2670                    | 560                      | 890                        | 840                    | 1335                     |
| #12-14   | 1788                  | 3211                    | 596                      | 1070                       | 894                    | 1606                     |
| 1/4-14   | 2307                  | 4803                    | 769                      | 1601                       | 1154                   | 2402                     |
| <b>Drilit® Extended Drilling Capacity Screws</b> |                       |                         |                          |                            |                        |                          |
| #12-24   | 2283                  | 3553                    | 761                      | 1184                       | 1142                   | 1777                     |
| <b>Architectural Roof Clip Fasteners</b>         |                       |                         |                          |                            |                        |                          |
| #10-16   | 1560                  | 2326                    | 520                      | 775                        | 780                    | 1163                     |

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

TABLE 3A—ALLOWABLE (ASD) SHEAR (BEARING) CAPACITY OF SCREW CONNECTIONS (lbf)<sup>1,2,3</sup>

| DESIGNATION                                      | NOMINAL DIAMETER (in.) | THICKNESS OF STEEL IN CONTACT WITH SCREW HEAD (in.) | THICKNESS OF STEEL NOT IN CONTACT WITH SCREW HEAD (in.) |       |       |       |       |       |       |       |       |       |     |
|--|------------------------|---|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|
|  |                        |   | 0.030   | 0.036 | 0.048 | 0.060 | 0.075 | 0.090 | 0.125 | 0.188 | 0.250 | 0.375 |     |
| <b>Drilit® Standard Drill Screws</b>             |                        |   |   |       |       |       |       |       |       |       |       |       |     |
| #10-16   | 0.190                  | 0.030   | 143   | 193   | 231   | 231   | 231   | 231   | 231   | 231   | -     | -     | -   |
|  |                        | 0.036   | 143   | 188   | 277   | 277   | 277   | 277   | 277   | 277   | -     | -     | -   |
|  |                        | 0.048   | 143   | 188   | 289   | 369   | 369   | 369   | 369   | 369   | -     | -     | -   |
|  |                        | 0.060   | 143   | 188   | 289   | 404   | 462   | 462   | -     | -     | -     | -     | -   |
|  |                        | 0.075   | 143   | 188   | 289   | 404   | 564   | 577   | -     | -     | -     | -     | -   |
|  |                        | 0.090   | 143   | 188   | 289   | 404   | 564   | 693   | -     | -     | -     | -     | -   |
| #12-14   | 0.216                  | 0.030   | 150   | 205   | 255   | 255   | 255   | 255   | 255   | 255   | 255   | -     | -   |
|  |                        | 0.036   | 150   | 197   | 304   | 306   | 306   | 306   | 306   | 306   | -     | -     | -   |
|  |                        | 0.048   | 150   | 197   | 304   | 408   | 408   | 408   | 408   | 408   | -     | -     | -   |
|  |                        | 0.060   | 150   | 197   | 304   | 424   | 510   | 510   | 510   | 510   | -     | -     | -   |
|  |                        | 0.075   | 150   | 197   | 304   | 424   | 593   | 638   | 638   | -     | -     | -     | -   |
|  |                        | 0.090   | 150   | 197   | 304   | 424   | 593   | 765   | 765   | -     | -     | -     | -   |
|  |                        | 0.125   | 150   | 197   | 304   | 424   | 593   | 765   | -     | -     | -     | -     | -   |
| 1/4-14   | 0.250                  | 0.030   | 160   | 222   | 292   | 292   | 292   | 292   | 292   | 292   | 292   | -     | -   |
|  |                        | 0.036   | 160   | 211   | 325   | 350   | 350   | 350   | 350   | -     | -     | -     | -   |
|  |                        | 0.048   | 160   | 211   | 325   | 454   | 467   | 467   | 467   | -     | -     | -     | -   |
|  |                        | 0.060   | 160   | 211   | 325   | 454   | 583   | 583   | 583   | -     | -     | -     | -   |
|  |                        | 0.075   | 160   | 211   | 325   | 454   | 634   | 729   | 729   | -     | -     | -     | -   |
|  |                        | 0.090   | 160   | 211   | 325   | 454   | 634   | 833   | 875   | -     | -     | -     | -   |
|  |                        | 0.125   | 160   | 211   | 325   | 454   | 634   | 833   | -     | -     | -     | -     |     |
| <b>Drilit® Extended Drilling Capacity Screws</b> |                        |   |   |       |       |       |       |       |       |       |       |       |     |
| #12-24   | 0.216                  | 0.036   | -   | -     | -     | -     | -     | -     | -     | 404   | -     | 370   | 400 |
|  |                        | 0.060   | -   | -     | -     | -     | -     | -     | -     | 829   | -     | 630   | 677 |
|  |                        | 0.090   | -   | -     | -     | -     | -     | -     | -     | 588   | -     | 643   | 667 |
| <b>Architectural Roof Clip Fasteners</b>         |                        |   |   |       |       |       |       |       |       |       |       |       |     |
| #10-16   | 0.190                  | 0.030   | -   | -     | 232   | 286   | 350   | 335   | -     | -     | -     | -     |     |
|  |                        | 0.036   | -   | -     | 343   | 423   | 484   | 472   | -     | -     | -     | -     |     |

