REPORT HOLDER:

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EVALUATION SUBJECT:
BOSTITCH® HURRIQUAKE® NAILS

1.0 EVALUATION SCOPE

Compliance with the following codes:

2006 International Building Code® (IBC)

2006 International Residential Code® (IRC)

Standard for Hurricane Resistant Residential Construction, SSTD 10-99

Property Evaluated:

Structural

2.0 USES

Bostitch® HurriQuake® nails are used to attach wood, engineered wood products, metals, plastics and other engineering materials to wood and wood-based substrates. They are especially well suited for attachment of wood structural panel sheathing to wood-based framing products and for connections between wood-based framing members. The connections may be structural or nonstructural.

3.0 DESCRIPTION

The Bostitch® HurriQuake® nails are nominally 2-1/2 inches (63.5 mm) or 3 inches (76.2 mm) long. The shank has three identifiable sections: 1/2 inch (12.7 mm) of the shank starting at the head has a five—sided fluted spiral shank, the mid portion of shank is smooth round and is either nominally 0.113 inch (2.9 mm) or 0.131 inch (3.3 mm) diameter, and the 1-1/4 inches (31.8 mm) from the smooth round shank to the tip is a deformed ring-shank. The outer diameters of the fluted spiral and the ring-shank are 0.125 inch (3.1 mm) or 0.143 inch (3.6 mm) for the nominal 0.113 inch and 0.131 inch nails, respectively. The nails have a 0.320 inch (8.1 mm) full round head and a diamond point tip; tip length is 0.155 inch (3.9 mm) and 0.178 inch (4.5 mm) for the 0.113 and 0.131-inch diameter nails, respectively. In addition, the heads are stamped with identification as shown in Figure 1.

FIGURE 1. Head identification for HurriQuake® Nails, HQ1: 2-1/2x0.113 inch, HQ2: 2-1/2x0.131 inch, HQ3: 3x0.113 inch, and HQ4: 3x0.131 inch.

The proprietary head and shank geometries of Bostitch® HurriQuake® nails comply with the material requirements, physical properties, dimensional tolerances, workmanship, protective coating and finishes, and packaging requirements of ASTM F1667. The nails are manufactured from SAE J403 low-carbon steel wire grades 1015-1030 or Q235B low-carbon steel wire. The HurriQuake® Nails have minimum average bending yield strength, Fyb, of 100,000 psi (689 MPa). When a corrosion resistant coating is required, the nails are supplied with a zinc coating that is applied by hot-dip galvanization process in accordance with ASTM A 153, Class D. Nails are supplied collated in strips or coils. HurriQuake® Nails are manufactured in accordance with approved quality control procedures.

4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 Design Value Adjustments: The reference withdrawal and lateral design values of this report shall be adjusted by applicable factors referenced in the NDS.

4.1.2 Lateral Design Values: Reference lateral design values (Z) for Bostitch® HurriQuake® nails with common sheathing materials are determined from the design functions shown in Table 1. The design equations

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of NDS, Chapter 11 may be used with nominal diameters for a more conservative estimate of Z to be used with wood structural panel sheathing. The SI equivalent values for reference lateral resistance (N) are obtained by multiplying the function product by 4.5.

4.1.3 Withdrawal Design Values: The withdrawal (W) reference design values for the 0.113-inch and 0.131-inch diameter (2.9 mm and 3.3 mm) Bostitch® HurriQuake® nails are determined by using the functions $W_{HQ1} = 1555G^{1.4}0.113$ and $W_{HQ2}=1495G^{1.5}0.131$, respectively, over the specific gravity (G) range, $0.35 \leq G \leq 0.55$. The reference allowable withdrawal capacity of the HQ3 (W_{HQ3}) is equivalent to W_{HQ1} and the reference allowable withdrawal capacity of the HQ4 (W_{HQ4}) is equivalent to the W_{HQ2}. The reference design withdrawal values W are pounds per inch of main member penetration. The SI equivalent values for reference withdrawal (N/mm) are obtained by multiplying the calculated W values by 0.175.

