# Listing and Technical Evaluation Report™

**A Duly Authenticated Report from an Approved Agency**

**Report No: 2506-111**

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Subject to Renewal: October 1, 2027

## Owens Corning® Lumber Structural Framing for Deck Ledger Applications

**Trade Secret Report Holder:**

## Owens Corning

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### CSI Designations:

**DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES**

Section: 06 05 23 - Wood, Plastic, and Composite Fastenings

Section: 06 11 00 - Wood Framing

Section: 06 15 00 - Wood Decking

Section: 06 73 13 - Composite Structural Decking

## 1 Innovative Product Evaluated[1]

1.1 Owens Corning Lumber Structural Framing

## 2 Product Description and Materials

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




**Figure 1**. Owens Corning Lumber Structural Framing


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2.2 *Owens Corning Lumber Structural Framing*

2.2.1 Owens Corning Lumber Structural Framing is described in **Table 1**.

**Table 1**. Description of Owens Corning Lumber Structural Framing

| Owens Corning Lumber Structural Framing | Description |
|---|---|
| Product Type | Continuous Glass fiber reinforced High Density Polyethylene (HDPE) with less than twenty-five percent (25%) calcium carbonate in base HDPE resin.<br>≥ 5% of overall total weight is fibrous glass<br>< 2.5% by weight of organic surface binder |
| Application | Reinforced and semi-reinforced extruded products for use in non-structural and structural applications. |
| Deck Ledger Applications<br>(Owens Corning Lumber Structural Framing) | Reinforced polymeric lumber used in deck ledger applications (edgewise orientation) available in the following sizes:<br>*Nominal:* 2 x 6, 2 x 8, 2 x 10, and 2 x 12<br>*Actual:* 1.5" x 5.5", 1.5" x 7.5", 1.5" x 9.25" and 1.5" x 11.25" |
| SI: 1 in = 25.4 mm | |

2.3 *Fasteners*

2.3.1 The substantiating tests referenced in **Section 10** were conducted using Starborn® F23 Structural Screws as a representative product for the proprietary screw categories.

2.3.2 This report covers the use of commercially available, self-tapping, dowel-type structural screws for attaching the Owens Corning Lumber Structural Framing ledger to a wood or Structural Composite Lumber (SCL) band joist. The evaluated fasteners fall into three general categories:

2.3.2.1 *Carbon Steel Structural Screws:*

2.3.2.1.1 Fasteners manufactured from heat-treated carbon steel (e.g., Grade 10B21 wire) and finished with a proprietary corrosion-resistant coating system. The coating system must provide corrosion resistance that is equivalent to, or exceeds, the requirements for hot-dip galvanization under ASTM A153, Class D, making them suitable for use in exterior environments and with preservative-treated lumber.

2.3.2.2 *Stainless Steel Structural Screws:*

2.3.2.2.1 Fasteners manufactured from Grade 316 stainless steel, which inherently meets the material requirements of ASTM F1667. These fasteners are suitable for applications requiring a higher level of corrosion resistance, including severe exterior environments and use with all types of preservative-treated or fire-retardant-treated wood.

2.3.2.3 *Other Approved Structural Screws:*

2.3.2.3.1 Any lag screw or structural wood screw recognized for use by the applicable building code.

2.3.2.3.1.1 Per IRC Section R507.2.3, lag screws must comply with ASTM A307 and be provided with a corrosion-resistant coating in accordance with ASTM A153/A153M or equivalent. For the purposes of design using this report, such screws must also meet the minimum dimensional and mechanical properties specified in the NDS.


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2.4 *Main and Side Members*

2.4.1 The connection assemblies evaluated in this report consist of the following components:

2.4.1.1 *Side Member (Ledger):*

2.4.1.1.1 Owens Corning Lumber Structural Framing with nominal and actual dimensions as defined in **Section 2.3**.

2.4.1.2 *Main Member (Band Joist):*

2.4.1.2.1 The primary building's band joist must be either solid sawn lumber or Structural Composite Lumber (SCL). Minimum material specifications and dimensions for the band joist are provided in the footnotes of the design tables in **Section 6**.

2.5 *Fastener Specifications*

2.5.1 The generalized mechanical and dimensional properties for the fastener categories evaluated in this report are listed in **Table 2**. These properties form the basis for the engineering analysis and design values presented in **Section 6**. The use of these defined categories allows for the generic application of this report to any structural screw product that meets or exceeds the specified properties for its category. The specifications for the carbon steel and stainless-steel structural screws are obtained from approved sources.

