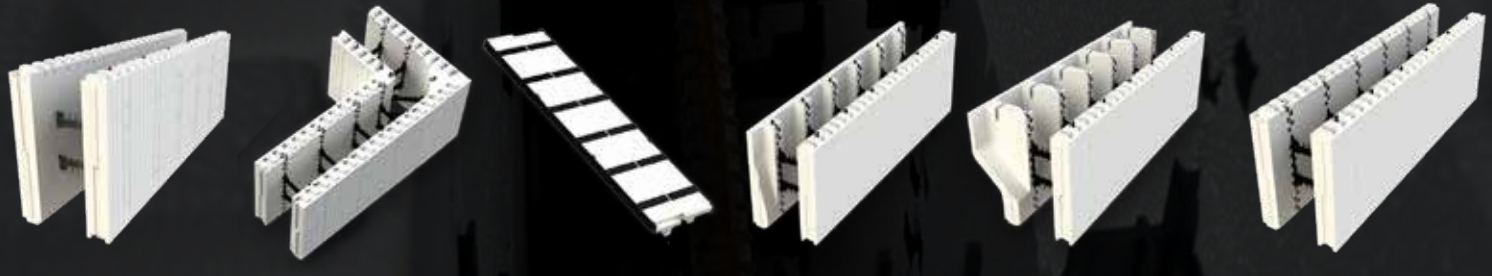
ELEMENTICF®
LOGIX BRANDS

CODE AND COMPLIANCE GUIDE



DISCLAIMER

Reference to “Logix Brands Ltd.”, “Element Insulated Concrete Forms”, and/or “Element” means the manufacturer (the “Manufacturer”) selling the product(s) (the “Products”) referenced in the Product Specific Table and Accessories section of and detailed within the installation guides throughout this manual (the “Manual”) to consumers (the “User”). The Manufacturer sells its Products “as is” and the contents of the Manual are provided “as is”.

NO EXPRESS WARRANTIES ARE GIVEN. ALL WARRANTIES, EXPRESS, STATUTORY AND IMPLIED, INCLUDING BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY DISCLAIMED.

The User assumes all risks as to the use of the Products and/or the Manual. The Manual is to be used as a reference guide only. The User shall confirm the information contained in the Manual meets local building codes and construction practices by consulting with local building officials and professionals, and determine if there are any additional building and/or construction requirements. Before use, the User should fully investigate the Products to enable informed choices as to suitability for a particular construction project and proper design and implementation. It is the User’s responsibility and obligation to ensure all work performed conforms to applicable building code and labour safety regulations governing the construction.

As the Manufacturer has no control over installation design and workmanship, accessory materials or application conditions, the Manufacturer does not warranty the performance or results of any installation containing the Products and/or derived from the Manual. The User acknowledges that it has not relied upon any representation, condition or warranty made by the Manufacturer or any other person on the Manufacturer’s behalf.

The Manufacturer assumes no responsibility that its Products will be fit for any particular purpose. The Manufacturer will not be liable for any direct, incidental, consequently or indirect damages (including lost profits) arising out of the use of its Products and/or the Manual.

The Manufacturer reserves the right to make changes to the Manual without notice and assumes no liability in connection with the use of the Manual.

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7.1 – PENDING APPROVALS

The following State approvals are currently under review and awaiting approval.

- Miami-Dade Notice of Acceptance
- City oof LA Research Report

7.2 – QAI LISTING REPORT

QAI LABORATORIES
CERTIFICATION TESTING INSPECTION

VANCOUVER, BC: 877.461.8378 ph. | 604.527.8368 fx.
LOS ANGELES, CA: 909.483.0250 ph. | 909.483.0336 fx.
TULSA, OK: 918.437.8333 ph. | 918.437.8487 fx.
TORONTO, ON 905.605.5444
WEBSITE: WWW.QAI.ORG

BUILDING PRODUCTS LISTING PROGRAM

Customer:	Logix Brands, Ltd.
Class:	Insulated Concrete Forms (ICF)
Location:	Whistler, BC Canada
Website:	www.logixbrands.com
Listing No.	B1031-1
Project No.	B1031-1, Edition 4
Effective Date:	September 27, 2010
Last Revised:	March 12, 2024

Standards:		
	CAN/ULC S717.1	*Standard for Flat Wall Insulating Concrete Form (ICF) Systems.*
	ASTM E2634	*Standard Specification for Flat Wall Insulating Concrete Form (ICF) Systems.*
	ASTM D1761	*Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials.*
	CAN/ULC S701.1	*Thermal Insulation, Polystyrene, Boards and Pipe Covering.*
	ASTM C578	*Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.*
	CAN/ULC S102.2	*Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.*
	ASTM E84	*Standard Test Method for Surface Burning Characteristics of Building Materials.*
	ASTM D2843	*Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics*
	UL 1715	*Fire Test of Interior Finish Material*
	ASTM D635	*Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.*
	ASTM D1929	*Standard Test Method for Determining Ignition Temperature of Plastics.*
	ASTM E119	*Standard Test Methods for Fire Tests of Building Construction and Materials.*
	CAN/ULC S101	*Standard Methods of Fire Endurance Tests of Building Construction and Materials.*
	UL 263	*Standard for Fire Tests of Building Construction and Materials.*

Product: Insulated Concrete Forms (ICF) are available in the following Models:

- Logix ICF
- Element™ ICF

7.2 – QAI LISTING REPORT CONTINUED

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WEBSITE: WWW.QAI.ORG

Markings: Product is marked with labels supplied by Logix Brands Ltd. Products are marked in a permanent manner where it is readily visible after installation with the following:

a) Manufacturer's name or trademark
b) Product model designation
c) Month and year of manufacture
d) QAI file Number: B1031-1
e) CAN/ULC S701.1 Type 2, ASTM C578 Type II,
f) ASTM E84 FSI and SDI Rating (FSI ≤ 25 / SDI ≤ 450) and
g) CAN/ULC S102.2 FSI and SDI ratings (FSI ≤ 230 / SDI ≥ 500).
h) QAI logo shown here:

Models / Ratings:

Logix and Element™ ICF complies with specifications for flat-walled ICF in accordance with CAN/ULC S717.1.

Logix and Element™ ICF complies with specifications for flat-walled insulated concrete forms in accordance with ASTM E2634.

Logix and Element™ ICF cross ties have a spontaneous ignition temperature ≥ 650°F when evaluated in accordance with ASTM D1929.

Logix ICF cross ties have a rate of burning of CC2 and Element™ ICF cross ties have a rate of burning of CC1 when evaluated in accordance with ASTM D635.

Logix and Element™ ICF cross ties have smoke density index < 75 when evaluated in accordance with ASTM D2843.

Logix ICF has the following allowable fastener load capacities determined in accordance with CAN/ULC S717.1 / ASTM E2634 following ASTM D1761:

FASTENER	ALLOWABLE WITHDRAWAL		ALLOWABLE LATERAL SHEAR	
	lbs	kg	lbs	kg
#6 1-¼ inch Length Coarse Thread Drywall Screw.	23	10	59	26

7.2 – QAI LISTING REPORT CONTINUED

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Element™ ICF has the following allowable fastener load capacities determined in accordance with CAN/ULC S717.1 / ASTM E2634 following ASTM D1761:

FASTENER	ALLOWABLE WITHDRAWAL		ALLOWABLE LATERAL SHEAR	
	lbs	kg	lbs	kg
#6 1-5/8inch Length Coarse Thread Drywall Screw.	37	16.8	40	18.2
#6 1-5/8inch Length Fine Thread Drywall Screw.	33.9	15.4	21	9.6
#8 x 2" Wood Screw	40	18.2	46	20.8
#10 x 2" Wood Screw	42.1	19.1	30	13.5
#8 x 2" Exterior Deck Screw	42.3	19.2	56	25.2

Fasteners are to penetrate through flange of cross-tie at minimum 19 mm (3/4-inch).

Logix and Element™ ICF Expanded Polystyrene (EPS) Thermal Insulation Type 2 Specifications per CAN/ULC S701.1

PROPERTY	LOGIX ICF EPS SPECIFICATIONS
Thermal Resistance m^2*°C/W at 25 mm Thickness	Minimum 0.70
Water Vapour Permeance Ng/Pa*s*m^2 at 25 mm Thickness	Maximum 200
Dimensional Stability % Linear Change	Maximum 1.5
Flexural Strength kPa	Minimum 240
Water Absorption % Volume	Maximum 4.0
Compressive Strength kPa at 10% Deformation	Minimum 110
Limiting Oxygen Index %	Minimum 24

Logix and Element™ ICF EPS Thermal Insulation Type II Specifications per ASTM C578

PROPERTY	LOGIX ICF EPS SPECIFICATIONS
Compressive Resistance psi at Yield or 10% Deformation	Minimum 15.0
Thermal Resistance F*ft^2*h/Btu at 1.00 Inch Thickness	Minimum 4.0
Flexural Strength psi	Minimum 35.0
Water Vapor Permeance Perms at 1.00 Inch Thickness	Maximum 3.5
Water Absorption % Volume	Maximum 3.0
Dimensional Stability % Change Dimensions	Maximum 2.0
Oxygen Index % Volume	Minimum 24.0
Density lbs/ft^3	Minimum 1.35

Logix and Element™ ICF Surface Burning Characteristics per CAN/ULC S102.2

LOGIX COMPONENT	DENSITY	MAXIMUM THICKNESS	FLAME SPREAD INDEX (FSI)	SMOKE DEVELOPED INDEX (SDI)
Expanded Polystyrene (EPS Panel)	22 – 29 kg/m^3	100 mm Maximum	≤ 250	≥ 500

7.2 – QAI LISTING REPORT CONTINUED

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Logix and Element™ ICF Surface Burning Characteristics per ASTM E84[1]

LOGIX COMPONENT	DENSITY	MAXIMUM THICKNESS	FLAME SPREAD INDEX (FSI)	SMOKE DEVELOPED INDEX (SDI)
Expanded Polystyrene (EPS Panel)	1.35 – 1.65 lbs/ft^3	4.0 Inches Maximum	≤ 25	≤ 450

[1]Ceiling Measurement Only. This measurement is conducted through determination of flame spread index and smoke developed index with the removal of any contribution of molten materials ignited on the floor of the tunnel assembly.

