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ICC-ES Evaluation Report

Issued March 2022

ESR-4893

This report is subject to renewal March 2023.

DIVISION: 03 00 00—CONCRETE
Section: 03 15 00—Concrete Accessories
Section: 03 16 00—Concrete Anchors

DIVISION: 04 00 00—MASONRY
Section: 04 05 19.16—Masonry Anchors

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

DIVISION: 09 00 00—FINISHES
Section: 09 22 16.23—Fasteners

REPORT HOLDER:

ROBERT BOSCH TOOL CORPORATION

EVALUATION SUBJECT:

BOSCH FASTENERS

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015 and 2012 *International Building Code®* (IBC)
- 2021, 2018, 2015 and 2012 *International Residential Code®* (IRC)

For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see ESR-4893 LABC and LARC Supplement.

Property evaluated:

Structural

2.0 USES

Bosch fasteners are used to attach miscellaneous building components to base materials of normalweight concrete, steel deck panels with sand-lightweight concrete fill, concrete masonry or structural steel. The fasteners are alternatives to the cast-in-place anchors described in IBC Section 1901.3 (2012 IBC Section 1908) for placement in concrete; the embedded anchors described in Section 8.1.3 of TMS 402, referenced in Section 2107 of the IBC (Section 2.1.4 of TMS 402-11, referenced in Section 2107 of the 2012 IBC) for placement in masonry; and the welds and bolts used to attach materials to steel, described in IBC Sections 2204.1 and 2204.2, respectively. For structures regulated under the IRC, the fasteners may be used where an engineered design is submitted in accordance with IRC Section R301.1.3.

3.0 DESCRIPTION

3.1 Fasteners:

Bosch fasteners are power-actuated fasteners (PAFs) manufactured from carbon steel which is hardened in accordance with the manufacturer's quality documentation. The minimum specified core hardness for the fastener is 53 HRC. The fasteners have zinc plating. See Table 1 for shank type and fastener dimensions. Maximum point length is the maximum specified length from the tip of the fastener to the location where the diameter of the shank becomes constant. Minimum effective shank length is the minimum specified length from the underside of the fastener head to the tip of the fastener.

3.2 Substrate Materials:

3.2.1 Concrete: Uncracked normalweight and sand-lightweight concrete must comply with IBC Chapter 19 or IRC Section R402.2, as applicable. The minimum concrete compressive strength at the time of fastener installation must be as noted in the applicable allowable load table.

3.2.2 Concrete Masonry: Concrete masonry units (CMUs) must be uncracked lightweight units complying with ASTM C90, having a face shell thickness of 1.25 inches (32 mm).

3.2.3 Steel: Structural steel supports must comply with the minimum requirements of ASTM A36 or ASTM A572 Grade 50, as applicable, and must have minimum thickness as noted in Tables 2A and 2B, as applicable.

3.2.4 Steel Deck Panels: Steel deck panel properties and configurations must be as described in footnote 4 of Tables 4A and 4B and Figures 5 and 6.

4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 General: Selection of fasteners must take into consideration the applicable base material and the length of the fastener. The minimum fastener length must be determined as follows:

- For installation into concrete, concrete-filled steel deck panels, concrete masonry and steel base materials, the minimum effective shank length shown in Table 1 must equal or exceed the sum of the thickness of the attached material and the minimum embedment depth (penetration) shown in the applicable tables in this report.
- For installation through steel base materials, the minimum effective shank length shown in Table 1 must equal or exceed the sum of the following: the thickness of the attached material, the thickness of the base material and the required point penetration beyond the base material as shown in the applicable tables in this report.

4.1.2 Allowable Loads: The applicable allowable load tables for Bosch power-actuated fasteners driven into different base materials are shown in Table 1.

The most critical applied loads, excluding seismic load effects, resulting from the load combinations in Section 2.4 of ASCE 7-16/S1 (referenced in 2021 IBC Section 1605.1) or 2021 IBC Section 1605.2 (Section 1605.3.1 or 1605.3.2 of the 2018, 2015 and 2012 IBC) must not exceed the allowable loads in Tables 2 through 5 of this report. For fasteners which are subjected to seismic loads, see Section 4.1.5 for additional information. The stress increases and load reductions described in 2021 IBC Section 1605.2 (2018, 2015 and 2012 IBC Section 1605.3) are not allowed.

