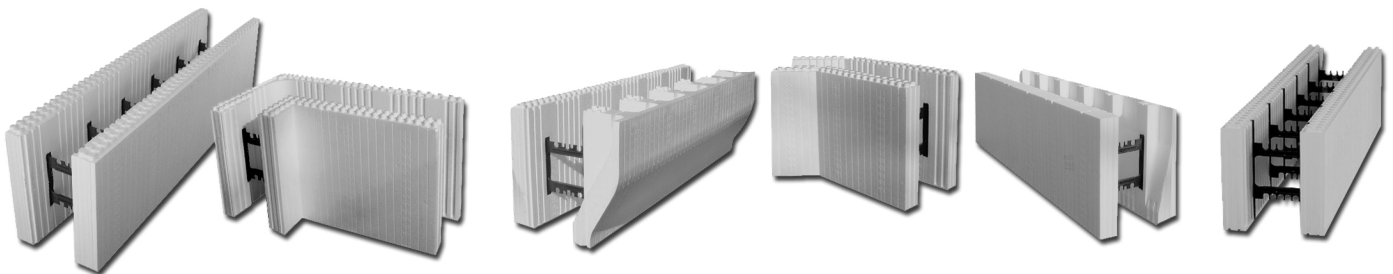




CODE COMPLIANCE AND EVALUATIONS BOOKLET (USA)

Build **Anything** Better.™



7.0 – USA EVALUATION REPORTS

7.0 – USA EVALUATION REPORTS..... 7-1

7.1 – WISCONSIN BUILDING PRODUCTS.....7-3

7.2 – STATE OF FLORIDA CERTIFICATE OF APPROVAL7-11

7.3 – MIAMI-DADE COUNTY7-13

7.4 – CITY OF NEW YORK - MEA (MATERIALS & EQUIPMENT ACCEPTANCE).....7-16

7.5 – NON-COMBUSTIBLE CONSTRUCTION (I-CODES)7-18

7.6 – VAPOR BARRIER (I-CODES)7-21

7.7 – LEED V4 EVALUATION7-24

7.8 – QAI FIRE RESISTANCE RATING7-26

7.9 – QAI LISTING REPORT7-27

7.1 – WISCONSIN BUILDING PRODUCTS



Approval #

20199000
(Replaces 201307-I)

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

Wisconsin
Building Product Evaluation

Material

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**.

7.1 – WISCONSIN BUILDING PRODUCTS EVALUATION CONTINUED

Commercial Building Product Evaluation No. 20199000

Page 2

- **Structural:** The Logix Insulated Concrete Form Wall System was evaluated in accordance with the requirements of **IBC Chapter 16**.
- **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**.

7.1 – WISCONSIN BUILDING PRODUCTS EVALUATION CONTINUED

Commercial Building Product Evaluation No. 20199000

Page 3

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

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

7.1 – WISCONSIN BUILDING PRODUCTS EVALUATION CONTINUED

Commercial Building Product Evaluation No. 20199000

Page 4

- 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
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:

- Web Tensile:** $842 \text{ lbs.} \times 0.75 = 631 \text{ lbs.}$ (Proportional limit assumed to be the same as ultimate load – brittle failure)
 $842 \text{ lbs.} \div 3.2 = 263 \text{ lbs.}$ (Based on average ultimate load)
- Fastener Testing:**
 - Withdrawal Resistance:**

Type “S” Screw	$F_{\text{allow}} = 178 \text{ lbs.} \div 5 = 35 \text{ lbs.}$
Type “W” Screw	$F_{\text{allow}} = 166 \text{ lbs.} \div 5 = 33 \text{ lbs.}$
 - Lateral Resistance:**

Type “S” Screw	$F_{\text{allow}} = F \div 3.2 = 328 \text{ lbs.} \div 3.2 = 102.5 \text{ lbs.}$
Type “W” Screw	$F_{\text{allow}} = F \div 3.2 = 367 \text{ lbs.} \div 3.2 = 114 \text{ lbs.}$

7.1 – WISCONSIN BUILDING PRODUCTS EVALUATION CONTINUED

Commercial Building Product Evaluation No. 20199000

Page 5

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 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./ft². 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:

$$q_s = K v^2$$

where: q_s = wind pressure (lbs./ft²)

and: v = basic wind speed (mph)

and: $K = 0.00256$

thus: $v = (q_s \div 0.00256)^{1/2}$

given: $q_s = 99 \text{ lbs./ft}^2$ (allowable negative withdrawal)

then: $v = 197 \text{ mph}$

- **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

7.1 – WISCONSIN BUILDING PRODUCTS EVALUATION CONTINUED

Commercial Building Product Evaluation No. 20199000

Page 6

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

- **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.

7.1 – WISCONSIN BUILDING PRODUCTS EVALUATION CONTINUED

Commercial Building Product Evaluation No. 20199000

Page 7

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.
- **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.

LOGIX® INSULATED CONCRETE FORMS

All documents are downloadable at logixicf.com

7.1 – WISCONSIN BUILDING PRODUCTS EVALUATION CONTINUED

Commercial Building Product Evaluation No. 20199000
Page 8

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 labels indicate the Wisconsin Building Product Evaluation Number and the name and logo of the quality control agency.

DISCLAIMER

This approval will be valid through December 31, 2024, unless manufacturing modifications are made to the product or a re-examination is deemed necessary by the department. The Wisconsin Building Product Evaluation Number must be provided when plans that include this product are submitted for review. This approval addresses only the specified applications for the product and does not waive any code requirement not specified in this document.

