Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

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Arrowhead® Fastening System

Trade Secret Report Holder:

Fairview Architectural

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CSI Designations:

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

Section: 07 24 00 - Exterior Insulation and Finish Systems Section: 07 42 00 - Wall Panels Section: 07 48 00 - Exterior Wall Assemblies

1 Innovative Products Evaluated[1]

1.1 Arrowhead Flex and Arrowhead Lean

2 Product Description and Materials

2.1 Arrowhead Flex and Arrowhead Lean are for use as a mechanical attachment for Vitrabond®, VitrabondG2® and Vitraplate®.

2.1.1 Arrowhead Flex:

2.1.1.1 Panels are riveted to frame extrusions.

2.1.2 Arrowhead Lean:

2.1.2.1 Panels are formed around frame extrusions without rivets (double groove and slot method).

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

2.3 The Arrowhead Flex fastening system shown in **Figure 1**, is designed so that the base extrusions attach to the exterior wall first per an engineered design. The frame extrusion is held to the base extrusion by T-clips (AH 104). The Vitrabond, VitrabondG2 or Vitraplate panels are attached to the frame extrusion by rivets.

2.4 Arrowhead Lean fastening system shown in **Figure 2**, is designed such that the base extrusions attach to the exterior wall first per an engineered design. The frame extrusion is held to the base wall extrusion by T-clips. The Vitrabond panels are attached to the frame extrusion by a double groove and slot method.

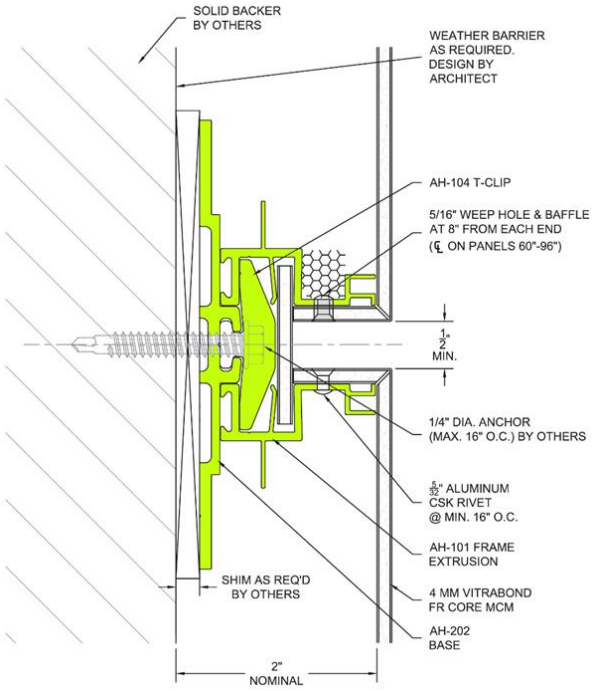

Figure 1. Arrowhead Flex Fastening System

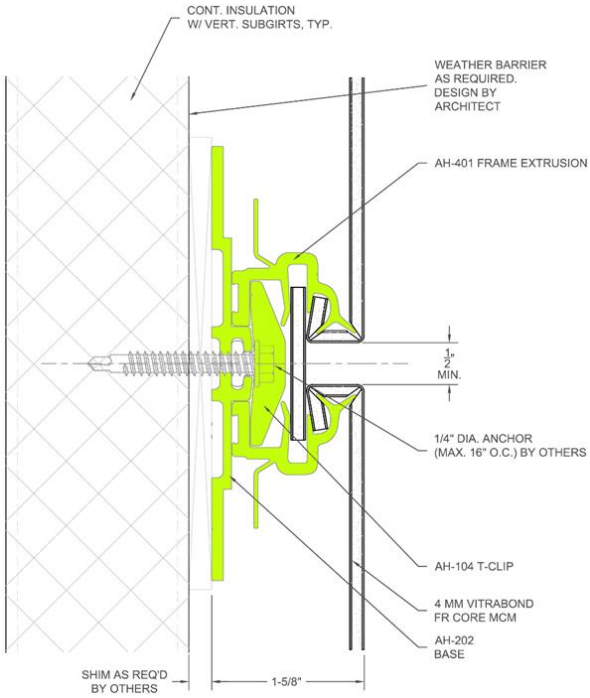

Figure 2. Arrowhead Lean Fastening System

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

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 *NFPA 285: Standard Fire Test Method for the Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components*[20]