Allowable shear loads and tension loads in this report apply to the connection of the fastener to the base material only. Other limit states applicable to the design of a connection, such as fastener pull-through (pull-over) and lateral bearing on the attached material, which are governed by the properties of attached materials, are outside the scope of this report. Design of the connection to the attached material must comply with the applicable requirements of the IBC.

4.1.3 Combined Loading: For fasteners subjected to both tension and shear loads, compliance with the following interaction equation must be verified:

$$(p/P_a) + (v/V_a) \leq 1$$

where:

p = Actual applied tension load on fastener, lbf (N).

P_a = Allowable tension load on fastener, lbf (N).

v = Actual applied shear load on fastener, lbf (N).

V_a = Allowable shear load on fastener, lbf (N).

4.1.4 Steel-to-steel Connections: When the Bosch fasteners listed in Tables 2A and 2B are used in connections of two steel elements in direct contact with one another and in accordance with Section J5 of AISI S100 (Section E5 of AISI S100-12 for the 2015 and 2012 IBC), connection capacity must be determined in accordance with Sections 4.1.4.1 and 4.1.4.2, as applicable.

4.1.4.1 Connection Strength—Tension: To determine tensile connection strength in accordance with Section J5.2 of AISI S100 (Section E5.2 of AISI S100-12), fastener tension strength, the pull-out strength and the pull-over strength must be known. These characteristics must be determined as follows:

- **Pull-out Strength:** See Table 2A or 2B for available pull-out strength, as applicable.
- **Pull-over Strength:** The available pull-over strengths must be calculated in accordance with Section J5.2.3 of AISI S100 (Section E5.2.3 of AISI S100-12).
- **PAF Tensile Strength:** The allowable fastener tension strengths must be determined in accordance with Section J5.2.1 of AISI S100 (Section E5.2.1 of AISI S100-12).

4.1.4.2 Connection Strength—Shear: To determine shear connection strength in accordance with Section J5.3 of AISI S100 (Section E5.3 of AISI S100-12), the fastener shear strength, bearing and tilting strength, pull-out strength in shear, net section rupture strength and shear strength limited by edge distance must be known. These characteristics must be determined as follows:

- **Bearing and Tilting Strength:** The available bearing and tilting strengths must be calculated in accordance with Section J5.3.2 of AISI S100 (Section E5.3.2 of AISI S100-12).
- **Pull-out Strength in Shear:** The available pull-out strength in shear must be the applicable allowable shear strength from Table 2A or 2B or must be calculated in accordance with Section J5.3.3 of AISI S100 (Section E5.3.3 of AISI S100-12).
- **Net Section Rupture Strength and Shear Strength Limited by Edge Distance:** The net section rupture strength must be determined in accordance with Section J5.3.4 of AISI S100 (Section E5.3.4 of AISI S100-12) and the shear strength limited by edge distance must be determined in accordance with Section J5.3.5 of AISI S100 (Section E5.3.5 of AISI S100-12).
- **PAF Shear Strength:** The allowable fastener shear strengths must be determined in accordance with Section J5.3.1 of AISI S100 (Section E5.3.1 of AISI S100-12).

4.1.5 Seismic Considerations: When subjected to seismic loads, the Bosch fasteners may be used as follows:

1. The Bosch fasteners may be used for attachment of nonstructural components listed in Section 13.1.4 of ASCE/SEI 7, which are exempt from the requirements of ASCE/SEI 7.
2. Concrete base materials: The Bosch fasteners installed in concrete may be used to support distributed systems and distribution systems where the service load on any individual fastener does not exceed the lesser of 90 lbf (400 N) or the allowable load shown in Tables 3, 4A and 4B, as applicable.
3. Steel base materials: The Bosch fasteners may be used for attaching nonstructural components where the service load on any individual fastener does not exceed the lesser of 250 lbf (1112 N) or the published allowable load shown in Table 2A or 2B, as applicable.
4. For interior, nonstructural walls that are not subject to sustained tension loads and are not a bracing application, the power-actuated fasteners may be used to attach steel track to concrete or steel in all Seismic Design Categories. In Seismic Design Categories D, E and F, the allowable shear load due to transverse pressure must be no more than the allowable load described in Item 2 when attaching to concrete; or the allowable load described in Item 3, above, when attaching to steel. Substantiating calculations must be submitted addressing the fastener-to-base-material capacity and the fastener-to-attached-material capacity. Interior nonstructural walls are limited to locations where bearing walls, shear walls or braced walls are not required by the approved plans. The design load on the fastener must not exceed the allowable load established in this report for the concrete or steel base material.