For **SI**: 1 inch = 25.4 mm, 1 lbf = 4.4 N, 1 ksi = 6.89 MPa.

<sup>1</sup>Values are based on steel members with a minimum yield strength of  $F_y = 33$  ksi and tensile strength of  $F_u = 45$  ksi. When both pieces of steel have  $F_u \geq 58$  ksi, the capacities in the table may be multiplied by 1.29 and when both pieces of steel have  $F_u \geq 65$  ksi, the capacities in the table may be multiplied by 1.44.

<sup>2</sup>For shear connections, the lower of the fastener shear strength and the shear (bearing) capacity must be used for design.

<sup>3</sup>Capacity for other member thickness may be determined by interpolating within the table.

TABLE 3B—DESIGN (LRFD) SHEAR (BEARING) CAPACITY OF SCREW CONNECTIONS (lbf)<sup>1,2,3</sup>

| DESIGNATION                                      | NOMINAL DIAMETER (in.) | THICKNESS OF STEEL IN CONTACT WITH SCREW HEAD (in.) | DESIGN THICKNESS OF STEEL NOT IN CONTACT WITH SCREW HEAD (in.) |       |       |       |       |       |       |       |       |       |   |
|--|------------------------|---|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|---|
|  |                        |   | 0.030  | 0.036 | 0.048 | 0.060 | 0.075 | 0.090 | 0.125 | 0.188 | 0.250 | 0.375 |   |
| <b>Drilit® Standard Drill Screws</b>             |                        |   |  |       |       |       |       |       |       |       |       |       |   |
| #10-16   | 0.190                  | 0.030   | 214  | 290   | 346   | 346   | 346   | 346   | 346   | 346   | -     | -     | - |
|  |                        | 0.036   | 214  | 281   | 416   | 416   | 416   | 416   | 416   | 416   | -     | -     | - |
|  |                        | 0.048   | 214  | 281   | 433   | 554   | 554   | 554   | 554   | 554   | -     | -     | - |
|  |                        | 0.060   | 214  | 281   | 433   | 605   | 693   | 693   | -     | -     | -     | -     | - |
|  |                        | 0.075   | 214  | 281   | 433   | 605   | 846   | 866   | -     | -     | -     | -     | - |
|  |                        | 0.090   | 214  | 281   | 433   | 605   | 846   | 1039  | -     | -     | -     | -     | - |
| #12-14   | 0.216                  | 0.030   | 225  | 307   | 383   | 383   | 383   | 383   | 383   | 383   | -     | -     |   |
|  |                        | 0.036   | 225  | 296   | 456   | 459   | 459   | 459   | 459   | 459   | -     | -     |   |
|  |                        | 0.048   | 225  | 296   | 455   | 612   | 612   | 612   | 612   | 612   | -     | -     |   |
|  |                        | 0.060   | 225  | 296   | 455   | 636   | 765   | 765   | 765   | 765   | -     | -     |   |
