Technical Evaluation Report
TER 1312-03
Versetta Stone® Panelized Stone
Veneer Applications Using Continuous
Insulation Over Concrete or Masonry
Walls

Boral Stone Group

Product:
Versetta Stone® Panelized
Stone Veneer

Issue Date:
February 11, 2014
Revision Date:
September 3, 2019
Subject to Renewal:
April 1, 2020
**Technical Evaluation Report (TER)**

**Versetta Stone® Panelized Stone Veneer**

**Applications Using Continuous Insulation Over Concrete or Masonry Walls**

**TER No. 1312-03**

Boral Stone Group

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**Issue Date: February 11, 2014**

**Updated: September 3, 2019**

**Subject to Renewal: April 1, 2020**

**DIVISION: 07 00 00 – THERMAL AND MOISTURE PROTECTION**

Section: 07 44 53 – Glass Fiber Reinforced Cementitious Panels
Section: 07 44 63 – Fabricated Faced Panel Assemblies

1. **Product Evaluated:**

1.1. Versetta Stone® Panelized Stone Veneer

1.2. For the most recent version of this Technical Evaluation Report (TER), visit drjcertification.org. For more detailed state professional engineering and code compliance legal requirements and references, visit drjcertification.org/statelaw. DrJ is fully compliant with all state professional engineering and code compliance laws.

1.3. This TER can be used to obtain product approval in any country that is an IAF MLA Signatory (all countries found [here](https://iafmla.org/)) and covered by an IAF MLA Evaluation per the Purpose of the MLA (as an example, see letter to ANSI from the Standards Council of Canada). Manufacturers can go to jurisdictions in the U.S., Canada and other IAF MLA Signatory Countries and have their products readily approved by authorities having jurisdiction using DrJ’s ANSI accreditation.

1.4. Building code regulations require that evaluation reports are provided by an approved agency meeting specific requirements, such as those found in *IBC Section 1703*. Any agency accredited in accordance with ANSI ISO/IEC 17065 meets this requirement within ANSI’s scope of accreditation. For a list of accredited agencies, visit ANSI’s [website](https://www.ansi.org/). For more information, see drjcertification.org.

1.5. Requiring an evaluation report from a specific private company (i.e. ICC-ES, IAPMO, CCMC, DrJ, etc.) can be viewed as discriminatory and is a violation of international, federal, state, provincial and local anti-trust and free trade regulations.

1.6. DrJ’s code compliance work:

1.6.1. Conforms to code language adopted into law by individual states and any relevant consensus based standard such as an ANSI or ASTM standard.

1.6.2. Complies with accepted engineering practice, all professional engineering laws and by providing an engineer’s seal DrJ takes professional responsibility for its specified scope of work.
2. Applicable Codes and Standards:


2.2. 2012, 2015 and 2018 International Residential Code (IRC)

2.3. AISI S100 – North American Specification for the Design of Cold-Formed Steel Structural Members (S100)

2.4. ANSI/AWC NDS – National Design Specification® (NDS®) for Wood Construction

2.5. ASCE/SEI 7 – Minimum Design Loads and Associated Criteria for Buildings and Other Structures


2.7. ASTM C1186 – Standard Specification for Flat Non-Asbestos Fiber-Cement Sheets

2.8. ASTM C90 – Standard Specification for Loadbearing Concrete Masonry Units


2.13. AWC TR 12 – General Dowel Equations for Calculating Lateral Connection Values

2.14. SBCA FS 100 – Standard Requirements for Wind Pressure Resistance of Foam Plastic Insulating Sheathing Used in Exterior Wall Covering Assemblies

3. Performance Evaluation:

3.1. Versetta Stone® was evaluated:

3.1.1. For use as an exterior wall covering on new or existing concrete or masonry walls in accordance with IBC Section 1402 and IRC Section R703.

3.1.2. For use as a weather-resistant covering in accordance with IBC Section 1403.2 and IRC Section R703.1.1.

3.1.3. To determine the ability of the product to resist wind loads in accordance with IBC Section 1609 and IRC Section R703.1.2.