4.2 Installation:

The fasteners must be installed in accordance with this report and the Bosch published installation instructions. A copy of these instructions must be available on the jobsite at all times during fastener installation. In the event of conflict between this report and the Bosch published instructions, the more restrictive requirements govern.

Fastener installation requires the use of a gas-actuated tool in accordance with Bosch recommendations.

The fastener size, minimum embedment depth or penetration, minimum spacing, and edge distances must comply with Tables 2 through 5, as applicable. For fasteners installed into concrete, the fasteners must not be driven until the concrete has reached the designated compressive strength.

5.0 CONDITIONS OF USE

The Bosch fasteners 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 manufactured and identified in accordance with this report.

5.2 Calculations demonstrating that the applied loads are less than the allowable loads described in this report must be submitted to the code official for approval. The calculations must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is constructed.

5.3 For steel-to-steel connections that meet the applicability requirements of Section J5 of AISI S100-16 (Section E5 of AISI S100-12 for the 2015 and 2012 IBC), calculations demonstrating that the available connection strength has been determined in accordance with Section J5 of AISI S100-16 (Section E5 of AISI S100-12) and Section 4.1.4 of this report, and equals or exceeds the applied load, must be submitted to the code official. The calculations must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.4 Refer to Section 4.1.5 for seismic considerations.

5.5 The fasteners must be limited to dry, interior locations, which include exterior walls which are protected by an exterior wall envelope.

5.6 The use of fasteners in concrete or masonry is limited to installation in uncracked concrete or masonry. Cracking occurs when $f_t > f_r$ due to service loads or deformations.

5.7 The Bosch products addressed in this report 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 Power-actuated Fasteners Driven into Concrete, Steel, and Masonry Elements (AC70), dated December 2019 (editorially revised January 2021).

7.0 IDENTIFICATION

7.1 The heads of the Bosch fasteners are marked as shown in Figure 4. Packages of fasteners are identified with the report holder name (Bosch), the fastener type and size and the evaluation report number (ICC-ES ESR-4893).

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

ROBERT BOSCH TOOL CORPORATION
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MOUNT PROSPECT, ILLINOIS 60056
(224) 232-2000
www.boschtools.com

TABLE 1—FASTENER DESCRIPTION AND APPLICATIONS

FASTENER DESIGNATIONS[1]	SHANK TYPE	SHANK DIAMETER [inch (mm)]	HEAD DIAMETER, [inch (mm)]	MAXIMUM POINT LENGTH [inch (mm)]	MINIMUM EFFECTIVE SHANK LENGTH [inches (mm)]	APPLICABLE BASE MATERIAL	APPLICABLE LOAD TABLES
NB-063, NB-16	Straight, smooth	0.106 (2.7)	0.246 (6.25)	0.217 (5.5)	0.543 (13.8)	Steel, concrete, concrete-filled deck, CMU	2A, 2B, 3, 4A, 4B, 5
NB-075, NB-19					0.661 (16.8)		
NB-100, NB-25					0.898 (22.8)		
NB-125, NB-32					1.17 (29.8)		
NB-150, NB-38					1.41 (35.8)		
NK-138, NK-35	Straight, knurled	0.106 (2.7)	0.246 (6.25)	0.217 (5.5)	1.29 (32.8)	Steel, concrete, concrete-filled deck, CMU	2A, 2B, 3, 4A, 4B, 5
NM-050, NM-13	Stepped, smooth	0.117/0.102 (3.00/2.60)	0.246 (6.25)	0.217 (5.5)	0.421 (10.7)	Steel, concrete, CMU	2A, 2B, 3, 5
NM-063, NM-16					0.539 (13.7)		
NM-075, NM-19					0.657 (16.7)		

For **SI:** 1 inch = 25.4 mm.

[1]Numerical digits represent the overall length of the fastener in inches (designations with three numerical digits) or in mm (designations with two numerical digits).

