Listing

Report No: 2205-06

Issue Date: September 23, 2022

Revision Date: October 1, 2024

Subject to Renewal: October 1, 2024

Performance Characteristics of Diamond Age 3D Composite Wall System

Trade Secret Report Holder:

Diamond Age 3D, Inc.

Phone: 650-533-6766 Website: www.diamondage3d.com Email: brian@diamondage3d.com

CSI Designations:

DIVISION: 03 00 00 - CONCRETE

Section: 03 23 00 - Stressed Tendon Reinforcing

Section: 03 37 00 - Specialty Placed Concrete

Section: 03 37 19 - Pneumatically Placed Concrete

DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

Section: 06 02 00 - Design Information

Section: 06 12 00 - Structural Panels

Section: 06 12 19 - Shear Wall Panels

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

Section: 07 20 00 - Thermal Protection

Section: 07 25 00 - Water-Resistive Barriers/Weather Barriers

Section: 07 42 43 - Composite Wall Panels

Section: 07 80 00 - Fire and Smoke Protection

Section: 07 84 26 - Thermal Barriers for Plastics

1 Innovative Product Evaluated[i]

1.1 Diamond Age 3D Composite Wall System

2 Product Description and Materials

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



Figure 1. Diamond Age 3D Composite Wall System

LEGACY

2.2 Diamond Age 3D Composite Wall System is constructed using the components listed in **Table 1**.

Table 1. Diamond Age 3D Composite Wall System Components

Wall Assembly Details		
General Details	Description	Diamond Age 3D Wall Assembly Two concrete wythes, pour-in-place foam core, tension ties between inner and outer wythes, QuickTie hold-downs
	Manufacturer	Diamond Age
Concrete Wythes	Description	Diamond Age 3D Proprietary Formulation
	Avg. Width (in)	2.75
	Avg. Height (in)	2.5
Lateral Ties	Description	Diamond Age 3D Proprietary Steel Wall Ties
	Placement	Every 5th print-course, 6" from QuickTie cable
Foam	Description	Proprietary Diamond Age 3D Pour in Place Foam
	Manufacturer	Huntsman Building Solutions
	Min. Foam Cure (Hours)	9
Tie-Downs	Description	QuickTie Orange Post-Tension Tendons
	Avg. Pre-Tension Load (lbs)	4,800

2.3 Diamond Age 3D Composite Wall System:

2.3.1 Features inner and outer proprietary 3D printed concrete wythes using a proprietary concrete formulation.

2.3.2 Utilizes periodic proprietary steel ties embedded into the concrete to hold the wythes in place for foam placement and final composite assembly curing.

2.3.3 Utilizes a proprietary Diamond Age 3D-Huntsman pour-in-place closed-cell foam to fill the Diamond Age 3D printed wall cavity.

2.3.4 Is held to the foundation using QuickTie Orange Post-Tensioned Tendons (QTO-PTT).

2.3.5 Features the use of a Diamond Age 3D proprietary lintel system to transfer gravity and uplift loads to the foundation.

2.4 As needed, review material properties for design in **Section 6**.

3 Definitions

3.1 New Materials[ii] 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.[iii] The design strengths and permissible stresses shall be established by tests[iv] and/or engineering analysis.[v]

3.2 Duly Authenticated Reports[vi] and Research Reports[vii] are test reports and related engineering evaluations, which are written by an approved agency[viii] and/or an approved source.[ix]

LEGACY

Confidential Intellectual Property Is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

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

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 [RDP]) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.[xi]

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[xii] ISO/IEC 17025 and ISO/IEC 17020 accredited.