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1 Unless otherwise noted, all references in this code compliant technical evaluation report (TER) are from the 2018 version of the codes and the standards referenced therein, including, but not limited to, ASCE 7, SDPWS, and WFCM. This product also complies with the 2000-2015 versions of the IBC and IRC and the standards referenced therein. As required by law, where this TER is not approved, the building official shall respond in writing, stating the reasons this TER was not approved. For variations in state and local codes, if any see Section 8.

2 2015 IBC Section 1403

3 2015 IBC Section 1404.2
3.1.4. For use as an exterior finish over concrete or masonry walls with the addition of continuous insulation installed between the concrete or masonry walls and the Versetta Stone®.

3.1.4.1. Foam sheathing shall have a minimum compressive strength of 15 psi in accordance with ASTM C578 or ASTM C1289 and be qualified for wind pressure resistance in accordance with ANSI/SBCA FS 100.

3.1.5. To determine the ability of various fasteners to support the gravity and transverse loads induced by the products when installed over concrete and masonry construction with the addition of continuous insulation installed between the framing and the Versetta Stone®.

3.2. Use in applications requiring a fire-resistance rating are outside the scope of this evaluation.

3.3. Any code compliance issues not specifically addressed in this section are outside the scope of this TER.

4. Product Description and Materials:

4.1. Versetta Stone® is a non-structural, fiber-reinforced, cement-based masonry wall cladding that is mechanically attached to masonry or concrete walls.

4.2. The panels have a simulated stone veneer surface.

4.3. The panels measure 36.4" long x 9.5" tall and 1.8" thick and have tongue-and-groove edges that engage adjacent panels.

4.3.1. The finished exposure of the panels is 8" x 36".

4.4. A 0.0217"-thick painted G90 galvanized steel nailing flange is molded along the top edge of the panels for attachment to the substrate (Figure 1).

4.5. The bottom edge and the ends of the panels fit together using tongue-and-groove technology.

4.6. The panels have an installed weight of approximately 8.5 psf (17 pounds per panel).

4.7. Additionally, the stone veneer panels are supplemented with various accessories (such as starter strips, bridging, corner pieces, etc.) to aid with installation.

5. Applications:

5.1. Versetta Stone® is used as an exterior wall covering in accordance with the applicable sections of IBC Chapter 14 and IRC Section R703 and is installed over concrete and masonry walls capable of supporting the imposed loads in accordance with IBC Section 1609 and IRC Section R301.2.1, including all required transverse wind loads.

5.2. Versetta Stone® is also used as an exterior wall covering installed over concrete and masonry walls where the walls are over sheathed with continuous insulation.

5.3. Fasteners for gravity loaded single shear connections for this installation are as shown in Table 1.
5.4. Versetta Stone® shall not be installed in areas where the design wind pressure exceeds the capacity of the cladding and its attachment to resist the load in accordance with Table 2.

5.4.1. See Table 3 for wind pressures associated with $V_{ult}$ per ASCE 7-10 and ASCE 7-16.

5.4.2. Table 3 is provided as an aid for designers in determining the allowable wind pressures for Versetta Stone® panel installation. Wind speeds are included for both $V_{ult}$ and $V_{asd}$.

5.4.3. Design in accordance with generally accepted engineering practice may be used as an alternative to Section 5.3.

5.5. For additional information or use in other applications, consult the manufacturer’s installation instructions.

**Table 1: Fastener Requirements to Support Versetta Stone® Installation Over Continuous Insulation in Concrete or Masonry Construction**

