Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

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Kenoteq® K-BRIQ® and K-SLIP™ Masonry Veneer

Trade Secret Report Holder:

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CSI Designations:

DIVISION: 04 00 00 - MASONRY

Section: 04 20 00 - Unit Masonry

Section: 04 21 00 - Clay Unit Masonry

Section: 04 21 13.13 - Brick Veneer Masonry

Section: 04 71 00 - Manufactured Brick Masonry

1 Innovative Products Evaluated[1]

1.1 K-BRIQ and K-SLIP

2 Product Description and Materials

2.1 The innovative products evaluated in this report are shown in **Figure 1** and **Figure 2**.

Figure 1. Kenoteq K-BRIQ

Figure 2. Kenoteq K-SLIP

2.2 K-BRIQ and K-SLIP are specialty facing brick products that are used in interior and exterior wall covering applications.

2.2.1 K-BRIQ and K-SLIP are manufactured from inert recycled materials and a patented proprietary non-toxic binder, then formed under high pressure. Following compression, products are allowed to cure in a controlled environment. Unlike traditional manufacturing of clay bricks, the innovative low carbon production process that does not require high temperature firing, virgin cement or high volumes of clay.

2.3 K-BRIQ is used in anchored masonry veneer, non-loadbearing applications when in installed for exterior applications in accordance with IBC Section 1404.6 and IRC Section R703.8.

2.4 For interior applications, K-BRIQ installation shall be in accordance with the application subsections of TMS 402, Sections 12.1 and 12.3 per IBC Section 1404.6, IRC Section R703.7.1, and IRC Section R703.7.4 per IRC Section R702.1.

2.5 K-SLIP is an alternative to the traditional brick slip. While not directly defined in IBC or IRC, a brick slip is a thin brick that is used as a decorative facing material. K-SLIP gives the appearance of a traditional brick wall, but with significantly less volume and weight.

2.5.1 K-SLIP is used in adhered masonry veneer, non-loadbearing applications when in installed in accordance with IBC Section 1404.10 and IRC Section R703.12.

2.5.2 For interior applications, installation shall be in accordance with IBC Section 1404.10.3, IRC Section R703.7.1, and IRC Section R703.7.4 per IRC Section R702.1.

2.6 K-BRIQ and K-SLIP shall be backed by wood-framed or light-gauge cold-formed steel stud walls, masonry walls or concrete walls as specified in IBC Section 1403.4.

2.7 *Product Availability*

2.7.1 *K-BRIQ (Perforated or Solid Profiles):*

2.7.1.1 *Product Dimensions:*

2.7.1.1.1 215 x 102.5 x 65 mm ($8^{15}/_{32}$" x $4^{1}/_{16}$" x $2^{9}/_{16}$")

2.7.1.2 Custom profiles may be available upon request.

2.7.2 *K-SLIP (Solid Profile Only):*

2.7.2.1 *Product Dimensions:*

2.7.2.1.1 215 x 65 x 20 mm ($8^{15}/_{32}$" x $2^{9}/_{16}$" x $2^{5}/_{32}$")

2.7.2.1.2 330 x 50 x 20 mm (13" x $1^{31}/_{32}$" x $^{25}/_{32}$")

2.7.2.1.3 440 x 50 x 20 mm ($17^{5}/_{16}$" x $1^{31}/_{32}$" x $^{25}/_{32}$")

2.7.2.2 Custom profiles may be available upon request.

2.7.3 K-BRIQ and K-SLIP are available in 12 stock colors:

2.7.3.1 The K-BRIQ and K-SLIP colors are made from recycled pigments that are presented in **Figure 3**.

Figure 3. Available Colors for Kenoteq K-BRIQ and K-SLIP

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

3 Definitions

3.1 New Materials[2] 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.[3] The design strengths and permissible stresses shall be established by tests[4] and/or engineering analysis.[5]

3.2 Duly authenticated reports[6] and research reports[7] are test reports and related engineering evaluations, which are written by an approved agency[8] and/or an approved source.[9]

3.2.1 These reports contain intellectual property and/or trade secrets, which are protected by the Defend Trade Secrets Act (DTSA).[10]

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

3.4 An approved source is *"approved"* when a professional engineer (i.e., Registered Design Professional) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.[11]

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 Registered Design Professional (RDP).

