

ICC Evaluation Service, Inc.
www.icc-es.org

Business/Regional Office ■ 5360 Workman Mill Road, Whittier, California 90601 ■ (562) 699-0543
Regional Office ■ 900 Montclair Road, Suite A, Birmingham, Alabama 35213 ■ (205) 599-9800
Regional Office ■ 4051 West Flossmoor Road, Country Club Hills, Illinois 60478 ■ (708) 799-2305

DIVISION: 06—WOOD AND PLASTICS
Section: 06095—Nails

REPORT HOLDER:

STANLEY FASTENING SYSTEMS
ROUTE 2, BRIGGS DRIVE
EAST GREENWICH, RHODE ISLAND 02818
(410) 884-2500
www.bostitch.com

EVALUATION SUBJECT:

BOSTITCH HURRIQUAKE® NAILS

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2006 *International Building Code*® (IBC)
- 2006 *International Residential Code*® (IRC)

Property evaluated:

Structural

2.0 USES

The Bostitch HurriQuake® nails are used as an alternate nail for code-prescribed wood-framed connections, wood-structural-panel shear walls and diaphragms; for design of engineered wood connections; and for fastening of wood-structural panels used as roof sheathing to wood framing.

3.0 DESCRIPTION

Bostitch HurriQuake® nails come in four configurations denoted as HQ1, HQ2, HQ3, and HQ4. The HQ1 and HQ2 nails are nominally 0.113 inch (2.9 mm) and 0.131 inch (3.3 mm) in diameter, respectively, and 2½ inches (64 mm) long. The HQ3 and HQ4 nails are nominally 0.113 inch (2.9 mm) and 0.131 inch (3.3 mm) in diameter, respectively, and 3 inches (76 mm) long. The nail shank has three identifiable sections: starting at the head the nail has a ½-inch-long (12.7 mm) five-sided fluted spiral shank; the middle of the shank is smooth and has either a 0.113-inch (2.9 mm) or a 0.131-inch (3.3 mm) diameter; and the remainder of the nail has a deformed ring shank. The outer diameters of the fluted spiral shank and the deformed ring-shank are either 0.125 inch (3.1 mm) or 0.143 inch (3.6 mm) for the nominal by 0.113-inch- and 0.131-inch-diameter nails, respectively. The nails have a 0.320-inch-diameter (8.1 mm) head and a diamond tip. Nail 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 (2.9 and 3.3 mm) nails, respectively.

The nails have proprietary head and shank geometries and comply with the material requirements, physical properties, dimensional tolerances, workmanship, protective coating and

finishes, and packaging requirements of ASTM F 1667. The nails are manufactured from SAE J403 low-carbon steel wire, grades 1015–1030 (or Q235B). When a coating is required, the nails can be supplied with a coating of zinc that is applied by hot-dip process in accordance with ASTM A 153, Class D. Nails are supplied in strips, coils or in bulk.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The reference withdrawal and lateral design values described in Sections 4.1.2 and 4.1.3 of this report must be adjusted using the applicable adjustment factors referenced in the NDS.

4.1.1 Nail Bending Yield Strength (F_{yb}): Bostitch HurriQuake® nails described in this report have a minimum average bending yield strength, F_{yb} , of 100,000 psi (689 MPa).

4.1.2 Reference Lateral Design Values: Reference lateral design values (Z) for Bostitch HurriQuake® nails with wood-based sheathing as the side member of the wood connection are shown in Table 1, where the main member is southern pine, douglas fir-larch, or spruce-pine-fir sawn lumber. Table 1 also specifies functions that may be used to calculate the reference design value, Z , for a wood-panel-to-wood-member single shear connection. The yield-mode equations of Chapter 11 of the NDS may also be used with nominal diameters to determine the reference lateral design value of other types of connections.

4.1.3 Reference Withdrawal Design Values: The reference withdrawal (W) 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 withdrawal design value of the HQ3 (W_{HQ3}) is equivalent to W_{HQ1} and the reference withdrawal design value of the HQ4 (W_{HQ4}) is equivalent to W_{HQ2} . The reference withdrawal design values are in pounds per inch penetration of the nail in the side grain of the main member. The SI equivalent values for withdrawal design values (N/mm) are obtained by multiplying the calculated W values by 0.175.