Reviewed by: Jack A. Miller

Approval Date: February 19, 2019 By: Jack A. Miller
Commercial building plan examiner and product reviewer

7.2 – STATE OF FLORIDA CERTIFICATE OF APPROVAL

2/20/2021

Florida Building Code Online

FLORIDA DEPARTMENT OF
Business & Professional Regulation

BCIS Home | Log In | User Registration | Hot Topics | Submit Surcharge | Stats & Facts | Publications | Contact Us | BCIS Site Map | Links | Search

Florida dbpr
Department of Business & Professional Regulation

Product Approval
USER: Public User

[Product Approval Menu](#) > [Product or Application Search](#) > [Application List](#) > [Application Detail](#)

OFFICE OF THE SECRETARY

myFlorida.com

DBPR HOME | ABOUT DBPR | DBPR DIVISIONS | CONTACT DBPR

FL # FL14469-R3
Application Type Revision
Code Version 2017
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
Address/Phone/Email
Logix Insulated Concrete Forms
199-1917 West 4th Avenue
Vancouver, FL 33133
(866) 944-0153
francis@logixicf.com

Authorized Signature
Francis Roma
francis@logixicf.com

Technical Representative
Address/Phone/Email
Francis Roma
2755 Columbia Street
Vancouver
(866) 944-0153
francis@logixicf.com

Quality Assurance Representative
Address/Phone/Email
Francis Roma
106 Perma R Road
Johnson City, TN 37063
francis@logixicf.com

Category
Subcategory
Structural Components
Insulation Form Systems

Compliance Method
Certification Mark or Listing

Certification Agency
Validated By
QAI Laboratories
QAI Laboratories

Referenced Standard and Year (of Standard)	Standard	Year
	ASTM C578	2012
	ASTM D1761	2006
	ASTM D1929	2012
	ASTM D635	2010
	ASTM E119	2012
	ASTM E2634	2011
	ASTM E84	2013

Equivalence of Product Standards
Certified By

https://www.floridabuilding.org/pr/pr_app_dtl.aspx?param=wGEVXQwtDquiKNpeAsu%2bZM79cusQpogW3e6v6rZiI4lgEcZ9r3d6dA%3d%3d 1/2

LOGIX® INSULATED CONCRETE FORMS

All documents are downloadable at logixicf.com

7.2 – STATE OF FLORIDA CERTIFICATE OF APPROVAL CONTINUED

2/20/2021

Florida Building Code Online

Product Approval Method

Method 1 Option A

Date Submitted

07/21/2017

Date Validated

07/21/2017

Date Pending FBC Approval

Date Approved

07/25/2017

Summary of Products		
FL #	Model, Number or Name	Description
14469.1	Logix Insulated Concrete Forms	Insulated concrete forms
Limits of Use Approved for use in HVHZ: Yes Approved for use outside HVHZ: Yes Impact Resistant: Yes Design Pressure: N/A Other:		Certification Agency Certificate FL14469_R3_C_CAC_3_B1031-1 Edition 2 - Logix - ICF Listing Page 2015.pdf FL14469_R3_C_CAC_Logix- Load Bearing Exterior Wall Assembly Design Listing.pdf Quality Assurance Contract Expiration Date 01/01/2022 Installation Instructions FL14469_R3_II_Logix-Design-Manual-2017 Part I.pdf FL14469_R3_II_Logix-Design-Manual-2017 Part II.pdf FL14469_R3_II_Logix-Design-Manual-2017 Part III.pdf Verified By: QAI Laboratories Created by Independent Third Party: Evaluation Reports Created by Independent Third Party:

Back

Next

[Contact Us](#) :: 2601 Blair Stone Road, Tallahassee FL 32399 Phone: 850-487-1824

The State of Florida is an AA/EEO employer. [Copyright 2007-2013 State of Florida](#). :: [Privacy Statement](#) :: [Accessibility Statement](#) :: [Refund Statement](#)

Under Florida law, email addresses are public records. If you do not want your e-mail address released in response to a public-records request, do not send electronic mail to this entity. Instead, contact the office by phone or by traditional mail. If you have any questions, please contact 850.487.1395. *Pursuant to Section 455.275(1), Florida Statutes, effective October 1, 2012, licensees licensed under Chapter 455, F.S. must provide the Department with an email address if they have one. The emails provided may be used for official communication with the licensee. However email addresses are public record. If you do not wish to supply a personal address, please provide the Department with an email address which can be made available to the public. To determine if you are a licensee under Chapter 455, F.S., please click [here](#).

Product Approval Accepts:



Credit Card

Safe

securityMETRICS

7.3 – MIAMI-DADE COUNTY



DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES (RER)
BOARD AND CODE ADMINISTRATION DIVISION
NOTICE OF ACCEPTANCE (NOA)

MIAMI-DADE COUNTY
PRODUCT CONTROL SECTION
11805 SW 26 Street, Room 208
Miami, Florida 33175-2474
T (786) 315-2590 F (786) 315-2599
www.miamidade.gov/economy

Perma R Products, Inc.
P.O. Box 5235
Johnson City, TN 37602

SCOPE:

This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed and accepted by Miami-Dade County RER-Product Control Section to be used in Miami Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Section (In Miami Dade County) and/or the AHJ (in areas other than Miami Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. RER reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Section that this product or material fails to meet the requirements of the applicable building code.

This product is approved as described herein, and has been designed to comply with the Florida Building Code, including the High Velocity Hurricane Zone.

DESCRIPTION: Logix Insulating Concrete Forms

APPROVAL DOCUMENT: Drawing No. SB-Rev7, titled "Logix Standard Forms", sheet 1 of 1, prepared by Logix Insulated Concrete Forms, dated 09/16/2014, signed and sealed by Hermes F. Norero, P.E. on 09/27/2019, bearing the Miami-Dade County Product Control revision stamp with the Notice of Acceptance number and expiration date by the Miami-Dade County Product Control Section.

MISSILE IMPACT RATING: None

LABELING: Each unit shall bear a permanent label with the manufacturer's name or logo, city, state, model/series, and following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein.