3.5.1 The Center for Building Innovation (CBI) is ANAB[12] ISO/IEC 17025 and ISO/IEC 17020 accredited.

3.6 The regulatory authority shall enforce[13] 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[14] 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.[15]

3.8 ANAB is an International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) signatory where recognition of certificates, validation and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA with the appropriate scope, shall be approved.[16] Therefore, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent.[17]

3.9 Approval equity is a fundamental commercial and legal principle.[18]

4 Applicable Standards for the Listing; Regulations for the Regulatory Evaluation[19]

4.1 *Standards*

4.1.1 *ASCE 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures*

4.1.2 *ASTM C67/C67M: Test Methods for Sampling and Testing Brick and Structural Clay Tile*

4.1.3 *ASTM C216: Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)*

4.1.4 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*

4.1.5 *BS EN 772-1 Methods of Test for Masonry Units – Part 1: Determination of Compressive Strength*

4.1.6 *BS EN 772-5 Methods of Test for Masonry Units – Part 5: Determination of the Active Soluble Salts Content of Clay Masonry Units*

4.1.7 *BS EN 772-11 Methods Of Test For Masonry Units – Part 11: Determination Of Water Absorption Of Aggregate Concrete, Autoclaved Aerated Concrete, Manufactured Stone And Natural Stone Masonry Units Due To Capillary Action And The Initial Rate Of Water Absorption Of Clay Masonry Units*

4.1.8 *BS EN 772-13 Methods of Test for Masonry Units – Part 13: Determination of Net and Gross Dry Density of Masonry Units (Except For Natural Stone)*

4.1.9 *BS EN 772-16 Methods of Test for Masonry Units – Part 16: Determination of Dimensions*

4.1.10 *BS EN 772-18 Methods of Test for Masonry Units – Part 18: Determination of Freeze-Thaw Resistance of Calcium Silicate Masonry Units*

4.1.11 *BS EN 772-21 Methods of Test for Masonry Units – Part 21: Determination of Water Absorption of Clay and Calcium Silicate Masonry Units by Cold Water Absorption*

4.1.12 *BS EN 772-22 Methods of Test for Masonry Units – Part 22: Determination of Freeze/Thaw Resistance of Clay Masonry Units*

4.1.13 *BS EN 1052-3 Methods of Test for masonry. Determination of Initial Shear Strength*

4.1.14 *BS EN 1716 Reaction To Fire Tests For Products. Determination of the Gross Heat Of Combustion (Calorific Value)*

4.1.15 *BS EN 13501-1 Part 1: Fire Classification of Construction Products and Building Elements - Classification Using Data from Reaction to Fire Tests*

4.1.16 *BS EN 13823 Reaction To Fire Tests For Building Products. Building Products Excluding Floorings Exposed To the Thermal Attack by a Single Burning Item*

4.1.17 *TMS 402: Building Code Requirements for Masonry Structures*

4.1.18 *TMS 602: Specifications for Masonry Structures*

4.2 *Regulations*

4.2.1 *IBC – 15, 18, 21: International Building Code®*

4.2.2 *IRC – 15, 18, 21: International Residential Code®*

5 Listed[20]

5.1 Equipment, materials, products or services included in a List published by a nationally recognized testing laboratory (i.e., CBI), approved agency (i.e., CBI and DrJ), and/or approved source (i.e., DrJ) or other organization concerned with product evaluation (i.e., DrJ) that maintains periodic inspection (i.e., 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 K-BRIQ and K-SLIP were evaluated for compliance in accordance with ASTM C216 as specified in TMS 602 Article 2.3B, per IBC Section 2103.1 and IRC Section R606.2.2. The results are shown in **Table 1**.

Table 1. Physical and Mechanical Properties of Kenoteq K-BRIQ and K-SLIP

Property		Results
Compressive Strength		> 3,000 psi
Water Absorption	24 hour Cold Water	< 8%
Freeze/Thaw[1]	50 cycles	No damage had occurred: no individual bricks showed signs of bulging, cavities in excess of 5mm diameter, or cracking of the specimens.
Initial Rate of Water Absorption (IRA)[2]		2.3 g/(min-30in^2)
Dimensional Tolerance[3] (variation to specified dimensions)	Length	+/- $^5/_{64}$"
	Width	+/- $^5/_{64}$"
	Height	+/- $^5/_{64}$"
Density		98 lb/ft^3
Mortar Joint Shear Strength[4]	29 psi Compressive Pre-load	45 psi
	87 psi Compressive Pre-load	105 psi
	145 psi Compressive Pre-load	155 psi
Mortar Compressive Strength		725 psi

SI: 1 in = 25.4 mm, 1 psi = 6.89 kPa

1. Freeze-thaw was tested in accordance with BS EN 772-18.
2. Tested in accordance with BS EN 772-11. Results shown is the equivalent absorption rate for a 30 in^2 surface area as specified in Section 10.4.2 of ASTM C67/C67M.
3. Dimensional tolerances meet the requirements for Type FBS in accordance with ASTM C216, Table 2.
4. Shear strength of the mortar joint was tested in accordance with BS EN 1052-3. Mortar tested was a prescribed M4 mortar of 1:1:6 cement:lime:sand (by volume) mixture as specified in BS EN 998-2. This is the same ratio as Type N cement lime mortar per ASTM C270.

6.2 *Fire Performance*

6.2.1 K-BRIQ was evaluated for fire performance in accordance with BS EN 13823 and determination of gross heat of combustion in accordance with BS EN 1716 per BS EN 13501-1.