|  |                        | 0.075   | 225  | 296   | 455   | 636   | 889   | 957   | 957   | 957   | -     | -     |   |
|  |                        | 0.090   | 225  | 296   | 455   | 636   | 889   | 1148  | 1148  | -     | -     | -     |   |
|  |                        | 0.125   | 225  | 296   | 455   | 636   | 889   | 1148  | -     | -     | -     | -     |   |
| 1/4-14   | 0.250                  | 0.030   | 241  | 316   | 437   | 437   | 437   | 437   | 437   | 437   | -     | -     |   |
|  |                        | 0.036   | 241  | 316   | 487   | 525   | 525   | 525   | 525   | -     | -     | -     |   |
|  |                        | 0.048   | 241  | 316   | 487   | 680   | 700   | 700   | 700   | -     | -     | -     |   |
|  |                        | 0.060   | 241  | 316   | 487   | 680   | 875   | 875   | 875   | -     | -     | -     |   |
|  |                        | 0.075   | 241  | 316   | 487   | 680   | 951   | 1094  | 1094  | -     | -     | -     |   |
|  |                        | 0.090   | 241  | 316   | 487   | 680   | 951   | 1250  | 1312  | -     | -     | -     |   |
| <b>Drilit® Extended Drilling Capacity Screws</b> |                        |   |  |       |       |       |       |       |       |       |       |       |   |
| #12-24   | 0.216                  | 0.036   | -  | -     | -     | -     | -     | -     | 647   | -     | 591   | 640   |   |
|  |                        | 0.060   | -  | -     | -     | -     | -     | -     | 1327  | -     | 1008  | 1083  |   |
|  |                        | 0.090   | -  | -     | -     | -     | -     | -     | 941   | -     | 1029  | 1068  |   |
| <b>Architectural Roof Clip Fasteners</b>         |                        |   |  |       |       |       |       |       |       |       |       |       |   |
| #10-16   | 0.190                  | 0.030   | -  | -     | 373   | 458   | 559   | 535   | -     | -     | -     | -     |   |
|  |                        | 0.036   | -  | -     | 548   | 676   | 775   | 755   | -     | -     | -     | -     |   |

For SI: 1 inch = 25.4 mm, 1 lbf = 4.4 N, 1 ksi = 6.89 MPa.

<sup>1</sup>Values are based on steel members with a minimum yield strength of  $F_y = 33$  ksi and tensile strength of  $F_u = 45$  ksi. When both pieces of steel have  $F_u \geq 58$  ksi, the capacities in the table may be multiplied by 1.29 and when both pieces of steel have  $F_u \geq 65$  ksi, the capacities in the table may be multiplied by 1.44.

<sup>2</sup>For shear connections, the lower of the fastener shear strength and the shear (bearing) capacity must be used for design.

<sup>3</sup>Capacity for other member thickness may be determined by interpolating within the table.