TABLE 2A—ALLOWABLE LOADS FOR FASTENERS DRIVEN INTO ASTM A36 STEEL[1,2,3,4,5,6]

FASTENER DESIGNATION	SHANK DIAMETER [inch (mm)]	ALLOWABLE LOADS [lbf (N)]									
Steel Thickness [inch (mm)]:		1/8 (3.2)		3/16 (4.8)		1/4 (6.4)		3/8 (9.5)		1/2 (12.7)	
Load Direction:		Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear
NB	0.106 (2.7)	120 (534)	210 (934)	205 (912)	230 (1,023)	215 (956)	250 (1,112)	260 (1,157)	250 (1,112)	–	–
NK	0.106 (2.7)	135 (601)	190 (845)	180 (801)	275 (1,223)	220 (979)	300 (1,335)	230 (1,023)	350 (1,557)	250 (1,112)	–
NM	0.117/0.102 (3.00/2.60)	170 (756)	155 (689)	210 (934)	235 (1,045)	250 (1,112)	285 (1,268)	290 (1,290)	345 (1,535)	–	–

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

[1]Fasteners must be driven to where the full length of the point of the fastener penetrates through the steel base material.
[2]The tabulated design values apply only to the fastener in the steel base material. Design of the connection to the attached material is outside the scope of this report and must comply with the applicable requirements of the IBC.
[3]Tabulated loads apply to static load conditions only. For seismic loading, allowable loads must be limited in accordance with Section 4.1.5, Item 3.
[4]Steel base material must have minimum yield and tensile strengths (F_y and F_u) equal to 36 ksi and 58 ksi, respectively.
[5]Fastener spacing must be a minimum of 1.0 inch and edge distance must be a minimum of 0.50 inch.
[6]For steel-to-steel connections designed in accordance with Section 4.1.4, the tabulated allowable tension loads may be increased by a factor of 1.25, and the design strength may be taken as the tabulated allowable load multiplied by a factor of 2.0.

TABLE 2B—ALLOWABLE LOADS FOR FASTENERS DRIVEN INTO ASTM A572 GRADE 50 STEEL[1,2,3,4,5,6]

FASTENER DESIGNATION	SHANK DIAMETER [inch (mm)]	ALLOWABLE LOADS [lbf (N)]							
Steel Thickness [inch (mm)]:		1/8 (3.2)		3/16 (4.8)		1/4 (6.4)		3/8 (9.5)	
Load Direction:		Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear
NB	0.106 (2.7)	140 (623)	225 (1,001)	225 (1,001)	245 (1,090)	260 (1,157)	365 (1,623)	300 (1,334)	390 (1,735)
NK	0.106 (2.7)	160 (712)	240 (1,068)	200 (890)	260 (1,157)	225 (1,001)	310 (1,379)	–	–
NM	0.117/0.102 (3.00/2.60)	110 (489)	170 (756)	225 (1,001)	245 (1,090)	285 (1,268)	340 (1,512)	–	–

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

[1]Unless otherwise noted, fasteners must be driven to where the full length of the point of the fastener penetrates through the steel base material.
[2]The tabulated design values apply only to the fastener in the steel base material. Design of the connection to the attached material is outside the scope of this report and must comply with the applicable requirements of the IBC.
[3]Tabulated loads apply to static load conditions only. For seismic loading, allowable loads must be limited in accordance with Section 4.1.5, Item 3.
[4]Steel base material must have minimum yield and tensile strengths (F_y and F_u) equal to 50 ksi and 65 ksi, respectively.
[5]Fastener spacing must be a minimum of 1.0 inch and edge distance must be a minimum of 0.50 inch.
[6]For steel-to-steel connections designed in accordance with Section 4.1.4, the tabulated allowable tension loads may be increased by a factor of 1.25, and the design strength may be taken as the tabulated allowable load multiplied by a factor of 2.0.