6.2.1.1 K-BRIQ Medero Dark Grey attained Class A2-s1, d0 per BS EN 13501-1. All other colors attained Class B-s1, d0 per BS EN 13823 and EN ISO 11925-2.

6.2.1.1.1 As stated in Annex A.4 of BS EN 13501-1, under the conditions of a fully developed fire, products achieving a Class A2 will not significantly contribute to the fire load and fire growth.

6.2.1.2 Based on comparative testing between BS EN 13501-1 and ASTM E84/UL 723, these classifications (A2 s1, d0 for Medero Dark Grey and B-s1, d0 for the other K-BRIQ colors) indicate that K-BRIQ does not contribute to the spread of a fire and is equivalent to or better than ASTM E84/UL 723 Class A flame spread of ≤ 25 and smoke developed index of ≤ 450.

Table 2. Surface Burn Characteristics for Kenoteq K-BRIQ products[1]

Product Colors	Expected Flame Spread	Expected Smoke Developed	ASTM E84 Classification
Medero Dark Grey Medero Light Grey Chapman Burnt Orange Chapman Burnt Orange Light Heriot Mustard Heriot Light Mustard Watt Brown Watt Light Brown Gillespie Magenta Gillespie Magenta Light Gullane Cyan Gullane Cyan Light	≤ 25	≤ 450	Class A

1. Kenoteq K-BRIQ tested in accordance with BS EN 13501-1. Flame spread, smoke developed index and ASTM E84 classifications are based upon comparative testing.

6.3 Where the application falls outside of the performance evaluation, conditions of use and/or installation requirements set forth herein, alternative techniques shall be permitted in accordance with accepted engineering practice and experience. This includes but is not limited to the following areas of engineering: mechanics or materials, structural, building science and fire science.

7 Certified Performance[21]

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.[22]

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.[23]

8 Regulatory Evaluation and Accepted Engineering Practice

8.1 K-BRIQ and K-SLIP comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 Physical and mechanical properties of K-BRIQ and K-SLIP were evaluated in accordance with ASTM C216 as specified in TMS 602 Article 2.3B per IBC Section 2103.1 and IRC Section R606.2.2.

8.1.2 For use as an interior finish, K-BRIQ and K-SLIP were evaluated for fire performance in accordance with BS EN 13823 and BS EN 1716 as specified in BS EN 13501.

8.1.2.1 Classification equivalency was determined by DrJ Engineering, LLC.

8.1.3 Shear strength of mortar joint in accordance with BS EN 1052-3.

8.2 Any building code, regulation and/or accepted engineering evaluations (i.e., research reports, duly authenticated reports, etc.) that are conducted for this Listing were performed by DrJ Engineering, LLC (DrJ), an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP/approved sources. DrJ is qualified[24] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise, respectively.

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

8.4 Any regulation specific issues not addressed in this section are outside the scope of this report.

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, the more restrictive shall govern.

9.3 Prior to installation, surfaces shall be clean, free from efflorescence,[25] sufficiently damp and rough for proper bond. If the surface is insufficiently rough, approved bonding agents or a Portland cement dash-bond coat mixed in proportions of not more than two parts volume of sand to one part volume of Portland cement or plastic cement shall be applied. The dash-bond coat shall be left undisturbed and shall be moist cured not less than 24 hours.

9.4 *Installation Procedure*

9.4.1 K-BRIQ shall be installed in accordance with the manufacturer installation instructions, as well as, TMS 402 Section 12.1 and 12.2 as specified in IBC Section 1404.6 and IRC Section R703.8, as applicable.

9.4.2 K-SLIP shall be installed in accordance with the manufacturer installation instructions, as well as, TMS 402 Section 12.1 and 12.3 as specified in IBC Section 1404.10 and IRC Section R703.12, as applicable.

9.4.3 Where there is a conflict between the code provisions and the manufacturer installation instructions, the more restrictive shall govern.

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 Compressive strength in accordance with BS EN 772-1 and ASTM C67/67M

10.1.2 Freeze-thaw in accordance with BS EN 772-18

10.1.3 Water absorption in accordance with BS EN 772-21 and ASTM C67/67M

10.1.4 Initial rate of water absorption in accordance with BS EN 772-11 and ASTM C67/67M

10.1.5 Dimensional tolerance verification in accordance with BS EN 772-16 and ASTM C67/67M

10.1.6 Gross dry density in accordance with BS EN 772-13 and ASTM C67/67M

10.1.7 Mortar joint shear strength in accordance with BS EN 1052-3

10.1.8 Soluble salt content in accordance with BS 772-5

10.1.9 Reaction to fire in accordance with BS EN 13823

10.1.10 Heat of combustion in accordance with BS EN 1716

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 RDPs. Accuracy of external test data and resulting analysis is relied upon.

