Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

Report No: 1711-01

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Subject to Renewal: July 1, 2027

$^{5}/_{16}$" SPAX® PowerLags® Fasteners for Use in Deck Ledger Board Applications

Trade Secret Report Holder:

Altenloh, Brinck & Company U.S., Inc.

Phone: 419-636-6715 Website: spax.us

CSI Designations:

DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

Section: 06 11 00 - Wood Framing

Section: 06 15 00 - Wood Decking

1 Innovative Product Evaluated[1]

1.1 $^{5}/_{16}$" SPAX PowerLags Fasteners

2 Product Description and Materials

2.1 The innovative product evaluated in this report is shown in **Figure 1**.

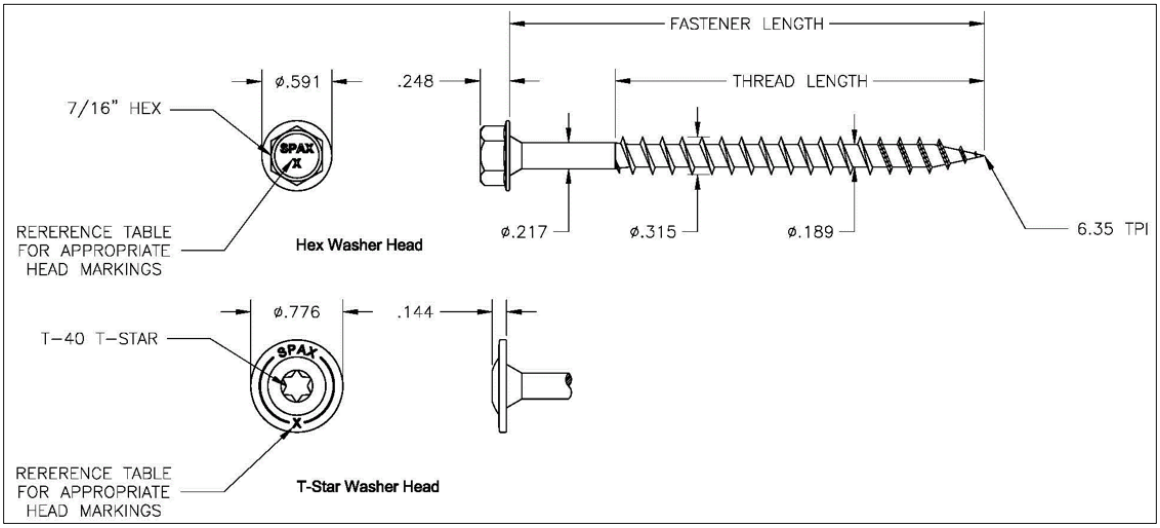

Figure 1. SPAX PowerLags Fasteners (in)

2.2 SPAX PowerLags Fasteners are manufactured with carbon steel grade 1022 or 10B21 wire conforming to ASTM A510, or grade 17MnB3 or 19MnB4 wire conforming to DIN 1654.

2.3 SPAX PowerLags Fasteners are manufactured using a standard cold-formed process followed by a heat-treating process. Allowable bending yield and critical dimensions are found in **Figure 1** and **Table 1**.

2.3.1 SPAX PowerLags Fasteners heads are a $^{7}/_{16}$" hex drive or a T-40 T-star drive.

2.3.2 SPAX PowerLags Fasteners have a gimlet point.

2.4 SPAX PowerLags Fasteners are available with proprietary coatings HCR™ and HCR-X™ that exceed the protection provided by code-approved hot-dipped galvanized coatings meeting ASTM A153 as specified in IBC Section 2304.10.6[2] and IRC Section R304.3.[3]

2.4.1 HCR coating is approved for use in ground contact and pressure-treated wood (e.g., Alkaline Copper Quaternary Type D [ACQ-D]) in general construction (freshwater) applications.

2.4.2 HCR-X coating is approved for use in ground contact and pressure-treated wood (ACQ-D) in coastal construction (saltwater) applications.

2.5 HCR and HCR-X coated fasteners are approved for use in fire-retardant treated lumber, provided the conditions set forth by the fire-retardant treated lumber manufacturer be met, including appropriate strength reductions.

2.6 The fasteners evaluated in this report are set forth in **Table 1**.

Table 1. Fastener Specifications

Fastener Name	Head (in)				Lengths (in)		Diameters (in)			Bending Yield Strength,[3] F_{yb} (psi)
	Style	Marking	Diameter	Height	Fastener[1]	Thread[2]	Shank	Minor	Major	
$^{5}/_{16}$" SPAX PowerLags Fasteners	Hex	4	0.591	0.248	4	2.993	0.217	0.189	0.315	150,000
	T-Star		0.776	0.140		2.375				
	Hex	5	0.591	0.248	5	2.375				
	T-Star		0.776	0.140		2.375				

SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1-psi = 0.00689 MPa

1. Fastener length is measured from the underside of the head to the tip.
2. Thread length includes tip; see **Figure 1**.
3. Determined in accordance with methods specified in ASTM F1575, based on minor thread diameter using a five percent (5%) offset of the load displacement curves developed from bending tests.