<table>
<thead>
<tr>
<th>Material</th>
<th>Fastener</th>
<th>Fastener Diameter (in)</th>
<th>Minimum Fastener Penetration (in)</th>
<th>Thickness of Continuous Insulation (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete (minimum 2,500 psi)</td>
<td>$\frac{3}{16}''$ Tapcon</td>
<td>0.1875</td>
<td>1.5</td>
<td>x x x x x x</td>
</tr>
<tr>
<td></td>
<td>$\frac{1}{4}''$ Tapcon</td>
<td>0.25</td>
<td>1.5</td>
<td>x x x x x x</td>
</tr>
<tr>
<td></td>
<td>Hilti X-C</td>
<td>0.138</td>
<td>0.75</td>
<td>x x x x x x</td>
</tr>
<tr>
<td></td>
<td>Hilti X-U</td>
<td>0.157</td>
<td>0.75</td>
<td>x x x x x x</td>
</tr>
<tr>
<td></td>
<td>Hilti X-C</td>
<td>0.138</td>
<td>1</td>
<td>x x x x x x</td>
</tr>
<tr>
<td></td>
<td>Hilti X-U</td>
<td>0.157</td>
<td>1</td>
<td>x x x x x x</td>
</tr>
<tr>
<td>Masonry (medium/normal hollow CMU per ASTM C90)</td>
<td>$\frac{3}{16}''$ Tapcon</td>
<td>0.1875</td>
<td>1</td>
<td>x x x x x x</td>
</tr>
<tr>
<td></td>
<td>$\frac{1}{4}''$ Tapcon</td>
<td>0.25</td>
<td>1</td>
<td>x x x x x x</td>
</tr>
<tr>
<td>Masonry (lightweight hollow CMU per ASTM C90)</td>
<td>Masonry Nail</td>
<td>0.148</td>
<td>1</td>
<td>x x x x x x</td>
</tr>
<tr>
<td></td>
<td>$\frac{3}{16}''$ Tapcon</td>
<td>0.1875</td>
<td>1</td>
<td>x x x x x x</td>
</tr>
<tr>
<td></td>
<td>$\frac{1}{4}''$ Tapcon</td>
<td>0.25</td>
<td>1</td>
<td>x x x x x x</td>
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<td>Hilti X-C</td>
<td>0.138</td>
<td>1</td>
<td>x x</td>
</tr>
<tr>
<td></td>
<td>Hilti X-U</td>
<td>0.157</td>
<td>1</td>
<td>x x x x x x</td>
</tr>
</tbody>
</table>

1. Table values are based on the manufacturer's published fastener properties. The methodology for reducing the fastener capacities to account for the insulation are based on the NDS® allowable lateral loads for fasteners as modified by AWC TR12 for use with a gap parameter for gravity load only (i.e., fasteners sized to support weight of cladding, while cantilevered from framing a distance equal to the foam sheathing thickness).
2. Maximum thickness of continuous insulation shall include any rain screen material, sheathing that does not serve as a nail base, and airspace between the cladding and the continuous insulation, where present.
3. Each panel shall contain a minimum of three (3) fasteners and penetrate the concrete or masonry wall as identified above.
4. Where a substrate other than nailable sheathing is used, its thickness shall be added to the continuous insulation thickness for the purpose of determining the fastener size.
5. Fasteners shall have the following minimum head diameter: Masonry nails, 0.312"; Hilti fasteners, 0.322"; Tapcon fasteners, 0.325".
6. Tools used for driving pneumatic or powder actuated fasteners shall be adjusted to avoid over driving the fasteners and damaging the panel.
### Technical Evaluation Report (TER)

#### Table 2: Wind Pressure Capacity of Versetta Stone® Installation Over Continuous Insulation on Concrete or Masonry Walls