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: 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.[26]

10.6 Where additional condition of use and/or regulatory compliance information is required, please search for K-BRIQ and K-SLIP on the DrJ Certification website.

11 Findings

11.1 As outlined in **Section 6**, K-BRIQ and K-SLIP have performance characteristics that were tested and/or meet applicable regulations and 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, K-BRIQ and K-SLIP shall be approved for the following applications:

11.2.1 K-BRIQ is permitted to be used as anchored, non-loadbearing exterior/interior wall coverings on walls constructed of concrete, masonry, steel framing or wood framing.

11.2.2 K-SLIP is permitted to be used as adhered, non-loadbearing exterior/interior wall coverings on walls constructed of concrete, masonry, steel framing or wood framing.

11.2.3 When used as interior wall finish, K-BRIQ and K-SLIP, achieving a Class A classification in accordance with ASTM E84 or UL 723, are permitted to be used in all locations specified in IBC Table 803.13.

11.3 K-BRIQ and K-SLIP meet the criteria for ASTM C216 Grade SW and may be used where high resistance to damage caused by cyclic freezing and thawing is desired. See **Figure 4**.

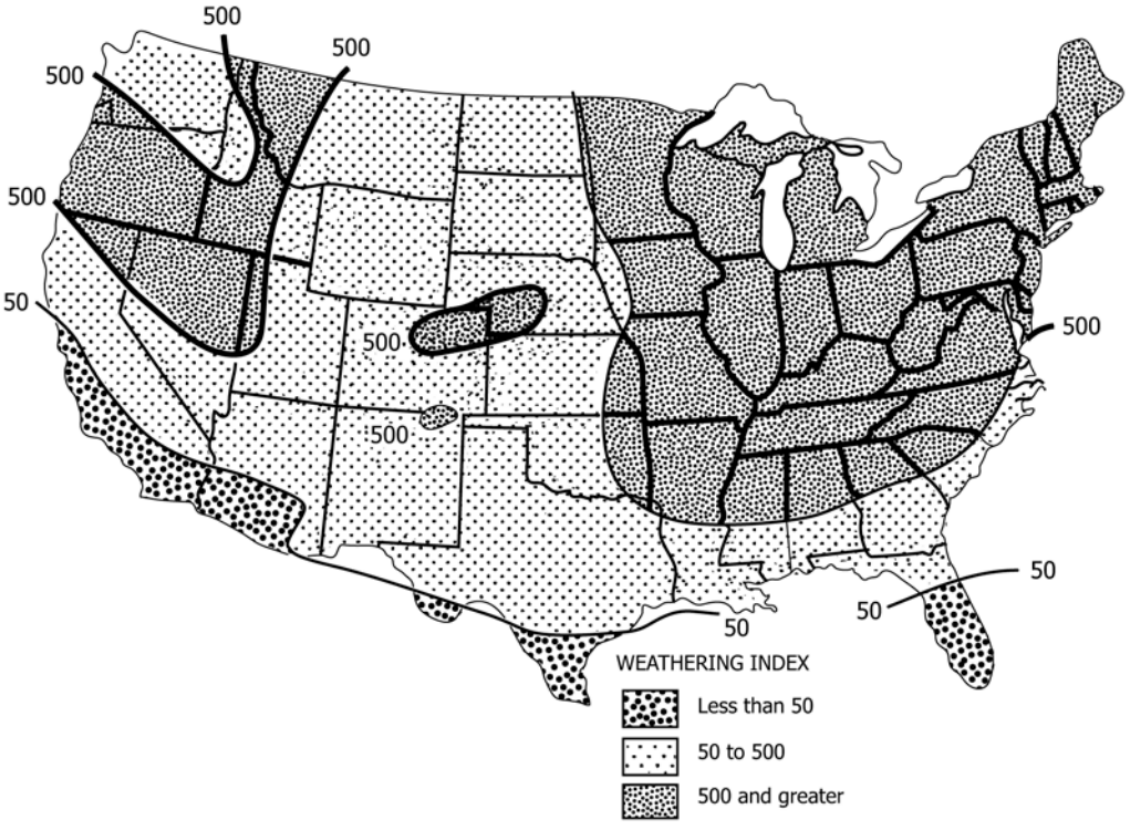

Figure 4. Weathering Indices in the United States (ASTM C216)

11.4 K-BRIQ and K-SLIP meet the criteria for ASTM C216 Type FBX for dimensional tolerances and warpage tolerances.

11.4.1 K-BRIQ and K-SLIP are manufactured under high pressure and steel molds with squared edges and corners.

11.5 Unless exempt by state statute, when K-BRIQ and K-SLIP are 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.

11.6 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Kenoteq, Ltd.

11.7 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10[27] are similar) in pertinent part 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. 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.

11.8 **Approved**:[28] Building regulations require that the building official shall accept duly authenticated reports.[29]

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

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

11.8.3 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.