3.6 The regulatory authority shall enforce[xiii] 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[xiv] 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.[xv]

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.[xvi] Therefore, all ANAB ISO/IEC 17065 Duly Authenticated Reports are approval equivalent.[xvii]

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

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

4.1 *Standards*

4.1.1 *ASTM E72: Standard Test Methods of Conducting Strength Tests of Panels for Building Construction*

4.1.2 *ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Uniform Static Air Pressure Difference*

4.1.3 *ASTM E564: Standard Practice for Static Load Test for Shear Resistance of Framed Walls for Buildings*

4.1.4 *ASTM E575: Standard Practice for Reporting Data from Structural Tests of Building Constructions, Elements, Connections, and Assemblies*

4.1.5 *ASTM E2126: Standard Test Methods for Cyclic (Reversed) Load Test for Shear Resistance of Vertical Elements of the Lateral Force Resisting Systems for Buildings*

4.1.6 *ASTM E2322: Standard Test Method for Conducting Transverse and Concentrated Load Tests on Panels Used in Floor and Roof Construction*

4.2 Structural performance for shear wall assemblies used as lateral force resisting systems in Seismic Design Categories A through F, have been tested and evaluated in accordance with the following standards:

4.2.1 *ASCE/SEI 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures*

4.2.2 *ASTM D7989: Standard Practice for Demonstrating Equivalent In-Plane Lateral Seismic Performance to Wood-Frame Shear Walls Sheathed with Wood Structural Panels*

4.2.3 *ASTM E72: Standard Test Methods of Conducting Strength Tests of Panels for Building Construction*

4.2.4 *ASTM E564: Standard Practice for Static Load Test for Shear Resistance of Framed Walls for Buildings*

LEGACY

4.2.5 *ASTM E2126: Standard Test Methods for Cyclic (Reversed) Load Test for Shear Resistance of Vertical Elements of the Lateral Force Resisting Systems for Buildings*

4.2.5.1 ASTM D7989 is accepted engineering practice used to establish Seismic Design Coefficients (SDCs). Test data generated by ISO/IEC 17025 approved agencies and/or professional engineers and all associated professional engineering evaluations which use ASTM D7989 as their basis, are defined as intellectual property and/or trade secrets and are also defined as an Independent Design Review (i.e., Listings, certified reports, duly authenticated reports from approved agencies and/or research reports prepared by approved agencies and/or approved sources).

5 Listed[xx]

5.1 A nationally recognized testing laboratory such as CBI, states that the materials, designs, methods of construction and/or equipment have met nationally recognized standards and/or have been tested and found suitable for use in a specified manner.

6 Tabulated Properties Generated from Nationally Recognized Standards

6.1 Allowable stress design properties for resistance to transverse loads are shown in **Table 2**.

Table 2. Positive/Negative Allowable Stress Design Pressure (PSF) for Diamond Age 3D Composite Wall System

Diamond Age 3D Composite Wall System (Maximum 9-foot Tall Wall)	Positive/Negative Design Pressure (PSF) ASD	EI (lb-in^2)	Pressure (in PSF) at Various Deflection Limits			
			H/480	H/360	H/240	H/180
Design Properties	65	300,000,000	80	90	100	110

6.2 Allowable stress design properties for resistance to lateral loads when used as lateral force resisting systems are shown in **Table 3**.

Table 3. Allowable Lateral Force Resistance for Wind and Seismic (PLF) for Diamond Age 3D Composite Wall System

Diamond Age 3D Composite Wall System	Lateral Load Resistance (PLF)
QuickTie Tension Tendon 8 Foot High Wall	615
QuickTie Tension Tendon 9 Foot High Wall	545
QuickTie Tension Tendon 10 Foot High Wall	490

1. Maximum 4' spacing on the QuickTie Tension Tendons
2. For seismic resistance use a Response modification factor of 1.5 and a Deflection Amplification Coefficient of 2.5.

LEGACY

Confidential Intellectual Property Is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

6.3 Allowable stress design properties for resistance to compressive loads are shown in **Table 4**.

Table 4. Allowable Gravity Force Resistance (PLF) for Diamond Age 3D Composite Wall System

Diamond Age 3D Composite Wall System	Gravity Resistance (PLF)
Design Property	7,500

6.4 Allowable stress design properties for resistance to uplift loads are shown in **Table 5**.

Table 5. Allowable Uplift Force Resistance (PLF) for Diamond Age 3D Composite Wall System

Diamond Age 3D Composite Wall System	Uplift Resistance (PLF)
Design Property	1,200

6.5 Allowable stress design properties for resistance to compression and uplift loads for Diamond Age 3D Composite Wall System Proprietary Lintels are shown in **Table 6** and **Table 7**.