RENEWAL of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

TERMINATION of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

ADVERTISEMENT: The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

INSPECTION: A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official. This NOA **renews** and **revises** NOA #14-0715.04 and consists of this page 1, evidence page E-1, as well as approval document mentioned above.

The submitted documentation was reviewed by **Carlos M. Utrera, P.E.**



Handwritten signature and date: 10/23/2019

NOA No 19-0925.02
Expiration Date: September 23, 2024
Approval Date: November 31, 2024
Page 1

7.3 – MIAMI-DADE COUNTY CONTINUED

Perma R Products, Inc.

NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED

1. Evidence submitted under previous NOA's
- A. **DRAWINGS** *"Submitted under NOA #14-0715.04"*
1. Drawing No. **SB-Rev7**, titled "Logix Standard Forms", sheet 1 of 1, prepared by Logix Insulated Concrete Forms, dated 09/16/2014, signed and sealed by Christopher W.C. Bowness, P.E.
- B. **TESTS** *"Submitted under NOA #14-0715.04"*
- | | <u>Report</u> | <u>Test</u> | <u>Date</u> | <u>Signature</u> |
|----|-----------------|-------------|-------------|------------------|
| 1. | RJ3526-1 Rev. 1 | ASTM D1929 | 10/23/14 | C. Bowness, P.E. |
| 2. | RJ3526-2 Rev. 1 | ASTM D1929 | 10/23/14 | C. Bowness, P.E. |
- "Submitted under NOA # 03-0319.01"*
- | | <u>Report</u> | <u>Test</u> | <u>Date</u> | <u>Signature</u> |
|-----|---------------|-------------|-------------|---------------------|
| 3. | RAD-3015 | ASTM C303 | April 2002 | J. D. Waldman |
| 4. | RAD-3015 | ASTM C518 | April 2002 | J. D. Waldman |
| 5. | RAD-3015 | ASTM E96 | April 2002 | J. D. Waldman |
| 6. | RAD-3015 | ASTM C272 | April 2002 | J. D. Waldman |
| 7. | RAD-2725 | ASTM D1929 | Feb 2001 | M. L. Zieman. |
| 8. | UL R-7503 | ASTM E84 | 06/18/98 | No signature. |
| 9. | UL R-7503 | ASTM E84 | 06/18/98 | No signature. |
| 10. | ETL 3050535 | ASTM G21 | 03/17/04 | S. J. Emermas, P.E. |
- C. **CALCULATION**
1. None.
- D. **QUALITY ASSURANCE**
1. Miami-Dade Department of Regulatory and Economic Resources (RER)
- E. **MATERIAL CERTIFICATION**
1. None.
- F. **STATEMENTS**
1. Statement letter of code conformance to 6th edition (2017) FBC and of no financial interest issued by Building Drops, Inc., dated 09/27/2019, signed and sealed by Hermes F. Norero, P.E.



Carlos M. Utrera, P.E.
Product Control Examiner
NOA No 19-0925.02
Expiration Date: September 23, 2024
Approval Date: November 31, 2019

7.3 – MIAMI-DADE COUNTY CONTINUED

PRODUCT DESCRIPTION:
The Logix Insulated Concrete Forms consist of expanded polystyrene (EPS) interlocking rigid foam plastic boards that serve as permanent formwork for reinforced concrete, exterior and interior walls, lintel beams, and foundation and retaining walls.

PRODUCT PROPERTIES:

Description	Properties	Requirements	Test
Min. Density	1.35 pcf	1.35 pcf	ASTM C303
Flame Spread	5	Max 75	ASTM E84
Smoke Development	400	Max 450	ASTM E84
Self Ignition	810°F	Min. 650°F	ASTM D1929
Max. Thermal Conductivity per inch	0.237 Btu-in/hr-ft ² -F	0.25 Btu-in/hr-ft ² -F	ASTM C518
Odor Emission	Not detected	Not detected	AATCC-112
Water Vapor Transmission per inch	3.10 perms	Max. 3.5 perms	ASTM E96
Max Water Absorption	0.76% water abs by vol.	Max 3.0%	ASTM C272
Fungus Resistance	No bacteria growth	No growth	ASTM G21

PLAN VIEW

END VIEW

FORM SIZES

	4"	6.25"	8"	10"	12"
A	4"	6.25"	8"	10"	12"
B	9.5"	11.75"	13.5"	15.5"	17.5"

NOTES:

- The product shown herein is designed and manufactured to comply with the 6th Edition (2017) Florida Building Code (FBC).
- This approval pertains to the insulation properties of the Logix Insulated Concrete Forms and it does not approve the concrete, the structure and/or the forming capacity of the material and the system.
- The forming system shall comply with ACI 347.
- The Concrete walls shall comply with the requirements of ACI 318.

SIDE ELEVATION

PRODUCT REVISED
as complying with the Florida Building Code
NOA-No. 19-0925.02
Expiration Date 09/23/2024
BY
Miami-Dade Product Control

LOGIX™
INSULATED CONCRETE FORMS
Good. Solid. Green™
www.logixicf.com
PERMA R PRODUCTS, INC.
P.O. BOX 5235
JOHNSON CITY, TN 37602
1-800-251-7532

Drawing: SB-Rev7
Date: SEP 16/14
Sheet: 1/1
Title: LOGIX STANDARD FORMS

LOGIX® INSULATED CONCRETE FORMS

All documents are downloadable at logixicf.com

7.4 – CITY OF NEW YORK - MEA (MATERIALS & EQUIPMENT ACCEPTANCE)



NYC Department of Buildings
280 Broadway, New York, NY 10007
Patricia Lancaster, FAIA, Commissioner
(212) 566-5000, TTY: (212) 566-4769

Report of Materials and Equipment Acceptance Division

Pursuant to Administrative Code Section 27-131, the following equipment or material has been found acceptable for use subject to the terms and conditions contained herein.