<table>
<thead>
<tr>
<th>Fastener</th>
<th>Material</th>
<th>Minimum Fastener Penetration (in)</th>
<th>Maximum Wind Pressure (psf)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hilti Pin X-C</strong></td>
<td>Masonry (Lightweight)</td>
<td>1 or ¾</td>
<td>37.3</td>
</tr>
<tr>
<td></td>
<td>Masonry (Medium/normal)</td>
<td>1 or ¾</td>
<td>37.3</td>
</tr>
<tr>
<td></td>
<td>Concrete</td>
<td>1</td>
<td>117.3</td>
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<tr>
<td></td>
<td></td>
<td>¾</td>
<td>67.2</td>
</tr>
<tr>
<td><strong>Hilti Pin X-U</strong></td>
<td>Masonry (Lightweight)</td>
<td>1 or ¾</td>
<td>37.3</td>
</tr>
<tr>
<td></td>
<td>Masonry (Medium/normal)</td>
<td>1 or ¾</td>
<td>37.3</td>
</tr>
<tr>
<td></td>
<td>Concrete</td>
<td>1 or ¾</td>
<td>117.3</td>
</tr>
<tr>
<td><strong>Tapcon 3/16&quot; Hex Screw</strong></td>
<td>Masonry (Lightweight)</td>
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<td>54.3</td>
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<tr>
<td></td>
<td>Masonry (Medium/normal)</td>
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<td>89.6</td>
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<td>Concrete</td>
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<tr>
<td><strong>Tapcon 1/4&quot; Hex Screw</strong></td>
<td>Masonry (Lightweight)</td>
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<td></td>
<td>Masonry (Medium/normal)</td>
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<tr>
<td></td>
<td>Concrete</td>
<td>1.5</td>
<td>136.6</td>
</tr>
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</table>

1. Each panel shall contain a minimum of three (3) fasteners and penetrate the concrete or masonry wall as identified above.
2. Reported maximum wind pressure is the lower of the manufacturer published withdraw capacity per fastener or the calculated allowable pull over capacity using 2.5 lb. metal lath, converted to psf.
### Table 3: General Wind Pressure Resistance Criteria per ASCE 7-10 and 7-16 for Components & Cladding, Method 1

<table>
<thead>
<tr>
<th>Exposure Category</th>
<th>Wind Speed, $V_{ul}$ (mph)</th>
<th>Mean Roof Height (ft)</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
<th>40</th>
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<td>29.1</td>
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<td>159.9</td>
<td>163.7</td>
<td>167.6</td>
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</tr>
</tbody>
</table>

1. Design wind pressures shown are for 30' mean roof height, effective wind area of 10 sq. ft., wall corner Zone 5. For other conditions, see ASCE 7-10 and 7-16 Table 30.5-1

### 5.6. Example for use of the tables in this TER

Given the following:
- Wind Speed, $V_{ul} = 180$ mph
- Exposure D
- Mean roof height = 25'
- Concrete construction with 2" continuous insulation (CI)

Locate the appropriate fasteners in Table 1. Many will work with 2" CI.

The corresponding wind pressure from Table 3 shows that this installation corresponds to an allowable wind pressure of 125.6 psf.

Verify the withdrawal value of fasteners in Table 2.

For this example, either the $\frac{3}{16}''$ or $\frac{1}{4}''$ Tapcon Hex screws will provide both sufficient shear and withdrawal.
6. Installation:

6.1. General

6.1.1. Versetta Stone® shall be installed in accordance with the manufacturer's installation instructions and this TER. In the event of a conflict between the manufacturer’s installation instructions and this TER, the more restrictive shall govern.

6.1.2. Installation is subject to the conditions of use set forth in Section 9.

6.1.3. All Versetta Stone® vertical joints shall be staggered between courses.

6.1.4. All other installation and flashing details germane to the project shall be in accordance with the applicable building code, the building designer's details and the manufacturer's installation instructions.

6.2. Concrete and Masonry Walls

6.2.1. Versetta Stone® shall be installed over walls capable of resisting 100% of the design wind loads and shall be attached, at a minimum, in accordance with Table 1.

6.2.2. Versetta Stone® may be installed with (an) intervening layer(s) of continuous insulation and attached in accordance with Table 1.

6.2.3. Each Versetta Stone® panel shall be installed with a minimum of three (3) fasteners as follows:

6.2.3.1. Two (2) of the fasteners must be installed into the concrete or masonry at each end of the panel and have a minimum penetration depth as shown in Table 1.