2.7 In-plant quality control procedures, under which the SPAX PowerLags Fasteners are manufactured, are audited through an inspection process performed by an approved agency.

2.8 As needed, review material properties for design in **Section 6** and the regulatory evaluation in **Section 8**.

3 Definitions[4]

3.1 New Materials[5] are defined as building materials, equipment, appliances, systems, or methods of construction, not provided for by prescriptive and/or legislatively adopted regulations, known as alternative materials.[6] The design strength and permissible stresses shall be established by tests[7] and/or engineering analysis.[8]

3.2 Duly authenticated reports[9] and research reports[10] are test reports and related engineering evaluations that are written by an approved agency[11] and/or an approved source.[12]

3.2.1 This report utilizes intellectual property and/or trade secrets to create public domain material properties for commercial end-use.

3.2.1.1 This report protects confidential Intellectual Property and trade secrets under the regulation, 18.US.Code.90, also known as Defend Trade Secrets Act of 2016 (DTSA).[13]

3.3 An approved agency is *"approved"* when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is accredited and listed in the ANAB directory.

3.4 An approved source is *"approved"* when a professional engineer (i.e., Registered Design Professional, hereinafter RDP) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.[14]

3.5 Testing and/or inspections conducted for this duly authenticated report were performed by an ISO/IEC 17025 accredited testing laboratory, an ISO/IEC 17020 accredited inspection body, and/or a licensed RDP.

3.5.1 The Center for Building Innovation (CBI) is ANAB[15] ISO/IEC 17025 and ISO/IEC 17020 accredited.

3.6 The regulatory authority shall enforce[16] the specific provisions of each legislatively adopted regulation. If there is a non-conformance, the specific regulatory section and language of the non-conformance shall be provided in writing[17] stating the nonconformance and the path to its cure.

3.7 The regulatory authority shall accept duly authenticated reports from an approved agency and/or an approved source with respect to the quality and manner of use of new materials or assemblies as provided for in regulations regarding the use of alternative materials, designs, or methods of construction.[18]

3.8 ANAB is an International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) signatory. Therefore, recognition of certificates and validation statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA with the appropriate scope shall be approved.[19] Thus, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent,[20] and can be used in any country that is an MLA signatory found at this link: https://iaf.nu/en/recognised-abs/

3.9 Approval equity is a fundamental commercial and legal principle.[21]

4 Applicable Local, State, and Federal Approvals; Standards; Regulations[22]

4.1 *Local, State, and Federal*

4.1.1 Approved in all local jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured local jurisdictions: Austin, Baltimore, Broward County, Chicago, Clark County, Dade County, Dallas, Detroit, Denver, DuPage County, Fort Worth, Houston, Kansas City, King County, Knoxville, Las Vegas, Los Angeles City, Los Angeles County, Miami, Nashville, New York City, Omaha, Philadelphia, Phoenix, Portland, San Antonio, San Diego, San Jose, San Francisco, Seattle, Sioux Falls, South Holland, St. Louis County, Texas Department of Insurance, and Wichita.[23]

4.1.2 Approved in all state jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured states: California, Florida, New Jersey, Oregon, New York, Texas, Washington, and Wisconsin.[24]

4.1.3 Approved by the Code of Federal Regulations Manufactured Home Construction: Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14[25] and Part 3280[26] pursuant to the use of ISO/IEC 17065 duly authenticated reports.

4.1.4 Approved means complying with the requirements of local, state, or federal legislation.

4.2 *Regulations*

4.2.1 *IBC – 18, 21, 24: International Building Code®*

4.2.2 *IRC – 18, 21, 24: International Residential Code®*

4.3 *Standards*

4.3.1 *ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction*

4.3.2 *ASTM A153: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware*

4.3.3 *ASTM A510: Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel*

4.3.4 *ASTM B117: Standard Practice for Operating Salt Spray (Fog) Apparatus*

4.3.5 *ASTM D1761: Standard Test Methods for Mechanical Fasteners in Wood*

4.3.6 *ASTM D2395: Standard Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials*

4.3.7 *ASTM D4442: Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood Based Materials*

4.3.8 *ASTM F1575: Standard Test Methods for Determining Bending Yield Moment of Nails*

4.3.9 *ASTM G85: Standard Practice for Modified Salt Spray (Fog) Testing*

5 Listed[27]

5.1 Equipment, materials, products, or services included in a List published by a nationally recognized testing laboratory (e.g., CBI), an approved agency (e.g., CBI and DrJ), and/or and approved source (e.g., DrJ), or other organization(s) concerned with product evaluation (e.g., DrJ), that maintains periodic inspection (e.g., CBI) of production of listed equipment or materials, and whose listing states either that the equipment or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner.