4.1.4 *TAS 201: Impact Test Procedures*

4.1.5 *TAS 202: Criteria for Testing Impact and Nonimpact Resistance Building Envelope Components Using Uniform Static Air Pressure*

4.1.6 *TAS 203: Criteria for Testing Products Subject to Cyclic Wind Pressure Loading*

4.2 *Regulations*

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

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

4.2.3 *FBC-B—17, 20: Florida Building Code – Building[21] (FL46016)*

4.2.4 *FBC-R—17, 20: Florida Building Code – Residential[21] (FL46016)*

4.2.5 *CBC—16, 19: California Building Code[22]*

5 Listed[23]

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 Arrowhead Flex and Arrowhead Lean are used to attach Vitrabond, VitrabondG2 and Vitraplate to exterior walls designed in accordance with IBC Section 1406.4.[24]

6.2 *Structural Applications*

6.2.1 Exterior wall panels attached using Arrowhead Flex and Arrowhead Lean, shall be designed to resist components and cladding wind loads per IBC Chapter 16 and ASCE 7 Chapter 30.

6.2.2 Arrowhead Flex and Arrowhead Lean were evaluated in accordance with ASTM E330 for wind pressure resistance. When used with Vitrabond panels, see Report Number 1809-01 for allowable wind pressure resistance and wind speed. When used with other panels, refer to the manufacturer installation instructions.

6.3 *High Velocity Hurricane Zone (HVHZ) – Wind and Impact Testing*

6.3.1 Arrowhead Flex was tested in accordance with TAS 201 and meets the missile impact test criteria for windborne debris in HVHZ in accordance with FBC-B Section 1626.

6.3.1.1 Arrowhead Flex provides attachment to wall panels to resist the impact of the 9 lb. (40 N) missile propelled at 50 ft/s (15.2 m/s) without penetration, rupture or opening of the panel.

6.3.2 Arrowhead Flex was tested in accordance with TAS 202 and meets the uniform static air pressure criteria for HVHZ in accordance with FBC-B Section 1620.

6.3.2.1 Arrowhead Flex provides attachment to wall panels to resist a static positive design pressure of +100 psf and a negative design pressure of -150 psf.

6.3.3 Arrowhead Flex was tested in accordance with TAS 203 and meets the fatigue load test criteria for HVHZ in accordance with FBC-B Section 1625.

6.3.3.1 Arrowhead Flex provides attachment to wall panels to resist cyclic loading per FBC-B Table 1625.4 for a design load (p_{max}) of +100/-150 psf.

6.3.4 Arrowhead Lean has not been tested for use in High Velocity Hurricane Zones.

6.4 *Weather Resistance*

6.4.1 Arrowhead Flex and Arrowhead Lean are weather resistant in accordance with IBC Section 1406.6,[25] when installed with Vitrabond, VitrabondG2 and Vitraplate.

6.4.2 All Arrowhead Fastening Systems are made from corrosion-resistant aluminum and are mill-finished.

6.5 *Full Scale Tests*

6.5.1 Arrowhead Flex and Arrowhead Lean were tested to assess performance of vertical and lateral fire propagation in accordance with NFPA 285 and 2018 IBC Section 1406.10.4.[26]

6.5.2 Engineering analysis has been conducted to assess substitution of other products within the approved wall assemblies.

6.5.3 The wall assemblies listed in **Table 1** and **Table 2** are approved for use in buildings of Types I-IV construction.

Table 1. Approved NFPA 285 Wall Assemblies for use with Rmax Exterior Insulation[1]