Logix ICF / Element™ ICF UL 1715 Configuration

Meets requirements with ½ inch thickness gypsum fastened with 2-¼ inch length standard drywall screws at 12 inches on center spacing in the field and around the perimeter. Fasteners must be anchored into Logix and Element™ ICF web ties.

Logix and Element™ ICF CAN/ULC S101, UL 263, ASTM E119 Fire-Resistance Rated Load-Bearing Wall Assemblies[1]

QAI Design #	Wall Type	Wall Thickness Inches (mm)	Rating
B1031-1	Logix ICF with interior ½-inch (13 mm) gypsum board complying with ASTM C1396.	4 (102)	2
		6.25 (159)	3
		6.25[2] (159)	4
		8 (203)	4
	Element™ ICF with interior 1/2-inch (13 mm) gypsum board complying with ASTM C1396.	4 (102)	2
		6 (152)	3
		8 (203)	4

Note 1: The above Logix and Element™ ICF fire-resistance rated wall assemblies allowable load are to be determined by a registered design professional, or authority having jurisdiction in accordance with the applicable codes.
Note 2: 5/8-inch (16 mm) Type X gypsum board replacing noted ½" (13 mm) gypsum is required to meet the 4-hour fire-resistance rating as outlined in QAI design listing B1031-1.

7.2 – QAI LISTING REPORT CONTINUED

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Notes: Final acceptance of the product in the intended application is to be determined by the authority having jurisdiction.

Product is to be installed in accordance with the manufacturer's published installation instructions and the applicable code. Also see QAI CER_{US}-1005

The materials, products or systems listed herein have been qualified to bear the QAI Listing Mark under the conditions stated with each Listing. Only those products bearing the QAI Listing Mark are considered to be listed by QAI. No warranty is expressed or implied, and no guarantee is provided that any jurisdictional authority will accept the Listing found herein. The appropriate authorities should be contacted regarding the acceptability of any given Listing. Visit the QAI Online Listing Directory located at www.qai.org for the most up to date version of this Listing and to validate that this QAI Listing is active. Questions regarding this listing may be directed to info@qai.org. Please include the listing number in the request.

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7.3 – QAI CODE EVALUATION REPORT

CODE EVALUATION REPORT

CERUS-1005

PUBLISHED: February 2022
REVISED: March 2024
EXPIRATION: March 2027

PRODUCT: **LOGIX and ELEMENT™ INSULATED CONCRETE FORMS (ICF)**

REPORT HOLDER: Logix Brands, Ltd.

CONTACT DETAILS:
9242 Pinetree Place
Whistler, British Columbia
V8E 0G5 Canada
www.logixbrands.com

CSI DIVISION:
03 00 00 – Concrete
07 00 00 – Thermal and Moisture Protection

CSI SECTION:
03 11 19 - Insulating Concrete Forming
07 21 00 – Thermal Insulation

APPLICABLE CODES:
2021, 2018, 2015 International Building Code (IBC)
2021, 2018, 2015 International Residential Code (IRC)
2018, 2015 International Energy Code (IEC)
2019 California Green Building Standards Code (CALGreen), Title 24, Part 11
2015, 2012 ICC 700 *National Green Building Standard* ™ (ICC 700)
2023, 2020 Florida Building Code, Building
2023, 2020 Florida Building Code, Residential

EVALUATED:
Flat Walled Insulated Concrete Forms
Foam Plastic, Surface Burning Characteristics
Foam Plastics, Use in Exterior Walls in Types I-IV Construction
Foam Plastics, Use in Attics and Crawlspaces
Plastics, Ignition Temperature
Plastics, Rate of Burning
Fire-Resistance Ratings

IAS ACCREDITED PCA-118

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7.3 – QAI CODE EVALUATION REPORT CONTINUED

CODE EVALUATION REPORT

LOGIX BRANDS, LTD.
CERus-1005
Revision: March 2024
Expiration: March 2027
Page 1 of 17

1.0 APPROVED FOR FOLLOWING:

APPROVED TYPES OF CONSTRUCTION:	Types I-V A/B
APPROVED USE:	Stay-in-place Concrete Forms
APPROVED INSTALLATIONS:	• Load Bearing and Non-load Bearing Exterior and Interior Walls • Load Bearing and Non-load Bearing Fire-Resistance Rated Walls • Foundation Walls • Retaining Walls • Attic and Crawlspace installations without Code Prescribed Ignition Barrier

2.0 DESCRIPTION:

2.1 General:

Logix ICF and Element™ Insulated Concrete Forms (ICF) are modular concrete formworks comprised of Type II expanded polystyrene (EPS) foam plastic thermal insulation panels connected with high density plastic cross ties. Logix and Element™ ICF are placed onsite as stay-in-place forms for concrete placement.

Logix ICF and Element™ ICF meet *Flat Wall Insulated Concrete Forms* specifications, as defined in Section 1903.4 of the 2021 / 2018 / 2015 IBC, and Sections R404.1.3.3.6.1 and R608.4.4 of the 2021 / 2018 / 2015 IRC through compliance to ASTM E2634.

Logix ICF are available in the following products and sizes:

Table 1a. LOGIX ICF Evaluated Products and Accessories[1]

Concrete Core Thickness		Length		Height		Style
inches	mm	inches	mm	inches	mm	
4, 6.25, 8, 10, 12	102, 159, 203, 254, 305	48	1219	12 16	305 406	Standard Straight
4, 6.25, 8, 10, 12	102, 159, 203, 254, 305	48	1219	16	406	Brick Ledge Block
4, 6.25, 8, 10, 12	102, 159, 203, 254, 305	48	1219	12 16	305 406	Taper Top Block
4, 6.25, 8, 10, 12	102, 159, 203, 254, 305	48	1219	16	406	Double Taper Top Block
4, 6.25, 8, 10	102, 159, 203, 254	32	813	12 16	305 406	90º Block
4, 6.25, 8	102, 159, 203	30	762	16	406	45º Block

1: Additional Logix ICF accessories, including but not limited to half height ICF, T-series blocks, and end caps are available for use with Logix ICF products.

7.3 – QAI CODE EVALUATION REPORT CONTINUED

Element™ ICF are available in the following products and sizes:

Table 1b. ELEMENT™ ICF Evaluated Products and Accessories[1]

Concrete Core Thickness		Length		Height		Style
inches	mm	inches	mm	inches	mm	
4, 6, 8, 10, 12	102, 152, 203, 254, 305	48	1219	16	406	Standard Straight
4, 6, 8, 10, 12	102, 152, 203, 254, 305	48	1219	16	406	Brick Ledge Block
4, 6, 8, 10, 12	102, 152, 203, 254, 305	48	1219	16	406	Taper Top Block
4, 6, 8, 10, 12	102, 152, 203, 254, 305	38.5	978	16	406	90° Block

Logix ICF and Element™ ICF comply for use as Flat Wall ICF including use in High Velocity Hurricane Zones as defined by the 2023 / 2020 Florida Building Code and 2023 / 2020 Florida Building Code, Residential. See Section 9 of this report for further details.

2.2 EPS Foam Plastic Panels:

Logix ICF and Element™ ICF include expanded polystyrene (EPS) *foam plastic* thermal insulation panels of 2-3/4 inches (70 mm) thickness on each ICF face. The EPS *foam plastic* component has a flame spread index of 25 or less, and smoke developed index of 450 or less evaluated following ASTM E84.

The EPS foam is listed by an *approved agency* and complies with Type II specifications per ASTM C578 for use as thermal insulation.

Logix ICF and Element™ ICF foam plastic has spontaneous ignition temperatures > 650°F (343°C) when evaluated to ASTM D1929.

2.3 Cross Ties:

Logix ICF and Element™ ICF include polypropylene cross ties spaced at 8 inches (203 mm), molded into the EPS panels, connecting EPS panels to create the molded concrete form work. Cross ties allow concrete flow through during concrete placement, and are molded to include rebar slots for ease of rebar placement. Additionally, the polypropylene cross ties include a flange molded into the EPS panels, providng an anchoring substrate for mechanical fasteners to connect interior finishes, exterior claddings, and decorum. Fasteners evaluated for use with Logix ICF and Element™ ICF are outlined in Tables 3a and 3b of this report including fastener capacities. Locations of cross tie flanges are outlined in Logix ICF and Element™ ICF EPS panel faces to provide direction during fastener installation.

Logix ICF and Element™ ICF cross ties have spontaneous igntion temperatures ≥ 650°F (343°C) when tested to ASTM D1929, a smoke density index less than 75 when tested to ASTM D2843 and are classifeid as minimum CC2 when tested to ASTM D635.

2.4 Concrete Core:

Concrete is placed at the jobsite. Concrete design, specifications and applications are to be in accordance with the project requirements per the applicable code(s) and are outside the scope of this report, except where specific concrete criteria are noted.

2.5 Rebar (reinforcement):

Reinforcement is applied at the jobsite. Reinforcement design, specifications and installation are to be in accordance with the project requirements and applicable code(s), and are outside the scope of this report.

7.3 – QAI CODE EVALUATION REPORT CONTINUED

3.0 DESIGN:

Logix ICF and Element™ ICF wall design including concrete and reinforcement is outside the scope of this report. See below for information regarding design criteria for use with Logix ICF and Element™ ICF.

2021 / 2018 / 2015 IBC: Logix ICF and Element™ ICF construction governed by the IBC are to have concrete walls designed in accordance with Chapters 16 and 19. Where used as footings or foundations, design shall be in accordance with Chapter 18.

2021 / 2018 / 2015 IRC: Logix ICF and Element™ ICF construction governed by the IRC are to have concrete walls designed in accordance with Section R608. Where used as footings or foundations, design shall be in accordance with IRC Chapter 4.

4.0 INSTALLATIONS:

4.1 General:

Installation of Logix ICF and Element™ ICF must comply with the manufacturer's published installation instructions, this report, and the applicable code(s). Where conflicts exist, this report and the applicable building code shall govern.

Logix ICF and Element™ ICF construction designed in accordance with 2021 / 2018 / 2015 IBC and 2021 / 2018 / 2015 IRC require special inspections as defined by Section 1705 of the IBC.

Logix ICF and Element™ ICF construction conducted following IRC prescriptive methodology does not require special inspections. The authority having jurisdiction should be consulted in case of question.

