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DIVISION: 07 00 00 – THERMAL AND MOISTURE
Section: 07 40 46 – Plastic Siding

REPORT HOLDER:
Boral Building Products Inc.
29797 Beck Road
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REPORT SUBJECT:
Grayne Engineered Shake and Shingle

1.0 SCOPE OF EVALUATION

1.1 This Research Report addresses compliance with the following Codes:

- 2018 and 2015 *International Building Code*® (IBC)
- 2018 and 2015 *International Residential Code*® (IRC)
- 2017 *Florida Building Code* excluding High Velocity Hurricane Zone (see Section 9)
- 2016 *California Building Code Including SFM 12-7A-1* (see Section 9)

NOTE: This report references 2018 Code sections with [2015] Code sections shown in brackets where they differ.

1.2 Grayne Engineered Shake and Shingle has been evaluated for the following properties:

- Durability
- Weather Resistance
- Wind Load Resistance

1.3 Grayne Engineered Shake and Shingle has been evaluated for the following uses:

- Use as an exterior siding attached to an approved structural sheathing

2.0 STATEMENT OF COMPLIANCE

Grayne Engineered Shake and Shingle complies with the Codes listed in Section 1.1, for the properties stated in Section 1.2 and uses stated in Section 1.3, when installed as described in this report, including the Conditions of Use stated in Section 6.

3.0 DESCRIPTION

3.1 Grayne Engineered Shake and Shingle is a composite polyvinyl chloride (PVC) siding, manufactured using a sheet extrusion process, simulating a natural cedar siding. The Grayne Engineered Shake and Shingle is available with exposure widths of 5 or 7.5 inches.

4.0 PERFORMANCE CHARACTERISTICS

4.1 Grayne Engineered Shake and Shingle products are not evaluated for resisting positive wind pressure and must be installed over sheathing materials designed and approved for the required positive design wind pressure.

4.2 Grayne Engineered Shake and Shingle installed in accordance with the code specified installation is recognized for use within the corresponding limitations prescribed by the code for wind speed, exposure category and other conditions, See Section 5.1 for applications within the code prescribed conditions.

4.3 Maximum allowable wind pressures are given in Table 1 and 2 for siding installed in accordance with Section 5.2.

5.0 INSTALLATION

5.1 General:

Grayne Engineered Shake and Shingle must be installed in accordance with the manufacturer's published installation instructions, the applicable Code, and this Research Report. A copy of the manufacturer's instructions must be available on the jobsite during installation.



5.2 Application:

5.2.1 Prescriptive Requirements

5.2.1.1 For IBC and FBC applications: Areas where the nominal design wind speed (V_{asd}) does not exceed 100 miles per hour and the building height is no greater than 40 ft. in Exposure C, installation shall comply with the prescriptive requirements in Section 1404.14 [1405.14 of the IBC and FBC] and one of the fastening methods specified in Table 1 and 2.

5.2.1.2 For IRC applications: Areas where the basic wind speed (V_{asd}) is less than 110 miles per hour in Exposure B and does not exceed 90 mph in Exposure C or 85 mph in Exposure D, installation shall comply with the prescriptive requirements in Section R703.11.1 and Table R703.3(1) of the IRC and one of the fastening methods specified in Table 1 and 2.

5.2.1.3 For FBC-Residential applications: Areas where the negative wind pressures do not exceed 30 psf, as determined in accordance with Table R301.2(2) and adjusted for mean roof height and exposure in accordance with Table R301.2(3), installation shall comply with the prescriptive requirements in Section R703.11.1 and Table R703.3(1) of the FBC-Residential code and one of the fastening methods specified in Table 1 and 2.

5.2.2 In Excess of Prescriptive Requirements

5.2.2.1 Grayne Engineered Shake and Shingle shall be installed over structural wood sheathing complying with DOC PS 1, DOC PS 2 or ANSI/APA PRG 320, per Section 2303.1.4 of the IBC and FBC.

5.2.2.2 Sheathing must be covered by an approved water-resistive barrier in accordance with IBC Section 1404.2 and provide a means for draining water that enters the assembly to the exterior.

5.2.2.3 Flashing shall be installed in accordance with Section 1404.4 [1405.4 of the IBC and FBC], and Section R703.8 of the IRC and FBC-Residential.

5.2.2.4 Protection against condensation shall be provided in accordance with Section 1404.3 [1405.3 of the IBC and FBC].

5.2.2.5 Fasteners shall be corrosion-resistant nails, staples or screws with dimensions and fastening schedule as described in Table 1 and 2.