TABLE 4A—ALLOWABLE (ASD) TENSION PULL-OUT CAPACITY OF SCREW CONNECTIONS (lbf)<sup>1,2,3</sup>

| DESIGNATION                                      | NOMINAL DIAMETER (in.) | THICKNESS OF STEEL NOT IN CONTACT WITH SCREW HEAD (in.) |       |       |       |       |       |       |       |       |       |
|--|------------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|  |                        | 0.030   | 0.036 | 0.048 | 0.060 | 0.075 | 0.090 | 0.125 | 0.188 | 0.250 | 0.375 |
| <b>Drilit® Standard Drill Screws</b>             |                        |   |       |       |       |       |       |       |       |       |       |
| #10-16   | 0.190                  | 73  | 87    | 116   | 145   | 182   | 218   | 303   | 454   | -     | -     |
| #12-14   | 0.216                  | 80  | 96    | 129   | 161   | 201   | 241   | 335   | 502   | -     | -     |
| 1/4-14   | 0.250                  | 92  | 110   | 147   | 184   | 230   | 275   | 383   | 574   | -     | -     |
| <b>Drilit® Extended Drilling Capacity Screws</b> |                        |   |       |       |       |       |       |       |       |       |       |
| #12-24   | 0.216                  | -   | -     | -     | -     | -     | -     | 257   | -     | 808   | 986   |
| <b>Architectural Roof Clip Fasteners</b>         |                        |   |       |       |       |       |       |       |       |       |       |
| #10-16   | 0.190                  | -   | -     | 127   | 173   | 215   | 324   | -     | -     | -     | -     |

For SI: 1 inch = 25.4 mm, 1 lbf = 4.4 N, 1 ksi = 6.89 MPa.

<sup>1-3</sup>See notes following [Table 4B](#).

TABLE 4B—DESIGN (LRFD) TENSION PULL-OUT CAPACITY OF SCREW CONNECTIONS (lbf)<sup>1,2,3</sup>

| DESIGNATION                                      | NOMINAL DIAMETER (in.) | THICKNESS OF STEEL NOT IN CONTACT WITH SCREW HEAD (in.) |       |       |       |       |       |       |       |       |       |
|--|------------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|  |                        | 0.030   | 0.036 | 0.048 | 0.060 | 0.075 | 0.090 | 0.125 | 0.188 | 0.250 | 0.375 |
| <b>Drilit® Standard Drill Screws</b>             |                        |   |       |       |       |       |       |       |       |       |       |
| #10-16   | 0.190                  | 109   | 131   | 174   | 218   | 273   | 327   | 454   | 681   | -     | -     |
| #12-14   | 0.216                  | 120   | 145   | 193   | 241   | 301   | 361   | 502   | 753   | -     | -     |
| 1/4-14   | 0.250                  | 138   | 165   | 220   | 275   | 344   | 413   | 574   | 861   | -     | -     |
| <b>Drilit® Extended Drilling Capacity Screws</b> |                        |   |       |       |       |       |       |       |       |       |       |
| #12-24   | 0.216                  | -   | -     | -     | -     | -     | -     | 412   | -     | 1293  | 1578  |
| <b>Architectural Roof Clip Fasteners</b>         |                        |   |       |       |       |       |       |       |       |       |       |
| #10-16   | 0.190                  | -   | -     | 204   | 277   | 343   | 519   | -     | -     | -     | -     |

For SI: 1 inch = 25.4 mm, 1 lbf = 4.4 N, 1 ksi = 6.89 MPa.

<sup>1</sup>Values are based on steel members with a minimum yield strength of  $F_y = 33$  ksi and tensile strength of  $F_u = 45$  ksi. When the steel not in contact with the screw head has  $F_u \geq 58$  ksi, the capacities in the table may be multiplied by 1.29 and when the steel not in contact with the screw head has  $F_u \geq 65$  ksi, the capacities in the table may be multiplied by 1.44.

<sup>2</sup>For tension connections, the lowest of the pull-out, pull-over, and fastener tension strength must be used for design.

<sup>3</sup>Capacity for other member thickness may be determined by interpolating within the table.