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

11.10 Through the IAF Multilateral Agreements (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.[30]

12 Conditions of Use

12.1 Material properties shall not fall outside the boundaries defined in **Section 6**.

12.2 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.

12.3 As listed herein, K-BRIQ and K-SLIP shall be subjected to the following conditions:

12.3.1 Location and placement of expansion or control joints shall be based on movement caused by fluctuation in temperature, moisture or applied loads.

12.3.2 Structural elements supporting the masonry veneer shall be designed so that deflection does not exceed L/600 in accordance with TMS 402 Section 12.2.2.3.1.5 as specified in IBC Section 1404.6, IBC Section 1404.10.3 and IRC Section R703.8.2.

12.3.3 When installed over exterior stud walls, the veneer units shall be installed not less than 4" above the earth, or not less than 2" above paved areas, or not less than $^{1}/_{2}$" above exterior walking surfaces that are supported by the same foundation that supports the exterior wall as specified in IBC Section 1404.10.1.3 and IRC Section R703.12.1.

12.3.4 An approved Water-Resistive Barrier (WRB) shall be installed in accordance with IBC Section 2510.6, as specified in IBC Section 1404.10.1.1.

12.3.5 Flashing shall comply with IBC Section 1404.4.2 and IBC Section 1404.10.1.2.1.

12.3.6 Weep holes shall be at least $^{3}/_{16}$" in diameter and spaced less than 33" o.c.

12.3.7 When applicable, the weight of the materials provision of IRC Section R301.2.2.2 shall apply.

12.3.7.1 In the event where the average weight of the wall supporting K-BRIQ and K-SLIP wall coverings exceed the applicable limits specified in IRC Section R301.2.2.2, an engineered design of the wall construction shall be performed per IRC Section R301.1.3.

12.4 When K-BRIQ is installed using the prescriptive requirements in TMS Section 12.2.2, K-BRIQ shall not be used in areas where the velocity pressure, q_z, exceeds 40 psf (1.92 kPa), as given in ASCE 7.

12.4.1 ***Exception:*** In areas where the velocity pressure exceeds 40 psf but does not exceed 55 psf (2.63 kPa), and the mean roof height of the building is less than or equal to 60 ft (18.3 m), the following shall be applied:

12.4.1.1 The maximum wall area supported by each anchor shall be reduced to seventy percent (70%) of that required.

12.4.1.2 Anchors shall be spaced at a maximum of 18" horizontally and vertically.

12.4.1.3 Additional anchors around openings larger than 16" (406 mm) in either direction shall be provided. Anchors shall be spaced at a maximum of 24" (610 mm) o.c. around the perimeter of the opening and shall be placed within 12" (305 mm) of the openings.

12.4.2 For the given velocity pressures, see **Table 3** for the corresponding design wind pressure and wind speeds.

Table 3. Design Wind Pressure and Wind Speeds for the Specified Prescriptive Velocity Pressure

Velocity Pressure, q_z	40 psf		50 psf	
Design Wind Pressure, p	-54 psf		-74 psf	
Exposure Category	V_{ult} (mph)	V_{asd} (mph)	V_{ult} (mph)	V_{asd} (mph)
B	177	137	208	161
C	152	118	178	138
D	141	109	165	128
SI: 1 psf = 0.049 kPa, 1 mph = 1.61 km/hr				

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 These innovative products have an internal quality control program and a third-party quality assurance program.

12.5.4 At a minimum, these innovative products shall be installed per **Section 9** of this report.

12.5.5 The review of this report by the AHJ shall comply with IBC Section 104 and IBC Section 105.4.

12.5.6 These innovative products have an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.4, IBC Section 110.4, IBC Section 1703, IRC Section R104.4 and IRC Section R109.2.

12.5.7 The application of these innovative products 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 accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new material or assemblies as provided for in Section 104.11*," all of IBC Section 104, and IBC Section 105.4.

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.

13 Identification

13.1 The innovative products 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 www.kenoteq.com.

14 Review Schedule

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

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

15 Approved for Use Pursuant to U.S. and International Legislation Defined in Appendix A

15.1 K-BRIQ and K-SLIP are included in this report published by an approved agency that is concerned with evaluation of products or services, maintains periodic inspection of the production of listed materials or periodic evaluation of services. This report states either that the material, product or service meets recognized standards or has been tested and found suitable for a specified purpose. This report meets the legislative intent and definition of being acceptable to the AHJ.