4.1.4 Diaphragms and Shear Walls: Any of the Bostitch® HurriQuake® nails are permitted to be substituted in the same nailing patterns for sheathing nails up to 10d common (3x0.148 inch [76.2x3.8 mm]) in IBC 2006 Tables 2306.3.1 and 2306.3.2, Table 2306.4.1, and Table 2306.4.3, and IRC 2006 Table R602.3(1). As alternates, allowable shear loads for diaphragms and shear walls of Tables 2 and 3 may be used. Diaphragm and shear wall deflections shall be calculated in accordance with IBC, Section 2305.2.2 and Section 2305.2.3, respectively, using the nail slip values (e_n) for the 0.113-inch and 0.131-in. diameter (2.9 mm and 3.3 mm) Bostitch® HurriQuake® nails as,

$$HurriQuake(d = 0.113in.) : e_n = \left(\frac{V_n}{400}\right)^{2.99}$$

$$HurriQuake(d = 0.131in.) : e_n = \left(\frac{V_n}{600}\right)^{2.50}$$

4.1.5 Roof Sheathing – Wind Uplift: Fastening schedules for Bostitch® HurriQuake® nails used to fasten wood structural panels as roof sheathing to wood roof framing members are shown in Table 4 for typical roof slopes and wind speeds. Edge nail spacing of 6 inches on center is adequate for all roof slopes, roof zones, and wind speeds v ≤170 mph (272 km/h) in Exposure C. The fastening schedules are based on the assumptions shown in the footnotes of Table 4. Additional fastening may be required for diaphragm performance.

4.1.6 Framing: Bostitch® HurriQuake® nails are permitted for framing applications. Design equations for face-nail shear and end-nail shear connections and prescriptive typical framing connections are given in Tables 5A, 5B and 5C. As an alternate, framing connections may be conservatively designed using the nominal diameters and lengths in the design equations of NDS, Chapter 11 with all applicable adjustments.

4.2 Installation: The Bostitch® HurriQuake® nails must be installed in accordance with Stanley Fastening Systems published installation instructions and this evaluation report. Nail installation must also comply with applicable requirements in the NDS, Section 11.1.5. The nails are driven either pneumatically or manually.

5.0 CONDITIONS OF USE

The Bostitch® HurriQuake® nails described in this report comply with, or are suitable alternatives to what is specified in the codes listed in Section 1.0 of this report subject to the following conditions:

5.1 Use of nails must comply with this report and the applicable code.

5.2 Diaphragm and shear wall construction must conform to applicable provisions in the IBC and IRC.

5.3 When required by the code official, calculations demonstrating the applied loads are less than the design values specified in this report must be submitted for approval. Calculations must be prepared by a registered design professional where required by the statues

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of the jurisdiction in which the project is to be constructed.

5.4 Use of nails in chemically treated wood, such as preservative-treated wood or fire-retardant-treated wood, must comply with Section 2304.9.5 of the IBC and Section R319.3 of the IRC.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Nails and Spikes (AC116) dated January 2007.

7.0 IDENTIFICATION

The nails are packaged in cartons bearing labels that provide the manufacturer name (Stanley Fastening Systems/Bostitch); nail description; (type, length, smooth-shank diameter); minimum bending yield strength (100,000 psi); and the evaluation report number (Evaluation Report 0120). The hyphenated product numbers identify the type of collation (e.g., C, AC, RH, PT), nail product (length, shank deformation, nominal diameter, e.g., 8DR113,10DR131, etc.), and coating condition (e.g., bright-HQ or hot-dipped zinc galvanized-HQG). For example, HQ nails collated in plastic with a bright finish are identified with Stanley Fastening Systems part numbers, such as, RH-S8DR113-HQ, RH-S8DR131-HQ, RH-S10DR113-HQ, and S10DR131HQ; and nails collated in plastic with a zinc galvanized coating are identified with Stanley Fastening Systems part numbers, such as, RHS8DR113-HQG, RH-S8DR131-HQG, RH-S10DR113-HQG, RH- S10DR131- HQG. The packages for galvanized nails shall be labeled "Hot-dip Galvanized ASTM A 153."