4.2 Interior:

4.2.1 General:

Logix ICF and Element™ ICF components located on the interior of the building are to be installed in accordance with section 4.2.2 and 4.2.3 of this report, as appropriate. Connecting of interior decorum, furniture and cabinetry are approved where the necessary load resistance for objects secured to Logix ICF and Element™ ICF are provided by fasteners as outlined in Tables 3a and 3b of this report. Service loads shall not exceed the allowable load carrying capacity of the fasteners noted.

4.2.2 Occupied Space:

4.2.2.1 Use With a Code Prescribed Thermal Barrier.

2021 / 2018 / 2015 IBC: Logix ICF and Element™ ICF EPS thermal insulation exposed to occupancies of the building interior shall be covered by a thermal barrier of minimum ½ inch (13 mm) thick gypsum board complying with ASTM C1396, or by a material complying with NFPA 275 compatible for use with the Type II EPS insulation at thicknesses of 2-¾ inches (70 mm) or greater. Gypsum shall be mechanically connected to the Logix ICF and Element™ ICF cross ties with fasteners outlined in Tables 3a and 3b of this report, with the gypsum oriented either vertically or horizontally. When used in applications not requiring fire-resistance ratings, the gypsum boards are to be secured with fasteners spaced at 12 inches (305 mm) on center vertically and horizontally, with fasteners penetrating the cross-tie flanges of the underlying Logix ICF and Element™ ICF. Joint treatment is not required. Where Logix ICF and Element™ ICF are constructed in applications requiring fire-resistance rating, attachment of the gypsum membrane and joint treatment shall follow Section 4.4 and Section 8.2 of this report.

7.3 – QAI CODE EVALUATION REPORT CONTINUED

2021 / 2018 / 2015 IRC: Logix ICF and Element™ ICF EPS thermal insulation exposed to occupancies of the building shall be protected by a thermal barrier of minimum of ½ inch (13 mm) thick gypsum wall board complying with ASTM C1396, 23/32-inch thickness structural wood panels, or a material complying with NFPA 275 compatible for use with the Type II EPS insulation at thicknesses 2-¾ inches (70 mm) or greater. Where gypsum or structural wood panels are used, they shall be mechanically connected to the Logix ICF and Element™ ICF cross ties with fasteners outlined in Tables 3a and 3b of this report, with panels oriented either vertically or horizontally. When used in applications not requiring fire-resistance ratings, the gypsum boards are to be secured with fasteners spaced at 12 inches (305 mm) on center vertically and horizontally, with fasteners penetrating the cross-tie flanges of the underlying Logix ICF and Element™ ICF. Joint treatment is not required. Where Logix ICF and Element™ ICF are constructed in applications requiring fire-resistance ratings, attachment of the gypsum membrane and joint treatment shall follow Section 4.4 and Section 8.2 of this report.

4.2.2.2 Use Without a Code Prescribed Thermal Barrier.

No alternative thermal barriers are approved under this current report over Logix ICF and Element™ ICF.

4.2.3 Attic and Crawlspace:

4.2.3.1 Use With a Code Prescribed Ignition Barrier:

Logix ICF and Element™ ICF EPS thermal insulation exposed in attics and crawlspaces is to be protected with a code prescribed ignition barrier as defined in the Section 2603.4.1.6 of the 2021 / 2018 / 2015 IBC and Sections R316.5.3 and R316.5.4 of the 2021 / 2018 / 2015 IRC. The ignition barrier is to cover all exposed foam.

4.2.3.2 Use Without a Code Prescribed Ignition Barrier:

Logix ICF and Element™ ICF EPS thermal insulation panels exposed in attics and crawlspaces can be installed without the prescribed ignition barrier as defined in the 2021 / 2018 / 2015 IBC and 2021 / 2018 / 2015 IRC, only when the following conditions are present:

- Entry to the attic or crawlspace is limited to service of utilities only. Storage or occupancy are not permitted.
- No interconnected areas exist to the attic or crawlspace.
- Air from the attic or crawlspace is not circulated to other areas of the building.
- Ventilation is provided as required by 2021 / 2018 / 2015 IBC Chapter 12 or 2021 / 2018 / 2015 IRC Section R306.
- Combustion air is provided in accordance with the IMC (International Mechanical Code) Section 701.
- Labels at minimum 1 per location, or 1 label per 160 ft^2 exposed foam, which ever greater, is present outlining product as "*Approved for Use in Attic and Crawlspace*". See Figure 1a of this report for an example of approved Logix ICF label. See Figure 1b of this report for an example of approved Element™ ICF label.

7.3 – QAI CODE EVALUATION REPORT CONTINUED

4.3 Exterior:

4.3.1. Above Grade:

4.3.1.1 Exterior Walls: Exterior walls of Logix ICF and Element™ ICF shall comply with Sections 4.3.1.2 through 4.3.1.4 of tthis report. Where Logix ICF and Element™ ICF is used in fire-resistance rated construction, installation shall comply with Sections 4.4 and 8.2 of this report. Where Logix ICF and Element™ ICF is used in Types I-IV construction, installation shall be in accordance with Section 4.5 of this report.

4.3.1.2 Weather Protection: Logix ICF and Element™ ICF used as exterior walls require installation with a approved exterior cladding and flashings for providing weather protection in accordance with Section 1402.2 of the 2021 / 2018 IBC, Section 1403.2 of the 2015 IBC and water resistance in accordance with Section R703.1.1 of the 2021 / 2018 / 2015 IRC. Exterior cladding materials shall comply with Section 1403 of the 2021 / 2018 IBC, Section 1404 of the 2015 IBC and R703 of the 2021 / 2018 / 2015 IRC, or have means for showing compliance to the noted applicable code. Anchoring of the exterior cladding and trim shall be done with approved fasteners outlined in Tables 3a and 3b of this report as appropriate, with the fastener spacing appropriate for ensuring anchorage capacities are within the specified allowable values. The water resistive barrier can be omitted in accordance with Section 1402.2 of the 2021 / 2018 IBC or 1403.2 of the 2015 IBC, and R703.1.1 of the 2021 / 2018 / 2015 IRC as applicable.

4.3.1.3 Vapor Retarders: Logix ICF and Element™ ICF EPS component is a Type II vapor retarder at a total installed EPS thickness of 5.5 inches (140 mm), so where a Class II vapor retarder is required, this can be omitted.

4.3.1.4 Termite Protection: Where Logix ICF and Element™ ICF are installed in areas defined as “very heavy” as indicated in Figure 2603.8 of the 2021 / 2018 / 2015 IBC and Figure R301.2(6) of the 2021 / 2018 / 2015 IRC, and where the EPS foam component is located within 6 inches (152 mm) above grade from exposed earth, construction is to follow Section 2603.8 of the 2021 / 2018 / 2015 IBC and R318.4 of the 2021 / 2018 / 2015 IRC. This construction requires all structural elements of walls, floors, ceilings and roofs to be of noncombustible materials or preservative-treated wood, unless an approved method of protecting the foam plastic from subterranean termite damage is provided to the authority having jurisdiction.

4.3.2. Below Grade:

4.3.2.1 Walls: For foundation walls designed as freestanding, backfill is permitted prior to floor installation. For below grade walls relying on the floor for structural support, backfill is not permitted until the floor installation is complete.

Foundation walls and footings are to be designed and installed in accordance with 2021 / 2018 / 2015 IBC Chapter 18 or 2021 / 2018 / 2015 IRC Section R404, as applicable. Foundation walls supporting steel or wood framed constructions require appropriate protection to the framing members as required by the applicable code.

Retaining walls are to be designed and installed in accordance with 2021 / 2018 / 2015 IBC Chapter 1807. Where used as retaining walls under the IRC, the authority having jurisdiction should be consulted.

4.3.2.2 Dampproofing or waterproofing: As required by site conditions, dampproofing or waterproofing shall be installed in accordance with 2021 / 2018 / 2015 IBC Chapter 1805 or 2021 / 2018 / 2015 IRC Section R406 as applicable. The dampproofing or waterproofing material must be compatible for use with EPS thermal insulation products.

7.3 – QAI CODE EVALUATION REPORT CONTINUED

4.3.2.3 Termite Protection: Where Logix ICF and Element™ ICF are used below grade in areas defined as "very heavy" termite infestation probability as indicated in Figure 2603.8 of the 2021 / 2018 / 2015 IBC and Figure R301.2(6) of the 2021 / 2018 / 2015 IRC, construction is to follow Section 2603.8 of the 2021 / 2018 / 2015 IBC and R318.4 of the 2021 / 2018 / 2015 IRC. This construction requires all structural elements to walls, floors, ceilings and roofs to be of noncombustible materials or preservative-treated wood unless an approved method of protecting the foam plastic from subterranean termite damage is provided to the authority having jurisdiction.

4.4. Fire-Resistance-Rated Construction:

Logix ICF and Element™ ICF are approved for use in applications where a load-bearing fire-resistance-rating is required for up to 4 hours interior or exterior orientated towards the fire.

See Section 8.2 of this report for details of installation for use in fire-resistance-rated applications.

4.5 Type I-IV (Non-combustible) Construction:

4.5.1 General:

Logix ICF and Element™ ICF are appproved for use in exterior walls of Types I-IV (non-combustible) construction.

All exterior claddings systems require a thermal barrier applied on the occupancy (interior) face, in accordance with Section 4.2.2.1 of this report.

Fire blocking is required in interior areas at maximum each floorline, to limit the spread of flames and smoke from one compartment to another.

4.5.2 Exterior Insulation Finishing Systems (EIFS):

When used with EIFS systems as outlined below where no additional EPS is incuded in the EIFS assembly, backwrapping and installtion of the EIFS lamina are to follow the EIFS manufacturer's published installation instructions.

Where additional EPS is applied over Logix ICF and Element™ ICF, the Logix ICF and Element™ ICF exterior foam plastic component must be considered in calculating an equivalent fuel load as nominal 1.5 lbs/ft^3 (24 kg/m^3) density to the approved expanded polystyrene fuel load component of the approved EIFS.