TABLE 3—ALLOWABLE LOADS FOR FASTENERS DRIVEN INTO NORMALWEIGHT CONCRETE[1,2,3,4]

FASTENER DESIGNATION	SHANK DIAMETER [inch (mm)]	MINIMUM EMBEDMENT DEPTH (inches)	ALLOWABLE LOADS [lbf (N)]									
Concrete Compressive Strength:			2,500 psi (17.2 MPa)		3,000 psi (20.7 MPa)		4,000 psi (27.6 MPa)		5,000 psi (34.5 MPa)		6,000 psi (41.4 MPa)	
Load Direction:			Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear
NB	0.106 (2.7)	5/8	30 (133)	35 (156)	30 (133)	35 (156)	35 (156)	45 (200)	40 (178)	45 (200)	45 (200)	50 (222)
		3/4	40 (178)	50 (222)	45 (200)	55 (245)	50 (222)	60 (267)	60 (267)	65 (289)	65 (289)	70 (311)
NK	0.106 (2.7)	5/8	55 (245)	60 (267)	55 (245)	60 (267)	70 (311)	85 (378)	70 (311)	90 (400)	70 (311)	110 (489)
		3/4	40 (178)	55 (245)	70 (311)	80 (356)	75 (334)	100 (445)	75 (334)	100 (445)	100 (445)	110 (489)
NM	0.117/0.102 (3.00/2.60)	1/4	35 (156)	40 (178)	55 (245)	65 (289)	50 (222)	65 (289)	60 (267)	80 (356)	–	–
		3/8	40 (178)	50 (222)	55 (245)	50 (222)	55 (245)	70 (311)	–	–	–	–

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

[1]Fasteners must not be driven until the concrete has reached the designated minimum compressive strength.
[2]Concrete thickness must be a minimum of 3 times the embedment depth of the fastener. Fastener spacing must be a minimum of 4 inches and edge distance must be a minimum of 3.2 inches.
[3]The tabulated design values apply only to the fastener in the concrete. Design of the connection to the attached material is outside the scope of this report and must comply with the applicable requirements of the IBC.
[4]The tabulated allowable loads apply to static load conditions only. For seismic load conditions, the allowable loads must be limited in accordance with Section 4.1.5, Item 2.

TABLE 4A—ALLOWABLE LOADS FOR FASTENERS DRIVEN INTO MINIMUM 3,000 psi LIGHTWEIGHT CONCRETE OVER 3-INCH-DEEP, COMPOSITE STEEL DECK PANELS [1,2,3,4,5]

FASTENER DESIGNATION	SHANK DIAMETER [inch (mm)]	MINIMUM EMBEDMENT DEPTH (inches)	ALLOWABLE LOADS [lbf (N)]				MINIMUM REQUIRED CONCRETE THICKNESS ABOVE DECK PANEL (inches)
Load Direction:			Tension		Shear		
Fastener Location:			Upper Flute	Lower Flute	Upper Flute	Lower Flute	
NB	0.106 (2.7)	5/8	55 (245)	65 (289)	150 (667)	165 (734)	3 1/4
		3/4	115 (512)	100 (445)	170 (756)	190 (845)	
NK	0.106 (2.7)	5/8	105 (467)	70 (311)	125 (556)	135 (601)	
		3/4	95 (423)	95 (423)	160 (712)	130 (578)	

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

[1]Fasteners must not be driven until the concrete has reached a minimum compressive strength of 3,000 psi.
[2]Fastener spacing must be a minimum of 4 inches and concrete edge distance at the end of the deck panel must be a minimum of 3.2 inches. See Figure 5 for additional placement details and direction of loading.
[3]Steel deck panel must be 3-inch-deep composite floor deck panel having a minimum base steel thickness of 0.047 inch-thick, complying with ASTM A653 SS minimum Grade 33, with a minimum yield strength of 40 ksi and a minimum tensile strength of 55 ksi. The thickness of sand-lightweight concrete fill above top of metal deck panel profiles must be as shown in the table. See Figure 5 for nominal flute dimensions.
[4]The tabulated design values apply only to the fastener in the concrete-filled steel deck. Design of the connection to the attached material is outside the scope of this report and must comply with the applicable requirements of the IBC.
[5]The tabulated allowable loads apply to static load conditions only. For seismic load conditions, the allowable loads must be limited in accordance with Section 4.1.5, Item 2.