**Table 2**. Fastener Specifications

| Product Name | Unthreaded Shank Diameter (in) | Thread Diameter (in) | | Nominal Bending Yield,[1] $F_{yb}$ (psi) | Allowable Fastener Strength[2] (lb) | |
|---|---|---|---|---|---|---|
| | | Minor | Major | | Tensile | Shear |
| Proprietary Carbon Steel Structural Screw | 0.230 | 0.209 | 0.307 | 183,155 | 1,980 | 1,490 |
| Proprietary Stainless Steel Structural Screw | 0.230 | 0.209 | 0.307 | 107,000 | 695 | 970 |
| 1/2" Lag Screw(1) | 0.500 | 0.371 | 0.500 | 45,000 | 2,835 | 1,700 |
| 1/2" Bolt | 0.500 | 0.406 | 0.500 | 45,000 | 2,835 | 1,700 |

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

1. Bending yield strength is determined in accordance with ASTM F1575 and based on the minor diameter. Listed nominal bending yield strength values are minimums.
2. Allowable tensile strength and shear strength are minimums and shall be based on threaded region of the fastener.

2.6 *Corrosion Resistance*

2.6.1 Fasteners used to attach Owens Corning Lumber Structural Framing ledgers shall possess corrosion resistance appropriate for the service environment.

2.6.1.1 Per IRC Section R507.2.3, deck fasteners and connectors must comply with IRC Section R304.3.[2] While Owens Corning Lumber Structural Framing is a composite material not corrosive to metal fasteners, the band joist to which it attaches is typically preservative-treated wood. Therefore, fasteners must meet the corrosion-resistance requirements for use with preservative-treated wood as specified in IRC Section R304.3[3] and IBC Section 2304.10.6.

2.6.1.1.1 Proprietary Coated Carbon Steel Screws shall have a coating that provides corrosion resistance equivalent to, or exceeding hot-dip galvanization in accordance with ASTM A153/A153M. This makes them suitable for use with preservative-treated lumber such as Alkaline Copper Quaternary (ACQ).

2.6.1.1.2 *Stainless Steel Screws:*

2.6.1.1.2.1 Grade 316 stainless steel screws are recognized for use in all preservative-treated and fire-retardant treated wood applications and are suitable for severe exterior environments.


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2.6.2 Use of fasteners in locations exposed to saltwater spray is outside the scope of this report, unless Grade 316 stainless steel fasteners are specified.

2.7 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]


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## 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/A153M: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware*

4.3.3 *ASTM A307: Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength*

4.3.4 *ASTM D1761: Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials*

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

4.3.6 *ASTM F1575: Standard Test Method for Determining Bending Yield Moment of Nails, Spikes, and Dowel-type Threaded Fasteners*

## 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 an 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.


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## 6 Tabulated Properties Generated from Nationally Recognized Standards

6.1 *General*

6.1.1 The allowable fastener spacing values presented in this section are derived from engineering analysis based on the reference lateral design values (Z) for dowel-type fasteners, calculated in accordance with the yield limit equations in NDS Chapter 12.

6.1.2 The engineering methodology for this report is anchored to empirical test data. Full-scale ledger-to-band-joist connection assemblies were constructed and tested to failure in accordance with ASTM D1761. The ultimate capacities observed in this testing were used to establish a performance benchmark.

6.1.3 For the purposes of all fastener capacity calculations within this report, Owens Corning Lumber Structural Framing, when used as a ledger (side member), shall be assigned an Equivalent Specific Gravity (ESG) of 0.54 for lateral shear loading applications.

6.1.3.1 See *Table 9* in Report Number 2302-42 for the published equivalent specific gravity values that apply to specific fastening conditions.

6.1.3.2 The resulting fastener spacing schedules provided in **Table 3**, **Table 4**, and **Table 5** have been engineered to provide connection capacities that meet or exceed the performance of the prescriptive connections detailed in IRC Table R507.9.1.3(1), establishing code compliance as an alternative solution.

6.1.4 *Design:*

6.1.4.1 Design of the connections in this report is governed by the applicable code and the provisions for dowel-type fasteners in the NDS.

6.1.4.2 Unless otherwise noted, adjustment of the design values for duration of load shall be in accordance with the applicable code.

6.2 *Owens Corning Lumber Structural Framing Ledger to Wood Band Joist Connections*

6.2.1 The fasteners specified in this report are designed for attaching an Owens Corning Lumber Structural Framing deck ledger to the band joist of a building in accordance with IBC Section 1604.8.3 and IRC Section R507.9.