6 Tabulated Properties Generated from Nationally Recognized Standards

6.1 SPAX PowerLags Fasteners are used for attaching the deck ledger to the band joists of a building in accordance with IBC Section 1604.8.3 and IRC Section R507.9.

6.2 SPAX PowerLags Fasteners are installed without lead holes as prescribed in the NDS.

6.2.1 The IRC provides prescriptive fastener spacing for the attachment of a deck ledger to a band joist with $^1/_2$" diameter lag screws or through bolts as shown in IRC Table R507.9.1.3(1). **Table 2** provides SPAX PowerLags Fasteners spacing required to provide performance at least equivalent to the lag screws found in IRC Table R507.9.1.3(1), in accordance with IBC Section 104.2.3, IBC Section 1604.8.3, IRC Section R104.2.2, and IRC Section R507.9 in accordance with generally accepted engineering practice.

6.2.1.1 **Table 2** provides SPAX PowerLags Fasteners spacing for items found in IRC Table R507.9.1.3(1), as well as a wider range of materials commonly used for band joists.

6.3 The maximum deck joist spans in ledger connection applications for SPAX PowerLags Fasteners are specified in **Table 2** and **Figure 3**.

Table 2. SPAX PowerLags Fasteners Spacing for Maximum Deck Joist Spans[1,4,5,10]

Loading Condition[6] (psf)	Head Type	Fastener Length[2] (in)	2x Nominal Ledger Species[3,7,8]	Band Joist Material[9]	Maximum Deck Joist Spans						
					Up to 6'	Up to 8'	Up to 10'	Up to 12'	Up to 14'	Up to 16'	Up to 18'
					Maximum On-Center Spacing of SPAX PowerLags Fasteners						
LL + DL 40 + 10	T-Star	4 or 5	HF/SPF	Sawn Lumber	22	16	16	15	12	11	10
				1" min EWP	23	17	16	15	13	11	10
			DF/SP	Sawn Lumber	34	25	20	17	13	12	10
				1" min EWP	23	17	16	14	12	11	9
	Hex Head		HF/SPF	Sawn Lumber	28	21	17	12	11	9	8
				1" min EWP	21	14	11	9	8	7	6
			DF/SP	Sawn Lumber	30	22	18	12	10	9	8
				1" min EWP	26	19	16	13	11	10	8
SL + DL 50 + 10	T-Star	4 or 5	HF/SPF	Sawn Lumber	18	16	15	12	10	9	8
				1" min EWP	19	16	15	12	11	9	8
			DF/SP	Sawn Lumber	28	21	17	13	11	10	8
				1" min EWP	19	16	14	12	10	9	8
	Hex Head		HF/SPF	Sawn Lumber	24	18	12	10	9	8	7
				1" min EWP	18	12	9	8	7	6	5
			DF/SP	Sawn Lumber	25	18	12	10	8	7	6
				1" min EWP	21	16	13	11	9	8	7
SL + DL 60 + 10	T-Star	4 or 5	HF/SPF	Sawn Lumber	16	16	12	10	9	8	7
				1" min EWP	16	16	13	11	9	8	7
			DF/SP	Sawn Lumber	24	18	13	11	9	8	7
				1" min EWP	16	15	12	10	9	7	7
	Hex Head		HF/SPF	Sawn Lumber	20	13	11	9	7	6	6
				1" min EWP	14	10	8	7	6	5	4
			DF/SP	Sawn Lumber	21	1	10	8	7	6	5
				1" min EWP	18	14	11	9	8	7	6

Table 2. SPAX PowerLags Fasteners Spacing for Maximum Deck Joist Spans[1,4,5,10]

Loading Condition[6] (psf)	Head Type	Fastener Length[2] (in)	2x Nominal Ledger Species[3,7,8]	Band Joist Material[9]	Maximum Deck Joist Spans						
					Up to 6'	Up to 8'	Up to 10'	Up to 12'	Up to 14'	Up to 16'	Up to 18'
					Maximum On-Center Spacing of SPAX PowerLags Fasteners						
SL + DL 70 + 10	T-Star	4 or 5	HF/SPF	Sawn Lumber	16	14	11	9	8	7	6
				1" min EWP	16	14	11	9	8	7	6
			DF/SP	Sawn Lumber	21	15	12	10	8	7	6
				1" min EWP	16	13	11	9	7	6	6
	Hex Head		HF/SPF	Sawn Lumber	18	12	9	8	6	6	5
				1" min EWP	12	9	7	6	5	4	4
			DF/SP	Sawn Lumber	18	11	9	7	6	5	5
				1" min EWP	16	12	10	8	7	6	5