6.2.3.2. The other fastener must be installed into the concrete or masonry at the center of the panel.

6.2.4. Fastener sizes shall be in accordance with Table 1 or generally accepted engineering practice.

6.2.5. A water-resistive barrier (WRB) is not required in this application; however, a WRB is permitted and may be mechanically attached, liquid applied or taped foam plastic insulating sheathing (FPIS) seams.

7. Test and Engineering Substantiating Data:

7.1. Reports showing compliance with ASTM C1185 for evaluation of moisture movement through the product as well as nail hem bond strength.

7.2. Reports showing compliance with ASTM C1186 for the physical and mechanical properties of the product.

7.3. Reports showing compliance with ASTM D3679, Annex 1 for Pressure Equalization.

7.4. Reports of transverse wind load testing in accordance with ASTM D5206, Procedure B.

7.5. Reports showing compliance with ASTM E84 for surface burning.

7.6. Report showing compliance with ASTM E2273 for water drainage efficiency.

7.7. Fastening Systems for Continuous Insulation, Final Report 10-11; New York State Energy Research and Development Authority (NYSERDA); Albany, NY; April 2010.


7.10. Report showing compliance with required quality control procedures and documentation.

7.11. The product(s) evaluated by this TER fall within the scope of one or more of the model, state or local building codes for building construction. The testing and/or substantiating data used in this TER is limited to buildings, structures, building elements, construction materials and civil engineering related specifically to buildings.
7.12. The provisions of model, state or local building codes for building construction do not intend to prevent the installation of any material or to prohibit any design or method of construction. Alternatives shall use consensus standards, performance-based design methods or other engineering mechanics based means of compliance. This TER assesses compliance with defined standards, accepted engineering analysis, performance-based design methods, etc. in the context of the pertinent building code requirements.

7.13. Some information contained herein is the result of testing and/or data analysis by other sources, which DrJ relies on to be accurate, as it undertakes its engineering analysis.

7.14. DrJ has reviewed and found the data provided by other professional sources are credible. The information in this TER conforms to DrJ’s procedure for acceptance of data from approved sources.

7.15. DrJ’s responsibility for data provided by approved sources conforms to IBC Section 1703 and any relevant professional engineering law.

7.16. Where appropriate, DrJ’s analysis is based on design values that have been codified into law through codes and standards (e.g., IRC, WFCM, IBC, SDPWS, NDS®, ACI®, AISI, PS-20, PS-2, etc.). This includes review of code provisions and any related test data that aids in comparative analysis or provides support for equivalency to an intended end-use application. Where the accuracy of design values provided herein is reliant upon the published properties of commodity materials (e.g. lumber, steel, concrete, etc), DrJ relies upon grade/properties provided by the raw material supplier to be accurate and conforming to the mechanical properties defined in the relevant material standard.

8. Findings:

8.1. Versetta Stone® is a suitable alternative to the products listed in the applicable building code for use as an exterior wall covering in accordance with IBC Section 1403.10 and the IRC Section R703.10.

8.2. Versetta Stone® is suitable for use as an exterior wall covering assembly when installed over concrete and masonry walls separately capable of resisting 100% of the design wind pressures. An intervening layer(s) of continuous insulation may be installed between the Versetta Stone® and the sheathing in accordance with Table 1-2.

8.3. IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.9 are similar) states:

104.11 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 has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code. ... Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons the alternative was not approved.

8.4. This product has been evaluated in the context of the codes listed in Section 2 and is compliant with all known state and local building codes. Where there are known variations in state or local codes that are applicable to this evaluation, they are listed here:

8.4.1. No known variations

8.5. This TER uses professional engineering law, the building code, ANSI/ASTM consensus standards and generally accepted engineering practice as its criteria for all testing and engineering analysis. DrJ’s professional engineering work falls under the jurisdiction of each state Board of Professional Engineers, when signed and sealed.

9. Conditions of Use:

9.1. Where required by the authority having jurisdiction (AHJ) in which the project is to be constructed, this TER and the installation instructions shall be submitted at the time of permit application.