6.2.2 The IRC provides prescriptive fastener spacing for the attachment of a deck ledger to a rim joist with $^1/_2$" diameter lag screws or through bolts as shown in IRC Table R507.9.1.3(1).

6.2.3 **Table 3**, **Table 4**, and **Table 5** provide the fastener 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,[28] IRC Section R104.2.2,[29] and IRC Section R507.9, in addition to generally accepted engineering practice.

6.2.3.1 Screw spacing is provided for a deck live load of 40-psf in accordance with IRC Section R301.5 and a deck dead load of 10-psf.

6.2.3.2 In addition, an alternate loading condition (deck live load = 60-psf, deck dead load = 10-psf) required by some jurisdictions is also shown.

6.2.4 When installed in accordance with the spacing requirements of **Table 3**, **Table 4**, and **Table 5**, the Owens Corning Lumber Structural Framing ledger connection provides performance equivalent to the requirements of IRC Section R507.9.


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**Table 3**. Allowable On-Center Spacing for Proprietary Carbon Steel Screws and Stainless Steel Screws in Owens Corning Lumber Structural Framing Ledgers[3,6]

| Loading Condition[2] | Fastener Length[4] (in) | Band Joist Material[5,7,9] | Ledger Material[8] | Maximum Deck Joist Spans (ft) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 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 Ledger Board Fasteners (in) | | | | | | |
| LL + DL 40-psf + 10-psf | 4 or 5 | Sawn Lumber | Owens Corning Lumber Structural Framing[10] | 31 | 23 | 18 | 15 | 13 | 11 | 10 |
| | | SCL[(1)] | | 35 | 26 | 21 | 17 | 15 | 13 | 11 |
| LL + DL 60-psf + 10-psf | 4 or 5 | Sawn Lumber | | 22 | 16 | 13 | 11 | 9 | 8 | 7 |
| | | SCL[(1)] | | 25 | 19 | 15 | 12 | 11 | 9 | 8 |

SI: 1 in = 25.4 mm, 1 ft = 0.305 m, 1-psf = 0.0479 kN/m$^2$

1. SCL = Structural Composite Lumber
2. 10 pounds (psf) added for typical dead load requirements. Additional dead loads are not accounted for.
3. For the wood-based component(s), a load duration factor ($C_D$) of 1.00 was applied. Spacing may be adjusted by the applicable load duration as specified in the NDS. All adjustment factors shall be applied per the NDS. For in-service moisture content greater than nineteen percent (19%), use Wet Service Factor ($C_M$) = 0.70.
4. Fasteners are required to have full penetration into the band joist and shall be staggered from the top to the bottom along the length of the ledger while maintaining the required edge and end distances shown in **Figure 3**.
5. Solid sawn band joists shall be minimum SPF, having a specific gravity of 0.42.
6. Fastener spacing is based on the governing evaluated connection strength and serviceability criteria. Maximum spacing shall not exceed the values shown in this table. See **Figure 2**. for installation diagram. See **Figure 3** for fastener spacing diagram
7. A maximum $^1/_2$" structural sheathing may be installed between the ledger and the band joist.
8. Minimum ledger board requirements: 1$^1/_2$" thick and 7$^1/_2$" depth.
9. Minimum band joist requirements: Specific gravity of 0.42 for sawn lumber and equivalent specific gravity of 0.50 for SCL; sawn lumber band joist 1$^1/_2$" thick and 7$^1/_2$" depth; SCL band joist 1$^1/_8$" thick and 7$^1/_2$" depth.
10. Refer to Report Number 2302-42 for properties of Owens Corning Lumber Structural Framing.

**Table 4**. Allowable On-Center Spacing for $^1/_2$" Lag Screws in Owens Corning Lumber Structural Framing Ledgers[3,6]

| Loading Condition[2] | Fastener Length[4] (in) | Band Joist Material[5,7,9] | Ledger Material[8] | Maximum Deck Joist Spans (ft) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 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 Ledger Board Fasteners (in) | | | | | | |
| LL + DL 40-psf + 10-psf | 4 or 5 | Sawn Lumber | Owens Corning Lumber Structural Framing[(10)] | 24 | 18 | 14 | 12 | 10 | 9 | 8 |
| | | SCL[(1)] | | 24 | 18 | 14 | 12 | 10 | 9 | 8 |
| LL + DL 60-psf + 10-psf | 4 or 5 | Sawn Lumber | | 17 | 13 | 10 | 8 | 7 | 6 | 5 |
| | | SCL[(1)] | | 17 | 12 | 10 | 8 | 7 | 6 | 5 |