4.1.4 Diaphragms and Shear Walls: The Bostitch HurriQuake® nails described in this report may be substituted, in the same nailing patterns, to attach wood-based sheathing, where nails up to 10d common (0.148 inch by 3 inches) are prescribed in Tables 2306.3.1, 2306.3.2, 2306.4.1 and 2306.4.3 of the IBC, and Table R602.3(1) of the IRC. Alternatively, allowable shear loads for diaphragms and shear walls shown in Tables 2 and 3 of this report, respectively, may be used. Design and installation of the diaphragm and shear walls described in this report must follow the provisions found in IBC Sections 2305, 2306, and 2307. Diaphragm and shear

wall deflections must be calculated in accordance with Section 2305.2.2 and Section 2305.3.2 of the IBC, respectively, using the following functions for the nail slip values, e_n :

For HurriQuake® HQ1 and HQ3 ($d=0.113$ inch):

$$e_n = (V_n/400)^{2.99} \text{ (inches)}$$

For HurriQuake® HQ2 and HQ4 ($d=0.131$ inch):

$$e_n = (V_n/600)^{2.50} \text{ (inches)}$$

where:

1. V_n is the fastener load (lbf/nail), which is determined by dividing the maximum shear load (pounds per linear foot) by the number of nails per foot at interior panel edges for diaphragms, and at panel edges for shear walls.
2. For conversion to SI units, multiply the nail slip value, e_n , by 25.4.

The nail slip value, e_n , must be reduced by 50 percent where the moisture content of the framing is greater than 19 percent at time of fabrication.

4.1.5 Roof Sheathing—Wind Uplift: Fastening schedules for HurriQuake® nails used to fasten wood structural panels used as roof sheathing to wood roof framing members are shown in Table 4 for buildings designed to resist wind loads determined using Method 1 (Simplified Method) described in Section 6.4 of ASCE 7-05. The fastening schedules are based on the assumptions shown in the footnotes 1 to Table 4.

4.1.6 Framing Connections: Bostitch HurriQuake® nails may be used as alternate fasteners for specific framing applications referenced in Table 2304.9.1 of the IBC and Table R602.3(1) of the IRC, as shown in Tables 5B and 5C of this report. For structures under the IBC, connections must be designed as set forth in Section 2304.9.1 of the IBC. Design equations for face-nail shear and end-nail shear connections are given in Table 5A of this report. As an alternate, framing connections may be designed using the nominal diameters and lengths in the design equations in Chapter 11 of the NDS.

4.2 Installation:

The nails must be installed in accordance with the Stanley Fastening Systems published installation instructions and this evaluation report. Nail installation must also comply with applicable requirements in Section 11.1.5 of the NDS. 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, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 Use of the 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 that 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 statutes of the jurisdiction in which the project is to be constructed.
- 5.4 Use of nails in chemically treated wood, such as preservative-treated 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, and smooth-shank diameter); the minimum bending yield strength (100,000 psi); and the evaluation report number (ESR-2020). The hyphenated product numbers identify the type of collation (C,AC,RH,PT), nail product length (8D = 2.5 inches, 10D = 3 inches), shank deformation (R = ring), nominal diameter (e.g., 8DR113, 10DR131, etc.), and coating condition (e.g., bright—HQ or zinc galvanized—HQG). For example, 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 nails collated in plastic with a zinc galvanized coating are identified with Stanley Fastening Systems part numbers such as, RH-S8DR113-HQG, RH-S8DR131-HQG, RH-S10DR113-HQG. Cartons of galvanized nails must be labeled "Hot-dip Galvanized ASTM A 153." In addition, the heads of the nail are stamped with the nails identification (HQ1, HQ2, HQ3, or HQ4) as shown in Figure 1 of this report.

TABLE 1—REFERENCE LATERAL DESIGN VALUES (Z) FOR BOSTITCH® HURRIQUAKE® NAILS WITH STRUCTURAL WOOD SHEATHING PRODUCTS^{1,2,3}

