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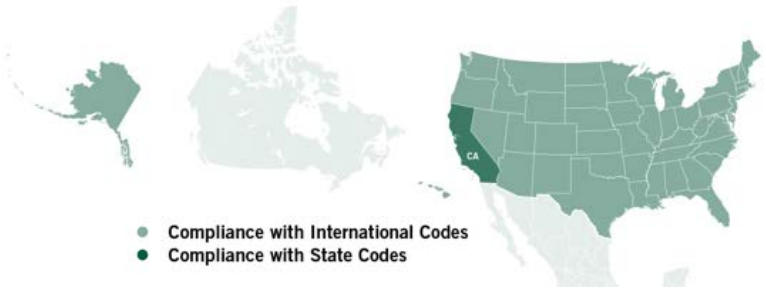

ICC-ES Evaluation Report
ESR-1768

Reissued August 2021
Revised September 2021
This report is subject to renewal August 2023.

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 05 23.13—Nails

REPORT HOLDER:

TREE ISLAND INDUSTRIES, LTD.

EVALUATION SUBJECT:

PNEUMATICALLY, MECHANICALLY AND MANUALLY DRIVEN ROUND-HEAD NAILS AND ROOFING NAILS

ADDITIONAL LISTEE:

HALSTEEL—TREE ISLAND WIRE (U.S.A.), INC.

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2021, 2018, 2015, 2012 and 2009 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)†

†The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

Properties evaluated:

- Bending yield strength.
- Compliance with material requirements and tolerances of ASTM F1667.
- Compliance with prescriptive requirements of the IBC and IRC.
- Use in diaphragms, shear walls and braced walls.

2.0 USES

The nails described in this report are used for engineered and prescriptive structural connections between wood members and for attachment of roofing materials to wood sheathing.

3.0 DESCRIPTION

3.1 General:

The nails are formed from plain steel wire of Grades 1006 through 1030. The nails have smooth, ring (annularly threaded) or screw (helically threaded) shanks and concentric round heads.

3.2 Structural Nails:

See Table 1 for dimensions and additional information for hand-driven nails recognized for use in structural applications, including specified bending yield strength and available finishes. See Table 2 for dimensions and additional information for collated, gun-driven nails recognized for use in structural applications. Dimensional tolerances conform to ASTM F1667.

Some of the sizes of the nails listed in Tables 1 and 2 are available as True Spec brand nails. The True Spec system is intended to allow the shank size and length of a nail to be determined after it is driven, by referring to the nail color and/or the code stamped on the head of the nail. For non-galvanized nails, the length is identified by the paint color on the nail head and the shank diameter is defined by a number. For galvanized nails, the length is identified by a letter and the shank diameter is defined by a number or letter. Non-galvanized nails intended for use with framing connectors (hardware) also have an 'H' on the head. Ring and screw shank nails are identified by an 'r' stamped on the head. See Table 3 for applicable colors and codes.

3.3 Roofing Nails:

Roofing nails have a nominal shank diameter of 11 gage [0.124 inch (3.1 mm)] and a flat round head with a nominal diameter of 0.437 inch (11.1 mm). The nails are available in lengths ranging from $^5/_8$ inch to 3 inches (15.9 to 76 mm) and are either hot-dipped galvanized or electro-galvanized. Nail length must comply with the applicable requirements in Section 1507 of the IBC or Section R905 of the IRC. Dimensional tolerances conform to ASTM F1667.

4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 Engineered Structural Connections: The structural nails listed in Tables 1 and 2 comply with the requirements of IBC Section 2303.6 and may be used in connections designed in accordance with the ANSI/AWC National Design Specification (NDS) for Wood Construction, using the specified bending yield strengths and nominal nail diameters shown in the tables. For nails with flat round heads and shank diameters that are no more than two-thirds of the head diameter, the reference head pull-through design values must be determined in accordance with

Section 12.2.5 of the 2018 NDS. Reference head pull-through design values for other nails are outside the scope of this report. Reference lateral and withdrawal design values for select connections are shown in Table 4. These reference design values must be adjusted by all applicable factors in the NDS.

4.1.2 Engineered Diaphragms and Shear Walls: The structural nails listed in Table 5 comply with the requirements of IBC Section 2303.6 and head area requirements defined in the ICC-ES Acceptance Criteria for Nails (AC116) and are equivalent to the code-prescribed nails listed in Table 5 for use in engineered diaphragms and shear walls in accordance with the AWC Special Design Provisions for Wind and Seismic (SDPWS), which is referenced in the IBC.