MEA 273-04-M

Manufacturer: Logix Insulated Concrete Forms Ltd., 840 Division Street, Cobourg, Ontario, Canada K9A 4J9.

Trade Name(s): Logix.

Product: Fire rated exterior insulation concrete forms wall assembly for combustible construction.

Pertinent Code Section(s): 27-297, 27-107, 27-133.

Prescribed Test(s): RS 5-5 (ASTM E84), Toxicity, RS 5-2 (ASTM 119).

Laboratory: Intertek Testing Services Ltd.

Test Report(s): Intertek Testing Services Test Report 3020964(b), dated April 24, 2002; Intertek Testing Services Test Report 3020964, dated April 8, 2002; Intertek Testing Services Test Report 3020964(a), dated June 12, 2002. Intertek letter dated November 11, 2003 and SwRI Project No. 01.10935.02.045 dated November 23, 2005.

Description: The Logix Insulated Concrete Forms are stay-in-place concrete forms for reinforced concrete wall systems. The wall system shall be constructed using a minimum ½ inch thick gypsum drywall to achieve the required fire resistance rating, and installed as shown in Figure 1.

Form Size (Wall Thickness)	Fire Rating
4"	2 hours
6.25"	3 hours
8" and larger	4 hours

MEA 273-04-M

Page 1 of 2

7.4 – CITY OF NEW YORK - MEA CONTINUED

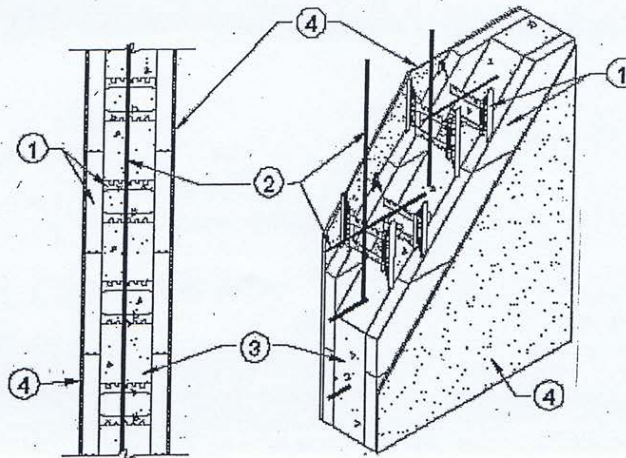


Figure 1. Logix Insulated Concrete Form wall system

1. **Insulated Concrete Forms** – Standard form units comprised of two 48" x 16" x 2.75" thick expanded polystyrene (EPS) panels linked by polypropylene webs spaced at 8" on center. The widths of the wall cavity are 4", 6.25", and 10". Height adjusters consist of 24" long, by 4" high, by 2.75" thick flat EPS panels. End caps are 16", 2.75" thick and range in widths are 4", 6.25", 8" and 10". For a complete listing of products visit the Logix website, www.logixicf.com. Logix ICF's bear the Warnock Hersey certification mark.
2. **Steel Reinforcement** – steel reinforcement shall be placed as per the Logix ICF Product Manual, or as per local engineering design and building code requirements.
3. **Normal Weight Concrete** – 145 ± 5 lb/ft³ density, 2900 psi compressive strength.
4. **Gypsum Board** – Classified or unclassified ½" thick, 48" wide gypsum wallboard fastened to flanges of polypropylene webs with 1.5" long drywall screws spaced on center 12" vertically and 16" horizontally. Minimum weight 1.6 psf. Joints covered with joint compound. Screwheads covered with joint compound.

Terms and Conditions – The above described wall assembly consisting of exterior concrete form and other components be accepted as having fire resistance classification listed above for combustible construction only, when installation complies with the applicable New York City Codes, Rules and Regulations and in particular with Section 27-297A, Tables 3-4, and 4-2 of the Building Code, for 1, 2 or 3 family, when interior and exterior of the concrete form is covered with accepted one hour fire rated material.

This acceptance does not include structural adequacy of wall design, which must be certified by a P.E., or R.A. for particular structures for compliance with the Building Code prior to plan examination by department engineers.

All shipments and deliveries of such materials shall be accompanied by a certificate or label certifying that the materials shipped or delivered are equivalent to those tested and acceptable for use, as provided for in Section 27-131 of the Building Code.

Final Acceptance February 10, 2006
 Examined By Simon Derkhoudam

LOGIX® INSULATED CONCRETE FORMS

All documents are downloadable at logixicf.com

7.5 – NON-COMBUSTIBLE CONSTRUCTION (I-CODES)

Intertek ETL SEMKO

February 2, 2006

Francis Roma
Logix Insulated Concrete Forms Ltd.
327 – 801 Klahanie Drive
Port Moody, BC V3H 5K4

Dear Mr. Roma,

RE: Installation of Logix ICF in Non-Combustible Construction, Project # 3091401

INTRODUCTION

Intertek Testing Services NA Ltd. (Intertek) has reviewed, at the request of Logix Insulated Concrete Forms (ICF) Ltd., the requirements for Non-Combustible Construction as it relates to Insulated Concrete Forms (ICFs) under the 2003 International Building Code (IBC). This evaluation is based on past test reports, and Logix ICF Ltd. current application to ICC-ES to include multi-storey construction.

STANDARDS AND CRITERIA

- 2003 International Building Code
- ICC-ES AC12 "Acceptance Criteria for Foam Plastic Insulation"

EVALUATION

Section 3.3 of ICC-ES AC12 states that in some instances foam plastic can be permitted where non-combustible materials are required if conditions of the 2003 IBC, Section 2603.5 are met. This section has been summarized below, and evidence provided to demonstrate how Logix ICF complies for use in non-combustible construction.