7.3 – QAI CODE EVALUATION REPORT CONTINUED

Table 2. Details of EIFS systems approved for use with Logix ICF and Element™ ICF include:

EIFS PRODUCT	EIFS MANUFACTURER	MAXIMUM EIFS EPS THICKNESS* (TYPE I @ 1.0 lb/ft³)	LOGIX ICF AND ELEMENT™ ICF EPS THICKNESS (TYPE II @ 1.5 lbs/ft³)	MAXIMUM APPLIED EPS THICKNESS FINISHED EIFS**
Outsulation®	Dryvit Corportion Inc.	9 inches (229 mm)	2-3/4 inches (70 mm)	11-3/4 inches (298 mm)
Outsulation® MD	Dryvit Corportion Inc.	9 inches (229 mm)	2-3/4 inches (70 mm)	11-3/4 inches (298 mm)
StoTherm Classic	Sto Corporation	8 inches (203 mm)	2-3/4 inches (70 mm)	10-3/4 inches (273 mm)
StoTherm Classic NexT® ci	Sto Corporation	8 inches (203 mm)	2-3/4 inches (70 mm)	10-3/4 inches (197 mm) when over ½ inch (13 mm) interior and exterior gypsum.
		5 inches (127 mm)	2-3/4 inches (70 mm)	7-3/4 inches (197 mm) when installed over TurboStick adhesive.

* Maximum thickness of EIFS (Type 1 @ 1.0 lb/ft³) when applied over Logix ICF and Element™ ICF.
** Maximum combined insulation total thickness of EIFS and Logix / Element™ ICF EPS.

EPS thickness above is provided considering combined Logix ICF and Element™ ICF EPS component with EIFS EPS component providing equivalent fuel load to above described Type I-IV approved EIFS assemblies. Manufacturer's installation instructions for application with EIFS including backwrap details are to be followed during installation, with backwrap anchoring and overlaps required, connected at competent anchor points. Anchoring of backwraps to the face of Logix ICF and Element™ ICF EPS component when installed in Types I-IV construction is not permitted.

4.5.3 Exterior Brick Veneer:

Brick veneer is to be anchored to Logix ICF and Element™ ICF cross ties with fasteners required to penetrate the cross tie flange. Anchoring schedules used shall be designed to resist the anticipated gravity and service loads based on fastener capacity values outlined in Tables 3a and 3b of this report. Brick veneer used is to comply with 2021 / 2018 / 2015 IBC, and shall be installed with a minimum 1 inch (25 mm) air gap between the exterior Logix ICF and Element™ ICF EPS panel face, and the brick veneer. Brick veneer is to be supported along floor lines in accordance with the applicable code.

4.5.4 Exterior Plaster:

Exterior plaster including metal lath is to comply with the applicable code, and shall be a minimum of 7/8 inch (22.2 mm) thickness. Fasteners connecting the metal lath to Logix ICF and Element™ ICF cross ties are required to penetrate the cross-tie flanges. Anchoring schedules used shall be designed to resist the anticipated gravity and service loads based on fastener capacity values outlined in Tables 3a and 3b of this report.

7.3 – QAI CODE EVALUATION REPORT CONTINUED

5.0 LIMITATIONS

- Logix ICF and Element™ ICF are to be protected from direct sunlight exposure to the plastic cross ties.
- Logix ICF and Element™ ICF are manufactured in in Chilliwack, BC, Acheson, AB, Headingly, MB, Cobourg, ON, Hayesville, KS and McFarland, CA with inspections by QAI Laboratories.
- Logix ICF and Element™ ICF are required to be separated from interior space by an approved thermal barrier when installed in accordance with Section 4.2.2 of this report and the applicable code
- Logix and Element™ ICF are approved for use in Attic and Crawlspace applications when installed in accordance with Section 4.2.3 of this report and the applicable code and where products bear a visible label outlining "*Approved for Use in Attics and Crawlspaces*".
- Logix ICF and Element™ ICF are required to be protected by a code-compliant exterior cladding when installed on the exterior of the buidling above grade, or code compliant damproofing and waterproofing material when installed on the exterior below grade. Refer to section 4.3 of this report for details.
- Logix ICF and Element™ ICF exposed within 6 inches (152) of grade or below grade in termite infestation areas defined as "very heavy"require protection in accordance with IBC Section 2603.8 or IRC R318.4 with installation required in accordance with Sections 4.3.1.4 and 4.3.2.3 of this report and the applicable code, as appropriate.
- Logix ICF and Element™ ICF when used in fire-resistance-rated construction are to be installed in accordance with Section 4.4 and Section 8.2 of this report.
- Logix ICF and Element™ ICF used in Types I-IV Construction are to be installed in accordance with Section 4.5 of this report.
- Logix ICF and Element™ ICF have product labels visible at minimum every 160 ft^2.

6.0 SUPPORTING INFORMATION:

The following data has been evaluated for Logix ICF and Element™ ICF:

- Data outlining compliance for use as Flat Wall Insulated Concrete Forms, as detailed in ASTM E2634.
- Data outlining determination of flame spread index and smoke developed index per ASTM E84.
- Data outlining details for use in load-bearing fire-resistance rated construction per ASTM E119.
- Data outlining details for use in exterior walls of Types I-IV construction as detalied in Chapter 26 of 2021 / 2018 / 2015 IBC.

7.3 – QAI CODE EVALUATION REPORT CONTINUED

7.0 MARKING:

Logix ICF finished products example label are outlined in Figure 1a below.

Figure 1a. Example of Logix ICF Finished Product Label

Element™ ICF finished products example label are outlined in Figure 1b below.

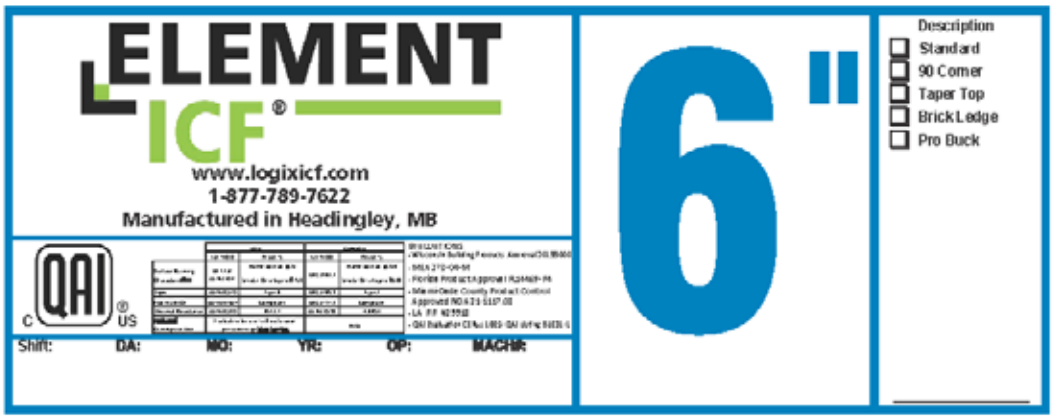


Figure 1b. Example of Element™ ICF Finished Product Label

7.3 – QAI CODE EVALUATION REPORT CONTINUED

8.0 RESULTS / RATINGS:

8.1 Allowable Fastener Capacities

Table 3a. Logix ICF Approved Fasteners Including Capacities

FASTENERS[1]	FASTENER CAPACITY	
	Allowable Withdrawal lbs (kg)	Allowable Lateral Shear lbs (kg)
#6 Coarse Thread Drywall Screw	23 (10)	59 (26)

Table 3b. Element™ ICF Approved Fasteners Including Capacities

FASTENERS[1]	FASTENER CAPACITY	
	Allowable Withdrawal lbs (kg)	Allowable Lateral Shear lbs (kg)
#6 Coarse Thread Drywall Screw	37 (17)	40 (18)
#6 Fine Thread Drywall Screw	34 (15)	21 (10)
#8 Wood Screw	40 (18)	46 (21)
#10 Wood Screw	42 (19)	30 (14)

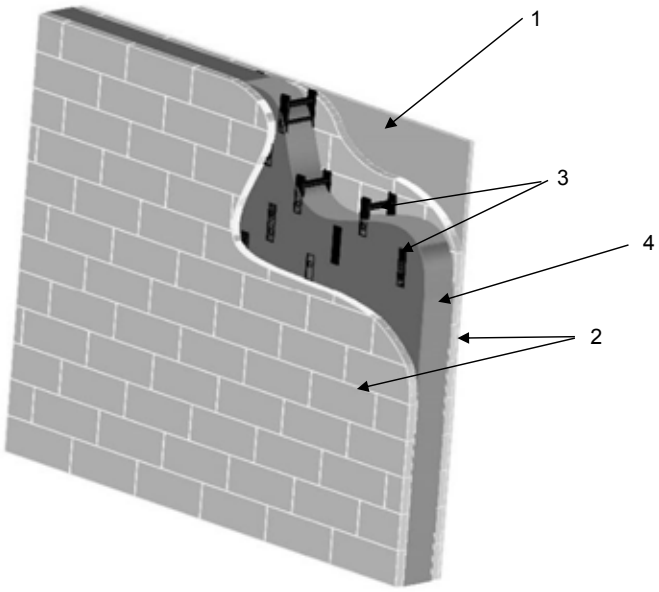
Note 1: Fasteners must penetrate the cross ties flanges, and should be specified as ¾ inches (76 mm) longer than object through which the fastener is penetrating.

7.3 – QAI CODE EVALUATION REPORT CONTINUED

8.2 Fire-Resistance-Rated Assembly Details

Table 4. Logix ICF and Element™ ICF Load-Bearing Fire-Resistance-Rated Assemblies.