SI: 1" = 25.4 mm

1. Based on load duration of 1.0. Spacing may be adjusted by the applicable load duration as specified in the NDS.
2. Fasteners are required to have full thread penetration into the main member. Excess fastener length extending beyond the main member is not reflected in the table above.
3. Solid sawn ledgers shall be HF/SPF or DF/SP species (specific gravity of 0.42 and 0.50, respectively), designed by others. Fasteners shall be staggered from the top to the bottom along the length of the ledger while maintaining the required edge and end distances as shown in **Figure 3**.
4. Fasteners shall be staggered from the top to the bottom along the length of the ledger while maintaining the required edge and end distances as shown in **Figure 3**.
5. A maximum $^5/_8$" structural sheathing may be installed between the ledger and the band joist.
6. Table values assume 10-psf dead load.
7. Ledger materials assumed to be in wet service condition.
8. Minimum ledger board requirements: $1^1/_2$" thickness and $7^1/_2$" depth.
9. Minimum band joist requirements: SPF (specific gravity of 0.42) solid-sawn lumber $1^1/_2$" thick and $7^1/_2$" depth; EWP 1.0" thick and $7^1/_4$" depth.
10. Tabulated on-center spacing values are applicable where a third-party tested plastic washer (i.e., Deck2wall® Spacer) is installed between the ledger board and band joist at each fastener location. The plastic washer shall be installed per the washer manufacturer instructions and this report. The plastic washer shall be 2" in diameter, $^1/_2$" thick (maximum), with an approximate $^5/_{16}$" hole in the center for the SPAX PowerLags Fasteners and three $^3/_{16}$" (approximate) holes for the #8 screws. The plastic washer shall be independently fastened to the ledger with three SPAX #8 x $1^5/_8$" or three SPAX #8 x 2" screws.

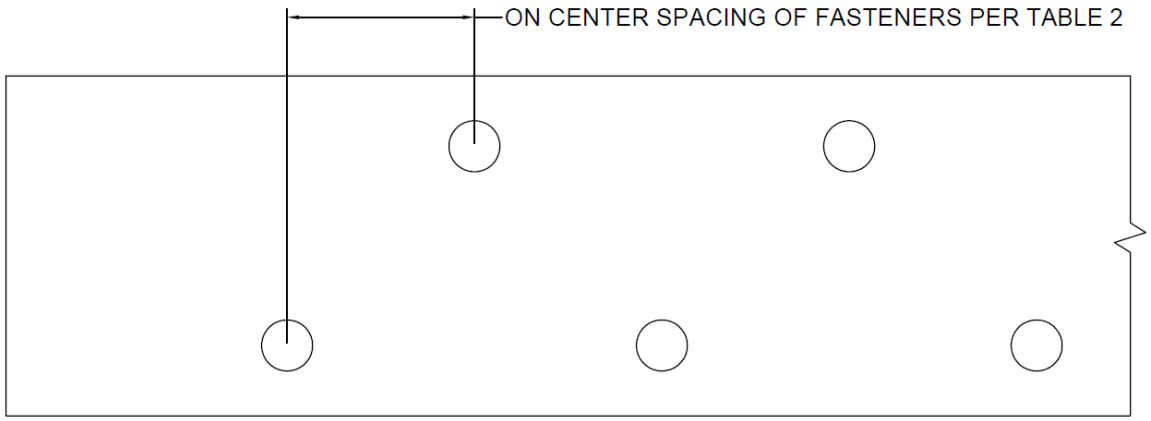

Figure 2. SPAX PowerLags Fasteners Spacing

6.4 Alternative techniques shall be permitted in accordance with accepted engineering practice and experience. These provisions for the use of alternative materials, designs, and methods of construction are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed herein. This includes, but is not limited to, the following areas of engineering: mechanics of materials, structures, building science, and fire science.

7 Certified Performance[28]

7.1 All construction methods shall conform to accepted engineering practices to ensure durable, livable, and safe construction and shall demonstrate acceptable workmanship reflecting journeyman quality of work of the various trades.[29]

7.2 The strength and rigidity of the component parts and/or the integrated structure shall be determined by engineering analysis or by suitable load tests to simulate the actual loads and conditions of application that occur.[30]

8 Regulatory Evaluation and Accepted Engineering Practice

8.1 $^{5}/_{16}$" SPAX PowerLags Fasteners comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 To determine their ability to provide code complying attachment of deck ledger boards to the building structure.