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TABLE 1. REFERENCE LATERAL DESIGN VALUES (Z) FOR BOSTITCH® HURRIQUAKE® NAILS WITH STRUCTURAL WOOD SHEATHING PRODUCTS WHERE G IS SPECIFIC GRAVITY OR EQUIVALENT SPECIFIC GRAVITY OF THE FRAMING MEMBER. [a,b,c]

Sheathing Panel		Reference Lateral Design Value, Z (lbf)
Type/Grade	**Thickness, t_s (inch)**	
HurriQuake® Nail, Diameter = 0.113 in.		
Plywood Structural 1/OSB	3/8	$125G^{0.345}$
	7/16	$95G^{0.240}$
	15/32	$95G^{0.062}$
	7/8	$250G^{1.215}$
Plywood/Single Floor and Other Grades in DOC PS1 and PS2	3/8	$150G^{0.750}$
	15/32	$125G^{0.250}$
	19/32	$120G^{0.300}$
HurriQuake® Nail, Diameter = 0.131 in.		
Plywood Structural 1/OSB	3/8	$180G^{0.800}$
	7/16	$100G^{0.300}$
	15/32	$105G^{0.020}$
	7/8	$110G^{0.200}$
Plywood/Single Floor and Other Grades in DOC PS1 and PS2	3/8	$150G^{0.750}$
	15/32	$120G^{0.300}$
	19/32	$110G^{0.115}$
	23/32	$115G^{0.205}$

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

[a] Reference lateral design values from design functions are for normal loads and must be adjusted with all applicable adjustment factors.

[b] For $0.35 \le G \le 0.50$, nominal lateral design values of other configurations with sawn lumber and engineered wood products, use NDS Section 11.3, where sheathing specific gravity, G, and dowel bearing strength, F_{es}, for wood structural panel are according to NDS Table 11.3.2B and F_{yb} = 100,000 psi.

[c] When $G > 0.50$, then $Z = K0.50^x$ where *K* and *x* are values for the sheathing panel and thickness being used.

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TABLE 2. ALLOWABLE SHEAR (ASD) IN POUNDS PER FOOT FOR WOOD STRUCTURAL PANEL HORIZONTAL DIAPHRAGMS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE AND BOSTITCH® HURRIQUAKE® NAILS FOR WIND AND SEISMIC LOADING. [a,b,c,d,e,f]

Sheathing panel		Minimum nominal width of framing member (inches)	Blocked diaphragms				Unblocked diaphragms Fasteners spaced 6 inches, maximum at supported edges	
			Nail spacing (in.) at diaphragm boundaries (all cases) at continuous panel edges parallel to load (Cases 3 and 4) and at all panel edges (Cases 5 and 6)					
			6	4	2-1/2	2		
Type/grade	Thickness (inch)		Nail spacing (inches) at other panel edges (cases 1,2,3,4)				Case 1	Cases 2,3,4,5,6
			6	6	4	3		
Bostitch® HurriQuake® Nail, Diameter = 0.113 in.								
Structural 1 / OSB	3/8	2	305	405	605	685	270	200
		3	340	455	680	770	305	230
	7/16	2	285	380	565	640	255	190
		3	320	425	635	720	285	215
	15/32	2	300	400	600	680	270	200
		3	340	450	675	765	300	225
	7/8	2	400	535	800	905	360	270
		3	450	600	900	1020	300	300
Rated Sheathing	3/8	2	240	320	480	545	215	160
		3	270	360	540	610	240	180
	15/32	2	275	365	545	620	245	185
		3	310	410	615	695	275	205
	19/32	2	310	415	620	705	280	210
		3	350	465	695	790	310	235
	23/32	2	280	375	560	635	250	190
		3	315	420	630	715	280	210
Bostitch® HurriQuake® Nail, Diameter = 0.131 in.								
Structural 1 / OSB	3/8	2	310	415	625	705	280	210
		3	350	465	700	790	310	235
	7/16	2	285	385	570	645	260	195
		3	320	430	640	725	290	215
	15/32	2	355	475	710	805	320	240
		3	400	535	800	905	360	270
	7/8	2	405	545	815	920	365	275
		3	460	610	915	1035	410	305
Rated Sheathing	3/8	2	245	330	500	565	220	165
		3	280	370	560	635	250	185
	15/32	2	300	400	600	680	270	200
		3	340	450	675	765	300	225
	19/32	2	365	490	740	835	330	245
		3	415	550	830	940	370	275
	23/32	2	330	440	660	745	295	220
		3	370	495	740	840	330	250