Table 6. Allowable Gravity Force Resistance (PLF) for Diamond Age 3D Composite Wall System Proprietary Lintels

Diamond Age 3D Composite Wall System (Maximum Lintel Span is 7 feet)	Gravity Resistance (PLF)
Design Property	11,400

Table 7. Allowable Uplift Force Resistance (PLF) for Diamond Age 3D Composite Wall System Proprietary Lintels

Diamond Age 3D Composite Wall System (Maximum Lintel Span is 7 feet)	Uplift Resistance (PLF)
Design Property	1,200

6.6 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[xxi]

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.[xxii]

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.[xxiii]

LEGACY

8 Installation

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

8.2 In the event of a conflict between the manufacturer installation instructions and this report, the more restrictive shall govern.

9 Substantiating Data

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

9.1.1 Transverse load testing in accordance with ASTM E330

9.1.2 Lateral shear wall testing from approved sources.

9.1.3 Compression testing on wall assemblies from approved sources.

9.1.4 Tension testing on wall assemblies from approved sources.

9.2 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.

9.3 Where pertinent, 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.

9.4 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.

9.5 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.[xxiv]

9.6 Where additional condition of use and/or regulatory compliance information is required, please search for Diamond Age 3D Composite Wall System on the DrJ Certification website.

10 Findings

10.1 As outlined in **Section 6**, Diamond Age 3D Composite Wall System has performance characteristics that were tested and/or meet applicable regulations and is suitable for use pursuant to its specified purpose.

10.2 When used and installed in accordance with this duly authenticated report and the manufacturer installation instructions, Diamond Age 3D Composite Wall System shall be approved for:

10.2.1 Resistance to transverse loads due to wind and gravity pressures on building surfaces.

10.2.2 Resistance to lateral loads for assemblies used as lateral force resisting systems for wind pressures on building surfaces.

10.2.3 Resistance to compressive loads.

10.2.4 Resistance to uplift loads.

10.2.5 Resistance to compressive and uplift loads for Diamond Age 3D Composite Wall System Proprietary Lintels.

10.2.6 A Water Resistive Barrier (WRB) is not required in accordance with the pertinent regulations.

LEGACY

Confidential Intellectual Property Is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

10.3 Unless exempt by state statute, when Diamond Age 3D Composite Wall System 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.

10.4 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Diamond Age 3D, Inc.

10.5 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10[xxv] 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.

10.6 **Approved**:[xxvi] Building regulations require that the building official shall accept duly authenticated reports.[xxvii]

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

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

10.6.3 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.

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

10.8 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.[xxviii]

11 Conditions of Use

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

11.2 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.

11.3 As listed herein, Diamond Age 3D Composite Wall System shall not be used:

11.3.1 Allowable stress design properties for resistance to transverse loads shall not exceed those described in **Section 6**.

11.3.2 Allowable stress design properties for resistance to lateral loads when used as lateral force resisting systems shall not exceed values in **Section 6**.

11.3.3 Allowable stress design properties for resistance to compressive loads shall not exceed those described in **Section 6**.

11.3.4 Allowable stress design properties for resistance to uplift loads shall not exceed those described in **Section 6**.

11.3.5 Allowable stress design properties for resistance to compressive and uplift loads for Diamond Age 3D Composite Wall System Proprietary Lintels shall not exceed those described in **Section 6**.

11.3.6 As a nailing base for claddings, trim, windows, and doors.

11.4 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:

11.4.1 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.

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

LEGACY

Confidential Intellectual Property Is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

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

11.4.4 At a minimum, this innovative product shall be installed per **Section 8** of this report.

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

11.4.6 This innovative product has 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.

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

11.5 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.

11.6 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).

11.7 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.