8.2 For conventionally framed buildings, the ledger is required to be attached to the band joist in accordance with IBC Section 1604.8.3 and IRC Section R507.9, as applicable.

8.2.1 This evaluation provides fastening patterns for SPAX PowerLags Fasteners in a format similar to what is presented in IRC Table R507.9.1.3(1).

8.2.2 As in some truss installations where a band joist is not used, an engineered design is required.

8.3 Ultimate connection capacities and deflections of typical ledger board connections were match tested and evaluated in accordance with the IRC and IBC.

8.4 Corrosion resistance in accordance with ASTM B117 and ASTM G85 Annex A5.

8.5 Any building code, regulation and/or accepted engineering evaluations (e.g., research reports, duly authenticated reports, etc.) that are conducted for this Listing were performed by DrJ, which is an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP or approved sources. DrJ is qualified[31] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise,[32] respectively.

8.6 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope of expertise, which is also its areas of professional engineering competence.

9 Installation

9.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, this report, and the applicable building code.

9.2 In the event of a conflict between the manufacturer installation instructions and this report, contact the manufacturer for counsel on the proper installation method.

9.3 The $^{5}/_{16}$" SPAX PowerLags Fasteners structural wood fastener must be installed with a $^{1}/_{2}$" (12.7 mm), low rpm/high torque electric drill (450 rpm) or impact wrench using the appropriate driver bit.

9.3.1 Drive the fasteners through the ledger and sheathing into the band joist until the built-in washer head is drawn firm and flush to the ledger board.

9.3.2 In the event where a fastener or fasteners are overdriven, contact the manufacturer for counsel on steps to take and if needed, a repair to be made.

9.4 Install SPAX PowerLags Fasteners so that the threads fully engage the band joist material and the fastener tip extends beyond the back face of the band joist material when fully seated against the installed ledger.

9.4.1 A third-party tested plastic washer (e.g., Deck2wall® Spacer) may be installed between the ledger board and band joist at each fastener location. The plastic washer shall be installed per the washer manufacturer instructions and this report.

9.4.1.1 The third-party tested plastic washer shall be 2" in diameter, $^{1}/_{2}$" thick (maximum), with an approximate $^{5}/_{16}$" hole in the center for the SPAX PowerLags Fasteners and three $^{3}/_{16}$" (approximate) holes for the #8 screws.

9.4.1.2 The third-party tested plastic washer shall be independently fastened to the ledger with three SPAX #8 x $1^{5}/_{8}$" or three SPAX #8 x 2" screws.

9.5 Lead holes are not required.

9.6 **Figure 3** shows a detail of the SPAX PowerLags Fasteners deck connection, including minimum edge and end distances.

9.7 Stagger the SPAX PowerLags Fasteners from the top to the bottom along the length of the ledger while maintaining the required edge and end distances.