TABLE 4B—ALLOWABLE LOADS FOR FASTENERS DRIVEN INTO MINIMUM 3,000 psi LIGHTWEIGHT CONCRETE OVER $1^1/_2$-INCH-DEEP, "B" DECK PANELS [1,2,3,4,5]

FASTENER DESIGNATION	SHANK DIAMETER [inch (mm)]	MINIMUM EMBEDMENT DEPTH (inches)	ALLOWABLE LOADS [lbf (N)]				MINIMUM REQUIRED CONCRETE THICKNESS ABOVE DECK PANEL (inches)
Load Direction:			Tension		Shear		
Fastener Location:			Upper Flute	Lower Flute	Upper Flute	Lower Flute	
NB	0.106 (2.7)	$^5/_8$	60 (267)	50 (222)	130 (578)	150 (667)	$2^1/_4$
		$^3/_4$	70 (311)	70 (311)	130 (578)	165 (734)	
NK	0.106 (2.7)	$^5/_8$	80 (356)	70 (311)	135 (601)	130 (578)	
		$^3/_4$	90 (400)	90 (400)	125 (556)	155 (690)	

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

[1]Fasteners must not be driven until the concrete has reached a minimum compressive strength of 3,000 psi.
[2]Fastener spacing must be a minimum of 4 inches and concrete edge distance at the end of the deck panel must be a minimum of 3.2 inches. See Figure 6 for additional placement details and direction of loading.
[3]Steel deck panel must be $1^1/_2$-inch-deep B-deck, having a minimum base steel thickness of 0.047 inch-thick, complying with ASTM A653 SS minimum Grade 33, with a minimum yield strength of 40 ksi and a minimum tensile strength of 55 ksi. The thickness of sand-lightweight concrete fill above top of metal deck panel profiles must be as shown in the table. See Figure 6 for nominal flute dimensions.
[4]The tabulated design values apply only to the fastener in the concrete-filled steel deck. Design of the connection to the attached material is outside the scope of this report and must comply with the applicable requirements of the IBC.
[5]The tabulated allowable loads apply to static load conditions only. For seismic load conditions, the allowable loads must be limited in accordance with Section 4.1.5, Item 2.

TABLE 5—ALLOWABLE LOADS FOR FASTENERS DRIVEN INTO CONCRETE MASONRY UNIT FACE SHELL [1,2,3,4]

FASTENER DESIGNATION	SHANK DIAMETER [inch (mm)]	MINIMUM EMBEDMENT DEPTH (inch)	CMU TYPE	ALLOWABLE LOADS (lbf)	
				Tension	Shear
NB	0.106 (2.7)	$^5/_8$	Lightweight	40 (178)	75 (334)
NK	0.106 (2.7)	$^5/_8$		45 (200)	90 (400)
NM	0.117/0.102 (3.00/2.60)	$^1/_4$		35 (156)	35 (156)

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

[1]No more than one fastener may be installed in an individual masonry unit cell.
[2]Fasteners must be installed a minimum of 3 inches from the edge of the concrete masonry unit. See Figure 7 for the applicable placement zone.
[3]The tabulated design values apply only to the fastener in the CMU. Design of the connection to the attached material is outside the scope of this report and must comply with the applicable requirements of the IBC.
[4]The fasteners listed in the table above may be used for static load conditions and for the seismic load conditions described in Item 1 of Section 4.1.5.