Wall Type	ASSEMLY RATING (Hours)	MINIMUM CONCRETE CORE (MM)	MINIMUM CONCRETE CORE (INCHES)
Logix ICF	2	102	4
	3	159	6.25
	4	203	6.25* 8
Element™ ICF	2	102	4
	3	152	6
	4	203	8



7.3 – QAI CODE EVALUATION REPORT CONTINUED

NO.	COMPONENT	DESCRIPTION
1	Interior Finish	Minimum ½ inch (12 mm) thickness ASTM C1396 listed gypsum wall board, installed with minimum 2 inches (51 mm) length coarse thread drywall screws spaced at maximum 16 inches (406 mm) on center horizontally and vertically. *For Logix 6 ¼ inch (159 mm) products used in 4-hour load-bearing fire-resistance-rated wall assemblies, listed 5/8-inch (16 mm) thickness Type X gypsum wall board complying with ASTM C1396 is required with fastening requirements as noted above. Gypsum joints and fasteners are required taped and mudded per industry standard.
2	Expanded Polystyrene (EPS) Insulation	Maximum 2 ¾ inches (70 mm) thickness Type II (per ASTM C578) expanded polystyrene thermal insulation. Logix ICF and Element™ ICF EPS panels have interlocking teeth to allow stacking onsite to create the forming wall.
3	Cross Ties	Logix and Element™ polypropylene cross ties, spaced at 8 inches (203 mm) on center spacing through Logix and Element™ ICF. Cross ties can be stacked or staggered vertically during installation (staggered cross tie system shown).
4	Concrete Core	Minimum core thickness as outlined in the Table 4, using 3,000 psi (20 MPa) compressive strength concrete at 28 days. Steel reinforcing, while not shown, is approved for use. Reinforcing is to be designed and approved by a registered design professional, or authority having jurisdiction in accordance with the applicable code.
5	Exterior Sheathing (Not Shown)	*For Logix 6 ¼ inch (159 mm) products used in 4-hour load-bearing fire-resistance-rated wall assemblies, listed 5/8-inch (16 mm) thickness Type X gypsum wall board complying with ASTM C1396 or ASTM C1177 is required with fastening requirements as noted above. Taping and mudding of joints and fasteners is optional.
6	Exterior Cladding (Not Shown)	Exterior claddings are approved for use with the Logix ICF and Element™ ICF load-bearing fire-resistance-rated wall assemblies without negatively impacting the fire rating. These exterior claddings include: brick veneer, stucco, fire rated exterior insulating finish systems, cultured stone, aluminum and steel products. All exterior claddings are to be installed with the applicable building code, and the manufacturer's approved installation instructions.

Note 1: The allowable load for Logix ICF and Element™ ICF load-bearing fire-resistance rated assemblies are to be determined by a registered design professional, or authority having jurisdiction in accordance with the applicable codes.

7.3 – QAI CODE EVALUATION REPORT CONTINUED

CODE EVALUATION REPORT

LOGIX BRANDS, LTD.
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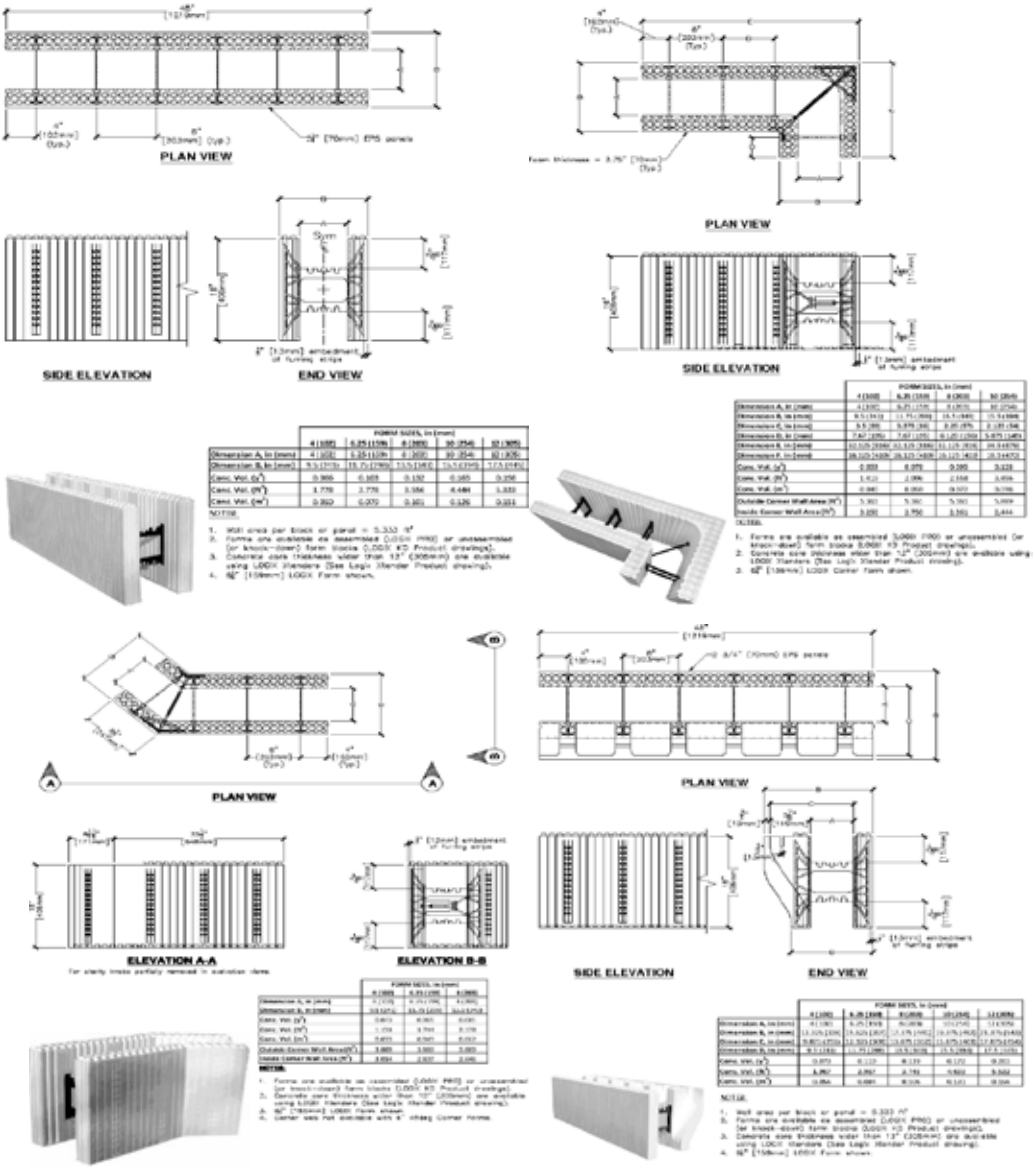

Figure 2a. Example Logix ICF Product Details

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info@qai.org

CODE AND COMPLIANCE GUIDE

7.3 – QAI CODE EVALUATION REPORT CONTINUED

CODE EVALUATION REPORT

LOGIX BRANDS, LTD.
CERus-1005
Revision: March 2024
Expiration: March 2027

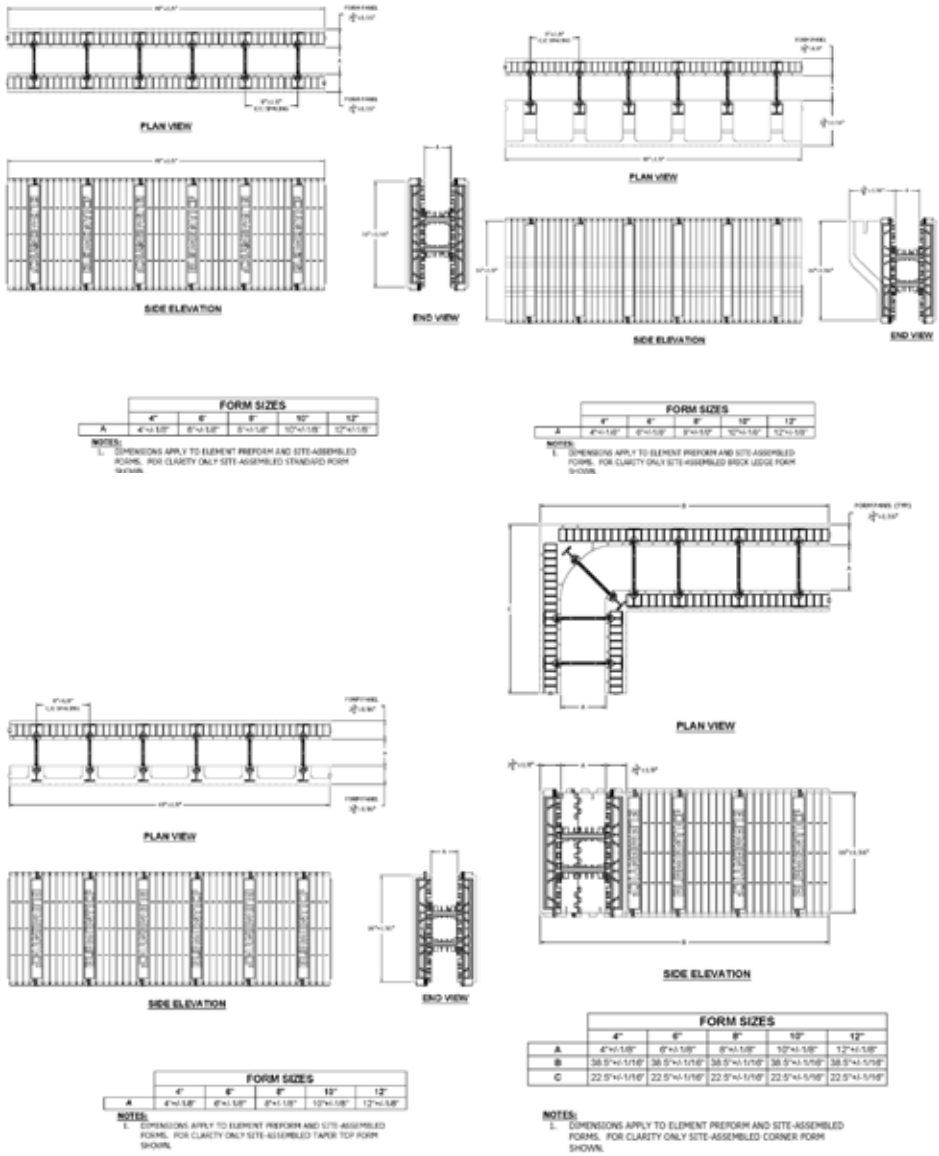

Figure 2b. Example of Element™ ICF Product Details

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7.3 – QAI CODE EVALUATION REPORT CONTINUED

CODE EVALUATION REPORT

LOGIX BRANDS, LTD.
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9.0 SUPPLEMENTAL CODES

9.1 2023 Florida Building Code:

Logix ICF and Element™ ICF as detailed in Sections 2.0 through 8.0 of QAI CERus-1005 comply with the 2023 / 2020 Florida Building Code, Building and 2023/ 2020 Florida Building Code, Residential when installed in accordance with the applicable building codes and this report.

Logix ICF and Element™ ICF comply with Section 1620 High Velocity Hurricane Zones – Wind Loads of the 2023, 2020 Florida Building Code, Building when designed in accordance with Section 3 of this report.