1) 2603.5.1 Fire Resistance rated Walls: Where the wall is required to have a fire-resistance rating, data based on tests conducted in accordance with ASTM E119 shall be provided.



This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

Intertek Testing Services NA Ltd.

1500 Brigantine Drive, Coquitlam, BC V3K 7C1 Canada
tel: 604-520-3321 fax: 604-524-9186 Home Page www.intertek-etlsemko.com

7.5 – NON-COMBUSTIBLE CONSTRUCTION (I-CODES) CONTINUED

Logix Insulated Concrete Forms Ltd.
Project # 3091401

February 2, 2006
Page 2 of 3

The Logix ICFs achieved a 3 hour fire resistance rating when tested by Intertek in Intertek Test Report 3020964(d) dated June 2, 2004. A further study was conducted in which, the Intertek Letter dated November 11, 2003 showed that the presence of plastic ties in the concrete would not affect the ability of the wall to achieve a fire resistance rating of up to 4 hours.

2) 2603.5.2 Thermal Barrier: Any foam plastic insulation shall be separated from the building interior by a thermal barrier meeting the provisions of Section 2603.4.

Section 2603.4 requires that the interior of a building be separated from the foam plastic by an approved thermal barrier of ½ inch (12.7 mm) gypsum wallboard or equivalent thermal barrier that will limit the average temperature rise of the unexposed surface to not more than 250°F (120°C) after 15 minutes of fire exposure. The thermal barrier must also be installed in a manner that will remain in place for 15 minutes based on UL1715 (UBC Standard 26-3).

ASTM E119 testing per Intertek Test Report 3020964(d) was conducted using a ½ inch gypsum wallboard, and results showed that the temperature rise after 15 minutes was less than 60°F on the unexposed side.

A standard room fire test per Intertek Test Report 3020964(a) was also conducted in accordance with UBC Standard 26-3, and results showed that the ½ inch gypsum wallboard remained intact.

3) 2603.5.3 Potential Heat: The potential heat of the foam plastic insulation shall be determined by tests conducted in accordance with NFPA 259.

One of the polystyrene beads used in Logix ICF are Huntsmen Grade 40 and 54, for which Southwest Research Institute conducted testing per NFPA 259 and have reported in SwRI Project No. 01.03049.01.303. Results showed potential heat ratings of 17,293 Btu/lb and 17,269 Btu/lb for Grade 40 and 54 respectively.

4) 2603.5.4 Flame Spread and Smoked Developed Indexes: Foam plastic insulation shall have a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84.

Flame Spread and Smoke Developed indexes have been obtained for Huntsmen Grade 40 and 54, one of the main polystyrene beads used in Logix ICF. These results are reported in Underwriters Laboratories Inc. Test Report 96RT6559, which show that various densities of Huntsmen polystyrene beads all achieve flame spread index ratings less than 25 and smoke-developed indices below 450 when tested in accordance to UL 723.

LOGIX® INSULATED CONCRETE FORMS

All documents are downloadable at logixicf.com

7.5 – NON-COMBUSTIBLE CONSTRUCTION (I-CODES) CONTINUED

Logix Insulated Concrete Forms Ltd.
Project # 3091401

February 2, 2006
Page 3 of 3

5) 2603.5.5 Test Standard: The wall assembly shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

Testing to NFPA 285 is done on the finished wall assembly which includes the cladding (ex. Exterior Insulation and Finish System (EIFs)). This is a test that is primarily done by the cladding manufacturers to show conformance to NFPA 285 per the requirements of Section 3.3.2.1 and 3.3.2.2 of ICC-ES AC12. This is beyond the scope for an ICF manufacturer.

6) 2603.5.6 Label Required: The edge or face of each piece of foam plastic insulation shall bear the label of an approved agency.

Logix ICFs are manufactured under a third party inspection and listing program by Intertek, and all complying Logix ICF are marked with the Intertek – Warnock Hersey Certification Mark.

Each ICF is labeled with the following information: Company Name & Contact Information, Manufacturer's Location, Product Description, Complying Test Standards, Warnock Hersey Certification Mark, and Traceability Information (operator name, date, time).

7) 2603.5.7 Ignition: Exterior walls shall not exhibit sustained flaming when tested in accordance with NFPA 268.

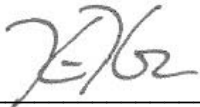
This section lists a few exceptions that result in the foam plastic insulation not requiring testing in accordance to NFPA 268. Logix ICFs meet the exceptions as a thermal barrier (½" gypsum wallboard) complying with Section 2603.4 is used.


CONCLUSION

It is Intertek's professional opinion after reviewing Section 2603.5 of the 2003 IBC and the evidence shown above, that the Logix ICF meets the requirements for non-combustible construction for exterior walls of buildings of Type I, II, III or IV construction.

If you have any questions, please do not hesitate to contact us at 604-520-3321.

INTERTEK TESTING SERVICES NA LTD.
Warnock Hersey

Prepared By: 
Kal Kooner, EIT
Engineer, Building Products

Reviewed By: 
Peter Gildenstern, ASCT
Asst. Mgr., Engineering Services

Enclosure

EVALUATION REPORTS

7.6 – VAPOR BARRIER (I-CODES)

The following evaluation report, although evaluated to the Canadian Codes, determines the permeance value of Logix. (Both I-codes and Canadian Codes determines permeance in accordance with ASTM E96)

The permeance value, as per the report, is noted as
36 ng/Pa-s-m² (or 0.63perms), which meets the requirement as a vapor retarder/barrier, according to the I-codes.