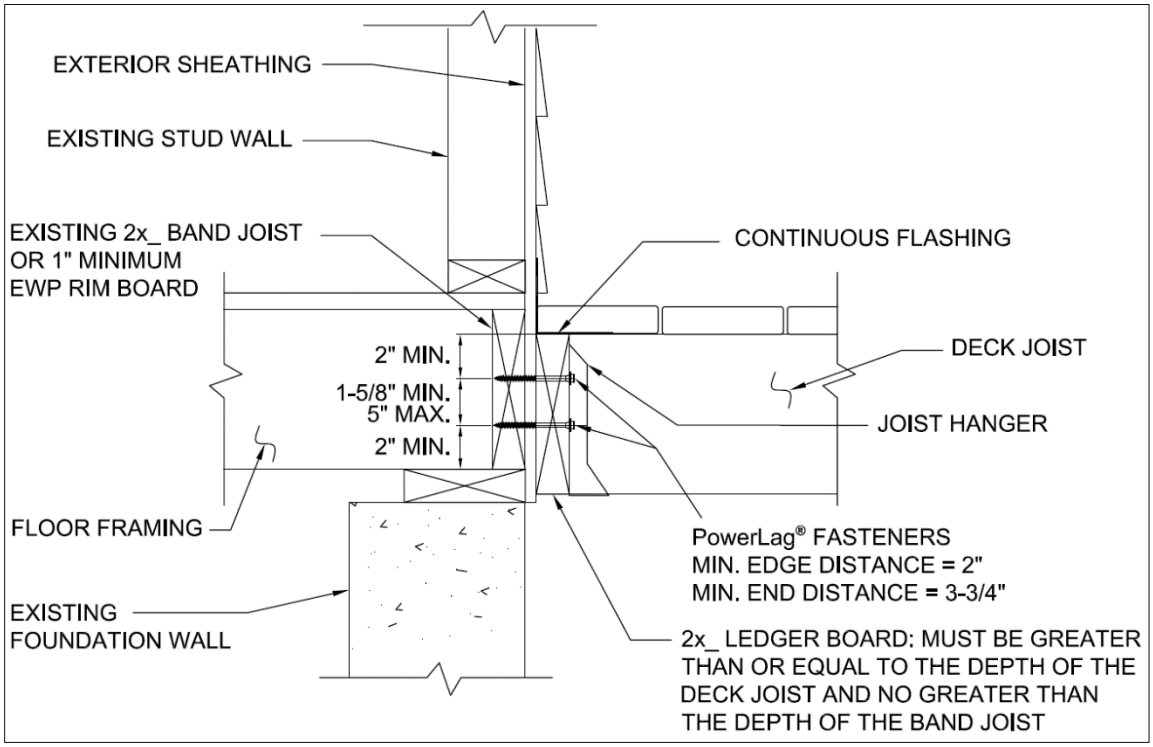

Figure 3. SPAX PowerLags Fasteners Deck Connection

9.8 For applications outside the scope of this report, an engineered design is required.

10 Substantiating Data

10.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:

10.1.1 Bending yield, shear, and tensile strength testing in accordance with ASTM F1575

10.1.2 Lateral resistance and withdrawal resistance testing in accordance with ASTM D1761

10.1.3 Head pull-through resistance testing in accordance with ASTM D1037

10.1.4 Corrosion resistance testing in accordance with ASTM B117 and ASTM G85, Annex A5

10.1.5 Deck ledger assembly testing in general accordance with ASTM D1761

10.2 DCA 6, Prescriptive Residential Wood Deck Construction Guide; AF&PA; 2010

10.3 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies, approved sources, and/or an RDP. Accuracy of external test data and resulting analysis is relied upon.

10.4 Where applicable, testing and/or engineering analysis are based upon provisions that have been codified into law through state or local adoption of regulations and standards. The developers of these regulations and standards are responsible for the reliability of published content. DrJ's engineering practice may use a regulation-adopted provision as the control. A regulation-endorsed control versus a simulation of the conditions of application to occur establishes a new material as being equivalent to the regulatory provision in terms of quality, strength, effectiveness, fire resistance, durability, and safety.

10.5 The accuracy of the provisions provided herein may be reliant upon the published properties of raw materials, which are defined by the grade mark, grade stamp, mill certificate, or duly authenticated reports from approved agencies and/or approved sources provided by the supplier. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this duly authenticated report, may be dependent upon published design properties by others.

10.6 *Testing and Engineering Analysis*

10.6.1 The strength, rigidity, and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.[33]

10.7 Where additional condition of use and/or regulatory compliance information is required, please search for SPAX PowerLags Fasteners on the DrJ Certification website.

11 Findings

11.1 As outlined in **Section 6**, SPAX PowerLags Fasteners have performance characteristics that were tested and/or meet applicable regulations. In addition, they are suitable for use pursuant to its specified purpose.

11.2 When used and installed in accordance with this duly authenticated report and the manufacturer installation instructions, SPAX PowerLags Fasteners shall be approved for the following applications:

11.2.1 Used as a suitable alternative to the requirements of the IBC Section 1604.8.3 and IRC Section R507.9.

11.2.2 SPAX PowerLags Fasteners with HCR coating are approved for use in ground contact and pressure-treated wood (ACQ) in general construction (freshwater) applications.

11.2.3 SPAX PowerLags Fasteners with HCR-X coating are approved for use in ground contact and pressure-treated wood (ACQ) in coastal construction (saltwater) applications.

11.2.4 HCR and HCR-X Coated SPAX PowerLags Fasteners are approved for use in fire-retardant treated lumber, provided the conditions set forth by the fire-retardant treated lumber manufacturer be met, including appropriate strength reductions.

11.3 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Altenloh, Brinck & Company U.S., Inc.

11.4 IBC Section 104.2.3[34] (IRC Section R104.2.2[35] and IFC Section 104.2.3[36] are similar) in pertinent part state:

> **104.2.3 Alternative Materials, Design and Methods of Construction and Equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative is not specifically prohibited by this code and has been approved.