4.1.3 Prescriptive Framing Connections: The structural nails listed in Tables 1 and 2 comply with the requirements of IBC Section 2303.6 and may be used in framing connections where the applicable nail type and size is prescribed in 2021 IBC Table 2304.10.2 (2018 and 2015 IBC Table 2304.10.1, 2012 and 2009 IBC Table 2304.9.1) or IRC Table R602.3(1), as applicable.

4.1.4 Prescriptive Sheathing Attachment: The structural nails listed in Table 5 comply with the requirements of IBC Section 2303.6 and head area requirements of AC116, and are equivalent to the code-prescribed nails listed in Table 5 for attachment of sheathing to wood framing in accordance with 2021 IBC Table 2304.10.2 (2018 and 2015 IBC Table 2304.10.1, 2012 and 2009 IBC Table 2304.9.1) or IRC Table R602.3(1), as applicable.

4.2 Installation:

4.2.1 Structural Nails: Edge distances, end distances, and spacings must be sufficient to prevent splitting of the wood, and must be in accordance with NDS Section 12.1.6 (2012 NDS Section 11.1.6 for the 2012 IBC; 2005 NDS Section 11.1.5 for the 2009 IBC).

4.2.2 Roofing Nails: Roofing nails must be installed in accordance with IBC Chapter 15 or IRC Chapter 9. When used in roofing applications, the roofing nails must be hot-dipped galvanized in accordance with ASTM A153, Class D.

5.0 CONDITIONS OF USE

The nails described in this report comply with the 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 When required by the code official, calculations demonstrating that the applied loads are less than the design values specified by 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.

5.3 Use of roofing nails must be limited to installation of roof covering materials and other non-structural materials in accordance with IBC Chapter 15 or IRC Chapter 9.

5.4 Tree Island nails with a hot-dip galvanized coating may be used with preservative-treated wood and fire-retardant-treated wood in accordance with 2021 IBC Section 2304.10.6 (2018 and 2015 IBC Section 2304.10.5, 2012 and 2009 IBC Section 2304.9.5) and IRC Section 317.3.

5.5 Use of the nails with a bright finish in chemically-treated wood, such as preservative- or fire-retardant-treated wood; or in exterior or exposed conditions, is not permitted.

5.6 Use of the electro-galvanized zinc or zinc-phosphate coated nails in chemically-treated wood, such as preservative- or fire-retardant-treated wood; or in exterior or exposed conditions, is outside the scope of this report.

5.7 The nails 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 Nails (AC116), dated March 2018 (editorially revised February 2021).

7.0 IDENTIFICATION

7.1 Product labeling shall include, the name of the report holder or listee, and the ICC-ES mark of conformity. The listing or evaluation report number (ICC-ES ESR-1768) may be used in lieu of the mark of conformity. Containers of nails must be identified with the company name (Tree Island Industries, Ltd., or Halsteel) and address; nail type and pennyweight and/or nail size [length and diameter (or gage for roofing nails)]; the finish or coating, and the evaluation report number (ESR-1768). True Spec nails must also be identified as described in Section 3.2 and Table 3.

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

TREE ISLAND INDUSTRIES, LTD.
3933 BOUNDARY ROAD
RICHMOND, BRITISH COLUMBIA V6V 1T8
CANADA
(604) 524-3744
www.treeisland.com