6.0 CONDITIONS OF USE

6.1 Installation must comply with this Research Report, the manufacturer's published installation instructions, and the applicable Code. In the event of a conflict, this report governs.

6.2 The *Grayne Engineered Shake and Shingle* described in this Research Report complies with, or is a suitable alternative to, what is specified in those Codes listed in Sections 1.0 and 2.0 of this report, subject to the following conditions:

6.2.1 Installation must comply with this Research Report, the manufacturer's published installation instructions and the applicable Code. In the event of a conflict between the manufacturer's instructions and this report, this report governs.

6.2.2 Grayne Engineered Shake and Shingle products listed in this report are limited to exterior use in Type V-B (IBC and FBC) construction and construction permitted by the IRC and FBC-Residential.

6.2.3 Wind design pressures determined from nominal design wind speeds (V_{asd}) in accordance with Chapter 16 of the IBC and FBC, and Section R301.2.1.1 of the IRC and FBC-Residential, shall not exceed the allowable wind loads in Table 1 and 2.

6.2.4 Exterior walls must be braced or sheathed to resist racking loads with approved materials in accordance with the applicable code.

6.2.5 All products are manufactured by Boral Building Products Inc. in accordance with the manufacturer's approved quality control system with inspections by Intertek.

7.0 SUPPORTING EVIDENCE

7.1 Manufacturer's drawings and installation instructions.





7.2 The reports of testing and engineering analysis demonstrating compliance with the performance requirements of ICC-ES AC37, Acceptance Criteria for Vinyl Siding, Revised October 2017 and of ASTM D 3679-13 [-11], Rigid Poly (Vinyl Chloride) (PVC) Siding.

7.3 Reports of testing in accordance with California Building Code Standard SFM 12-7A-1.

7.4 Documentation of an Intertek approved quality control system for the manufacturing of products recognized in this report.

8.0 IDENTIFICATION

Grayne Engineered Shake and Shingle is identified with the manufacturer's name (Boral Building Products Inc.), address and telephone number, the product name (Grayne Engineered Shake and Shingle), the following statement: "Conforms to SFM 12-7A-1 and ASTM Specification D3679", the Intertek Mark as shown below, and the Code Compliance Research Report number (CCRR-0241).



9.0 OTHER CODES

9.1 FLORIDA BUILDING CODE

9.1.1 Scope of Evaluation:

Grayne Engineered Shake and Shingle were evaluated for compliance with the 2017 *Florida Building Code*.

9.1.2 Conclusion:

Grayne Engineered Shake and Shingle, described in Sections 2.0 through 7.0 of this Research Report, comply with the 2017 *Florida Building Code*, subject to the following conditions:

- Use of Grayne Engineered Shake and Shingle for compliance with the High-Velocity Hurricane Zone provisions of the 2017 *Florida Building Code – Building* and the *Florida Building Code – Residential* has not been evaluated and is outside the scope of this Research Report.
- Intertek is a quality assurance entity approved by the Florida Building Commission.

9.2 CALIFORNIA BUILDING CODE

9.2.1 Scope of Evaluation: The Grayne Engineered Shake and Shingle was evaluated for compliance to the 2016 *California Building Code*.

9.2.2 Conclusion: The Grayne Engineered Shake and Shingle, described in sections 2.0 through 7.0 of this Research Report comply with the 2016 *California Building Code*.

10.0 CODE COMPLIANCE RESEARCH REPORT USE

10.1 Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

10.2 Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

10.3 Reference to the <https://bpdirectory.intertek.com> is recommended to ascertain the current version and status of this report.

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TABLE 1 - WIND RESISTANCE – MAXIMUM ALLOWABLE NEGATIVE DESIGN PRESSURE (PSF)

Product Name	Exposure Width	Fasteners	Allowable Design Pressure ⁽¹⁾
Grayne Engineered Shake and Shingle	5 inches	1-1/2" long, 7/16" crown staples spaced 16" on center, penetrating through the nail hem and sheathing, and into the studs.	132
		1-1/2" long, 7/16" crown staples spaced 10" on center, penetrating through the nail hem and sheathing,	213
		1-1/2" long galvanized roofing nails spaced 16" on center, with every nail penetrating through the sheathing and into the studs	150
		1-1/2" long galvanized roofing nails spaced 10" on center penetrating through the sheathing	225
		1-1/2" long galvanized roofing nails spaced 8" on center, with every other nail penetrating through the sheathing and into the studs.	166
		1-1/2" long galvanized #8 pan head screws spaced 16" on center penetrating through the sheathing into the studs	151
		1-1/2" long galvanized #8 pan head screws spaced 10" on center penetrating through the sheathing	250

- (1) Allowable wind loads are applicable to wind design pressure derived from nominal wind speed (V_{asd}) per IBC Section 1609.3.1
- (2) Allowable Design Pressures are determined in accordance with Annex A1 of ASTM D3679, using a pressure equalization factor (PEF) of 0.36 and safety factor of 1.5.
- (3) Allowable Design Pressures apply to siding installed on walls with solid internal and external sheathing. For applications where siding is installed on walls without internal sheathing (open studs), Allowable Design Pressures shall be reduced by applying a 0.36 adjustment factor.