7.6 – VAPOR BARRIER (I-CODES) CONTINUED

Logix Insulated Concrete Forms Ltd.
Project No. 3109888-R1

January 30, 2007
Revised: January 31, 2007
Page 2 of 4

1 Introduction

Intertek Testing Services NA Ltd. (Intertek) has conducted an engineering evaluation for Logix Insulated Concrete Forms Ltd., on Logix ICF, to evaluate the vapor permeance properties of the product. The evaluation was conducted to determine if Logix ICF meets the 2005 National Building Code (NBC) for use as a vapor barrier.

2 Sample Description

Logix ICF consists of rigid interlocking expanded polystyrene (EPS) foam plastic boards that serve as permanent formwork for reinforced concrete, exterior and interior walls, and foundation and retaining walls.

3 Reference Documents

- 2005 National Building Code (NBC)
- ASTM E96/96M-05, Standard Test Methods for Water Vapor Transmission of Materials (ASTM E96)
- Intertek Test Report 3048347 dated October 14, 2003
- Intertek Letter dated January 6, 2005

4 Evaluation Method

Vapor barrier properties and installation are described in detail in Section 5.5.1.2 of the 2005 NBC. These details are summarized below:

- 1) The vapor barrier shall have sufficiently low permeance and shall be positioned in the building component or assembly so as to
 - a) minimize moisture transfer by diffusion, to surfaces within the assembly that would be cold enough to cause condensation at the design temperature and humidity conditions, or
 - b) reduce moisture transfer by diffusion, to surfaces within the assembly that would be cold enough to cause condensation at the design temperature and humidity conditions, to a rate that will not allow sufficient accumulation of moisture to cause deterioration or otherwise adversely affect any of
 - i. the health or safety of building users,
 - ii. the intended use of the building, or
 - iii. the operation of building services.
- 2) Coatings applied to gypsum wallboard to provide required resistance to vapour diffusion shall conform to the requirements of Sentence (1) when tested in accordance with CAN/CGSB-1.501-M, "Method for Permeance of Coated Wallboard."

Intertek ETL SEMKO
Testing everywhere for markets anywhere.

7.6 – VAPOR BARRIER (I-CODES) CONTINUED

Logix Insulated Concrete Forms Ltd.
Project No. 3109888-R1

January 30, 2007
Revised: January 31, 2007
Page 3 of 4

- 3) Coatings applied to materials other than gypsum wallboard to provide required resistance to vapor diffusion shall conform to the requirements of Sentence (1) when tested in accordance with ASTM E96, "Water Vapor Transmission of Materials" by the desiccant method (dry cup).

Vapor Barrier materials are further discussed in Section 9.25.4.2 of the 2005 NBC under Sentence (1) which is summarized below:

- 1) Vapor barriers shall have a permeance not greater than 60 ng/Pa-s-m² measured in accordance with ASTM E96, "Water Vapor Transmission of Materials" by the desiccant method (dry cup).

Logix ICF fall under Sentence (3) of Section 5.5.1.2 of the 2005 NBC and have been tested by Intertek in accordance with ASTM E96 using the desiccant method. The results were summarized in Intertek Test Report 3048347 dated October 14, 2003 and showed that a 1-inch Logix ICF had a water permeance of 100 ng/Pa-s-m². In the field, Logix ICF is installed with a 2.75-inch thickness and thus the calculated water permeance at this thickness is 36 ng/Pa-s-m². The detailed calculations are shown in Intertek Letter dated January 5, 2005. Based on these results, Logix ICF meets the requirements of Section 9.25.4.2, Sentence (1) of the 2005 NBC and can be installed without the use of a vapor barrier.

5 Conclusion

Intertek has conducted an engineering evaluation for Logix Insulated Concrete Forms Ltd., on Logix ICF, to determine if the Logix ICF meets the 2005 National Building Code as a vapor barrier. The analysis, per Section 4 above, showed that Logix ICF meets the water permeance requirements and can be installed without a vapor barrier.

INTERTEK TESTING SERVICES NA LTD.

Reported by:



Matt Lansdowne, EIT
Engineer, Building Products

Reviewed by:



Kal Kooner, EIT
Team Leader, Engineering Services Canada

Intertek ETL SEMKO
Testing everywhere for markets anywhere.

LOGIX® INSULATED CONCRETE FORMS

All documents are downloadable at logixcf.com

7.7 – LEED V4 EVALUATION

TECHNICAL BULLETIN **LEED v4 BD+C for Logix**
No.37 - 053014 **(US & Canada)**

POTENTIAL LEED POINTS CONTRIBUTION WITH LOGIX¹

Sustainable Sites	Applicable Building Types	Maximum Points Contribution	Comments
Protect or Restore Habitat	All	2 (1 for healthcare)	Although the points may not apply to LOGIX, wall bracing for LOGIX is one of a combination of actions that, together with other procedures, can result in proper protection or restoration of natural areas around the job site. LOGIX is typically placed within the building perimeter. This type of assembly avoids disturbance to existing natural areas and keeps construction activity close to the building perimeter.
Energy & Atmosphere	Applicable Building Types	Maximum Points Contribution	Comments
Minimum Energy Performance	All	n/a (required)	The continuous insulation and air barrier properties of Logix can help meet required minimum levels of efficiency for the building.
Optimize Energy Performance	All	18 except Schools and Healthcare (16 for Schools, 20 for Healthcare)	The continuous insulation and air barrier properties of Logix can help achieve the levels of energy performance that go beyond the prerequisite standard.
Material & Resources	Applicable Building Types	Maximum Points Contribution	Comments
Construction and Demolition Waste Management Planning	All	n/a (required)	Logix products produce little waste compared to wood, which should ease the waste management planning. In addition, EPS recycling programs can be implemented as part of the waste management planning.
Building Life-cycle Impact Reduction	All	3	Can help contribute 3 points under "Option 4. Whole-Building-Life-Cycle Assessment." The high energy efficient walls Logix creates contributes to the reduction of a building's impact on global warming.
Building Product Disclosure & Optimization - Environmental Product Declarations.	All	1	Can help contribute 1 point under "Option 1. Environmental Product Declaration (EPD)." Logix uses EPS which carries EPD documents, which conform to ISO 14025.
Building Product Disclosure & Optimization - Sourcing of Raw Materials.	All	2	Logix products are made with up to 10% recycled pre-consumer EPS.
Building Product Disclosure & Optimization - Material Ingredients.	All	1	Contributes to 1 point under "Option 3. Product Manufacturer Supply Chain Optimization." Logix products are certified under a third party program with Quality Auditing Institute (QAI).