For SI: 1 inch = 25.4 mm, 1 pound per foot = 14.59 N/m

[a] Minimum penetration of the 0.113 in. nail is 1.13 in.; minimum penetration of the 0.131 in. nail is 1.31 in.

[b] Tabulated shear values are adjusted for other specific gravities by multiplying the table shear value by the adjustment factor: $F_{sg} = 1-(0.5-G)$ where $F_{sg} \leq 1.0$, or by multiplying the table value by the calculated ratio of the appropriate single-fastener shear capacities of Table 1 such that the ratio is less than 1.0.

[c] Maximum fastener spacing on intermediate members shall be 12 in. o.c.

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[d] Minimum nominal width of the framing members not located at the boundaries or adjoining panel edges shall be 2 in.

[e] For normal or permanent duration shear loads, the values in the table are multiplied by 0.63 or 0.56, respectively.

[f] For LRFD, nominal design values for wind loading are calculated by multiplying the table values by 2.8 and nominal design values for seismic are obtained by multiplying the design values by 2.0. The resistance factor for in-plane shear of shear walls and diaphragms is discussed in SDPWS (AF&PA 2005).

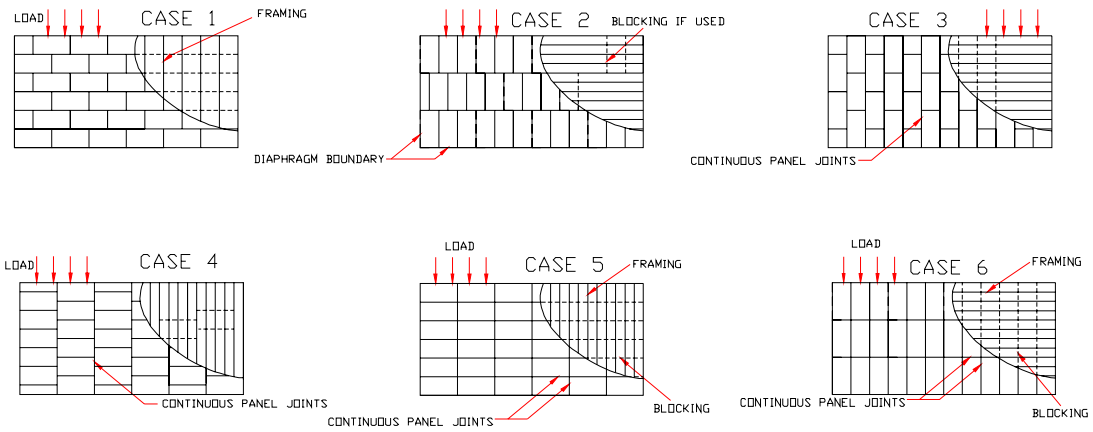

FIGURE 1 – Diaphragms cases referenced in Table 2

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TABLE 3. ALLOWABLE SHEAR (ASD) IN POUNDS PER FOOT FOR WOOD PANEL SHEAR WALLS WITH DOUGLAS FIR-LARCH OR SOUTHERN PINE FRAMING AND BOSTITCH® HURRIQUAKE® NAILS FOR WIND AND SEISMIC LOADING.[a,b,c,d,e]