SHEATHING PANEL		REFERENCE LATERAL DESIGN VALUE, Z (lbf)		
TYPE/GRADE	THICKNESS, t_s (inch) ⁴	G=0.50 Southern pine / Douglas fir-larch	G=0.42 Spruce-pine-fir	0.36≤G≤0.50
HurriQuake® Nail, Diameter = 0.113 in.				
Plywood/ Structural 1 OSB / All Grades	³ / ₈ (Ply S1)	98	93	125G ^{0.345}
	⁷ / ₁₆	75	70	95G ^{0.240}
	¹⁵ / ₃₂ (Ply S1)	91	90	95G ^{0.062}
	¹⁵ / ₃₂ (OSB)	92	85	125G ^{0.440}
	⁷ / ₈	108	87	250G ^{1.215}
Plywood/Single Floor and Other Grades in DOC PS1 and PS2	³ / ₈	89	78	150G ^{0.750}
	¹⁵ / ₃₂	105	101	125G ^{0.250}
	¹⁹ / ₃₂	97	92	120G ^{0.300}
HurriQuake® Nail, Diameter = 0.131 in.				
Plywood/ Structural 1 OSB / All Grades	³ / ₈ (Ply S1)	103	90	180G ^{0.800}
	⁷ / ₁₆	81	77	100G ^{0.300}
	¹⁵ / ₃₂ (Ply S1)	104	103	105G ^{0.020}
	¹⁵ / ₃₂ (OSB)	96	89	130G ^{0.440}
	⁷ / ₈	96	92	110G ^{0.200}
Plywood/Single Floor and Other Grades in DOC PS1 and PS2	³ / ₈	89	78	150G ^{0.750}
	¹⁵ / ₃₂	97	92	120G ^{0.300}
	¹⁹ / ₃₂	102	96	110G ^{0.115}
	²³ / ₃₂	100	96	115G ^{0.205}

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

¹Reference lateral design values from design functions are for normal loads and must be adjusted with all applicable adjustment factors.

²0.36 ≤ G ≤ 0.50. If G > 0.50, the reference lateral strength value at G=0.50 must be used.

³For reference lateral design values of other configurations with sawn lumber and engineered wood products, use NDS, Section 11.3, where wood structural panel sheathing specific gravity, G, and dowel-bearing strength, F_{es} , are according to NDS Table 11.3.2B, and F_{yb} =100,000 psi (690 MPa).

⁴Ply S1 indicates that lateral design values are applicable for Plywood sheathing / Structural 1 grade. OSB indicates that lateral design values are applicable for OSB sheathing / All Grades.



FIGURE 1

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 ^{1,2,3,4,5,6,7}

SHEATHING PANEL		MINIMUM NOMINAL WIDTH OF FRAMING MEMBER (inches)	BLOCKED DIAPHRAGMS				UNBLOCKED DIAPHRAGMS	
			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)				FASTENERS SPACED 6 INCHES, MAXIMUM AT SUPPORTED EDGES	
Type/grade	Thickness (inch)		6	4	2 1/2	2	Case 1	Cases 2,3,4,5,6
			Nail spacing (inches) at other panel edges (cases 1,2,3,4)					
			6	6	4	3		
Bostitch® HurriQuake® Nail, Diameter = 0.113 in.								
Structural 1/OSB	3/8 (Ply S1)	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 (Ply S1)	2	310	410	615	690	275	205
		3	345	460	690	775	310	230
	7/16	2	285	385	570	645	260	195
		3	320	430	640	725	290	215
	15/32 (Ply S1)	2	355	475	710	805	320	240
		3	400	535	800	905	360	270
	15/32 (OSB)	2	340	450	675	765	300	225
		3	380	505	760	860	340	250
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.

¹Minimum penetration of the 0.113-inch nail and 0.131-inch (HQ1 and HQ2) nails is $[2.5 - t_s]$, where t_s is the sheathing thickness shown above.

²Tabulated 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.

³Maximum fastener spacing on intermediate members must be 12 inches o.c.

⁴Minimum nominal width of the framing members not located at the boundaries or adjoining panel edges must be 2 in.

⁵For normal or permanent duration shear loads, the values in the table are multiplied by 0.63 or 0.56, respectively.

⁶For ASD, the tabulated ASD values are permitted to be increased by 40 percent for wind design.

⁷For LRFD, the unfactored unit resistance for wind design are calculated by multiplying the tabulated ASD values by 2.8. and the unfactored unit resistance for seismic design are obtained by multiplying the tabulated ASD design values by 2.0. The LRFD factored unit resistance must be calculated by multiplying the unfactored unit resistance values by the resistance factor, ϕ_D , of 0.8.