7.7 – LEED V4 EVALUATION CONTINUED

TECHNICAL BULLETIN
No.37 - 053014

**LEED v4 BD+C for Logix
(US & Canada)**

Material & Resources	Applicable Building Types	Maximum Points Contribution	Comments
Construction & Demolition Waste Management	All	2	Programs can be put in place to recycle EPS from job sites. EPS is also light in weight, and produces less waste than wood products.

Indoor Environmental Quality	Applicable Building Types	Maximum Points Contribution	Comments
Minimum Acoustic Performance	Schools	N/a (required)	Logix can help increase the acoustical performance of wall and ceiling assemblies.
Low-emitting Materials	All	3	Logix Platinum is made with BASF Neopor, which is Greenguard Certified. In addition, the EPS used for Logix has been tested to show no signs of harmful emissions.
Thermal Comfort	All except Core & Shell	1	Logix offers continuous insulation in wall and ceiling assemblies, and is made with BASF Neopor, which offer the highest thermal value of any EPS material.
Acoustic Performance	All except Core & Shell	1	Logix can contribute to the STC ratings of wall and ceiling assemblies. STC testing of various wall assemblies have been conducted with Logix.

¹The total LEED point contribution from Logix is a best estimate based on available information and test data. The actual LEED point contribution may change based on project specifics, and should be determined by a LEED Accredited Professional for each project seeking LEED accreditation.

For more information about the LEED green building rating system visit www.usgbc.org or www.cagbc.org.

7.8 – QAI FIRE RESISTANCE RATING

Quality Auditing Institute

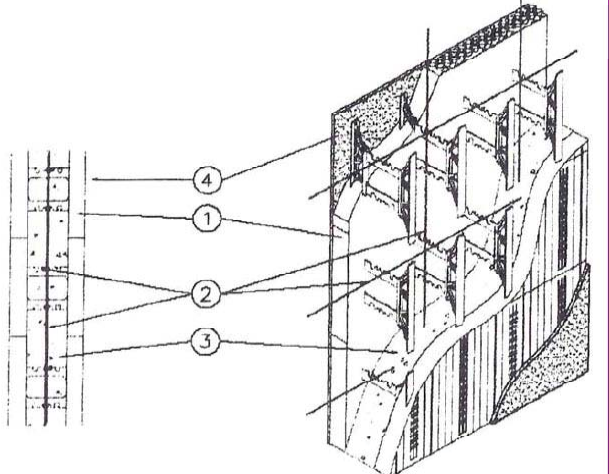
Listing Book

Standards: 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”

	Rating	Product Density	Maximum Cavity Width	Maximum Panel Thickness
ASTM E119 /	2-Hour	1.35 pcf	4 inches	2 3/4 inches
CAN/ULC S701	3-Hour	1.35 pcf	6 1/8 inches	2 3/4 inches
Ratings:	4-Hour	1.35 pcf	8 inches	2 3/4 inches

Structural Rating at above durations for concrete wall at structural design load.



Assembly Details:

1. Insulated Concrete Forms – Standard forms made of two 16” x 48” by 2.75” thick expanded polystyrene (EPS) block panels connected by polypropylene detail webs at 8” O.C. The minimum width of the cavity is 4” as shown in the ratings table above (rating depends on cavity thickness).
2. Reinforcing Steel - No. 4 steel reinforcing bars placed horizontally in each course and vertically at 16” O.C. along centerline of wall cavity thickness.
3. Sand-Limestone Concrete – 145 +/- 5 pcf density, 2900 psi nominal compressive strength concrete.
4. Gypsum Wallboard – Min. ½” thick, 1.5 psf minimum density, 48” wide gypsum wallboard fastened to flanges of polypropylene webs with 2” long drywall screws at 16” horizontally and vertically. Joints covered with joint compound, covered with joint tape, and covered with an additional coat of joint compound. Screw heads covered with joint compound.

7.9 – QAI LISTING REPORT

Quality Auditing Institute

Listing Book

BUILDING PRODUCTS LISTING PROGRAM**Class:** Insulated Concrete Forms (ICF)

Customer: LOGIX Insulated Concrete Forms, Ltd.
Location: 9242 Pinetree Place, Whistler, BC, Canada, V0N 1B9
Website: www.LOGIXicf.com

Listing No. B1031-1
Effective Date: September 27, 2010
Last Revised: May 27, 2014
Expires: N/A

Product: LOGIX Insulated Concrete Forms (ICF)**Standard(s):** ASTM E2634 “Standard Specification for Flat Wall Insulating Concrete Form (ICF) Systems”.

CAN/ULC S717.1 “Standard for Flat Wall Insulating Concrete Form (ICF) Systems”.

CAN/ULC S701 “Thermal Insulation, Polystyrene, Boards and Pipe Covering”.

CAN/ULC S102.2 “Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies”.

ASTM C578 “Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation”.

ASTM E84 - “Standard Test Method for Surface Burning Characteristics of Building Materials”.

UBC 26-3 “Room Fire Test Standard For Interior of Foam Plastic Systems”.