TABLE 2 (CONTINUED) - WIND RESISTANCE – MAXIMUM ALLOWABLE NEGATIVE DESIGN PRESSURE (PSF)

Product Name	Exposure Width	Fasteners	Allowable Design Pressure ⁽¹⁾
Grayne Engineered Shake and Shingle	7.5 inches	1-1/2" long, 7/16" crown staples spaced 16" on center, penetrating through the nail hem and sheathing, and into the studs.	157
		1-1/2" long, 7/16" crown staples spaced 10" on center, penetrating through the nail hem and sheathing.	179
		1-1/2" long galvanized roofing nails spaced 16" on center, with every nail penetrating through the sheathing and into the studs	123
		1-1/2" long galvanized roofing nails spaced 10" on center penetrating through the sheathing	97
		1-1/2" long galvanized #8 pan head screws spaced 16" on center penetrating through the sheathing into the studs	169
		1-1/2" long galvanized #8 pan head screws spaced 10" on center penetrating through the sheathing	250

- (1) Allowable loads are applicable to wind design pressure derived from nominal wind speed (V_{asd}) per IBC Section 1609.3.1
- (2) Allowable Design Pressures are determined in accordance with Annex A1 of ASTM D3679, using a pressure equalization factor (PEF) of 0.36 and safety factor of 1.5
- (3) Design Pressures apply to siding installed on walls with solid internal and external sheathing. For applications where siding is installed on walls without internal sheathing (open studs), Allowable Design Pressures shall be reduced by applying a 0.36 adjustment factor.