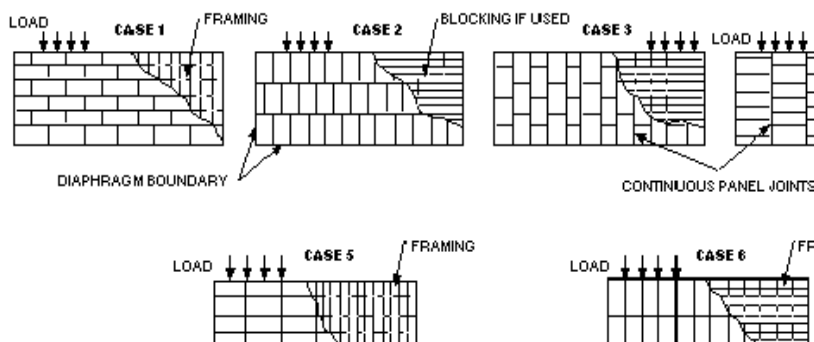


FIGURE 2

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.^{1,2,3,4,5,6,7}

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/OSB	³ / ₈ (Ply S1)	24	265	415	530	705
		16	320	500	640	845
	⁷ / ₁₆	24	285	425	565	725
		16	310	465	620	790
Rated Sheathing	¹⁵ / ₃₂	16 or 24	325	485	645	825
		24	220	325	435	620
	³ / ₈	16	265	395	525	745
		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/OSB	³ / ₈ (Ply S1)	24	265	410	530	695
		16	320	490	640	835
	⁷ / ₁₆	24	270	405	535	685
		16	295	440	585	750
	¹⁵ / ₃₂ (Ply S1)	16 or 24	385	575	770	980
¹⁵ / ₃₂ (OSB)	16 or 24	365	545	730	930	
Rated Sheathing	³ / ₈	24	215	325	435	555
		16	260	395	525	665
	¹⁵ / ₃₂	16 or 24	350	530	690	885
		16 or 24	350	520	695	885

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

¹Tabulated loads are short-duration loads due to wind and earthquake and must be reduced by a multiplication factor of 0.63 for normal loading.

²Tabulated shear values are adjusted for specific gravity of other species groups by multiplying F_{sg} , where $F_{sg} = 1 - (0.5 - G)$, or 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.

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

⁴Values apply to OSB and all veneer plywood. Thickness at point of fastening on panel edges governs shear values.

⁵In Seismic Design category D, E, or F, where shear design values exceed 350 lbf per linear foot, all framing members receiving edge nailing must 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 must be staggered in all cases.

⁶For ASD, the tabulated ASD values are permitted to be increased by 40 percent for wind design.

⁷For LRFD, the unfactored unit resistance for wind design are calculated by multiplying the tabulated ASD values by 2.8. and the unfactored unit resistance for seismic design are obtained by multiplying the tabulated ASD design values by 2.0. The LRFD factored unit resistance must be calculated by multiplying the unfactored unit resistance values by the resistance factor, ϕ_D , of 0.8.

TABLE 4—BOSTITCH® HURRIQUAKE® NAIL SCHEDULE (inches o.c.) FOR WOOD ROOF SHEATHING SUPPORTED BY SPRUCE-PINE-FIR FRAMING MEMBERS^{1,2,3,4,5} RESISTING WIND UPLIFT PRESSURES

ROOF SLOPE, θ (degrees)	ROOF RISE (inches per 12 inches run)	ROOF ZONE ⁶	BASIC WIND SPEED (v) (3-second Gust, mph)							
			80<v<100		105<v<120		120<v<150 ⁷		v<170 ⁷	
			Exposure Category							
		B and C		B	C	B	C	B	C	
BOSTITCH® HURRIQUAKE® NAIL, 0.113 inch or 0.131 inch diameter sheathing ⁷ / ₁₆ ≤ t _s ≤ ¹⁹ / ₃₂ inch, framing 16 in. oc										
0° ≤ θ ≤ 7°	0 to 1.5	2	12	12	12	12	12	12	8	
		3	12	8	8	8	8	8	6	
7° < θ ≤ 27°	1.5+ to 6	2	12	12	12	12	12	12	8	
		3	12	12	8	12	8	8	6	
27° < θ ≤ 45°	6+ to 12	2	12	12	12	12	12	12	12	
		3	12	12	12	12	12	12	12	
BOSTITCH® HURRIQUAKE® NAIL, 0.113 inch or 0.131 inch diameter sheathing ¹⁵ / ₃₂ ≤ t _s ≤ ¹⁹ / ₃₂ inch, framing 24 in. oc										
0° ≤ θ ≤ 7°	0 to 1.5	2	12	12	12	12	8	8	6	
		3	12	12	8	8	6	6	4	
7° < θ ≤ 27°	1.5+ to 6	2	12	12	12	12	8	8	6	
		3	12	12	8	8	6	6	4	
27° < θ ≤ 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.