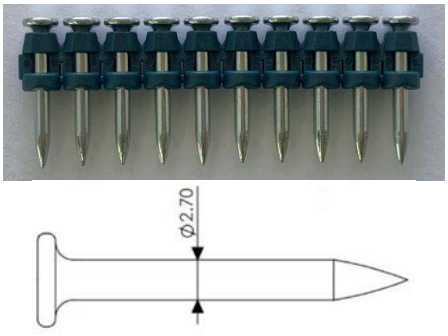

FIGURE 1—BOSCH NB FASTENER

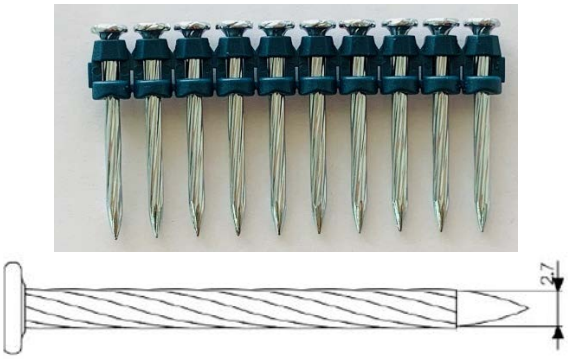

FIGURE 2—BOSCH NK FASTENER

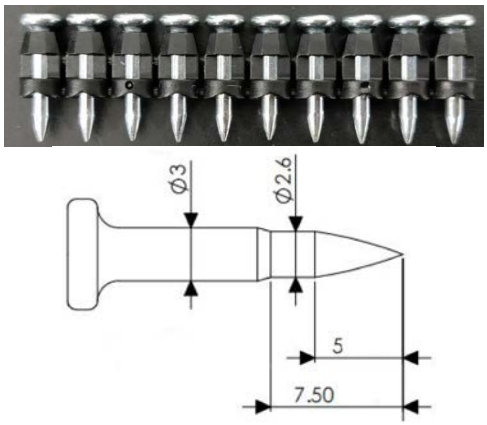

FIGURE 3—BOSCH NM FASTENER

FIGURE 4—BOSCH FASTENER HEAD MARKING

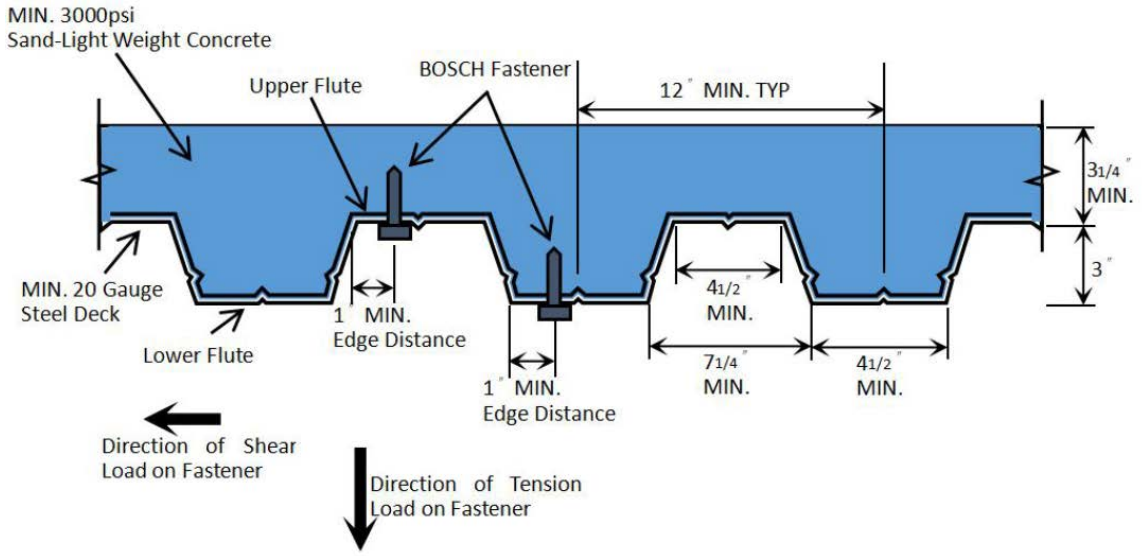

FIGURE 5—BOSCH FASTENER LOCATIONS IN 3-INCH-DEEP COMPOSITE FLOOR DECK PANEL

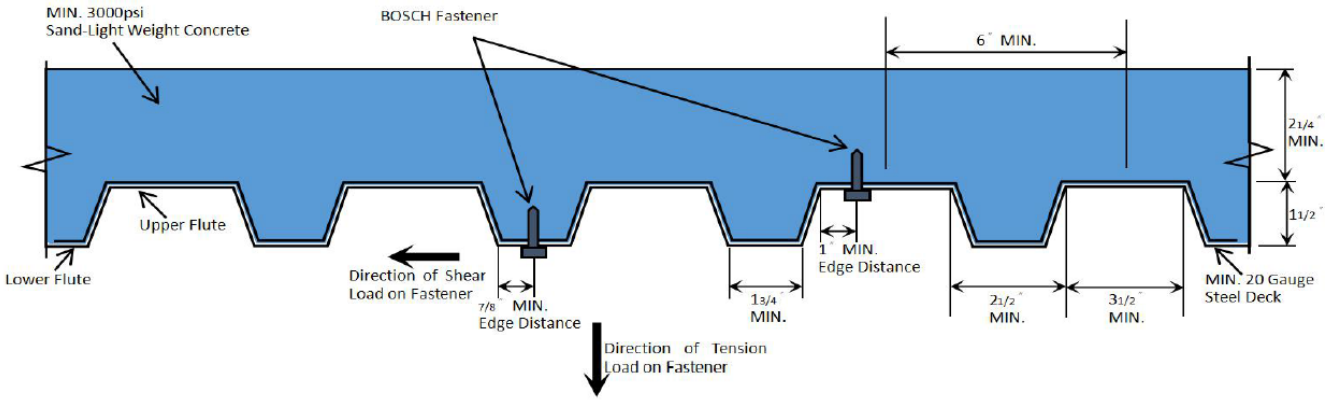

FIGURE 6—BOSCH FASTENER LOCATIONS IN $1^1/_2$-INCH-DEEP B-DECK PANEL

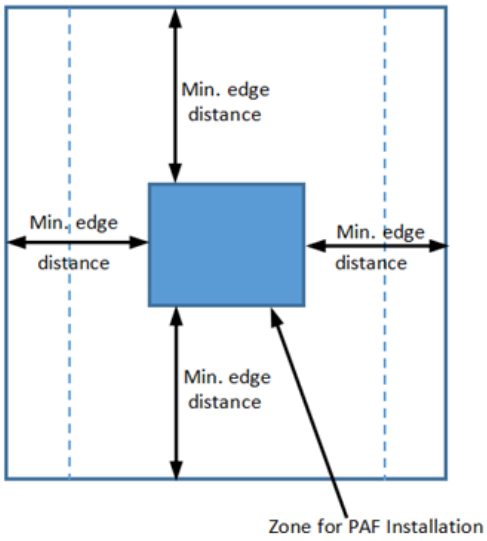

FIGURE 7—ZONE FOR FASTENER INSTALLATION IN FACE SHELL OF CMU

DIVISION: 03 00 00—CONCRETE
Section: 03 15 00—Concrete Accessories
Section: 03 16 00—Concrete Anchors

DIVISION: 04 00 00—MASONRY
Section: 04 05 19.16—Masonry Anchors

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

DIVISION: 09 00 00—FINISHES
Section: 09 22 16.23—Fasteners

REPORT HOLDER:

ROBERT BOSCH TOOL CORPORATION

EVALUATION SUBJECT:

BOSCH FASTENERS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Bosch fasteners, described in ICC-ES evaluation report ESR-4893, have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

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

2.0 CONCLUSIONS

The Bosch fasteners, described in Sections 2.0 through 7.0 of the evaluation report ESR-4893, comply with the LABC Chapters 19, 21, 22, 23 and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Bosch fasteners described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-4893.
- The design, installation, conditions of use and identification of theBosch fasteners are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report ESR-4893.
- 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.