SI: 1 in = 25.4 mm, 1 ft = 0.305 m, 1-psf = 0.0479 kN/m$^2$

1. SCL = Structural Composite Lumber
2. 10 pounds (psf) added for typical dead load requirements. Additional dead loads are not accounted for.
3. For the wood-based component(s), a load duration factor ($C_D$) of 1.00 was applied. Spacing may be adjusted by the applicable load duration as specified in the NDS. All adjustment factors shall be applied per the NDS. For in-service moisture content greater than nineteen percent (19%), use Wet Service Factor ($C_M$) = 0.70.
4. Fasteners are required to have full penetration into the band joist and shall be staggered from the top to the bottom along the length of the ledger while maintaining the required edge and end distances shown in **Figure 3**.
5. Solid sawn band joists shall be minimum SPF, having a specific gravity of 0.42.
6. Fastener spacing is based on the governing evaluated connection strength and serviceability criteria. Maximum spacing shall not exceed the values shown in this table. See **Figure 2**. for installation diagram. See **Figure 3** for fastener spacing diagram
7. A maximum $^1/_2$" structural sheathing may be installed between the ledger and the band joist.
8. Minimum ledger board requirements: 1$^1/_2$" thick and 7$^1/_2$" depth.
9. Minimum band joist requirements: Specific gravity of 0.42 for sawn lumber and equivalent specific gravity of 0.50 for SCL; sawn lumber band joist 1$^1/_2$" thick and 7$^1/_2$" depth; SCL band joist 1$^1/_8$" thick and 7$^1/_2$" depth.
10. Refer to Report Number 2302-42 for properties of Owens Corning Lumber Structural Framing.


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**Table 5**. Allowable On-Center Spacing for 1/2" Bolt in Owens Corning Lumber Structural Framing Ledgers[3,6]

| Loading Condition[2] | Fastener Length[4] (in) | Band Joist Material[5,6,9] | Ledger Material[8] | Maximum Deck Joist Spans (ft) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 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 Ledger Board Fasteners (in) | | | | | | |
| LL + DL 40-psf + 10-psf | 4 or 5 | Sawn Lumber | Owens Corning Lumber Structural Framing[10] | 26 | 20 | 16 | 13 | 11 | 10 | 8 |
| | | SCL[1] | | 26 | 19 | 15 | 13 | 11 | 9 | 8 |
| LL + DL 60-psf + 10-psf | 4 or 5 | Sawn Lumber | | 19 | 14 | 11 | 9 | 8 | 7 | 6 |
| | | SCL[1] | | 18 | 14 | 11 | 9 | 8 | 7 | 6 |

SI: 1 in = 25.4 mm, 1 ft = 0.305 m, 1-psf = 0.0479 kN/m$^2$

1. SCL = Structural Composite Lumber
2. 10 pounds (psf) added for typical dead load requirements. Additional dead loads are not accounted for.
3. For the wood-based component(s), a load duration factor ($C_D$) of 1.00 was applied. Spacing may be adjusted by the applicable load duration as specified in the NDS. All adjustment factors shall be applied per the NDS. For in-service moisture content greater than nineteen percent (19%), use Wet Service Factor ($C_M$) = 0.70.
4. Fasteners are required to have full penetration into the band joist and shall be staggered from the top to the bottom along the length of the ledger while maintaining the required edge and end distances shown in **Figure 3**.
5. Solid sawn band joists shall be minimum SPF, having a specific gravity of 0.42.
6. Fastener spacing is based on the governing evaluated connection strength and serviceability criteria. Maximum spacing shall not exceed the values shown in this table. See **Figure 2**. for installation diagram. See **Figure 3** for fastener spacing diagram
7. A maximum 1/2" structural sheathing may be installed between the ledger and the band joist.
8. Minimum ledger board requirements: 1 1/2" thick and 7 1/2" depth.
9. Minimum band joist requirements: Specific gravity of 0.42 for sawn lumber and equivalent specific gravity of 0.50 for SCL; sawn lumber band joist 1 1/2" thick and 7 1/2" depth; SCL band joist 1 1/8" thick and 7 1/2" depth.
10. Refer to Report Number 2302-42 for properties of Owens Corning Lumber Structural Framing.