Wall Component	Materials
Base Wall Use Item 1, 2 or 3 ***Note:*** May use Item 4 optionally when FRTW framing is allowed by code.	1. Cast Concrete Walls 2. CMU Concrete Walls 3. 20-gauge (min.) 3 5/8" (min.) steel studs spaced 24" o.c. (max.) a. 5/8" type X Gypsum Wallboard Interior b. Bracing as required by code 4. Where allowed in Types I, II, III or IV construction, FRTW (Fire-Retardant Treated Wood) studs complying with IBC Section 2303.2, min. nominal 2x4 dimension spaced 24" o.c. (max.). a. 5/8" type X Gypsum Wallboard Interior b. Bracing as required by code
Fire-Stopping in Stud Cavity at Floor Lines As an option, use Item 2 with FRTW framing	1. 4 pcf mineral wool installed with z-clips 2. FRTW fire blocking at floor line per applicable code requirements
Cavity Insulation Use any Item 1 – 15 ***Note:*** Items 5 – 15 are SPF foam type and may only be used with 5/8" exterior gypsum sheathing EZ FLO may be used inside the box headers and jamb studs for NFPA 285 assemblies requiring SPF in stud cavities.	1. None 2. Any noncombustible insulation per ASTM E136 3. Any Mineral Fiber (Board type Class A ASTM E84 faced or unfaced) 4. Any Fiberglass (Batt Type Class A ASTM E84 faced or unfaced) 5. 5 1/2" (max.) Icynene LD-C-50 spray foam in 6" deep studs (max.). Use with 5/8" exterior sheathing. 6. 5 1/2" (max.) Icynene MD-C-200 2 pcf spray foam in 6" deep studs (max.) full fill without an air gap. Use with 5/8" exterior sheathing. 7. 5 1/2" (max.) Icynene MD-R-210 2 pcf spray foam in 6" deep studs (max.) full fill without an air gap. Use with 5/8" exterior sheathing. 8. SWD Urethane QS 112 2-pcf spray foam in 6" deep studs (max.) partial fill with a maximum 2 1/2" air gap or full fill. Use with 5/8" exterior sheathing. 9. Gaco Western 183M (3 1/2" max.). Use with 5/8" exterior sheathing. 10. Gaco Western F1850 (3 1/2" max.). Use with 5/8" exterior sheathing. 11. Demilec Sealection 500 (3 5/8" max.). Use with 5/8" exterior sheathing. 12. Demilec Heatlok Soy 200 Plus (3.4" max.). Use with 5/8" exterior sheathing. 13. Bayer Bayseal (3" max.). Use with 5/8" exterior sheathing. 14. Lapolla Foam-Lok FL 2000 (3" max.). Use with 5/8" exterior sheathing. 15. BASF Spraytite 81206 or Walltite (US & US-N) (3 5/8" max.). Use with 5/8" exterior sheathing.

Table 1. Approved NFPA 285 Wall Assemblies for use with Rmax Exterior Insulation[1]

Wall Component	Materials
Exterior Sheathing Use Item 1, 2 or 3	1. 1/2" or thicker exterior gypsum sheathing 2. 1/2" (min.) FRTW structural panels complying with IBC Section 2303.2 and installed in accordance with code allowances for Types I, II, III or IV construction 3. None (only with 3" max. Rmax exterior insulation) ***Note**:* Exterior FRTW sheathing or gypsum board is optional for Base Walls 1 and 2. When SPF is used, 5/8" exterior gypsum sheathing must be used.
Water-Resistive Barrier (WRB)[2] Applied to Exterior Sheathing or Base Wall Surface (under the exterior insulation) Select Item 1 or 2 installed per manufacturer installation instructions. ***Note:*** When using Exterior Sheathing Option 2 (no exterior sheathing), Items 2 a-d may be applied directly to studs. NLA = No Longer Available. Replace with Spraywrap MVP.	1. None 2. Any WRB tested in accordance with ASTM E1354 (at a minimum of 20 kW/m^2 heat flux) and shown by analysis to be less flammable (improved T_{ign}, Pk. HRR) than the baseline WRB or exterior insulation foam core. The following WRB products are allowed (item t. based on NFPA 285): a. Pactiv Green Guard® Max Building Wrap b. Dupont Tyvek® (Various per ESR 2375) c. DOW WeatherMate™ d. DOW WeatherMate™ Plus e. Carlisle CCW Fire Resist 705FR-A f. Carlisle CCW Fire Resist Barritech NP g. Carlisle CCW Fire Resist Barritech VP h. BASF Enershield HP i. BASF Enershield I j. Henry Air Bloc 31MR k. Henry EnviroCap l. Henry Air Bloc 33MR m. Henry Air Bloc 21 FR n. Henry VP 160 o. Henry Air Bloc 17 p. Henry BlueSkin SA q. Henry FoilSkin r. Henry MetalClad s. Henry 32MR t. Soprema Stick VP or Soprasolin HD u. Soprema 1100T or Sopraseal Xpress G v. Prosoco R-Guard Spray Wrap (NLA) w. Prosoco R-Guard MVP (NLA) x. Prosoco Spraywrap MVP y. Prosoco R-Guard VB z. Prosoco R-Guard Cat 5 aa. Vaproshield RevealShield SA bb. Vaproshield Wrapshield SA cc. Pecora XL-Perm^{ULTRA} VP (10 mil DFT) dd. W.R. Grace PAB NPL 10 ee. W.R. Grace PAB VPL ff. W.R. Grace PAB VPL LT gg. W.R. Grace PAB VPS hh. W.R. Grace PAB AWM ii. W.R. Grace PAB VPL 50 jj. Dryvit Backstop NT kk. WR Meadows Air-Shield LMP (Gray) ll. WR Meadows Air-Shield LMP (Black)