Appendix A

1 Legislation that Authorizes AHJ Approval

1.1 **Fair Competition**: State legislatures have adopted Federal regulations for the examination and approval of building code referenced and alternative products, materials, designs, services, assemblies and/or methods of construction that:

1.1.1 Advance innovation

1.1.2 Promote competition so all businesses have the opportunity to compete on price and quality in an open market on a level playing field unhampered by anticompetitive constraints

1.1.3 Benefit consumers through lower prices, better quality, and greater choice

1.2 **Adopted Legislation**: The following local, state and federal regulations affirmatively authorize these innovative products to be approved by AHJs, delegates of building departments and/or delegates of an agency of the federal government:

1.2.1 Interstate commerce is governed by the Federal Department of Justice to encourage the use of innovative products, materials, designs, services, assemblies, and/or methods of construction. The goal is to "*protect economic freedom and opportunity by promoting free and fair competition in the marketplace*."

1.2.2 Title 18 US Code Section 242 affirms and regulates the right of individuals and businesses to freely and fairly have new products, materials, designs, services, assemblies and/or methods of construction approved for use in commerce. Disapproval of alternatives shall be based upon non-conformance with respect to specific provisions of adopted legislation and shall be provided in writing stating the reasons why the alternative was not approved, with reference to the specific legislation violated.

1.2.3 The federal government and each state have a public records act. In addition, each state also has legislation that mimics the federal Defend Trade Secrets Act 2016 (DTSA),[31] where providing test reports, engineering analysis and/or other related IP/TS is subject to prison of not more than ten years[32] and/or a $5,000,000 fine or 3 times the value of[33] the Intellectual Property (IP) and Trade Secrets (TS).

1.2.3.1 Compliance with public records and trade secret legislation requires approval through the use of Listings, certified reports, Technical Evaluation Reports, duly authenticated reports and/or research reports prepared by approved agencies and/or approved sources.

1.2.4 For new materials[34] that are not specifically provided for in any regulation, the design strengths and permissible stresses shall be established by tests, where suitable load tests simulate the actual loads and conditions of application that occur.

1.2.5 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design using accepted engineering practice.[35]

1.2.6 The commerce of approved sources (i.e., registered PEs) is regulated by professional engineering legislation. Professional engineering commerce shall always be approved by AHJs, except where there is evidence provided in writing, that specific legislation have been violated by an individual registered PE.

1.2.7 The AHJ 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 IBC Section 104.11.[36]

1.3 **Approved**[37] **by Los Angeles**: The Los Angeles Municipal Code (LAMC) states in pertinent part that the provisions of LAMC are not intended to prevent the use of any material, device or method of construction not specifically prescribed by LAMC. The Department shall use Part III, Recognized Standards in addition to Part II, Uniform Building Code Standards of Division 35, Article 1, Chapter IX of the LAMC in evaluation of products for approval where such standard exists for the product or the material and may use other approved standards that apply. Whenever tests or certificates of any material or fabricated assembly are required by Chapter IX of the LAMC, such tests or certification shall be made by a testing agency approved by the Superintendent of Building to conduct such tests or provide such certifications. The testing agency shall publish the scope and limitation(s) of the listed material or fabricated assembly.[38] The Superintendent of Building Approved Testing Agency Roster is provided by the Los Angeles Department of Building and Safety (LADBS). The Center for Building Innovation (CBI) Certificate of Approval License is TA24945. Tests and certifications found in a DrJ Listing are LAMC approved. In addition, the Superintendent of Building 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 the California Building Code (CBC) Section 1707.1.[39]

1.4 **Approved by Chicago**: The Municipal Code of Chicago (MCC) states in pertinent part that an Approved Agency is a Nationally Recognized Testing Laboratory (NRTL) acting within its recognized scope and/or a certification body accredited by the American National Standards Institute (ANSI) acting within its accredited scope. Construction materials and test procedures shall conform to the applicable standards listed in the MCC. Sufficient technical data shall be submitted to the building official to substantiate the proposed use of any product, material, service, design, assembly and/or method of construction not specifically provided for in the MCC. This technical data shall consist of research reports from approved sources (i.e., MCC defined Approved Agencies).

1.5 **Approved by New York City**: The 2022 NYC Building Code (NYCBC) states in part that an approved agency shall be deemed[40] an approved testing agency via ISO/IEC 17025 accreditation, an approved inspection agency via ISO/IEC 17020 accreditation, and an approved product evaluation agency via ISO/IEC 17065 accreditation. Accrediting agencies, other than federal agencies, must be members of an internationally recognized cooperation of laboratory and inspection accreditation bodies subject to a mutual recognition agreement[41] (i.e., ANAB, International Accreditation Forum also known as IAF, etc.).

1.6 **Approved by Florida**: Statewide approval of products, methods or systems of construction shall be approved, without further evaluation by:

1.6.1 A certification mark or listing of an approved certification agency,

1.6.2 A test report from an approved testing laboratory,

1.6.3 A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, from an approved product evaluation entity, or

1.6.4 A product evaluation report based upon testing, comparative or rational analysis, or a combination thereof, developed, signed and sealed by a professional engineer or architect, licensed in Florida.