TABLE 5A—ALLOWABLE (ASD) TENSION PULL-OVER CAPACITY OF SCREW CONNECTIONS (lbf)<sup>1,2,3</sup>

| DESIGNATION                                      | NOMINAL HEAD DIAMETER (in.) | THICKNESS OF STEEL IN CONTACT WITH SCREW HEAD (in.) |       |       |       |       |       |       |       |       |  |
|--|-----------------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|--|
|  |                             | 0.030   | 0.036 | 0.048 | 0.060 | 0.075 | 0.090 | 0.125 | 0.188 | 0.250 |  |
| <b>Drilit® Standard Drill Screws</b>             |                             |   |       |       |       |       |       |       |       |       |  |
| #10-16   | 0.399                       | 259   | 311   | 415   | 518   | 648   | 778   | 1080  | -     | -     |  |
| #12-14   | 0.415                       | 269   | 322   | 430   | 537   | 672   | 806   | 1119  | 1679  | -     |  |
| 1/4-14   | 0.415                       | 269   | 322   | 430   | 537   | 672   | 806   | 1119  | 1679  | -     |  |
| 1/4-14   | 0.500                       | 324   | 389   | 518   | 648   | 810   | 972   | 1350  | 2025  | -     |  |
| <b>Drilit® Extended Drilling Capacity Screws</b> |                             |   |       |       |       |       |       |       |       |       |  |
| #12-24   | 0.415                       | 269   | 322   | 430   | 537   | 672   | 806   | 1119  | 1684  | 2239  |  |
| <b>Architectural Roof Clip Fasteners</b>         |                             |   |       |       |       |       |       |       |       |       |  |
| #10-16   | 0.437                       | 288   | 346   | 461   | 576   | 721   | 865   | -     | -     | -     |  |

For SI: 1 inch = 25.4 mm, 1 lbf = 4.4 N, 1 ksi = 6.89 MPa.

<sup>1-3</sup>See notes following [Table 5B](#).

TABLE 5B—DESIGN (LRFD) TENSION PULL-OVER CAPACITY OF SCREW CONNECTIONS (lbf)<sup>1,2,3</sup>

| DESIGNATION                                      | NOMINAL HEAD DIAMETER (in.) | THICKNESS OF STEEL IN CONTACT WITH SCREW HEAD (in.) |       |       |       |       |       |       |       |       |  |
|--|-----------------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|--|
|  |                             | 0.030   | 0.036 | 0.048 | 0.060 | 0.075 | 0.090 | 0.125 | 0.188 | 0.250 |  |
| <b>Drilit® Standard Drill Screws</b>             |                             |   |       |       |       |       |       |       |       |       |  |
| #10-16   | 0.399                       | 389   | 467   | 622   | 778   | 972   | 1166  | 1620  | -     | -     |  |
| #12-14   | 0.415                       | 403   | 484   | 645   | 806   | 1007  | 1209  | 1679  | 2519  | -     |  |
| 1/4-14   | 0.415                       | 403   | 484   | 645   | 806   | 1007  | 1209  | 1679  | 2519  | -     |  |
| 1/4-14   | 0.500                       | 486   | 583   | 778   | 972   | 1215  | 1458  | 2025  | 3038  | -     |  |
| <b>Drilit® Extended Drilling Capacity Screws</b> |                             |   |       |       |       |       |       |       |       |       |  |
| #12-24   | 0.415                       | 403   | 484   | 645   | 806   | 1007  | 1209  | 1679  | 2525  | 3358  |  |
| <b>Architectural Roof Clip Fasteners</b>         |                             |   |       |       |       |       |       |       |       |       |  |
| #10-16   | 0.437                       | 432   | 519   | 692   | 865   | 1081  | 1297  | -     | -     | -     |  |

For SI: 1 inch = 25.4 mm, 1 lbf = 4.4 N, 1 ksi = 6.89 MPa.

<sup>1</sup>Values are based on steel members with a minimum yield strength of  $F_y = 33$  ksi and tensile strength of  $F_u = 45$  ksi. When the steel in contact with the screw head has  $F_u \geq 58$  ksi, the capacities in the table may be multiplied by 1.29 and when the steel in contact with the screw head has  $F_u \geq 65$  ksi, the capacities in the table may be multiplied by 1.44.

<sup>2</sup>For tension connections, the lowest of the pull-out, pull-over, and fastener tension strength must be used for design.

<sup>3</sup>Capacity for other member thickness may be determined by interpolating within the table.