11.5 **Approved:**[37] Building regulations require that the building official shall accept duly authenticated reports.[38]

11.5.1 An approved agency is *"approved"* when it is ANAB ISO/IEC 17065 accredited.

11.5.2 An approved source is *"approved"* when an RDP is properly licensed to transact engineering commerce.

11.5.3 Federal law, Title 18 US Code Section 242, requires that, where the alternative product, material, service, design, assembly, and/or method of construction is not approved, the building official shall respond in writing, stating the reasons why the alternative was not approved. Denial without written reason deprives a protected right to free and fair competition in the marketplace.

11.6 DrJ is a licensed engineering company, employs licensed RDPs and is an ANAB Accredited Product Certification Body – Accreditation #1131.

11.7 Through the IAF Multilateral Arrangement (MLA), this duly authenticated report can be used to obtain product approval in any jurisdiction or country because all ANAB ISO/IEC 17065 duly authenticated reports are equivalent.[39]

12 Conditions of Use

12.1 As defined in **Section 6**, where material and/or engineering mechanics properties are created for load resisting design purposes, the resistance to the applied load shall not exceed the ability of the defined properties to resist those loads using the principles of accepted engineering practice.

12.2 As listed herein, SPAX PowerLags Fasteners shall not be used:

12.2.1 With fastener spacing exceeding values set in **Table 2** for code compliance and the installation conditions considered.

12.3 When required by adopted legislation and enforced by the building official, also known as the Authority Having Jurisdiction (AHJ) in which the project is to be constructed:

12.3.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice and, when prepared by an approved source, shall be approved when signed and sealed.

12.3.2 This report and the installation instructions shall be submitted at the time of permit application.

12.3.3 This innovative product has an internal quality control program and a third-party quality assurance program.

12.3.4 At a minimum, this innovative product shall be installed per **Section 9**.

12.3.5 The review of this report by the AHJ shall comply with IBC Section 104.2.3.2 and IBC Section 105.3.1.

12.3.6 This innovative product has an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.7.2, IBC Section 110.4, IBC Section 1703, IRC Section R104.7.2, and IRC Section R109.2.

12.3.7 The application of this innovative product in the context of this report is dependent upon the accuracy of the construction documents, implementation of installation instructions, inspection as required by IBC Section 110.3, IRC Section R109.2, and any other regulatory requirements that may apply.

12.4 The approval of this report by the AHJ shall comply with IBC Section 1707.1, where legislation states in part, *"the building official shall make, or cause to be made, the necessary tests and investigations; or the building official shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in Section 104.2.3"*, all of IBC Section 104, and IBC Section 105.3.

12.5 Design loads shall be determined in accordance with the regulations adopted by the jurisdiction in which the project is to be constructed and/or by the building designer (i.e., owner or RDP).

12.6 The actual design, suitability, and use of this report for any particular building, is the responsibility of the owner or the authorized agent of the owner.

13 Identification

13.1 $^{5}/_{16}$" SPAX PowerLags Fasteners, as listed in **Section 1.1**, are identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number, and other information to confirm code compliance.

13.2 Additional technical information can be found at the SPAX PowerLags webpage.

14 Review Schedule

14.1 This report is subject to periodic review and revision. For the latest version, visit www.drjcertification.org.

14.2 For information on the status of this report, please contact DrJ Certification.

Notes

1 For more information, visit drjcertification.org or call us at 608-310-6748.

2 2018 IBC Section 2304.10.5

3 2021 IRC Section R317.3

4 Capitalized terms and responsibilities are defined pursuant to the applicable building code, applicable reference standards, the latest edition of TPI 1, the NDS, AISI S202, US professional engineering law, Canadian building code, Canada professional engineering law, Qualtim External Appendix A: Definitions/Commentary, Qualtim External Appendix B: Project/Deliverables, Qualtim External Appendix C: Intellectual Property and Trade Secrets, definitions created within Design Drawings and/or definitions within Reference Sheets. Beyond this, terms not defined shall have ordinarily accepted meanings as the context implies. Words used in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

5 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1702

6 Alternative Materials, Design and Methods of Construction and Equipment: The provisions of any regulation code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by a regulation. Please review https://www.justice.gov/atr/mission and https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3

7 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1706.2:~:text=the%20design%20strengths%20and%20permissible%20stresses%20shall%20be%20established%20by%20tests

8 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design of accepted engineering practice. https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1706.1:~:text=Conformance%20to%20Standards-,The%20design%20strengths%20and%20permissible%20stresses,-of%20any%20structural

9 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1:~:text=the%20building%20official%20shall%20make%2C%20or%20cause%20to%20be%20made%2C%20the%20necessary%20tests%20and%20investigations%3B%20or%20the%20building%20official%20shall%20accept%20duly%20authenticated%20reports%20from%20approved%20agencies%20in%20respect%20to%20the%20quality%20and%20manner%20of%20use%20of%20new%20materials%20or%20assemblies%20as%20provided%20for%20in%20Section%20104.2.3.