Logix ICF and Element™ ICF comply with Section 1625 High Velocity Hurricane Zones – Load Tests of the 2023, 2020 Florida Building Code, Building when designed in accordance with Section 3 of this report.

Logix ICF and Element™ ICF comply with Section 1626 High Velocity Hurricane Zones – Impact Tests for Wind-Borne Debris of the 2023, 2020 Florida Building Code, Building when designed in accordance with Section 3 of this report.

Logix ICF and Element™ ICF EPS Foam Plastic Panels and Cross Ties comply with Section 26 Plastic of the 2023, 2020 Florida Building Code.

Logix ICF and Element™ ICF EPS Foam Plastic Panels and Cross Ties comply with Miami-Dade Checklist #0445 for the Approval of: Plastic and Foam Plastic

7.3 – QAI CODE EVALUATION REPORT CONTINUED

10.0 ELIGIBILITY OF REPORT

QAI's Code Evaluation Report complies with the 2021 / 2018 / 2015 IBC Section 104.11 *Alternative materials, design and methods of construction and equipment* subsection 104.11.1 *Research Reports*. Supporting data has been evaluated by QAI for compliance of the noted materials and assemblies to the applicable code by QAI, and *approved* source as detailed below.

The attached report has been reviewed by a QAI Registered Professional Engineer approved by the specific state Board of Professional Engineers noted on the specific P.E. seal(s).

Per section 1703 of the IBC, QAI is an independent third-party testing, inspection and certification agency accredited by the International Accreditation Service, Inc. (IAS) for this specific scope (see IAS PCA-118). QAI can confirm that based on its IAS accreditation it meets IBC Section 1703.1 on Independence, Section 1703.1.2 on Equipment and Section 1703.1 on Personnel.

This Evaluation report has been designed to meet the performance requirements of IBC Section 1703.4 and contains the required information to show the product, material or assembly meets the applicable code requirements.

The product is labeled per section IBC 1703 and subject to follow-up inspection per IBC 1703.6 using QAI IAS accredited ISO/IEC 17020 inspection program (see IAS AA-723).

For more information regarding QAI Laboratories, please visit www.qai.org.

The above is an example of the QAI registered Listing mark. The Listing mark may only be used by the Report Holder per the QAI service agreement on products defined in this report. The 'us' indicator in the 8 o'clock position indicates the product complies with the properties evaluated with limitations outlined in this report for use in the US market. A 'c' indicator in the 4 o'clock position indicates the product has been evaluated for use in the Canadian market.

7.3 – QAI CODE EVALUATION REPORT CONTINUED

11.0 REFERENCED STANDARDS

ASTM E2634	*Standard Specification for Flat Wall Insulating Concrete Form*.
ASTM E84	*Standard Test for Surface Burning Characteristics of Building Materials*.
ASTM D2843	*Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics*
ASTM C578	*Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation*.
ASTM D1929	*Standard Test Method for Determining Ignition temperature of Plastics.*
ASTM D635	*Test Method for Rate of Burning and/or Extent and Time of Building of Plastics in a Horizontal Position.*
ASTM C1396/C1396M	*Specification for Gypsum Board*.
NFPA 275	*Standard Method of Fire TSTS for the Evaluation of Thermal Barriers*.
ASTM E119	*Standard Test Methods for Fire Tests of Building Construction and Materials*
NFPA 285	*Standard Fire Test Method for the Evaluation of Fire Propagation Characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Compartments.*
UL 263	*Standard for Fire Tests of Building Construction and Materials.*
UL 1715	*Fire Test of Interior Finish Material*

7.4 – FLORIDA PRODUCT APPROVAL

6/17/24, 7:04 AM Florida Building Code Online

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Product Approval
USER: Public User

Product Approval Menu > Product or Application Search > Application List > **Application Detail**

OFFICE OF THE SECRETARY

FL #	FL14469-R5
Application Type	Revision
Code Version	2023
Application Status	Approved
	*Approved by DBPR. Approvals by DBPR shall be reviewed and ratified by the POC and/or the Commission if necessary.
Comments	
Archived	
Product Manufacturer	Logix Insulated Concrete Forms dba Logix Brands, Ltd.
Address/Phone/Email	9242 Pinetree Place Whistler, NON-US N/A (866) 944-0153 froma@logixbrands.com
Authorized Signature	Francis Roma froma@logixbrands.com
Technical Representative	Francis Roma
Address/Phone/Email	9242 Pinetree Place Whistler, NON-US N/A (866) 944-0153 froma@logixbrands.com
Quality Assurance Representative	Francis Roma
Address/Phone/Email	9242 Pinetree Place Whistler, NON-US N/A (866) 944-0153 froma@logixbrands.com
Category	Structural Components
Subcategory	Insulation Form Systems
Compliance Method	Evaluation Report from a Product Evaluation Entity
Evaluation Entity	QAI Laboraotories Ltd
Quality Assurance Entity	QAI Laboratories
Quality Assurance Contract Expiration Date	03/31/2027
Validated By	QAI Laboratories
Certificate of Independence	

Referenced Standard and Year (of Standard)

Standard	Year
ASTM C578	2018
ASTM D1761	2006
ASTM D1929	2016
ASTM D635	2014
ASTM E119	2018
ASTM E2634	2018
ASTM E84	2018

https://floridabuilding.org/pr/pr_app_dtl.aspx?param=wGEVXQwtDquiKNpeAsu%2bZM79cusQpogWIy3lyiPUbcpseHTYvhy89A%3d%3d 1/2

7.4 – FLORIDA PRODUCT APPROVAL CONTINUED

Equivalence of Product Standards
Certified By

Sections from the Code

Product Approval Method	Method 1 Option C
Date Submitted	01/16/2024
Date Validated	04/04/2024
Date Pending FBC Approval	
Date Approved	04/14/2024

Summary of Products

FL #	Model, Number or Name	Description
14469.1	Element Insulated Concrete Forms	Flat walled insulated concrete forms (ICF) of 4, 6, 8, 10 and 12 inch concrete core.
Limits of Use **Approved for use in HVHZ:** Yes **Approved for use outside HVHZ:** Yes **Impact Resistant:** Yes **Design Pressure:** N/A **Other:**		**Installation Instructions** FL14469_R5_II_Logix and Element ICF - Installation Guide.pdf Verified By: QAI Laboratories Ltd Created by Independent Third Party: **Evaluation Reports** FL14469_R5_AE_CERus-1005rev1-Logix-Brands-Logix-Element-ICF-2021-2015-IBC-FBC-15032024.pdf
14469.2	Logix Insulated Concrete Forms	Flat walled insulated concrete forms (ICF) of 4, 6.25, 8, 10 and 12 inch concrete core.
Limits of Use **Approved for use in HVHZ:** Yes **Approved for use outside HVHZ:** Yes **Impact Resistant:** Yes **Design Pressure:** N/A **Other:**		**Installation Instructions** FL14469_R5_II_Logix and Element ICF - Installation Guide.pdf Verified By: QAI Laboratories Ltd Created by Independent Third Party: **Evaluation Reports** FL14469_R5_AE_CERus-1005rev1-Logix-Brands-Logix-Element-ICF-2021-2015-IBC-FBC-15032024.pdf

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7.5 – WISCONSIN BUILDING PRODUCT EVALUATION

Approval # *20199000 (revised)*
(Replaces 201307-I)

Industry Services Division
4822 Madison Yards Way
P.O. Box 7302
Madison, WI 53701-7302

Wisconsin
Building Product Evaluation

Material	Element Insulated Concrete Form Formerly Logix Insulated Concrete Form
Manufacturer	AMC Foam Technologies, Inc. 35 Headingley St. Headingley, MB R4H0A8 Canada

SCOPE OF EVALUATION

GENERAL: This report evaluates the use of the Logix Insulated Concrete Form Wall System, manufactured by AMC Foam Technologies, Inc., evaluated as permanent form work and insulation system for reinforced concrete beams, lintels, exterior and interior walls, and foundation and retaining walls. The Logix Insulated Concrete Form Wall System was evaluated for safety requirements of the foam plastic and structural requirements for the codes listed below.

This review includes code requirements in accordance with the current **Wisconsin Uniform Dwelling Code** for 1 & 2 family dwellings **(UDC):**

- **Foam Plastic:** The Logix Insulated Concrete Form Wall System was evaluated in accordance with the fire safety requirements of **SPS 321.11**.
- **Structural:** The Logix Insulated Concrete Form Wall System was evaluated in accordance with the structural requirements of **SPS 321.02(3)(d)**.

This review includes the cited **International Building Code (IBC)** requirements below in accordance with the **Wisconsin Amended IBC Code:**

- **Foam Plastic & Fire Endurance:** The Logix Insulated Concrete Form Wall System was evaluated in accordance with the fire safety requirements **IBC 2603**.
- **Structural:** The Logix Insulated Concrete Form Wall System was evaluated in accordance with the requirements of **IBC Chapter 16**.

7.5 – WISCONSIN BUILDING PRODUCT EVALUATION CONTINUED

Commercial Building Product Evaluation No. 20199000
Page 2

- **Fire-Resistance Rating and Fire Tests:** The Logix Insulated Concrete Form Wall System was evaluated in accordance with the requirements of **IBC 703.1** and **703.2**.

Note: Structural calculations shall be submitted (job-to-job basis) in accordance with IBC Chapter 16 for applicable Live, Ground Snow, Roof, Wind, and Seismic Loads.

DESCRIPTION AND USE

General: The Logix Insulated Concrete Form Wall System consists of expanded polystyrene (EPS) forms which are stacked in running bond and serve as forms for a 4-inch-thick, 6.25-inch-thick, 8-inch-thick, 10-inch-thick, and 12-inch or more-thick reinforced concrete wall. The EPS forms remain in place to provide insulation for the wall. The reinforced concrete wall system may be used as a foundation wall, above grade wall, basement wall, shear wall, exterior load-bearing wall, non-load bearing, and lintel section.

The Logix EPS forms are 48 inches long and 16 inches high. The 4-inch Logix form for 4-inch-thick reinforced concrete walls is 9½ inches wide. The 6.25-inch Logix form for 6-inch-thick reinforced concrete walls is 11¾ inches wide. The 8-inch Logix form for 8-inch-thick reinforced concrete walls is 13½ inches wide. The 10-inch Logix form for 10-inch-thick reinforced concrete walls is 15½ inches wide. The 12-inch Logix form for 12-inch-thick reinforced concrete walls is 17½ inches wide. Thicker walls are achieved by the use of Logix Xtender Ties.