1.6.5 For local product approval, products or systems of construction shall demonstrate compliance with the structural wind load requirements of the Florida Building Code (FBC) through one of the following methods:

1.6.5.1 A certification mark, listing or label from a commission-approved certification agency indicating that the product complies with the code,

1.6.5.2 A test report from a commission-approved testing laboratory indicating that the product tested complies with the code,

1.6.5.3 A product-evaluation report based upon testing, comparative or rational analysis, or a combination thereof, from a commission-approved product evaluation entity which indicates that the product evaluated complies with the code,

1.6.5.4 A product-evaluation report or certification based upon testing or comparative or rational analysis, or a combination thereof, developed and signed and sealed by a Florida professional engineer or Florida registered architect, which indicates that the product complies with the code, or

1.6.5.5 A statewide product approval issued by the Florida Building Commission.

1.6.6 The Florida Department of Business and Professional Regulation (DBPR) website provides a listing of companies certified as a Product Evaluation Agency (i.e., EVLMiami 13692), a Product Certification Agency (i.e., CER10642), and as a Florida Registered Engineer (i.e., ANE13741).

1.7 **Approved by Miami-Dade County (i.e., Notice of Acceptance [NOA])**: A Florida statewide approval is an NOA. An NOA is a Florida local product approval. By Florida law, Miami-Dade County shall accept the statewide and local Florida Product Approval as provided for in Florida legislation 553.842 and 553.8425.

1.8 **Approved by New Jersey**: Pursuant to the 2018 Building Code of New Jersey in IBC Section 1707.1 General,[42] it states: "*In the absence of approved rules or other approved standards, 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 the administrative provisions of the Uniform Construction Code (N.J.A.C. 5:23)*".[43] Furthermore N.J.A.C 5:23-3.7 states: "*Municipal approvals of alternative materials, equipment, or methods of construction*."

1.8.1 **Approvals**: Alternative materials, equipment or methods of construction shall be approved by the appropriate subcode official provided the proposed design is satisfactory and that the materials, equipment or methods of construction are suitable for the intended use and are at least the equivalent in quality, strength, effectiveness, fire resistance, durability and safety of those conforming with the requirements of the regulations.

1.8.1.1 A field evaluation label and report or letter issued by a nationally recognized testing laboratory verifying that the specific material, equipment or method of construction meets the identified standards or has been tested and found to be suitable for the intended use, shall be accepted by the appropriate subcode official as meeting the requirements of the above.

1.8.1.2 Reports of engineering findings issued by nationally recognized evaluation service programs such as but not limited to, the Building Officials and Code Administrators (BOCA), the International Conference of Building Officials (ICBO), the Southern Building Code Congress International (SBCCI), the International Code Council (ICC), and the National Evaluation Service, Inc., shall be accepted by the appropriate subcode official as meeting the requirements of the above.

1.8.2 The New Jersey Department of Community Affairs has confirmed that technical evaluation reports, from any accredited entity listed by ANAB, meets the requirements of item the previous paragraph, given that the listed entities are no longer in existence and/or do not provide "*reports of engineering findings*."

1.9 **Approved by the Code of Federal Regulations Manufactured Home Construction and Safety Standards**: Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14[44] and Part 3280,[45] the Department encourages innovation and the use of new technology in manufactured homes. The design and construction of a manufactured home shall conform to the provisions of Part 3282 and Part 3280 where key approval provisions in mandatory language follow:

1.9.1 "*All construction methods shall be in conformance with accepted engineering practices*."

1.9.2 "*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*."

1.9.3 "*The design stresses of all materials shall conform to accepted engineering practice*."

1.10 **Approval by US, Local and State Jurisdictions in General**: In all other local and state jurisdictions, the adopted building code legislation states in pertinent part that:

1.10.1 For new materials that are not specifically provided for in this code, the design strengths and permissible stresses shall be established by tests.[46]

1.10.2 For innovative alternatives and/or methods of construction, the building official shall accept duly authenticated reports from approved agencies with respect to the quality and manner of use of new materials or assemblies.[47]

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

1.10.2.2 An approved source is *"approved"* when an RDP is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.[48]

1.10.3 The design strengths and permissible stresses of any structural material…shall conform to the specifications and methods of design of accepted engineering practice performed by an approved source.[49]

1.11 **Approval by International Jurisdictions**: The USMCA and GATT agreements provide for approval of innovative materials, designs, services, and/or methods of construction through the Agreement on Technical Barriers to Trade and the IAF Multilateral Recognition Arrangement (MLA), where these agreements:

1.11.1 State that conformity assessment procedures (i.e., ISO/IEC 17020, 17025, 17065, etc.) are prepared, adopted, and applied so as to grant access for suppliers of like products originating in the territories of other Members under conditions no less favourable than those accorded to suppliers of like products of national origin or originating in any other country, in a comparable situation.