Table 1. Approved NFPA 285 Wall Assemblies for use with Rmax Exterior Insulation[1]

Wall Component	Materials
	mm. WR Meadows Air-Shield TMP nn. WR Meadows Air-Shield LSR oo. Sika SikaGard 530 ***Special Case:*** When exterior insulation #7 is used (2", 4 pcf mineral wool – min.) over the WRB, any WRB can be used on the base wall surface (under the mineral wool).
Exterior Insulation Use any Item 1 – 7 ***IMPORTANT:*** When using no exterior sheathing, the maximum allowable Rmax insulation thickness is 3".	1. 4 1/2" (max. consisting of a single panel or multiple thinner panels) Rmax TSX-8500 2. 4 1/2" (max. consisting of a single panel or multiple thinner panels) Rmax ECOMAXci 3. 4 1/2" (max. consisting of a single panel or multiple thinner panels) Rmax TSX-8510 4. 1" thick (min.), 4 pcf density (min.) unfaced mineral wool meeting ASTM E136 as noncombustible 5. None (only with a WRB from the list below with the WRB applied direct to base wall surface) 6. 1" thick (min.), 4 pcf density (min.) unfaced mineral wool meeting ASTM E136 as noncombustible 7. 2" thick (min.), 4 pcf density (minimum) unfaced mineral wool that meets ASTM E136 (for use with any WRB under the mineral wool)
Water-Resistive Barrier Applied Over Exterior Insulation (or FRTW) Use any item 1) a-n for cladding 1-6 with non-open joint installation technique, or any item 2) a-w for all approved claddings 1-13 below. ***Note:*** Exterior WRB items 1 b-d are not traditional WRB products but are insulation panel joint tapes. The insulation panel joints shall be staggered. These tapes are listed to allow use in both categories 1-6 OR 1-13.	1. For use with all claddings a. None b. 6 in. (max.) Venture Tape CW over insulation joints c. 6 in. (max.) Rmax R-SEAL 3000 over insulation joints d. 6 in. (max.) asphalt or butyl based tape, or liquid flashing over insulation joints e. Pactiv Green Guard® Max Building Wrap f. Dupont Tyvek® (Various per 2375) g. Dow Weathermate™ h. Dow Weathermate™ Plus i. Henry FoilSkin j. Henry MetalClad k. Prosoco Spraywrap MVP l. Soprema Soprasolin HD m. Carlisle (CCW) Fire Resist 705FR-A n. W.R. Grace PAB AWM
Exterior Cladding ACM with maximum air gap as follows: Maximum 2 1/2" air gap between panel and polyiso insulation Maximum 3 5/16" air gap between panel and mineral wool insulation	1. Fairview 4 mm Vitrabond FR ACM a. With optional Arrowhead FlexPanel Attachment b. With optional horizontal or vertical Strongirt (with mineral wool only) c. Metallic Z-girt may be used with polyiso or mineral wool

SI: 1 in = 25.4 mm

1. The assembly combinations created herein, and the various substitutions of products, are based on testing and professional thermal engineering analysis by Priest & Associates Consulting, LLC.
2. All WRB must be installed at recommended application rates and per the manufacturer installation instructions. Window headers for all assemblies shall incorporate 0.08" (min.) aluminum flashing to cover air gaps between the exterior insulation and exterior veneer. All fenestrations and penetrations shall be flashed in accordance with the applicable code using asphalt, acrylic or butyl based flashing tape, liquid flashing or R-SEAL 6000 polyethylene tape up to 12" maximum width.