¹The tabulated nail schedule is based on the wind uplift pressure, p_{net} , determined for components and cladding of buildings designed to resist wind loads in accordance with Method 1-Simplified Method (Section 6.4 of ASCE 7) for buildings meeting the requirements specified therein. The tabulated nail schedule does not apply to buildings that are designed to resist wind loads determined using Method 2-Analytical Procedure (Section 6.5 of ASCE 7).

²Tabulated values have accounted for the NDS load duration factor. Other NDS adjustment factors, as applicable, have not been considered.

³Edge nail spacing is 6 in. o.c. for all roof slopes, roof zones, and wind speeds for Exposures B and C.

⁴Zone 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 roof wood sheathing having an actual thickness between ⁷/₁₆ in. (11.1 mm) ≤ t_s ≤ ¹⁹/₃₂ in. (15.1 mm).

⁵Nailing schedule assumptions:

- Mean roof height 30 ft (9144 mm).
- Exposure categories B and C as defined in Section 6.5.6.3 of ASCE 7.
- Net design uplift pressure (Components and Cladding), p_{net} , based on equation (6-2) in Section 6.4.2.2 of ASCE 7, adjustment factor, $\lambda=1.4$; importance factor, $I=1.0$; topographic factor, $K_{zt}=1.0$; $p_{net(30)}$ complies with Figure 6-3 of ASCE 7, effective wind area 10 ft² (0.929 m²).
- 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.
- Roof framing member minimum specified specific gravity, 0.42.
- Wood structural panel roof sheathing is 24/16 Rated Sheathing (maximum thickness ½ 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.
- Minimum penetration, p , of the Stanley BOSTITCH® HURRIQUAKE® nails into the roof framing members is 1.9 inches (51 mm).
- The building has either a flat roof, a gable roof with $\theta \leq 45^\circ$, or a hip roof with $\theta \leq 27^\circ$, where θ is the angle of plane of roof from horizontal, in degrees.

⁶Refer to Figure 6-3 of ASCE 7 for roof zones.

⁷The combination rated sheathing t_s= ¹⁵/₃₂ inch (rated 24/16 and 32/16), frame spacing 24 inches o.c., roof slope < 27 degrees must not be used where wind velocity > 140 mph in Exposure C.

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 $G = 0.50$), $T_s = 1\frac{1}{2}$ IN., NORMAL DURATION.

Connection type	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 lbf = 4.45 N.

TABLE 5B—IBC EQUIVALENT PRESCRIPTIVE FASTENING SCHEDULE FOR BOSTITCH® HURRIQUAKE® NAILS.