12 Identification

12.1 The innovative product 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.

12.2 Additional technical information can be found at www.diamondage3d.com.

13 Review Schedule

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

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

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

14.1 Diamond Age 3D Composite Wall System is 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.

LEGACY

Confidential Intellectual Property Is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC

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, and

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 [this/these] innovative product 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),[xxix] where providing test reports, engineering analysis and/or other related IP/TS is subject to prison of not more than ten years[xxx] and/or a $5,000,000 fine or 3 times the value of[xxxi] 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[xxxii] 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.[xxxiii]

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 has 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.[xxxiv]

1.3 **Approved**[xxxv] **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.[xxxvi] The Superintendent of Building Approved Testing Agency Roster is

LEGACY

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.[xxxvii]

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[xxxviii] 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[xxxix] (i.e., ANAB, International Accreditation Forum (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.

1.7 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;

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

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

1.7.3 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,

1.7.4 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

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

1.8 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).

1.9 **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.

1.10 **Approved by New Jersey**: Pursuant to the 2018 Building Code of New Jersey in IBC Section 1707.1 General,[xl] it states: "*In the absence of approved rules or other approved standards, the building official shall accept duly*

LEGACY

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)".[xli] Furthermore N.J.A.C 5:23-3.7 states: "*Municipal approvals of alternative materials, equipment, or methods of construction*."

1.10.1 **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.

1.10.1.1 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.

1.10.1.2 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.

1.10.2 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*".

1.11 **Approved by the Code of Federal Regulations Manufactured Home Construction and Safety Standards**: Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14[xlii] and Part 3280,[xliii] 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:

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

1.11.2 "*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.*"

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

LEGACY

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

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

1.12.2 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.[xlv]

1.12.2.1 An approved agency is “approved” when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is in the ANAB directory.

1.12.2.2 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.[xlvi]

1.12.3 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.[xlvii]

1.13 **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:

1.13.1 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.

1.13.2 **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.

1.13.3 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.[xlviii]

1.13.4 Therefore, all ANAB ISO/IEC 17065 Duly Authenticated Reports are approval equivalent.[xlix]

1.14 Approval equity is a fundamental commercial and legal principle.[l]

LEGACY

Notes

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

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

[iii] 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

[iv] 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

[v] 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

[vi] 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

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

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

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

[x] 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.

[xi] 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/

[xii] https://www.cbitest.com/accreditation/

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

[xiv] 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

[xv] 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

[xvi] 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

[xvii] True for all ANAB accredited product evaluation agencies and all International Trade Agreements.

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

[xix] 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.

[xx] 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

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

[xxii] 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

[xxiii] 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

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

[xxv] 2018 IFC Section 104.9

[xxvi] 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.

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

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

[xxix] http://www.drjengineering.org/AppendixC AND https://www.drjcertification.org/cornell-2016-protection-trade-secrets

[xxx] https://www.law.cornell.edu/uscode/text/18/1832#:~:text=imprisoned%20not%20more%20than%2010%20years

[xxxi] https://www.law.cornell.edu/uscode/text/18/1832#:~:text=Any%20organization%20that,has%20thereby%20avoided

[xxxii] https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706.2

[xxxiii] IBC 2021, Section 1706.1 Conformance to Standards

LEGACY

[xxxiv] IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General

[xxxv] See Section 11 for the distilled building code definition of **Approved**

[xxxvi] Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES

[xxxvii] https://up.codes/viewer/california/ca-building-code-2022/chapter/17/special-inspections-and-tests#1707.1

[xxxviii] New York City, The Rules of the City of New York, § 101-07 Approved Agencies

[xxxix] New York City, The Rules of the City of New York, § 101-07 Approved Agencies

[xl] https://up.codes/viewer/new_jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1

[xli] https://www.nj.gov/dca/divisions/codes/codreg/ucc.html

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

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

[xliv] IBC 2021, Section 1706 Design Strengths of Materials, 1706.2 New Materials. Adopted law pursuant to IBC model code language 1706.2.

[xlv] IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General. Adopted law pursuant to IBC model code language 1707.1.

[xlvi] 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/

[xlvii] IBC 2021, Section 1706 Design Strengths of Materials, Section 1706.1 Conformance to Standards Adopted law pursuant to IBC model code language 1706.1.

[xlviii] 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

[xlix] True for all ANAB accredited product evaluation agencies and all International Trade Agreements.

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

LEGACY

Confidential Intellectual Property Is protected by Defend Trade Secrets Act 2016, © DrJ Engineering, LLC