Table 2. Approved NFPA 285 Wall Assemblies for use with Dupont Thermax™ Exterior Insulation[1]

Wall Component	Materials
Base Wall Use Item 1, 2, 3 or 4	1. Cast Concrete Walls 2. CMU Concrete Walls 3. Standard Clay Brick Walls 4. 20-gauge (min.) 3 5/8" (min.) steel studs spaced 24" o.c. (max.) with lateral bracing every 4 ft. vertically a. 5/8" Type X Gypsum Wallboard Interior
Fire-Stopping in Stud Cavity at Floor Lines	1. 4 pcf mineral fiber insulation (mineral wool) installed with z-clips or equivalent
Cavity Insulation Use Item 1, 2 or 3	1. None 2. Full stud depth (max.) Dow Styrofoam Spray Polyurethane Foam CM2030, 2045 or 2060 complying with ESR-2670. Apply to the interior side of exterior sheathing. 3. Any Fiberglass Batt insulation (faced or unfaced) complying with the applicable code
Exterior Sheathing Use either Item 1 or 2	1. 1/2" Exterior Gypsum Sheathing 2. 5/8" Exterior Gypsum Sheathing
Water-Resistive Barrier Applied Over Exterior Sheathing Use either Item 1 or 2 ***Note:*** For use under exterior insulation only.	1. None 2. Any of the following: a. WEATHERMATE™ - Dow Chemical (ESR-2862) b. WEATHERMATE™ Plus – Dow Chemical (ESR-3401) c. Tyvek® CommercialWrap® - DuPont (ESR-2375) d. Backstop® NT – Dryvit e. Barritech™ VP – Carlisle f. AIR-SHIELD™ LMP (black only) – W.R. Meadows g. Green Guard® Max Building Wrap – Pactiv h. Perm-A-Barrier® VPS – W.R. Grace ***Note:*** All barriers to be installed in accordance with manufacturer installation instructions, the applicable ICC-ES evaluation report, and the applicable code.
Exterior Insulation Use any Item 1, 2 or 3	1. 5/8" (min.) to 3" (max.) DuPont Thermax Insulation 2. 1" thick (min.), 4 pcf density (min.) unfaced mineral wool meeting ASTM E136 as noncombustible 3. 2" thick (min.), 4 pcf density (min.) unfaced mineral wool that meets ASTM E136 (for use with any WRB under the mineral wool) ***Note:*** Flashing tape to cover insulation joints and/or cladding ties and connections consisting of 4" (max.) Dow WEATHERMATE™ Flashing or 4" (max.) asphalt or butyl based flashing tape.
Window Perimeter Flashing	1. 25-gauge Sheet Steel
Exterior Cladding ACM with air gap as follows: Maximum 1 3/4" air gap between panel and polyiso insulation Maximum 3 5/16" air gap between panel and mineral wool insulation	1. Fairview 4 mm Vitrabond FR ACM a. With optional Arrowhead Flex Panel Attachment b. With optional horizontal or vertical Strongirt (with mineral wool only) c. Metallic Z-girt may be used with polyiso or mineral wool

SI: 1 in = 25.4 mm

1. The assembly combinations created herein, and the various substitutions of products, are based on testing and professional thermal engineering analysis by Priest & Associates Consulting, LLC.

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[27]

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.[28]

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.[29]

8 Regulatory Evaluation and Accepted Engineering Practice

8.1 Arrowhead Flex and Arrowhead Lean comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 *Arrowhead Flex:*

8.1.1.1 Use as an exterior wall covering attachment for Vitrabond, VitrabondG2 and Vitraplate, in accordance with IBC Section 1406[30] for Types I-V construction

8.1.1.2 Structural design in accordance with IBC Section 1406.4[31]

8.1.1.3 Weather resistance in accordance with IBC Section 1406.6[32]

8.1.1.4 Durability in accordance with IBC Section 1406.7[33]

8.1.1.5 NFPA 285 full scale tests in accordance with 2018 IBC Section 1406.10.4[34]

8.1.1.6 Use in High Velocity Hurricane Zone (HVHZ) in accordance with the FBC-B Section 1620, FBC-B Section 1625 and FBC-B Section 1626