9.2. Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the code official for review and approval.
9.3. Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed and/or by the Building Designer (e.g., Owner, Registered Design Professional, etc.).

9.4. Versetta Stone® panels described in this TER comply with, or are a code compliant alternative material to, codes described in Section 2 subject to the following conditions.

9.4.1. Installation shall comply with the manufacturer’s installation instructions and this TER. In the event of a conflict between the manufacturer’s installation instructions and this TER, the more restrictive shall govern.

9.4.2. Installation shall be on exterior walls consisting of concrete or masonry and shall be capable of supporting the imposed loads, including transverse wind loads.

9.4.3. Where the seismic provisions of IRC Section R301.2.2 apply, the Versetta Stone® wall assembly shall not exceed the weight limits of IRC Section R301.2.2.1, unless an engineered design is provided in accordance with IRC Section R301.1.3.

9.4.4. Walls shall be braced to resist shear (racking) load by other means in accordance with the applicable code.

9.4.5. This product shall not be used in areas where the design wind pressure exceeds the resistance of the product in accordance with Table 2.

9.4.6. Versetta Stone® panels shall be manufactured under the direction of a third-party quality assurance program to ensure continued compliance with this TER and the applicable building code.

9.4.7. Concrete and masonry walls shall be designed in accordance with IBC Chapter 19 and 21, respectively.

9.4.8. Versetta Stone® panels are manufactured in Chester, South Carolina under a quality control program with inspections by a qualified third-party inspection agency.

9.4.9. Use of Versetta Stone® panels in installations exceeding 30’ in height are outside the scope of this TER.

9.4.10. Use of Versetta Stone® panels in the high velocity hurricane zone of southern Florida is outside the scope of this TER.

9.5. Design

9.5.1. Building Designer Responsibility

9.5.1.1. Unless the AHJ allows otherwise, the Construction Documents shall be prepared by a Building Designer for the Building and shall be in accordance with IBC Section 107 and IRC Section R106.

9.5.1.2. The Construction Documents shall be accurate and reliable and shall provide the location, direction and magnitude of all applied loads and shall be in accordance with IBC Section 1603 and IRC Section R301.

9.5.2. Construction Documents

9.5.2.1. Construction Documents shall be submitted to the Building Official for approval and shall contain the plans, specifications and details needed for the Building Official to approve such documents.

9.6. Responsibilities

9.6.1. The information contained herein is a product, material, detail, design and/or application TER evaluated in accordance with the referenced building codes, testing and/or analysis through the use of accepted engineering practice, experience and technical judgment.

9.6.2. DrJ TERs provide an assessment of only those attributes specifically addressed in the Products Evaluated or Code Compliance Process Evaluated sections.

9.6.3. The engineering evaluation was performed on the dates provided in this TER, within DrJ’s professional scope of work.

9.6.4. This product is manufactured under a third-party quality control program in accordance with IBC Section 104.4 and 110.4 and IRC Section R104.4 and R109.2.
9.6.5. The actual design, suitability and use of this TER, for any particular building, is the responsibility of the Owner or the Owner's authorized agent, and the TER shall be reviewed for code compliance by the Building Official.

9.6.6. The use of this TER is dependent on the manufacturer's in-plant QC, the ISO/IEC 17020 third-party quality assurance program and procedures, proper installation per the manufacturer's instructions, the Building Official's inspection and any other code requirements that may apply to demonstrate and verify compliance with the applicable building code.

10. Identification:

10.1. Versetta Stone® described in this TER is identified by a label on the board or packaging material bearing the manufacturer's name, product name, TER number, and other information to confirm code compliance.

10.2. Additional technical information can be found at versettastone.com.

11. Review Schedule:

11.1. This TER is subject to periodic review and revision. For the most recent version of this TER, visit drjcertification.org.

11.2. For information on the current status of this TER, contact DrJ Certification.

- Mission, Belief and Independence
- Product Evaluation Policies
- Product Approval – Building Code, Administrative Law and P.E. Law