Sheathing Panel		Framing spacing (inches on center)	Nail spacing at panel edges with panels applied directly to framing members (inches)			
Type/Grade	Thickness (inch)		6	4	3	2
Bostitch® HurriQuake® Nail, Diameter = 0.113 inch						
Structural 1/0SB	3/8	24	265	415	530	705
		16	320	500	640	845
	7/16	24	285	425	565	725
		16	310	465	620	790
	15/32	16 or 24	325	485	645	825
Rated Sheathing	3/8	24	220	325	435	620
		16	265	395	525	745
	15/32	16 or 24	295	445	585	750
	19/32	16 or 24	290	435	585	745
Bostitch® HurriQuake® Nail, Diameter = 0.131 inch						
Structural 1/0SB	3/8	24	265	410	530	695
		16	320	490	640	835
	7/16	24	270	405	535	685
		16	295	440	585	750
	15/32	16 or 24	385	575	770	980
Rated Sheathing	3/8	24	215	325	435	555
		16	260	395	525	665
	15/32	16 or 24	350	530	690	885
	19/32	16 or 24	350	520	695	885

For SI: 1 inch = 25.4 mm, 1 lbf/ft = 0.0146 N/mm

[a] Tabluated loads are short-duration loads due to wind or earthquake and must be reduced by 0.63 for normal loading.

[b] Tabulated shear values are adjusted for specific gravity of other species groups using F_{sg} = 1(0.5-G), of by multiplying the table value by the ratio of calculated single-fastener shear values of Table 1 where the calculated adjustment ratio is less than 1.0.

[c] Framing at adjoining panel edges shall be 3 in. nominal or wider, and nails shall be staggered where nails are spaced 2 in. o.c.

[d] Values apply to OSB and all veneer plywood. Thickness at point of fastening on panel edges governs shear values.

[e] In Seismic Design category D, E, or F, where shear design values exceed 350 lbf per linear foot, all framing members receiving edge nailing shall not be less than 3 in. nominal thickness, or two 2-inch nominal members fastened together to transfer the design shear between framing members. Wood structural panel joint and sill plate nailing shall be staggered in all cases.

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TABLE 4. FIELD NAIL SCHEDULE (inches o.c.) FOR WIND UPLIFT OF WOOD STRUCTURAL PANELS USED AS ROOF SHEATHING SUPPORTED BY SPRUCE-PINE-FIR FRAMING MEMBERS[a,b,c] IN ROOF ZONES 2 AND 3.

ROOF SLOPE (degrees)	ROOF RISE (inches per 12 inches run)	ROOF ZONE[b]	BASIC WIND SPEED (v) (3-second Gust, mph)						
			80<v<100	105<v<120		125<v<150		v<170	
			Exposure Category						
			B and C	B	C	B	C	B	C
BOSTITCH® HURRIQUAKE® NAIL, Diameter = 0.113 inch or 0.131 inch, sheathing 7/16 ≤ t_s ≤ 19/32 inch, framing **16** in. o.c.									
0 to 7	0 to 1.5	2	12	12	12	12	12	12	8
		3	12	8	8	8	8	8	6
+7 to 27	1.5 + to 6	2	12	12	12	12	12	12	8
		3	12	12	8	12	8	8	6
+27 to 45	6+ to 12	2	12	12	12	12	12	12	12
		3	12	12	12	12	12	12	12
BOSTITCH® HURRIQUAKE® NAIL, Diameter = 0.113 inch or 0.131 inch, sheathing[d] 15/32 ≤ t_s ≤ 19/32 inch, framing **24** in. o.c.									
0 to 7	0 to1.5	2	12	12	12	12	8	8	6
		3	12	12	8	8	6	6	4
+7 to 27	1.5+ to 6	2	12	12	12	12	8	8	6
		3	12	12	8	8	6	6	4
+27 to 45	6+ to 12	2	12	12	12	12	12	12	8
		3	12	12	12	12	12	12	8

For SI: 1 mph = 1.61 km/h, 1 inch = 25.4 mm

[a] Edge nail spacing is 6 in. o.c. for all roof slopes, roof zones, and wind speeds for Exposures B and C.