8.1.2 *Arrowhead Lean:*

8.1.2.1 Use as an exterior wall covering attachment for Vitrabond in accordance with IBC Section 1406 for Types I-V construction

8.1.2.2 Structural design in accordance with IBC Section 1406.4[35]

8.1.2.3 Weather resistance in accordance with IBC Section 1406.6[36]

8.1.2.4 Durability in accordance with IBC Section 1406.7[37]

8.1.2.5 NFPA 285 full scale tests in accordance with 2018 IBC Section 1406.10.4[38]

8.1.2.6 Use of Arrowhead Lean in HVHZ is outside the scope of this report.

8.2 The evaluation of Vitrabond, VitrabondG2 and Vitraplate is outside the scope of this report. For more information regarding Vitrabond, see Report Number 1809-01.

8.3 Use as part of a fire-rated wall assembly is outside the scope of this report.

8.4 Use as an interior wall and ceiling finish material attachment is outside the scope of this report.

8.5 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[39] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise, respectively.

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

8.7 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 Arrowhead Flex and Arrowhead Lean must be installed with Vitrabond, VitrabondG2, or Vitraplate panels, per the manufacturer installation instructions.

9.4 Component parts that appear to be defective in any way, including warped, bowed, dented, abraded and broken members, must not be installed. Members or parts that have been damaged during installation or thereafter, and before substantial completion of the project, shall be removed and replaced.

9.5 Anchorage of Arrowhead Flex and Arrowhead Lean shall be by approved methods in strict accordance with the specified and approved shop and/or installation drawings. Shop drawings must be submitted prior to installation.

9.6 The following installation procedure applies to both Arrowhead Flex and Arrowhead Lean. The procedure is the generic method for attaching panels with the frame extrusions to the wall. More specific installation instructions from the manufacturer shall be followed.

9.7 *Installation Procedure*

9.7.1 Insert first panel frame groove over sill lip and push panel into place.

9.7.2 Lock panel in place with one T-clip at center location on top of the panel using the locking tool.

9.7.3 Repeat with second panel.

9.7.4 Lock all required T-clips into place around the first panel, including the edge shared with the second panel.

9.7.5 Attach reveal strip to the S-clip at the bottom of the joint, preventing any slipping from occurring.

9.7.6 Cut reveal strip to size and insert it from the top of the reveal joint until it slides down and engages with the reveal keep.

9.7.7 Repeat along the panel row. Place a horizontal reveal strip into place to bridge the tops of installed panels as they are installed.

9.7.8 At the end of a panel row, start the next row above by lifting a panel into place and slipping the bottom panel frame extrusion over the reveal strip and T-clips.

9.7.9 Lock panel into place at the top center of the panel at the corresponding fastener on the panel.

9.7.10 Repeat down this new panel row.

9.7.11 Lock all T-clips into place and slide the pre-cut vertical reveal strips into place.

9.7.12 Repeat process for entire wall.

9.8 The procedure above can be adapted for use working from top to bottom or in vertical columns rather than in rows.

9.9 Insert all backer rods and seal perimeter joints per shop drawing details and specifications.

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 Wind load resistance in accordance with ASTM E330

10.1.2 HVHZ testing in accordance with TAS 201, TAS 202 and TAS 203

10.1.3 Full-scale fire resistance testing in accordance with NFPA 285

10.1.4 Test reports and engineering analysis for NFPA 285 approved wall assemblies

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.[40]

10.6 Where additional condition of use and/or regulatory compliance information is required, please search for Arrowhead Flex and Arrowhead Lean on the DrJ Certification website.

11 Findings

11.1 As outlined in **Section 6**, Arrowhead Flex and Arrowhead Lean 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, Arrowhead Flex and Arrowhead Lean shall be approved for the following applications:

11.2.1 *Arrowhead Flex:*

11.2.1.1 Use as an exterior wall covering attachment for Vitrabond, VitrabondG2 and Vitraplate, in accordance with IBC Section 1406[41] for Types I-V construction.

11.2.1.2 Use in High Velocity Hurricane Zone with Vitrabond, VitrabondG2 and Vitraplate in accordance with the FBC-B Section 1620, FBC-B Section 1625 and FBC-B Section 1626.

11.2.2 *Arrowhead Lean:*

11.2.2.1 Use as an exterior wall covering attachment for Vitrabond in accordance with IBC Section 1406[42] for Types I-V construction.