1.11.2 **Approved**: The purpose of the MLA is to ensure mutual recognition of accredited certification and validation/verification statements between signatories to the MLA and subsequently, acceptance of accredited certification and validation/verification statements in many markets based on one accreditation for the timely approval of innovative materials, designs, services, and/or methods of construction.

1.11.3 ANAB is an IAF-MLA signatory where recognition of certificates, validation, and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA, with the appropriate scope, shall be approved.[50]

1.11.4 Therefore, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent.[51]

1.12 Approval equity is a fundamental commercial and legal principle.[52]

Notes

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

2 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1702

3 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/colorado/ibc-2021/chapter/1/scope-and-administration#104.11

4 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706:~:text=the%20design%20strengths%20and%20permissible%20stresses%20shall%20be%20established%20by%20tests%20as

5 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/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706:~:text=shall%20conform%20to%20the%20specifications%20and%20methods%20of%20design%20of%20accepted%20engineering%20practice

6 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1:~:text=the%20building%20official%20shall%20accept%20duly%20authenticated%20reports%20from%20approved%20agencies

7 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1703.4.2

8 https://up.codes/viewer/wyoming/ibc-2021/chapter/2/definitions#approved_agency

9 https://up.codes/viewer/wyoming/ibc-2021/chapter/2/definitions#approved_source

10 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.

11 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/

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

13 https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#104:~:text=to%20enforce%20the%20provisions%20of%20this%20code

14 https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#104.11:~:text=Where%20the%20alternative%20material%2C%20design%20or%20method%20of%20construction%20is%20not%20approved%2C%20the%20building%20official%20shall%20respond%20in%20writing%2C%20stating%20the%20reasons%20why%20the%20alternative%20was%20not%20approved AND https://up.codes/viewer/colorado/ibc-2021/chapter/1/scope-and-administration#105.3.1:~:text=If%20the%20application%20or%20the%20construction%20documents%20do%20not%20conform%20to%20the%20requirements%20of%20pertinent%20laws%2C%20the%20building%20official%20shall%20reject%20such%20application%20in%20writing%2C%20stating%20the%20reasons%20therefore

15 https://up.codes/viewer/colorado/ibc-2021/chapter/17/special-inspections-and-tests#1707.1:~:text=the%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%20104.11

16 https://iaf.nu/en/about-iaf-mla/#:~:text=it%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

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

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

19 Unless otherwise noted, all references in this Listing are from the 2021 version of the codes and the standards referenced therein. This material, product, design, service and/or method of construction also complies with the 2000-2021 versions of the referenced codes and the standards referenced therein.

20 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#p-3280.2(Listed%20or%20certified); https://up.codes/viewer/colorado/ibc-2021/chapter/2/definitions#listed AND https://up.codes/viewer/colorado/ibc-2021/chapter/2/definitions#labeled

21 https://up.codes/viewer/colorado/ibc-2021/chapter/17/special-inspections-and-tests#1703.4

22 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

23 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

24 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.

25 Efflorescence is a white or grayish crystalline deposit of salts that forms on the surface of porous materials like concrete, brick, stone, stucco, and other building surfaces.

26 See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition.

27 2018 IFC Section 104.9

28 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 where the building code authorizes sentences to have an ordinarily accepted meaning such as the context implies.

29 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1

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

31 http://www.drjengineering.org/AppendixC AND https://www.drjcertification.org/cornell-2016-protection-trade-secrets
32 https://www.law.cornell.edu/uscode/text/18/1832#:~:text=imprisoned%20not%20more%20than%2010%20years
33 https://www.law.cornell.edu/uscode/text/18/1832#:~:text=Any%20organization%20that,has%20thereby%20avoided
34 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706.2
35 IBC 2021, Section 1706.1 Conformance to Standards
36 IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General
37 See **Section 11** for the distilled building code definition of **Approved**
38 Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES
39 https://up.codes/viewer/california/ca-building-code-2022/chapter/17/special-inspections-and-tests#1707.1
40 New York City, The Rules of the City of New York, § 101-07 Approved Agencies
41 New York City, The Rules of the City of New York, § 101-07 Approved Agencies
42 https://up.codes/viewer/new_jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1
43 https://www.nj.gov/dca/divisions/codes/codreg/ucc.html
44 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14
45 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280
46 IBC 2021, Section 1706 Design Strengths of Materials, 1706.2 New Materials. Adopted law pursuant to IBC model code language 1706.2.
47 IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General. Adopted law pursuant to IBC model code language 1707.1.
48 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/
49 IBC 2021, Section 1706 Design Strengths of Materials, Section 1706.1 Conformance to Standards Adopted law pursuant to IBC model code language 1706.1.
50 https://iaf.nu/en/about-iaf-mla/#:~:text=it%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
51 True for all ANAB accredited product evaluation agencies and all International Trade Agreements.
52 https://www.justice.gov/crt/deprivation-rights-under-color-law AND https://www.justice.gov/atr/mission