The forms are available as solid-form blocks or knock-down blocks. The solid-form blocks consist of opposing form panels connected by 6 polypropylene web ties embedded into the panels forming a solid form block. The knock-down blocks consist of opposing form panels connected by 6 polypropylene snap-in-place ties. The polypropylene plastic web ties are spaced 8 inches on center and black in color.

Material: Logix Form Blocks are molded from modified expandable polystyrene beads. Manufacturers include:

Product	Manufacturer
BFL-422	BASF Corporation (Beaver Plastics Ltd.)

The blocks are manufactured to a nominal density of 1.68 pounds per cubic foot.

Concrete: Normal-weight concrete complying with **SPS 321.02(3)(d)** and **IBC 1903.1** with maximum aggregate size of ¾ inch and a minimum compressive strength of 2,500 psi.

Reinforcement: The concrete is reinforced with Nos. 3, 4, 5 and 6 deformed steel reinforcing bars, Type A615, Grade No. 40, with a minimum yield strength of 40,000 psi and Grade No. 60, with a minimum yield strength of 60,000 psi. All steel reinforcement shall be in accordance with **IBC 1901.2** & ACI 318 as modified by IBC 1905.

Each pallet of Logix forms shall bear a label with the manufacturer's name, and the quality control inspection agency.

7.5 – WISCONSIN BUILDING PRODUCT EVALUATION CONTINUED

Commercial Building Product Evaluation No. 20199000
Page 3

TESTS AND RESULTS

Intertek Testing Services, ETL SEMKO, conducted testing on the Logix forms. The Logix insulated concrete forms produced by Foam Technologies, Inc. have been subject to and complied with the following testing:

- EPS has a maximum flame-spread rating of 25 and a maximum smoke-developed rating of 450. Testing was done in accordance with ASTM E 84.
- Meets 3-hour fire rating in accordance with ASTM E119 and CAN/ULC S101 conducted by Intertek Testing Services NA Ltd, on April 24, 2002 filed with previous approval report.

Assembly Rating, hours	Minimum ICF Cavity Thickness, in.
2	4
3	6.25 (4-hr. rating with 5/8" drywall)
4	Greater than or equal to 8

NOTE: 1. Unless noted otherwise, ratings are based on wall assembly having 1/2" drywall on fire exposed side.
2. Load bearing during test = 36,000lb/ft.

- Room fire Test Standard for Interior of Foam Plastics Systems in accordance with ASTM D1929, D635 and D2843.
- Crawl Space evaluation conducted in accordance with ICC ES requirements.
- Conforms to ASTM C578, with equivalency CAN/ULC S701 (Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation) as a Type II Thermal Insulating Material.
- Fastener Withdrawal Evaluation in accordance with ASTM D1761.
- Fastener Lateral Resistance tested in accordance with ASTM D1761.
- Polypropylene web material conforms to CC1 Plastic material when tested in accordance with ASTM D1929, D635, and D2843.

The Rigid Cellular (RCPS) Polystyrene Thermal Insulation was tested May 10, 2002 for apparent density, compressive properties, and flexural properties in accordance with ASTM C578-95 "Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation," using the following test methods:

- **Apparent Density:** ASTM D1622-98 "Standard Test Method for Apparent Density of Rigid Cellular Plastics".

Type	Test Result	Minimum Requirement	Status
Type II	1.68	1.35 lbs/ft^3	Complied

- **Compressive Properties:** ASTM C165-00 "Standard Test Method for Measuring Compressive Properties of Thermal Insulation".

Type	Test Result	Minimum Requirement	Status
Type II	24.5 psi	15.0 psi	Complied

- **Flexural Properties:** ASTM C203-99 "Standard Test Method for Breaking Load and Flexural Properties of Block-Type Thermal Insulation"

Type	Test Result	Minimum Requirement	Status

7.5 – WISCONSIN BUILDING PRODUCT EVALUATION CONTINUED

Commercial Building Product Evaluation No. 20199000
Page 4

SC Type II	44.9 psi	40.0 psi	Complied

Physical properties testing on May 10, 2002 of polypropylene reinforcing web material was performed in general accordance with the following test methods:

- **Screw Withdrawal:** ICC ES AC 116 (July 2001) "Acceptance Criteria for Nails and Spikes," in conjunction with ASTM D1761-88 (Re-approved 2000) "Standard Test Methods for Mechanical Fasteners in Wood", Sections 1 through 12 (two types of fasteners were tested: a type 'W' coarse thread drywall screw, and a type 'S' fine thread drywall screw)
- **Lateral Screw Resistance:** ICC ES AC 116 (July 2001) "Acceptance Criteria for Nails and Spikes," in conjunction with ASTM D1761-88 (Re-approved 2000) "Standard Test Methods for Mechanical Fasteners in Wood", Sections 13 through 20

	Fastener Type	**Withdrawal**	**Lateral**
		Max Load (lbs.)	**Max Load (lbs.)**
Average	Type 'W' Coarse Thread Drywall Screw	166	367
COV	Type 'W' Coarse Thread Drywall Screw	10.6 %	8.4 %
Average	Type 'S' Fine Thread Drywall Screw	169	328
COV	Type 'S' Fine Thread Drywall Screw	8.4 %	4.1 %

- **Tensile Strength:** ASTM D638-01 "Standard Test Method for Tensile Properties of Plastics"

	Ultimate Tensile Strength (lbs.)
Average	842
COV	1.7 %

DISCUSSION: ICC ES AC 116 references ASTM D1761 for lateral and withdrawal testing. The ASTM D6117 and ASTM D1761 are very similar in methodology, however ASTM D6117 is used for solid sections of plastic members and not for sheets of plastic material. In addition to this, the ICC ES AC 116 document gives guidance on establishing allowable loads, which ASTM D6117 does not provide. In the absence of a standard that more specifically addresses this issue, ITS (Intertek Testing Services) recommends that AC 116 is more appropriate.

It is ITS's opinion that it is appropriate to state specific loads for this material. ASTM D5456-99 clause A2.6.1 states, "The equivalent specific gravity is determined from Table 12.21 or Ref. (3) such that the table value for the tested nail does not exceed the average ultimate withdrawal resistance in pounds per inch (N/mm) from A2.4 divided by 5.0…" The safety factor for withdrawal in ASTM D5456 matches that of AC 116, again justifying its applicability to this issue. ASTM D5456 does not have a comparable safety factor for lateral load resistance. In the absence of a standard that more specifically addresses this issue, ITS suggests that AC 116 is more appropriate.

Given the low C.O.V. of the web tensile test results, it is the opinion of ITS that a safety factor of approximately three is appropriate. ITS chose to use the lateral resistance factors of AC 116 for consistency.

CALCULATIONS:

1. **Web Tensile:** 842 lbs. x 0.75 = 631 lbs. (Proportional limit assumed to be the same as ultimate load – brittle failure)
   842 lbs. ÷ 3.2 = 263 lbs. (Based on average ultimate load)

2. **Fastener Testing:**

(A) Withdrawal Resistance: Type "S" Screw F_{allow} = 178 lbs. ÷ 5 = 35 lbs.
Type "W" Screw F_{allow} = 166 lbs. ÷ 5 = 33 lbs.

(B) Lateral Resistance: Type "S" Screw $F_{allow} = F \div 3.2$ = 328 lbs. ÷ 3.2 = 102.5 lbs.
Type "W" Screw $F_{allow} = F \div 3.2$ = 367 lbs. ÷ 3.2 = 114 lbs.

CONCLUSIONS:
Physical Properties of Polypropylene Reinforcing Webs

The polypropylene reinforcing webs were found to have the following allowable loads, as recommended by ITS when analyzed in accordance with ICC ES AC 116 (July 2001) "Acceptance Criteria for Nails and Spikes." (The withdrawal

7.5 – WISCONSIN BUILDING PRODUCT EVALUATION CONTINUED

resistance utilized a safety factor of five as per ICC ES AC 116, Section 4.2. The lateral resistance of both the Type "W" screws and the Type "S" screws utilize a safety factor of 3.2 when analyzed in accordance with ICC ES AC 116, Section 4.1.):

- Withdrawal resistance of a Type "S" fine thread drywall screw is 35 lbs.
- Withdrawal resistance of a Type "W" coarse thread drywall screw is 33 lbs.
- Lateral resistance of a Type "S" fine thread drywall screw is 102 lbs.
- Lateral resistance of a Type "W" coarse thread drywall screw is 114 lbs.

The polypropylene reinforcing web tensile strength is recommended by ITS to be 263 lbs., based on a safety factor of 3.2 analyzed in accordance with ICC ES AC 116, Section 4.1. The maximum negative wind pressure for a cladding system attached to the EPS foam plastic panels is based on the maximum fastener values connected into the polypropylene reinforcing webs. For a screwed system into the webs, 8 inches on center vertically, and 6 inches on center horizontally, the allowable negative withdrawal is 99 lbs./ft^2. This withdrawal capacity can be converted to a wind speed based on the following formula extrapolated from the 1997 Uniform Building Code Table 16-F at a standard height of 33 feet:

$q_s = Kv^2$

where: q_s = wind pressure (lbs./ft^2)
and: v = basic wind speed (mph)
and: K = 0.00256
thus: $v = (q_s \div 0.00256)^{1/2}$
given: q_s = 99 lbs./ft^2 (allowable negative withdrawal)
then: v = 197 mph

- **Three Hour Fire Endurance Test:** ASTM E119-98, "Standard Test Methods for Fire Tests of Building Construction and Materials"

The objective of the test: to determine whether the polypropylene reinforcing web, a component of the form system, would melt out and cause a loss of support for the non-fire side standard ½-inch gypsum thermal barrier and consequently create a through opening in the concrete wall, and/or flaming of the polypropylene reinforcing web and expanded polystyrene foam on the unexposed side, or create openings in the concrete wall that would result in the ignition of cotton waste.

The April 23, 2002 Intertek Testing Services NA Ltd./Warnock Hersey fire test sample was constructed to be representative of the code requirements for a foam insulated concrete wall system. The Beaver Plastics Ltd. Insulating concrete form system was tested in accordance with UBC 26-3, "Room Fire Test Standard for Interior of Foam Plastic Systems," [refer to ITS/Warnock Hersey report #3020964(a)] and met the conditions of acceptance for a 15-minute index.