11.3 Unless exempt by state statute, when Arrowhead Flex and Arrowhead Lean 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.

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

11.5 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10[43] 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.

11.6 **Approved**:[44] Building regulations require that the building official shall accept duly authenticated reports.[45]

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

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

11.6.3 Federal law, Title 18 US Code Section 242, requires that where the alternative product, material, service, design, assembly and/or method of construction is not approved, the building official shall respond in writing, stating the reasons why the alternative was not approved. Denial without written reason deprives a protected right to free and fair competition in the marketplace.

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

11.8 Through the IAF Multilateral 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.[46]

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, Arrowhead Flex and Arrowhead Lean shall be used:

12.3.1 For exterior use only. Use of Arrowhead Flex and Arrowhead Lean in interior applications is outside the scope of this report.

12.4 Vitrabond, VitrabondG2 and Vitraplate panels attached with Arrowhead Flex and Arrowhead Lean shall be separated from the interior of a building by an approved thermal barrier consisting of $^1/_2$" (12.7 mm) gypsum wallboard, or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275 in accordance with IBC Section 1406.10.2.[47]

12.5 Materials shall be stored in accordance with manufacturer recommendations.

12.6 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:

12.6.1 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.

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

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

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

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

12.6.6 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.

12.6.7 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.

12.7 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.

12.8 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).

12.9 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.fairview-na.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 Arrowhead Flex and Arrowhead Lean 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),[48] where providing test reports, engineering analysis and/or other related IP/TS is subject to prison of not more than ten years[49] and/or a $5,000,000 fine or 3 times the value of[50] 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[51] 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.[52]

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.[53]

1.3 **Approved**[54] **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.[55] 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.[56]

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[57] 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[58] (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,[59] 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)*".[60] 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[61] and Part 3280,[62] 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.[63]

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.[64]

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.[65]

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.[66]

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.[67]

1.11.4 Therefore, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent.[68]

1.12 Approval equity is a fundamental commercial and legal principle.[69]

Issue Date: December 23, 2021
Subject to Renewal: January 1, 2026

FBC Supplement to Report Number 2006-02

REPORT HOLDER: Fairview Architectural

1 Evaluation Subject

1.1 Arrowhead Flex and Arrowhead Lean

2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Report Supplement is to show Arrowhead Flex and Arrowhead Lean, recognized in Report Number 2006-02, have also been evaluated for compliance with the codes listed below as adopted by the Florida Building Commission.

2.2 *Applicable Code Editions*

2.2.1 *FBC-B—20, 23: Florida Building Code – Building (FL46016)*

2.2.2 *FBC-R—20, 23: Florida Building Code – Residential (FL46016)*

3 Conclusions

3.1 Arrowhead Flex and Arrowhead Lean, described in Report Number 2006-02, comply with the FBC-B and FBC-R and are subject to the conditions of use described in this supplement.

3.2 Where there are variations between the IBC and IRC and the FBC-B and FBC-R applicable to this report, they are listed here:

3.2.1 FBC-B Section 104.4 and Section 110.4 are reserved.

3.2.2 FBC-R Section R104 and Section R109 are reserved.

3.2.3 FBC-B Section 1407 replaces IBC Section 1406.

3.2.4 FBC-B Section 1407.4 replaces IBC Section 1406.4.

3.2.5 FBC-B Section 1407.6 replaces IBC Section 1406.6.

3.2.6 FBC-B Section 1407.7 replaces IBC Section 1406.7.

3.2.7 FBC-B Section 1407.10.2 replaces IBC Section 1406.10.2.

3.2.8 FBC-B Chapter 16 replaces IBC Chapter 16.

3.2.9 FBC-B Section 2303.2 replaces IBC Section 2303.2.

4 Conditions of Use

4.1 Arrowhead Flex and Arrowhead Lean, described in Report Number 2006-02, must comply with all of the following conditions:

4.1.1 All applicable sections in Report Number 2006-02.

4.1.2 The design, installation, and inspections are in accordance with additional requirements of FBC-B Chapter 16 and Chapter 17, as applicable.