IBC Table 2304.9.1 Connection	Location	Fastening			
		HQ1	HQ2	HQ3	HQ4
1. Joist to sill or girder	toenail	3	3	2	2
2. Bridging to joist	toenail each end	2	2	2	2
3. 1" x 6" subfloor or less to each joist	face nail	2	2	2	2
4. Wider than 1" x 6" subfloor to each joist	face nail	3	3	2	2
5. 2" subfloor to joist or girder	face nail	----	----	3	3
6. Sole plate to joist or blocking	typical face nail	12 in. o.c.	16 in. o.c.	16 in. o.c.	16 in. o.c.
Sole plate to joist or blocking at braced wall panel	braced wall panels	4 at 16 in. o.c.	4 at 16 in. o.c.	4 at 16 in. o.c.	4 at 16 in. o.c.
7. Top plate to stud	end nail	3	3	2	2
8. Stud to sole plate	end nail	3	3	2	2
	toe nail	4	4	3	2
9. Double studs	face nail	8 in o.c.	8 in o.c.	12 in o.c.	16 in o.c
10. Double top plates	typical face nail	12 in o.c.	12 in o.c.	16 in o.c	24 in o.c
	lap splice	10	10	8	6
11. Blocking between joists or rafters to top plate	toenail	3	3	2	2
12. Rim joist to top plate	toenail	6 in o.c.	6 in o.c.	12 in o.c.	12 in o.c.
13. Top plates, laps and intersections	face nail	3	3	2	2
14. Continuous header, two pieces		8 in o.c. along edge	8 in o.c. along edge	12 in o.c. along edge	16 in o.c. along edge
15. Ceiling joists to plate	toenail	5	4	3	3
16. Continuous header to stud	toenail	6	6	4	3
17. Ceiling joists laps over partitions (see IBC Section 2308.10.4.1 and Table 2308.10.4.1)	face nail	4	4	3	2
18. Ceiling joists to parallel rafters(see IBC Section 2308.10.4.1 and Table 2308.10.4.1)	face nail	4	4	3	2
19. Rafter to plate (see IBC Section 2308.10.1 and Table 2308.10.1)	toenail	3	3	2	2
21. 1" x 8" sheathing to each bearing	face nail	3	3	2	2
22. Wider than 1" x 8" sheathing to each bearing	face nail	3	3	2	2
23. Built-up corner studs	face nail	24 in o.c	24 in o.c	24 in o.c c	24 in o.c
25. 2" planks	face nail	----	----	at each bearing	at each bearing
26. Collar tie to rafter	face nail	4	4	3	2
27. Jack rafter to hip	toenail	4	4	2	2
	face nail	3	3	2	2
28. Roof rafter to 2-by ridge beam	toenail	3	3	2	2
	face nail	3	3	2	2
29. Joist to band joist	face nail	4	4	3	2
30. Ledger strip	face nail	4	4	3	2

For SI: 1 inch = 25.4 mm.

TABLE 5C—IRC EQUIVALENT PRESCRIPTIVE FASTENING SCHEDULE FOR BOSTITCH® HURRIQUAKE® NAILS

IRC Table R602.3(1) Description of Building Elements	Spacing of Fasteners	Number and Type of Fasteners			
		HQ1	HQ2	HQ3	HQ4
Joist to sill or girder, toenail	-	3	3	2	2
1x6 subfloor or less to joist, face nail	-	2	2	2	2
2-in. subfloor to joist or girder, blind and face nail	-	----	----	2	2
Sole plate to joist or blocking, face nail	-	12 in oc	12 in oc	24 in oc	24 in oc
Top or sole plate to stud, end nail	-	3	3	2	2
Stud to sole plate, toe nail	-	3	3	2	2
Double studs, face nail	-	24 in oc	24 in oc	24 in oc	24 in oc
Double top plates, face nail	-	24 in oc	24 in oc	24 in oc	24 in oc
Sole plate to joist or blocking at braced wall panels	16 in o.c.	4	4	3	2
Double top plates, minimum 24-inch offset of end joints, face nail in lapped area	-	10	10	6	6
Blocking between joists or rafters to top plate, toe nail	-	3	3	2	2
Rim joist to top plate, toe nail	-	6 in oc	6 in oc	8 in oc	8 in oc
Top plates, corner laps and intersections, face nail	-	2	2	2	2
Built-up header, two pieces with ½-in. spacer	-	----	----	16 in oc along each edge	16 in oc along each edge
Continued header, two pieces	-	12 in oc along each edge	12 in oc along each edge	16 in oc along each edge	24 in oc along each edge
Ceiling joists to plate, toe nail	-	3	3	2	2
Continuous header to stud, toe nail	-	5	4	3	3
Ceiling joists, laps over partitions, face nail	-	3	3	2	2
Ceiling joists to parallel rafters, face nail	-	3	3	2	2
Rafter to plate, toe nail	-	3	3	2	2
1" x 6" sheathing at each bearing, face nail	-	2	2	2	2
1" x 8" sheathing at each bearing, face nail	-	2	2	2	2
Wider than 1" x 8" sheathing at each bearing, face nail	-	3	3	2	2
Built-up corner studs	-	24 in oc	24 in oc	24 in oc	24 in oc
Built-up girders and beams, 2-inch lumber layers	Nail each layer as follows: 24" o.c. at top and bottom and staggered. Two nails at ends and at each splice	----	----	24 in oc	24 in oc
2-in. planks	At each bearing	----	----	2	2
Roof rafters to ridge, valley or hip rafters:	-				
toe nail		5	5	3	3
face nail		4	4	3	2
Rafter ties to rafters, face nail	-	3	3	2	2
Collar tie to rafter, face nail	-	3	3	2	2

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