- The allowable values listed in the attached report and tables are for the fasteners only. Connected members shall be checked for their capacity (which may govern).

This supplement expires concurrently with the evaluation report issued March 2022.

DIVISION: 03 00 00—CONCRETE
Section: 03 15 00—Concrete Accessories
Section: 03 16 00—Concrete Anchors

DIVISION: 04 00 00—MASONRY
Section: 04 05 19.16—Masonry Anchors

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

DIVISION: 09 00 00—FINISHES
Section: 09 22 16.23—Fasteners

REPORT HOLDER:

ROBERT BOSCH TOOL CORPORATION

EVALUATION SUBJECT:

BOSCH FASTENERS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Bosch fasteners addressed in ICC-ES evaluation report ESR-4893, 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 Bosch fasteners, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-4893, comply with the *Florida Building Code—Building* and the *Florida Building Code—Residential*. The design requirements must be determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential,* as applicable. The installation requirements noted in ICC-ES evaluation report ESR-4893 for the 2018 *International Building Code*® meet the requirements of the *Florida Building Code—Building* and the *Florida Building Code—Residential.*

Use of the Bosch fasteners for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* or the *Florida Building Code—Residential* has not been evaluated, and is outside the scope of this supplemental report.

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

This supplement expires concurrently with the evaluation report issued March 2022.