Issue Date: December 23, 2021
Subject to Renewal: January 1, 2026

CBC and CRC Supplement to Report Number 2006-02

REPORT HOLDER: Fairview Architectural

1 Evaluation Subject

1.1 Arrowhead Flex and Arrowhead Lean

2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Report Supplement is to show Arrowhead Flex and Arrowhead Lean, recognized in Report Number 2006-02 have also been evaluated for compliance with the codes listed below.

2.2 *Applicable Code Editions*

2.2.1 *CBC—19, 22: California Building Code (Title 24, Part 2)*

2.2.2 *CRC—19, 22: California Residential Code (Title 24, Part 2.5)*

2.2.3 *CEC —19, 22: California Energy Code (Title 24, Part 6)*

3 Conclusions

3.1 Arrowhead Flex and Arrowhead Lean, described in Report Number 2006-02, comply with the CBC and CRC and are subject to the conditions of use described in this supplement.

3.2 Where there are variations between the IBC and IRC and the CBC and CRC applicable to this report, they are listed here:

3.2.1 CBC Section 104.11 replaces IBC Section 104.11.

3.2.2 CBC Section 1707.1 replaces IBC Section 1707.1.

3.2.3 CRC Section R104.11 replaces IRC Section R104.11.

3.2.4 CBC Chapter 16 replaces IBC Chapter 16.

4 Conditions of Use

4.1 Arrowhead Flex and Arrowhead Lean, described in Report Number 2006-02, must comply with all of the following conditions:

4.1.1 All applicable sections in Report Number 2006-02.

4.1.2 The design, installation, and inspections are in accordance with additional requirements of CBC and CRC, as applicable.

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 References to NFPA 285-12 in this report are code compliant through the 2018 version of the IBC.

21 All references to the FBC-B and FBC-R are the same as the 2021 IBC and 2021 IRC unless otherwise noted in the Florida Supplement at the end of this report.

22 All references to the CBC and CRC are the same as the 2021 IBC and 2021 IRC unless otherwise noted in the California Supplement at the end of this report.

23 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

24 2015 IBC Section 1407.4

25 2015 IBC Section 1407.6

26 2015 IBC Section 1407.10.4

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

28 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

29 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

30 2015 IBC Section 1407

31 2015 IBC Section 1407.4

32 2015 IBC Section 1407.6
33 2015 IBC Section 1407.7
34 2015 IBC Section 1407.10.4
35 2015 IBC Section 1407.4
36 2015 IBC Section 1407.6
37 2015 IBC Section 1407.7
38 2015 IBC Section 1407.10.4
39 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.
40 See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition.
41 2015 IBC Section 1407
42 2015 IBC Section 1407
43 2018 IFC Section 104.9
44 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.
45 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1
46 Multilateral approval is true for all ANAB accredited product evaluation agencies and all International Trade Agreements.
47 2015 IBC Section 1407.10.2
48 http://www.drjengineering.org/AppendixC AND https://www.drjcertification.org/cornell-2016-protection-trade-secrets
49 https://www.law.cornell.edu/uscode/text/18/1832#:~:text=imprisoned%20not%20more%20than%2010%20years
50 https://www.law.cornell.edu/uscode/text/18/1832#:~:text=Any%20organization%20that,has%20thereby%20avoided
51 https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706.2
52 IBC 2021, Section 1706.1 Conformance to Standards
53 IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General
54 See **Section 11** for the distilled building code definition of **Approved**
55 Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES
56 https://up.codes/viewer/california/ca-building-code-2022/chapter/17/special-inspections-and-tests#1707.1
57 New York City, The Rules of the City of New York, § 101-07 Approved Agencies
58 New York City, The Rules of the City of New York, § 101-07 Approved Agencies
59 https://up.codes/viewer/new_jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1
60 https://www.nj.gov/dca/divisions/codes/codreg/ucc.html
61 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14
62 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280
63 IBC 2021, Section 1706 Design Strengths of Materials, 1706.2 New Materials. Adopted law pursuant to IBC model code language 1706.2.
64 IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General. Adopted law pursuant to IBC model code language 1707.1.
65 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/
66 IBC 2021, Section 1706 Design Strengths of Materials, Section 1706.1 Conformance to Standards Adopted law pursuant to IBC model code language 1706.1.
67 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
68 True for all ANAB accredited product evaluation agencies and all International Trade Agreements.
69 https://www.justice.gov/crt/deprivation-rights-under-color-law AND https://www.justice.gov/atr/mission