[b] Zone 1 nailing schedule for roof slopes (0 to 45 degrees), wind speeds (0 to 170 MPH (274 km/h)), and Exposures B and C is 6 in. (152 mm) o.c. edge and 12 in. (305 mm) o.c. field for sheathing 7/16 in. (11.1 mm) t_s ≤19/32 in. (15.1 mm). Refer to Figure 3 for roof fastening zones.

[c] Nailing schedule assumptions:

1. Mean roof height 30 ft (9144 mm)
2. Exposure categories B and C as defined in ASCE 7-05.
3. Net design uplift pressure (Components and Cladding), p_{net}, based on ASCE 7-05, adjustment factor, λ=1.4; importance factor, I=1.0; p_{net30} complies with Figure 6-4 of ASCE 7-05, effective wind area 10 ft^2 (0.929 m^2).
4. Roof framing members have a nominal thickness of 2 in. (51 mm), spaced 24 in. (610 mm) on center in Roof Zone 1 for all wind speeds, and 16 in. (406 mm) on center for Roof Zones 2 and 3 for wind speeds > 125 MPH (201 km/h).
5. Roof framing member average specific gravity 0.42.
6. Wood structural panel roof sheathing is 24/16 Rated Sheathing (maximum thickness 1/2 inch [12.7 mm]), 32/16 Rated Sheathing (thickness 15/32 inch to 19/32 inch [11.9 mm to 15.1 mm]) or 40/20 rated sheathing (19/32 in. [15.1 mm]); oriented with the strength axis perpendicular to the framing; and blocked.
7. Minimum penetration, *p,* of the Stanley BOSTITCH® HURRIQUAKE® nails into the roof framing members is 1.9 inches (51 mm).

[d] The combination 15/32-inch plywood sheathing, frame spacing 24 inches o.c., roof slope < 27 degrees shall not be used where wind velocity > 140 mph with Exposure C.

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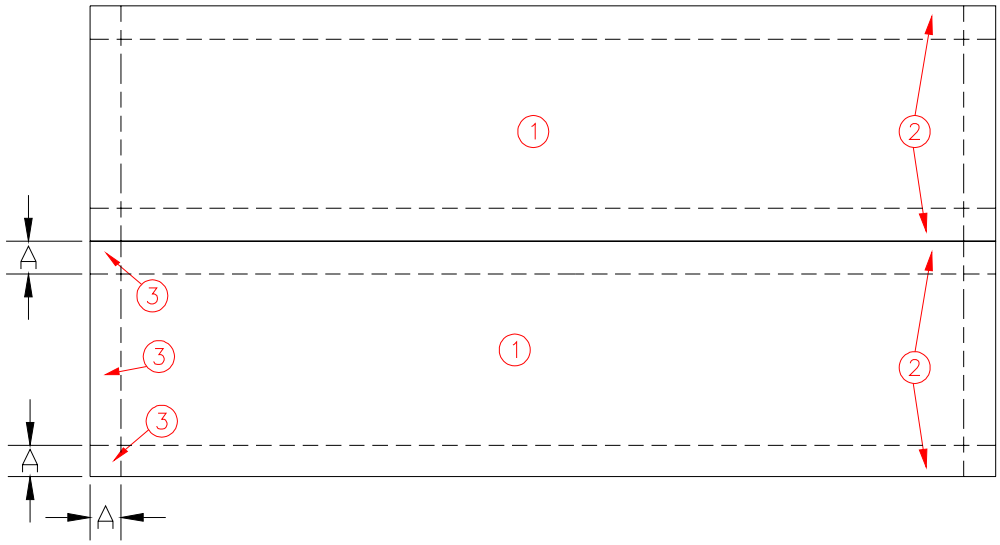

A: 10% of least dimension or .4h, whichever
is smaller, but not less than either 4% of least dimension or 3 ft.