6.3 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[30]

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.[31]

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.[32]


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## 8 Regulatory Evaluation and Accepted Engineering Practice

8.1 Owens Corning Lumber Structural Framing complies with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 The building codes provide a pathway for the approval of alternative materials and methods of construction that are not specifically prescribed, provided they can be shown to meet the intent of the code. IBC Section 104.2.3[33] and IRC Section R104.2.2[34] authorize the building official to approve such alternatives when sufficient evidence of compliance is submitted. This report constitutes that evidence.

8.1.2 The engineering analysis and testing documented in this report demonstrate that ledger connections designed using the tables in **Section 6.2**, provides a level of structural performance that is equivalent to, or greater than, the prescriptive wood ledger connections specified in IRC Table R507.9.1.3(1). This equivalency is the basis for its approval as an alternative.

8.2 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[35] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise,[36] respectively.

8.3 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 Pilot holes are not required for proprietary, self-tapping structural screws unless required by the fastener manufacturer installation instructions, or where the lumber component is prone to splitting. Where pilot holes are used, the provisions in NDS Chapter 12 shall be followed.

9.4 *Installation Procedure*

9.4.1 Choose an appropriate fastener from the categories listed in **Table 2**. The fastener must be long enough to pass through the Owens Corning Lumber Structural Framing ledger and any intermediate sheathing, so that the threads fully engage the band joist material and the fastener tip extends beyond the back face of the band joist.

9.4.1.1 For most applications, a 4" or 5" long screw will be required.

9.4.1.2 Through-bolts shall extend through the complete connection assembly and shall be provided with the required nuts and washers.

9.4.2 Temporarily brace the Owens Corning Lumber Structural Framing ledger in its final position against the building band joist, ensuring it is level and at the correct elevation. A maximum $^1/_2$" structural sheathing layer is permitted between the ledger and the band joist.

9.4.3 Install the fasteners at the required on-center spacing specified in **Table 3**, **Table 4**, and **Table 5**, through the ledger and into the band joist.

9.4.4 Fasteners must be installed in two rows, staggered along the length of the ledger as shown in **Figure 3**. This pattern ensures loads are distributed effectively and minimizes the potential for splitting in the wood band joist. Maintain all minimum edge and end distances as shown.


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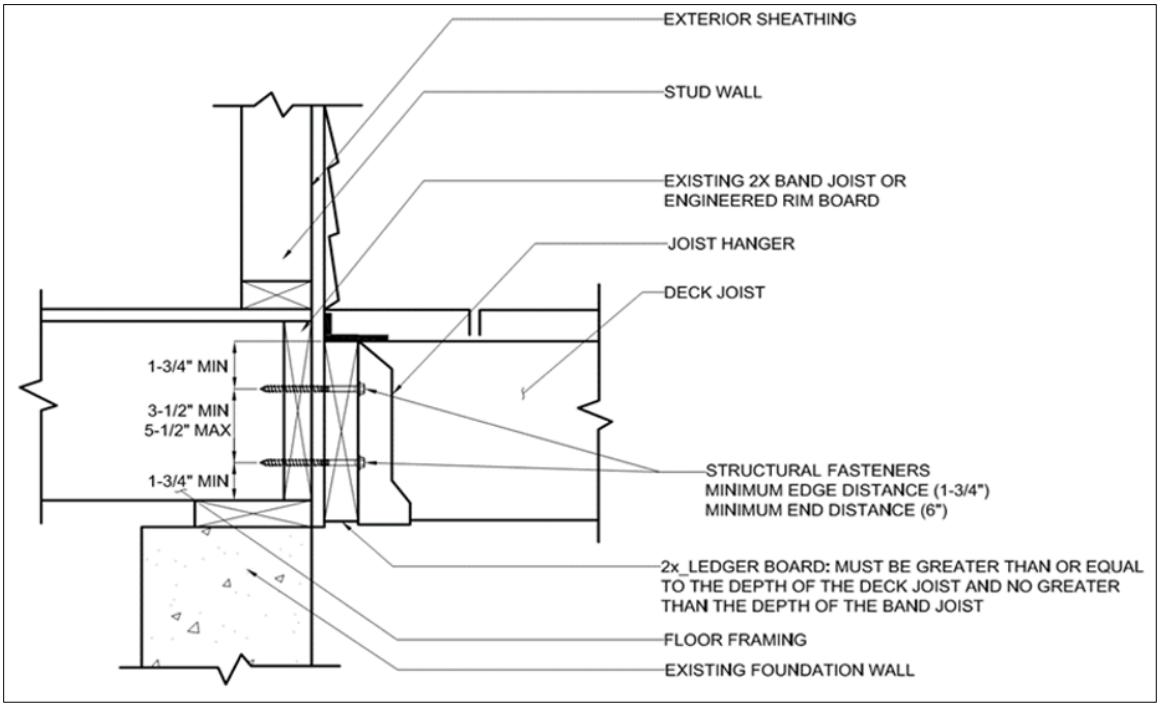