TABLE 6—MINIMUM FASTENER SPACING AND EDGE DISTANCE

| BASIC SCREW DIAMETER (inch) | FASTENED MATERIAL | MINIMUM SPACING <sup>1</sup> (3d) | MINIMUM EDGE DISTANCE (1.5d) | MINIMUM EDGE DISTANCE FOR FRAMING MEMBERS UNDER THE 2018 and 2015 IBC (3d) |
|-----------------------------|-------------------|-----------------------------------|------------------------------|--|
| 0.190 (#10)                 | Steel             | 9/16"                             | 5/16"                        | 9/16"  |
| 0.216 (#12)                 | Steel             | 11/16"                            | 3/8"                         | 11/16"   |
| 0.250 (1/4)                 | Steel             | 3/4"                              | 3/8"                         | 3/4"   |

For SI: 1 inch = 25.4 mm.

<sup>1</sup>For screws used in framing connections, when the spacing between screws is less than 3 times the nominal screw diameter, but at least 2 times the screw diameter, the connection shear strength values in Tables 3A and 3B must be reduced by 20 percent (Refer to Section B1.5.1.3 of AISI S240).

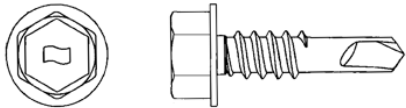


FIGURE 1—#10-16 HIGH HEX WASHER HEAD TYPE 1 SCREW

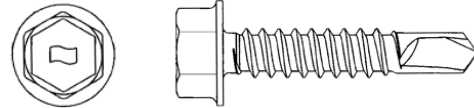


FIGURE 2—#10-16 HIGH HEX WASHER HEAD TYPE 2 SCREW

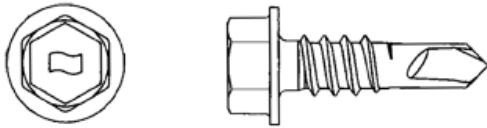


FIGURE 3—#12-14 HEX WASHER HEAD TYPE 3 SCREW

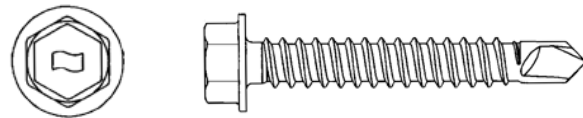


FIGURE 4—#12-14 HEX WASHER HEAD TYPE 4 SCREW

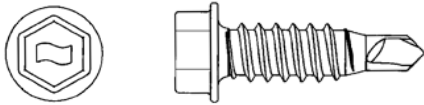


FIGURE 5—1/4-14 HEX WASHER HEAD TYPE 5 SCREW

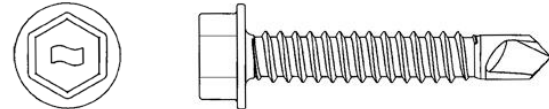


FIGURE 6—1/4-14 HEX WASHER HEAD TYPE 6 SCREW

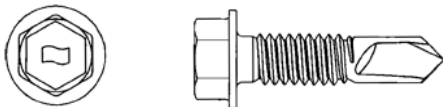


FIGURE 7—#12-24 HEX WASHER HEAD TYPE 7 SCREW

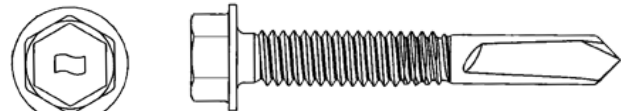


FIGURE 8—#12-24 HEX WASHER HEAD TYPE 8 SCREW

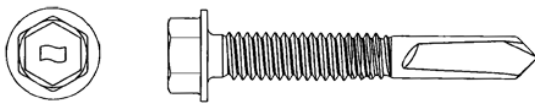


FIGURE 9—#12-24 HEX WASHER HEAD TYPE 9 SCREW

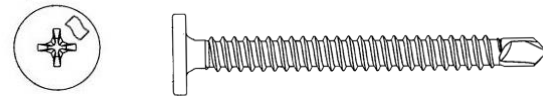


FIGURE 10—#10-16 PANCAKE HEAD TYPE 10 SCREW

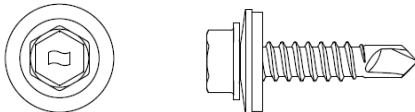


FIGURE 11—TYPICAL HEX WASHER HEAD SCREW WITH BONDED SEALING WASHER (TYPE A SCREW)