7.3 The Additional Listee's contact information is the following:

HALSTEEL—TREE ISLAND WIRE (U.S.A.), INC.
5080 HALLMARK PARKWAY
SAN BERNARDINO, CALIFORNIA 92407
(909) 594-7511

TABLE 1—HAND DRIVEN STRUCTURAL NAILS

NAIL TYPE	PENNYWEIGHT	NOMINAL SHANK DIAMETER (inch)	SPECIFIED BENDING YIELD STRENGTH Fyb (psi)	LENGTH (inches)	HEAD STYLE	NOMINAL HEAD DIAMETER (inch)	SHANK TYPE	FINISH[1]
Box	6d / 7d	0.099	100,000	2 / 2 1/4	Flat Round	0.265	Smooth	Bright, VC, EG, Phos, HDG
	8d / 9d	0.113		2 1/2 / 2 3/4		0.297		
	10d / 12d	0.128		3 to 3 3/4		0.312		
	16d	0.135		3 1/2		0.344		
	20d / 30d	0.148	90,000	4 to 4 1/2		0.375		
	40d	0.162		5		0.406		
Casing	6d / 7d	0.099	100,000	2 / 2 1/4	Countersunk, cupped	0.142	Smooth	HDG
	8d	0.113		2 1/2		0.155		
	10d / 12d	0.131		3 / 3 1/4		0.170		
	16d	0.135		3 1/2		0.177		
Common	4d / 5d	0.099	100,000	1 1/2 / 1 3/4	Flat Round	0.250	Smooth Ring	Bright, VC, HDG
	6d / 7d	0.113		2 / 2 1/4		0.265		
	8d / 9d	0.131		2 1/2 / 2 3/4		0.281		
	10d / 12d	0.148	90,000	3 / 3 1/4		0.312		
	16d	0.162		3 1/2		0.344		
	20d	0.192	80,000	4		0.406		
Hardware	n/a	0.120	100,000	1 1/4 to 1 1/2	Round	0.297	Smooth Ring Screw	Bright, EG, HDG
		0.120		1 1/2, 2 1/2		0.281		Bright, HDG
		0.131						
		0.148	90,000	1 1/4 to 1 1/2		0.312		Bright, EG, HDG
		0.162		2 1/2		0.344		
		0.192	80,000	2 1/2		0.375		HDG
Finishing	8d	0.099	100,000	2 1/2	Brad	0.142	Smooth	Bright, HDG
	10d / 12d	0.113		3 / 3 1/4		0.155		
	16d	0.120		3 1/2		0.162		
	20d	0.135		4		0.177		
Sinker	7d	0.099	100,000	2 1/8	Flat countersunk	0.250	Smooth	VC, Phos, HDG
	8d	0.113		2 3/8		0.266		
	10d	0.120		2 7/8		0.281		
	12d	0.135		3 1/8		0.312		
	16d	0.148	90,000	3 1/4		0.344		

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

[1]Finish types:
Bright = Non-galvanized
VC = Vinyl-coated
EG = Zinc-coated (Electro-galvanized)
Phos = Zinc-phosphate coated
HDG = Zinc –coated (Hot-dipped galvanized) complying with ASTM A153 Class D

TABLE 2—GUN DRIVEN STRUCTURAL NAILS

NOMINAL SHANK DIAMETER (inch)	SPECIFIED BENDING YIELD STRENGTH Fyb (psi)	RANGE OF LENGTHS (inch)	HEAD STYLE	NOMINAL HEAD DIAMETER (inch)	SHANK TYPE[1]	FINISH[2]
0.113	100,000	$1^1/_2$ to $2^1/_2$	Flat Round	0.275	S, R, Sc	Bright, EG, HDG
0.120		2 to $3^1/_4$		0.275	S, R, Sc	Bright, EG, HDG, HT
0.131		$1^1/_2$ to $3^1/_2$		0.285	S, R, Sc	Bright, EG, HDG, HT
0.135		$1^1/_2$ to $3^1/_2$		0.285	S, R, Sc	Bright, EG, HDG, HT
0.148	90,000	$1^1/_2$ to 4		0.285	S, R, Sc	Bright, EG, HDG, HT
0.162		$2^1/_2$ to $5^1/_8$		0.290	S, R, Sc	Bright, EG, HDG, HT

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

[1]Shank types: S = smooth, R = ring, Sc = screw
[2]Finish types:
Bright = Non-galvanized
EG = Zinc-coated (Electro-galvanized)
HDG = Zinc –coated (Hot-dipped galvanized) complying with ASTM A153 Class D
HT = Heat Treated

TABLE 3—TRUE SPEC HEAD IDENTIFICATION SYSTEM LEGEND[1]

DIAMETER INDICATOR		
Nominal Shank Diameter	**Indicator for Smooth Shank and Screw Shank Nails, All Finishes**	**Indicator for Ring Shank Nails with HDG Finish**
0.113	1	T
0.131	3	W
0.135	5	X
0.148	4	Y
0.162	6	Z
LENGTH INDICATOR		
Length (Inches)	**Indicator for Non-Galvanized Nails**	**Indicator for HDG Nails**
$1^1/_2$	Purple	A
$2^1/_8$	Pink	B
$2^1/_4$	Brown	C
$2^3/_8$	Green	D
$2^1/_2$	Blue	E
3	White	F
$3^1/_4$	Black	J
$3^1/_2$	Orange	K

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

[1]Non-galvanized nails intended for use with framing connectors (hardware) also have an ‘H’ on the head. Ring and screw shank nails are identified by an ‘r’ stamped on the head.