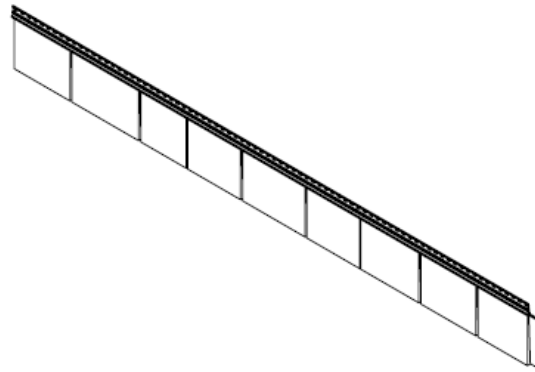


FIGURE 1 – GRAYNE ENGINEERED SHAKE AND SHINGLE PANEL

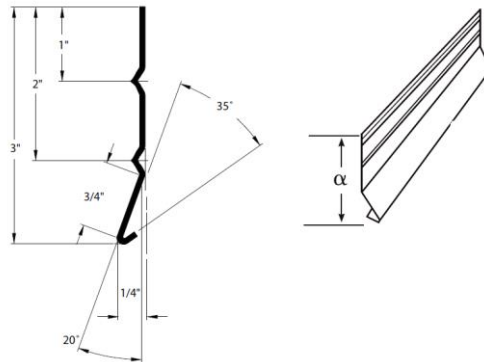


FIGURE 2 – STARTER STRIP

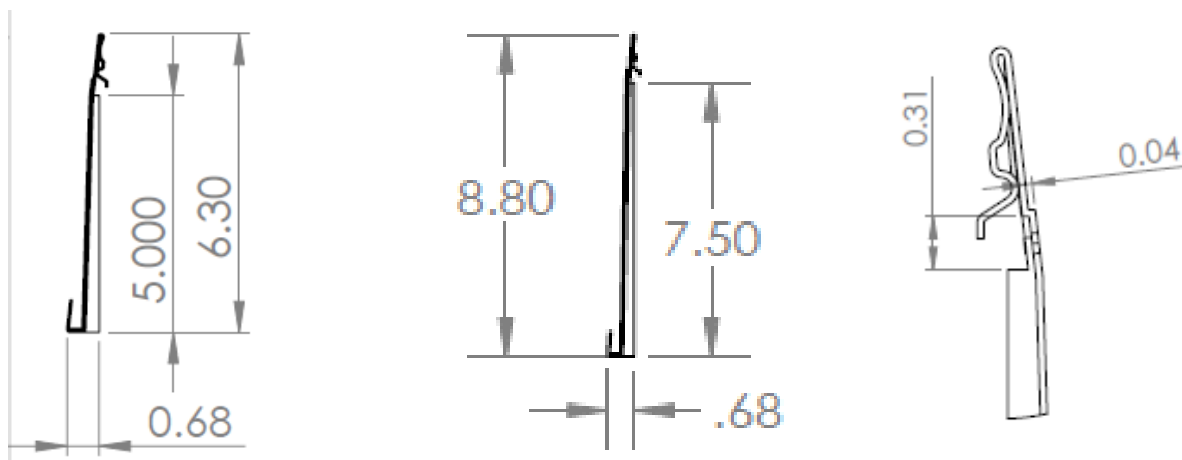


FIGURE 3 – GRAYNE ENGINEERED SHAKE AND SHINGLE PANEL CROSS SECTION AND CLIP DETAIL

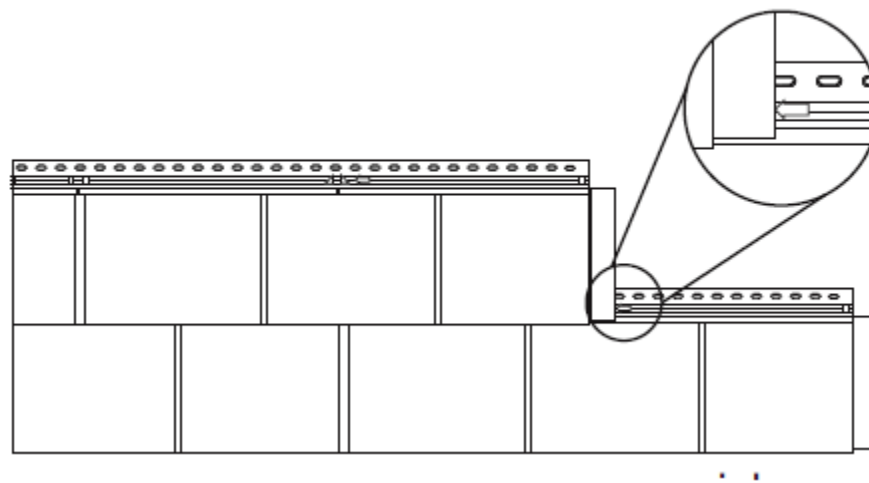
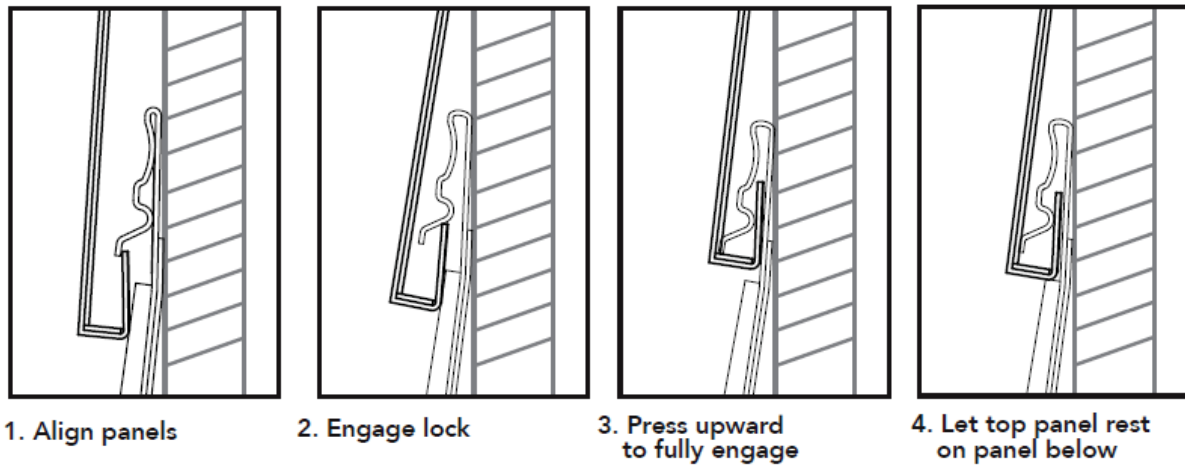


FIGURE 4 – GRAYNE ENGINEERED SHAKE AND SHINGLE TYPICAL INSTALLATION