CONCLUSIONS:
The Beaver Plastics Ltd. "Logix" insulating concrete forms (EPS) protected by a ½" standard gypsum wallboard thermal barrier met the criteria of acceptance of ASTM E119-98, "Standard Test Methods for Fire Tests of Building Construction and Materials" for a three-hour fire resistance rating. The polypropylene web did not melt out and did not cause a loss of support for the non-fire side standard ½" gypsum thermal barrier. As no through-openings developed in the concrete wall section, no possibility of ignition of cotton waste occurred. There was no occurrence of burn-through or through-openings in the concrete wall, nor was there flaming of the polypropylene web and expanded polystyrene foam on the unexposed side.

The Beaver Plastics Ltd. "Logix" insulating concrete forms (EPS) are consequently eligible for a three-hour fire resistance rating.

LIMITATIONS OF APPROVAL

The limitations below are in accordance with the current **Wisconsin Uniform Dwelling Code (UDC),** for 1 & 2 family dwellings**:**

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- **Foam Plastic:** The ICF wall system is approved for use with a thermal barrier to separate the blocks from interior spaces in accordance with **SPS 321.11(1)**. Where a 1-inch thickness of masonry does not separate the polystyrene blocks from the building interior, including at the top of the wall, a thermal barrier, which has a finish rating of at least 15 minutes, shall be provided.
  1. Logix Form Blocks are approved for use in combustible non-rated construction in accordance with **SPS 321.11**. In one- or two-family dwellings, thermal barriers shall be provided to separate the forms from the occupied space of the dwellings per **SPS 321.11**.
  2. The exterior face of the blocks shall be finished with an approved weather covering and must be protected from ultraviolet light.

- **Structural:** The Logix Form Blocks are approved as structural building elements.
  1. The units are approved for use as concrete forms for basement walls and exterior walls when the resulting concrete core thickness satisfies **Table 321.18-B** for one- or two-family dwellings, or when structural calculations for the product are submitted for review.
  2. Walls shall be anchored to all floors and roofs. Walls shall be interconnected at corners by embedding and lapping the reinforcement.
  3. Structures are **limited** to two stories in height.
  4. The forms are approved for use as concrete forms for basement walls, exterior walls and retaining walls when structural calculations are submitted to the local building inspector.
  5. Below grade walls shall be damp-proofed when required by the local building department.
  6. Damp-proofing and water-proofing materials shall be approved by AMC Foam Technologies, Inc. and the local building official, and shall be free of solvents that will adversely affect the EPS foam.

  NOTE: The Logix Insulated Concrete Form Wall System was **not** evaluated for compliance with the thermal requirements of **Subchapter III and IV** of chapter SPS 322 provisions.

The **2015 IBC** limitations below are in accordance with the 2018 **Wisconsin Commercial Building Code:**

- **Foam Plastic:** The Logix ICF wall system is approved for use with a thermal barrier to separate the blocks from interior spaces in accordance with **IBC 2603.4.**
  1. In accordance with **IBC 2603.4.1.6**, when the Logix ICF is used within the attic or crawl space where entry is made only for service utilities, the foam plastic insulation shall be protected against ignition by 1½" thick mineral fiber insulation, a ¼" thick wood structural panel, particleboard or hardboard, gypsum wallboard, corrosion-resistant steel or other approved material installed so that the foam plastic is not exposed.
  2. The protective covering shall be consistent with the requirements for the type of construction.
  3. The crawl space shall not be used for storage or air handling purposes, there are no interconnected basement areas and entry to the crawl space is only for service of utilities.
  4. The exterior face of the blocks shall be finished with an approved weather covering per IBC 1405.2 and must be protected from ultraviolet light per IBC 1404.13 & IECC C303.2.1.

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- **Structural:** Design of concrete formed by Logix Forms must comply with **IBC Chapter 19** with the following requirements:
  1. *The forms are approved for use as concrete forms for basement walls, exterior walls and retaining walls when structural calculations are submitted to the department by a Wisconsin registered professional engineer or architect.
  2. *Design calculations of walls must comply with section **IBC 1901.2.** Use of the empirical masonry design approach specified in **IBC 2109.1 [SPS 362.2109]** is prohibited.
  3. Design of lintels shall comply with the applicable provisions of **IBC Chapter 16.**
  4. Wall loading shall be in accordance with **IBC Chapter 16**.
  5. Minimum wall reinforcement shall conform to **IBC 1901.2**. When the code requires that vertical and horizontal reinforcement be spaced no further apart than 18 inches or three times the wall thickness, whichever is less, the maximum concrete wall thickness along the length of the wall is permitted to be used to determine rebar spacing.
  6. Walls shall be anchored to floors and roofs in accordance with **IBC 1604.8.2**. Walls shall be interconnected at corners by embedding and lapping reinforcement in accordance with the code.
  7. Design of shear walls shall be in accordance with sections **IBC 1901.2** and **1905**.
  8. Structures are **limited** to two stories in height plus a basement.
  9. Below grade walls shall be damp-proofed when required by the local building department. Water proofing shall be in accordance with **IBC 1805**.
  10. Damp-proofing and water-proofing materials shall be approved by AMC Foam Technologies, Inc. and the local building official, and shall be free of solvents that will adversely affect the EPS foam.
  11. Special inspection per **IBC chapter 17** are not required when meeting these limitations:
      a) Wall systems are a maximum of 8 feet high and are limited to use in single-story construction of Group R-3, or Group U occupancies.
      b) Maximum height of a concrete pour is 48 inches. Succeeding lifts must be placed in accordance with ACI 318 as modified by **IBC 1905.**
      c) Installation is by properly trained installers approved by AMC Foam Technologies, Inc.
      d) The installation instructions indicate methods used to verify proper placement of concrete.
  12. Walls constructed with Logix ICF are considered Type V Construction.

***Alternate Design:** In lieu of calculations, the structural design of reinforced concrete formed by Logix Insulated Concrete Form Wall System insulated concrete form blocks for residential construction is permitted to comply with the *Prescriptive Design of Exterior Concrete Walls for One- and 2-Family Dwellings* (PCA 100), published by the Portland Cement Association (PCA). Buildings constructed with the Logix Insulated Concrete Form Wall System insulated concrete form system and designed in accordance with the alternate design, will not exceed a height of two stories plus a basement, where the maximum unsupported wall height is 10 feet.

NOTE: The Logix Insulated Concrete Form Wall System was **not** evaluated for compliance with the thermal requirements of **IECC chapters C4 & R4**.

Identification: Each package bears a label specifying the name and address of the manufacturer (AMC Foam Technologies, Inc., Headingley, MB R4H0A8, Canada). Additionally, product

CONNECT WITH A LOCAL MANUFACTURER

888.838.5038
330 Cain Drive
Haysville, KS 67060-2004

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840 Division St.
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35 Headingley Rd.
Headingley, MB R4H 0A8

888.453.5961
11581-272 St.
Acheson, AB T7X 6E9

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6333 Unsworth Rd.
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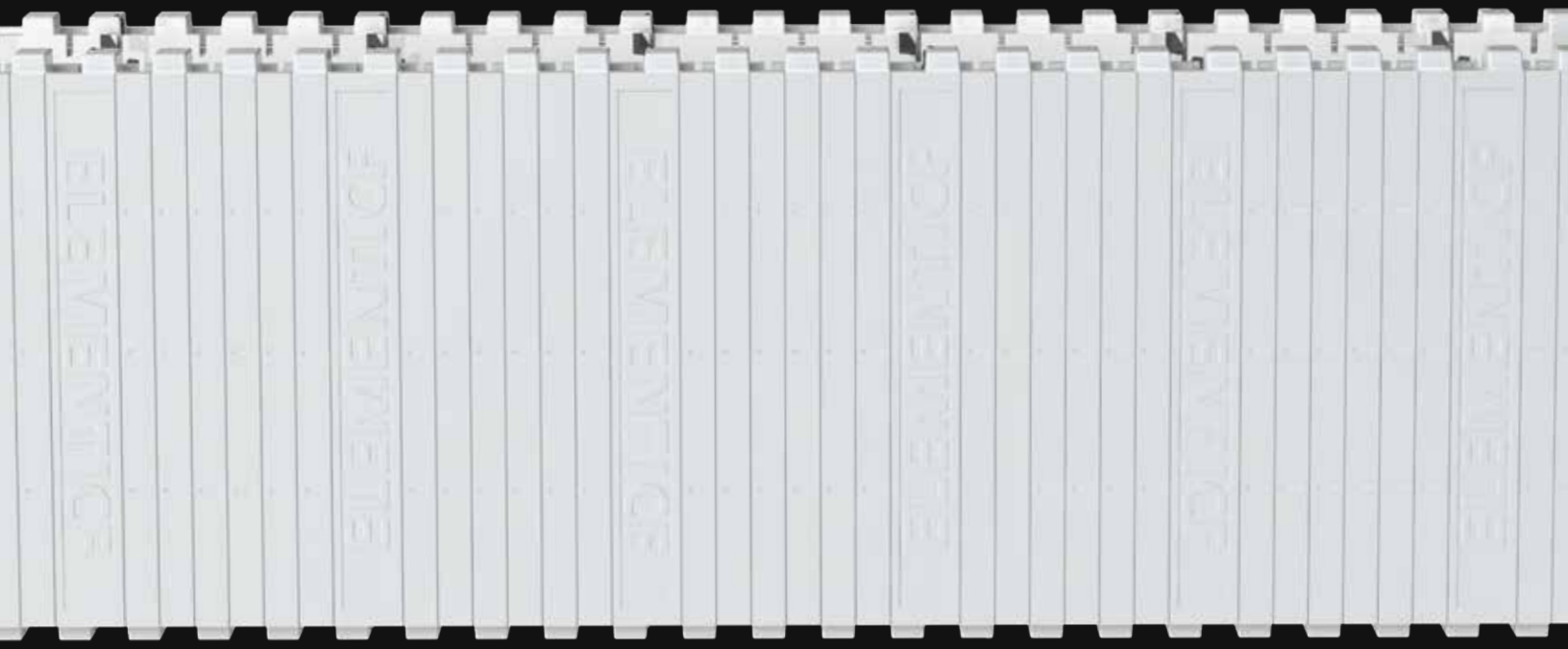

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