TABLE 7—CODE SECTION NUMBER REFERENCE MATRIX

| 2024 IBC                        | 2021 IBC                        | 2018 IBC              | 2015 IBC          |
|---------------------------------|---------------------------------|-----------------------|-------------------|
| 2206                            | 2211                            | 2211                  | 2211              |
| AISI S100-16(2020) w/S2-20 A3.1 | AISI S100-16(2020) w/S2-20 A3.1 | AISI S100-16 A3.1     | AISI S100-12 A2.1 |
| AISI S100-16(2020) w/S2-20 J4   | AISI S100-16(2020) w/S2-20 J4   | AISI S100-16 J4       | AISI S100-12 E4   |
| AISI S100-16(2020) w/S2-20 J6   | AISI S100-16(2020) w/S2-20 J6   | AISI S100-16 J6       | AISI S100-12 E6   |
| AISI S240-20 B1.5.1.3           | AISI S240-20 B1.5.1.3           | AISI S240-20 B1.5.1.3 | AISI S200-12 D1.5 |



**DIVISION: 05 00 00—METALS**

**Section: 05 05 23—Metal Fastenings**

**REPORT HOLDER:**

**DEWALT**

**EVALUATION SUBJECT:**

**DRILIT® SELF-DRILLING STRUCTURAL SCREWS AND ARCHITECTURAL ROOF CLIP FASTENERS (DEWALT)**

## 1.0 REPORT PURPOSE AND SCOPE

### Purpose:

The purpose of this evaluation report supplement is to indicate that Drilit® Self-drilling Structural Screws and Architectural Roof Clip Fasteners (DEWALT), described in ICC-ES evaluation report [ESR-3294](#), 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 Drilit® Self-drilling Structural Screws and Architectural Roof Clip Fasteners (DEWALT), described in Sections 2.0 through 7.0 of the evaluation report [ESR-3294](#), comply with the LABC Chapter 22, and the LARC, and are subjected to the conditions of use described in this supplement.

## 3.0 CONDITIONS OF USE

The Drilit® Self-drilling Structural Screws and Architectural Roof Clip Fasteners (DEWALT), described in this evaluation report supplement, must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-3294](#).
- The design, installation, conditions of use and identification are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-3294](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.

This supplement expires concurrently with the evaluation report [ESR-3294](#), reissued April 2024 and revised September 2024.

**DIVISION: 05 00 00—METALS**

Section: 05 05 23—Metal Fastenings

**REPORT HOLDER:**

DEWALT

**EVALUATION SUBJECT:**

DRILIT® SELF-DRILLING STRUCTURAL SCREWS AND ARCHITECTURAL ROOF CLIP FASTENERS (DEWALT)

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

The purpose of this evaluation report supplement is to indicate that Drilit® Self-drilling Structural Screws and Architectural Roof Clip Fasteners (DEWALT), described in ICC-ES evaluation report ESR-3294, have also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2023 Florida Building Code—Building
- 2023 Florida Building Code—Residential

**2.0 CONCLUSIONS**

The Drilit® Self-drilling Structural Screws and Architectural Roof Clip Fasteners (DEWALT), described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-3294, comply with the *Florida Building Code—Building and Florida Building Code—Residential*. The design requirements must be determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-3294 for the 2021 *International Building Code*® meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the Drilit® Self-drilling Structural Screws and Architectural Roof Clip Fasteners (DEWALT) has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building and 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 April 2024 and revised September 2024.