TABLE 4—SINGLE FASTENER CONNECTIONS—REFERENCE DESIGN VALUES (LATERAL AND WITHDRAWAL)[1,5]

NOMINAL NAIL SHANK DIAMETER (inch)	REFERENCE LATERAL DESIGN VALUE (lbf)[2]			REFERENCE WITHDRAWAL DESIGN VALUE (lbf per inch)[3]	
	Minimum Side Member Thickness (inches)	Southern Pine SG = 0.55	Douglas Fir–Larch SG = 0.50	Southern Pine SG = 0.55	Douglas Fir–Larch SG = 0.50
0.099	3/4	61	55	31	24
0.113	3/4	79	72	35	28
0.120	1	89	81	37	29
0.128	1	101	93	40	31
0.131	1	106	97	41	32
0.135	1	113	103	42	33
0.148	1	128	118	46	36
0.162	1	154	141	50	40
0.192	1	183	159	59	47

For **SI:** 1 inch = 25.4 mm, 1 lbf = 4.45 N; 1 lbf/inch = 0.175 N/mm

[1]Tabulated nominal values must be multiplied by all applicable adjustment factors in accordance with the NDS.
[2]Tabulated lateral design values are for connections of members with identical specific gravity and nails inserted in side grain with nail axis perpendicular to wood fibers; minimum nail penetration into the main member must equal 10 diameters.
[3]Tabulated nominal withdrawal values are for nails driven in the side grain of the main member, with the nail axis perpendicular to the wood fibers.
[4]For diameters other than those noted, withdrawal values must be the same as for the smooth nails.
[5]References: Lateral design values—2018 NDS Table 12N. Withdrawal design values—2018 NDS Table 12.2C.

TABLE 5—STRUCTURAL NAILS RECOGNIZED FOR USE IN ENGINEERED DIAPHRAGMS AND SHEAR WALLS AND PRESCRIPTIVE SHEATHING ATTACHMENTS

NAIL TYPE AND SIZE PRESCRIBED IN THE CODE	TREE ISLAND NAIL DESCRIPTION (RECOGNIZED EQUIVALENT)	
	Hand Driven (See Table 1)	Gun Driven (See Table 2)
6d common (2" x 0.113")	8d box; 6d and 7d common; 8d sinker	2 to $2^1/_2$" x 0.113"
8d common ($2^1/_2$" x 0.131")	10d box; 8d and 9d common	$2^1/_2$" to 3" x 0.131"
10d common (3" x 0.148")	10 and 12d common; 16d sinker	3" to $3^1/_4$" x 0.148"

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

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 05 23.13—Nails

REPORT HOLDER:

TREE ISLAND INDUSTRIES, LTD.

EVALUATION SUBJECT:

PNEUMATICALLY, MECHANICALLY AND MANUALLY DRIVEN ROUND-HEAD NAILS AND ROOFING NAILS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that pneumatically, mechanically and manually driven round-head nails and roofing nails, described in ICC-ES evaluation report ESR-1768, have also been evaluated for compliance with the code*(s)* noted below.

Applicable code edition*(s)*:

- 2019 *California Building Code* (CBC)

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

- 2019 *California Residential Code* (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The pneumatically, mechanically and manually driven round-head nails and roofing nails, described in Sections 2.0 through 7.0 of the evaluation report ESR-1768, comply with CBC Chapter 23, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions, as applicable, noted in the evaluation report and the additional requirements of CBC Chapters 16, 17 and 23, as applicable.

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

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

2.2 CRC:

The pneumatically, mechanically and manually driven round-head nails and roofing nails, described in Sections 2.0 through 7.0 of the evaluation report ESR-1768, comply with CRC Chapters 5, 6, 7, 8 and 9, provided the design and installation are in accordance with the 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report.

This supplement expires concurrently with the evaluation report, reissued August 2021 and revised September 2021.