FIGURE 3– Roof Fastening Zones (from ASCE 7-05, Figures 6-11B, C, D) referenced in Table 4.

TABLE 5. FRAMING AND FASTENING SCHEDULE FOR BOSTITCH® HURRIQUAKE® NAILS.

TABLE 5A. Reference Lateral shear resistance (Z) of BOSTITCH® HurriQuake® Nails in the specific gravity range, $0.35 \leq G \leq 0.50$ (for $G > 0.50$, use values for $G = 0.50$), t_s=1-1/2 in., normal duration.

Connection design	**Reference Lateral Shear Resistance, Z (lbf)**			
	HQ1	**HQ2**	**HQ3**	**HQ4**
Face-nail shear connections (e.g. double studs, top plates, laps, built-up corner studs, rafter ties, collar ties, sole plate to joist or blocking, ceiling joist to parallel rafters, ceiling joist laps over partition, built-up girder and beams)	$175G^{1.2}$	$195G^{1.2}$	$370G^{1.5}$	$245G^{0.9}$
End-nail shear connections (e.g., plate to stud, jack rafter to hip, rafter to ridge, joist to band joist)	$131G^{1.2}$	$146G^{1.2}$	$248G^{1.5}$	$147G^{0.9}$

For SI: 1 pound force = 4.45 N

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TABLE 5B. IBC equivalent prescriptive fastening schedule for BOSTITCH® HurriQuake® nails.

Connection	IBC Fastening[a]	HQ1	HQ2	HQ3	HQ4
Joist to sill or girder [T][b]	3, 10d131	3	3	2	2
Bridging to joist [T]	2, 10d131	2	2	2	2
Subfloor to joist (51x6) [F]	2, 8d131	2	2	2	2
Subfloor to joist (>1x6) [F]	3, 8d131	3	3	2	2
Subfloor to joist or girder (t=2 in.) [F]	2, 16d162	----	----	3	3
Sole plate to joist or blocking [F]	16d135, 16 in oc	12 in oc	16 in oc	16 in oc	16 in oc
Sole plate to joist at braced wall [F]	3, 16d135, 16 in oc	4	4	2	2
Top plate-stud [E]	3, 10d131	3	3	3	2
Sole plate-stud [E] [T]	3, 10d131 4, 10d131	3 4	3 4	2 3	2 2
Double studs [F]	10d131, 8 in oc	8 in. oc	8 in oc	12 in oc	16 in oc
Double top plates-typ. [F]	10d131, 12 in oc	12 in oc	12 in oc	16 in oc	24 in oc
Double top plates-splice [F]	12, 10d131	10	10	8	6
Blocking between joists or rafters to top plate [T]	3, 10d131	3	3	2	2
Rim joist to top plate [T]	10d131, 6 in oc	6 in oc	6 in oc	12 in oc	12 in oc
Top plates, laps and intersections [F]	3, 10d131	3	3	2	2
Continuous header, 2 pieces [F]	16d162, 16 in oc edges	8 in oc	8 in oc	12 in oc	16 in oc
Ceiling joists to plate [T]	5, 10d131	5	4	3	3
Continuous header to stud [T]	4, 8d131	6	6	4	3
Ceiling joists laps over partitions [F]	4, 10d131	4	4	3	2
Ceiling joists to parallel rafters [F]	4, 10d131	4	4	3	2
Rafter to plate [T]	3, 10d131	3	3	2	2
1x8 sheathing to bearing [F]	3, 8d131	3	3	2	2
>1x8 sheathing at bearing [F]	3, 8d131	3	3	2	2
Built-up corner studs [F]	10d131, 24 in oc	24 in oc	24 in oc	24 in oc	24 in oc
2-in. planks [F]	16d162	----	----	2	2
Collar tie to rafter [F]	4, 10d131	4	4	3	2
Jack rafter to hip [T] [F]	4, 10d131 3, 10d131	4 3	4 3	2 2	2 2
Rafter to 2-by ridge [T] [F]	3, 10d131 3, 10d131	3 3	3 3	2 2	2 2
Joist to band joist [F]	4, 10d131	4	4	3	2
Ledger strip [F]	4, 10d131	4	4	3	2