**Figure 2**. Owens Corning Lumber Structural Framing Deck Connection

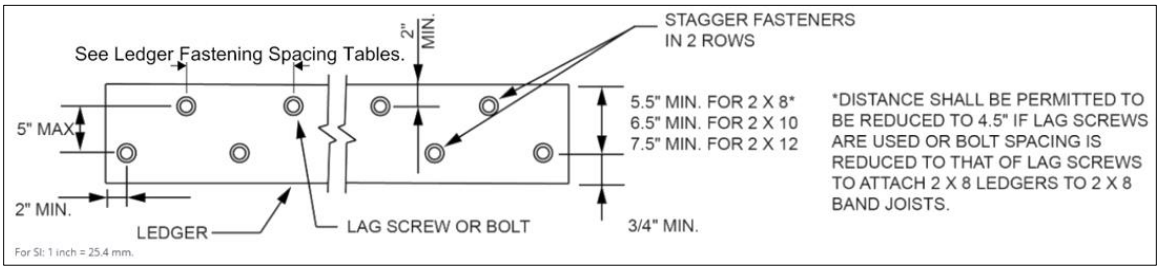


**Figure 3**. Fastener Ledger Connections Spacing

## 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 Testing performed in general accordance with ASTM D1761: Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials.

10.1.2 Full-scale lateral shear resistance tests were conducted on ledger-to-rim-board connections using Owens Corning Lumber Structural Framing as the ledger material and 4" proprietary stainless-steel screws. Test assemblies included a single layer of $^{7}/_{16}$" OSB sheathing between the ledger and the rim board.

10.2 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.


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10.3 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.

10.4 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.

10.5 *Testing and Engineering Analysis*

10.5.1 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.[37]

10.6 Where additional condition of use and/or regulatory compliance information is required, please search for Owens Corning Lumber Structural Framing on the DrJ Certification website.

## 11 Findings

11.1 As outlined in **Section 6**, Owens Corning Lumber Structural Framing has 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, Owens Corning Lumber Structural Framing shall be approved for the following applications:

11.2.1 As an alternative to the requirements of IBC Section 1604.8.3 and IRC Section R507.9.

11.3 Unless exempt by state statute, when Owens Corning Lumber Structural Framing is to be used as a structural and/or building envelope component in the design of a specific building, the design shall be performed by an RDP.

11.4 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Owens Corning.

11.5 IBC Section 104.2.3[38] (IRC Section R104.2.2[39] and IFC Section 104.2.3[40] 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.

11.6 **Approved:**[41] Building regulations require that the building official shall accept duly authenticated reports.[42]

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

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

11.6.3 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.


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

11.8 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.[43]

## 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 Where the band joist is preservative-treated wood or fire-retardant treated, the connection design shall account for applicable reductions or adjustment requirements specified by the treatment manufacturer and the applicable design standard.

12.3 For conditions not covered in this report, connections shall be designed in accordance with generally accepted engineering practice. When the capacity of a connection is controlled by fastener metal strength rather than wood strength, the metal strength must not be multiplied by the adjustment factors specified in the NDS.

12.4 Use of fasteners in locations exposed to saltwater or saltwater spray is outside the scope of this report.

12.5 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:

12.5.1 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.

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

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

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

12.5.5 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.

12.5.6 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.

12.6 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.

12.7 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).

12.8 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.


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## 13 Identification

13.1 Owens Corning Lumber Structural Framing, as listed in **Section 1.1**, is 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: www.owenscorning.com/en-us/lumber/products/structural-framing-and-posts.

## 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.


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# Notes

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

2 2021 IRC Section R317.3

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 2021 IBC Section 104.11

29 2021 IRC Section R104.11

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

31 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


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[32] 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

[33] 2021 IBC Section 104.11

[34] 2021 IRC Section R104.11

[35] 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.

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

[37] 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

[38] 2021 IBC Section 104.11

[39] 2021 IRC Section R104.11

[40] 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

[41] 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.

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

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


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