10 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4.2

11 https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_agency

12 https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_source

13 https://www.law.cornell.edu/uscode/text/18/1832 (b) Any organization that commits any offense described in subsection (a) shall be fined not more than the greater of $5,000,000 or 3 times the value of the stolen trade secret to the organization, including expenses for research and design and other costs of reproducing the trade secret that the organization has thereby avoided. The federal government and each state have a public records act. To follow DTSA and comply state public records and trade secret legislation requires approval through ANAB ISO/IEC 17065 accredited certification bodies or approved sources. For more information, please review this website: Intellectual Property and Trade Secrets.

14 https://www.nspe.org/resources/issues-and-advocacy/professional-policies-and-position-statements/regulation-professional AND https://apassociation.org/list-of-engineering-boards-in-each-state-archive/

15 https://www.cbitest.com/accreditation/

16 https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.1:~:text=directed%20to%20enforce%20the%20provisions%20of%20this%20code

17 https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3 AND https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#105.3.1

18 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1

19 https://iaf.nu/en/about-iaf-mla/#:~:text=Once%20an%20accreditation%20body%20is%20a%20signatory%20of%20the%20IAF%20MLA%2C%20it%20is%20required%20to%20recognise%20certificates%20and%20validation%20and%20verification%20statements%20issued%20by%20conformity%20assessment%20bodies%20accredited%20by%20all%20other%20signatories%20of%20the%20IAF%20MLA%2C%20with%20the%20appropriate%20scope

20 True for all ANAB accredited product evaluation agencies and all International Trade Agreements.

21 https://www.justice.gov/crt/deprivation-rights-under-color-law AND https://www.justice.gov/atr/mission

22 Unless otherwise noted, the links referenced herein use un-amended versions of the 2024 International Code Council (ICC) 2024 International Code Council (ICC) model codes as foundation references. Mississippi versions of the IBC 2024 and the IRC 2024 are un-amended. This material, product, design, service and/or method of construction also complies with the 2000-2012 versions of the referenced codes and the standards referenced therein. As pertinent to this technical and code compliance evaluation, CBI and/or DrJ staff have reviewed any state or local regulatory amendments to assure this report is in compliance.

23 See Adoptions by Publisher for the latest adoption of a non-amended or amended model code by the local jurisdiction. https://up.codes/codes/general

24 See Adoptions by Publisher for the latest adoption of a non-amended or amended model code by state. https://up.codes/codes/general

25 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14

26 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280

27 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#p-3280.2(Listed%20or%20certified); https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#listed AND https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#labeled

28 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4

29 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=All%20construction%20methods%20shall%20be%20in%20conformance%20with%20accepted%20engineering%20practices%20to%20insure%20durable%2C%20livable%2C%20and%20safe%20housing%20and%20shall%20demonstrate%20acceptable%20workmanship%20reflecting%20journeyman%20quality%20of%20work%20of%20the%20various%20trades

[30] https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=The%20strength%20and%20rigidity%20of%20the%20component%20parts%20and/or%20the%20integrated%20structure%20shall%20be%20determined%20by%20engineering%20analysis%20or%20by%20suitable%20load%20tests%20to%20simulate%20the%20actual%20loads%20and%20conditions%20of%20application%20that%20occur

[31] Qualification is performed by a legislatively defined Accreditation Body. ANSI National Accreditation Board (ANAB) is the largest independent accreditation body in North America and provides services in more than 75 countries. DrJ is an ANAB accredited product certification body.

[32] https://anabpd.ansi.org/Accreditation/product-certification/AllDirectoryDetails?prgID=1&orgID=2125&statusID=4#:~:text=Bill%20Payment%20Date-,Accredited%20Scopes,-13%20ENVIRONMENT.%20HEALTH

[33] See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition: https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280

[34] 2021 IBC Section 104.11

[35] 2021 IRC Section R104.11

[36] 2018: https://up.codes/viewer/wyoming/ifc-2018/chapter/1/scope-and-administration#104.9 AND 2021: https://up.codes/viewer/wyoming/ibc-2021/chapter/1/scope-and-administration#104.11

[37] Approved is an adjective that modifies the noun after it. For example, Approved Agency means that the Agency is accepted officially as being suitable in a particular situation. This example conforms to IBC/IRC/IFC Section 201.4 (https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#201.4) where the building code authorizes sentences to have an ordinarily accepted meaning such as the context implies.

[38] https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1

[39] Multilateral approval is true for all ANAB accredited product evaluation agencies and all International Trade Agreements.