For SI: 1 inch = 25.4 mm

[a]Other fastenings may be available in the code.

[b]Brackets indicate type of connection: [E] end nail, [F] face nail, [T] toe nail.

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TABLE 5C. IRC equivalent prescriptive fastening schedule for HurriQuake® nails.

Connection	IRC Fastening[a]	HQ1	HQ2	HQ3	HQ4
Joist to sill or girder [T][b]	3, 8d113	3	3	2	2
1x6 subfloor to joist [F]	2, 8d113	2	2	2	2
2-in. subfloor to support [F]	2, 16d135	----	----	2	2
Sole plate to joist or blocking [F]	16d135, 16 in oc	12 in oc	12 in oc	24 in oc	24 in oc
Top or sole plate to stud [E]	2, 16d135	3	3	3	2
Stud to sole plate [T]	3, 8d113	3	3	2	2
Double studs [F]	10d128, 24 in oc	24 in oc	24 in oc	24 in oc	24 in oc
Double top plates [F]	10d128, 24 in oc	24 in oc	24 in oc	24 in oc	24 in oc
Sole plate to joist or blocking at braced wall [F]	3, 16d135	4	4	3	2
Double top plates splice [F]	8, 16d135	10	10	6	6
Blocking between joists or rafters to top plate [T]	3, 8d113	3	3	2	2
Rim joist to top plate [T]	8d113, 6 in oc	6 in oc	6 in oc	8 in oc	8 in oc
Top plates, corner laps and intersections [F]	2, 10d128	2	2	2	2
Built-up header, two pieces with ½-in. spacer [F]	16d135, 16 in oc edges	----	----	16 in oc	16 in oc
Continuous header, two pc. [F]	16d135, 16 in oc edges	12 in oc	12 in oc	16 in oc	24 in oc
Ceiling joists to plate [T]	3, 8d113	3	3	2	2
Continuous header to stud [T]	4, 8d113	5	4	3	3
Ceiling joists, laps over partitions [F]	3, 10d128	3	3	2	2
Ceiling joists to parallel rafters [F]	3, 10d128	3	3	2	2
Rafter to plate [T]	2, 16d135	3	3	2	2
1x6 sheathing at bearing [F]	2, 8d113	2	2	2	2
1x8 sheathing at bearing [F]	2, 8d113	2	2	2	2
Wider than 1x8 sheathing at bearing [F]	3, 8d113	3	3	2	2
Built-up corner studs [F]	10d128, 24 in oc	24 in oc	24 in oc	24 in oc	24 in oc
Built-up girders and beams, 2 in layers [F]	10d128, 24 in oc	----	----	24 in oc	24 in oc
2-in. planks	2, 16d135 at bearing	----	----	2	2
Roof rafters to ridge, valley or hip rafters:					
[T]	4, 16d135	5	5	3	3
[F]	3,16d135	4	4	3	2
Rafter ties to rafters [F]	3, 8d113	3	3	2	2
Collar tie to rafter [F]	3, 10d128	3	3	2	2

For SI: 1 inch = 25.4 mm

[a]Other fastenings may be available in the code.

[b]Brackets indicate type of connection: [E] end nail, [F] face nail, [T] toe nail.

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