CAN/ULC-S101 “Standard Methods of Fire Endurance Tests of Building Construction and Materials”.

ASTM E119 / ANSI / UL 263 “Standard Test Methods for Fire Tests of Building Construction and Materials”.

Label: **Product is marked with labels supplied by LOGIX Insulated Concrete Forms, Ltd. The label includes the manufacturer’s name, trademark, or other recognized symbol of identification, the product model designation, month and year of manufacture or equivalent, QAI logo with the ‘US’ and ‘C’ identifier, and CAN/ULC S701 Type 2, ASTM C578 Type II, ASTM E84 FSI and SDI Rating, and CAN/ULC S102.2 FSI and SDI Rating. Labels are applied to palletized finished products to ensure visibility on the jobsite.**

Ratings: The following outlines LOGIX ICF test results determined in accordance with the noted standards.

Effective Date: September 15, 2006
 Revision Date: April 17, 2014

QM0604 Draft Listing Page
 Revision 3

Page 1 of 4

LOGIX® INSULATED CONCRETE FORMS

All documents are downloadable at logixicf.com

7.8 – QAI LISTING REPORT CONTINUED

Quality Auditing Institute

Listing Book

LOGIX ICF Fastener Resistance Ratings

FASTENER	ALLOWABLE WITHDRAWAL		ALLOWABLE LATERAL SHEAR	
	lbs	kg	lbs	kg
#6 1 1/4 inch Length Coarse Thread Drywall Screw	23	10	59	26

LOGIX ICF Type 2 Specifications per CAN/ULC S701

PROPERTY	LOGIX SPECIFICATION
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 ICF Type II Specifications per ASTM C578

PROPERTY	LOGIX SPECIFICATION
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 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	≤ 210	≥ 500

LOGIX ICF Surface Burning Characteristics per ASTM E84¹

LOGIX	DENSITY	MAXIMUM	FLAME	SMOKE
-------	---------	---------	-------	-------

Effective Date: September 15, 2006
Revision Date: April 17, 2014

QM0604 Draft Listing Page
Revision 3

Page 2 of 4

7.8 – QAI LISTING REPORT CONTINUED

Quality Auditing Institute

Listing Book

COMPONENT		THICKNESS	SPREAD INDEX (FSI)	DEVELOPED INDEX (SDI)
Expanded Polystyrene (EPS Panel)	1.35 – 1.80 lbs/ft ³	4.0 Inches Maximum	≤ 75	≤ 450

¹Ceiling 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 UBC 26-3 Configuration

Meets requirements with ½ inch thickness gypsum fastened with 2 ¼ inch length standard drywall screws at 12 inch on center. Fasteners must be anchored into LOGIX ICF web ties.

QAI Design Listing B1031-1 LOGIX Insulated Concrete Form (ICF) – CAN/ULC S101 / ASTM E119

Load Bearing Fire-Resistance-Rated Wall Assembly¹

ASSEMBLY RATING (Hours)	MINIMUM CONCRETE CORE THICKNESS (MM)	MINIMUM CONCRETE CORE THICKNESS (INCHES)
2	102	4
3	159	6.25
4	204	8

(See pdf Attachment)

NO.	COMPONENT	DESCRIPTION
1	Interior Sheathing	Minimum ½ inch (12 mm) thickness ASTM C1396 listed gypsum wall board, installed with 51 mm (2 inch) length drywall screws spaced at 406 mm (16 inches) on center horizontally and vertically. For 6 ¼ inch concrete LOGIX ICF product used in load bearing fire-resistance-rated wall assemblies, listed 16 mm (5/8 inch) thickness Type X gypsum wall board complying with ASTM C1396 is required fastened as noted above. Gypsum is required to be taped and mudded per industry standard and the applicable model code.
2	Expanded Polystyrene (EPS) Insulation	LOGIX ICF component 70 mm (2 ¾) inch thickness Type 2 (CAN/ULC S701) / Type II (ASTM C578) QAI certified expanded polystyrene thermal insulation. LOGIX ICF EPS panels have interlocking teeth to allow stacking onsite to create the forming wall.
3	Web Ties	LOGIX polypropylene web tie component, spaced at 203 mm (8 inches) on center spacing through LOGIX ICF. Web ties can be stacked or staggered vertically during installation (staggered web tie system shown).
4	Concrete Core	Minimum core as noted in Table above of 20 MPa (2,900 psi) compressive strength concrete. Steel reinforcing, while not shown, is approved for use. Rebar addition is to be designed and approved by a registered design professional, or authority having jurisdiction in accordance with the applicable code

Effective Date: September 15, 2006
Revision Date: April 17, 2014

QM0604 Draft Listing Page
Revision 3

Page 3 of 4

7.8 – QAI LISTING REPORT CONTINUED

Quality Auditing Institute Listing Book

		requirements.
5	Exterior Cladding (Not Shown)	Exterior claddings are approved for use with the LOGIX 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 where no additional EPS is added, 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 Load Bearing Fire-Resistance-Rated Construction is to be determined by a registered design professional, or authority having jurisdiction in accordance with the applicable codes.

Note: **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 by qualified installing personnel.

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 warrantee 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.

FORM History

History Date	Version	Change Description	Reviewed By	Approved By
04/17/2014	3.0	Added disclaimer to form.	J. Johnson	K. Adamson

8.0 – SPECIFICATIONS & REFERENCES

8.1 – TECHNICAL SPECIFICATIONS8-3

8.2 – MATERIAL SAFETY DATA SHEET8-9

8.3 – RECOMMENDED INDUSTRY PRACTICE FOR PLACING REINFORCING BARS8-14

8.4 – STANDARD PRACTICE - SPLICING & DOWELS8-15

8.5 – LOGIX R-VALUES8-18

8.1 – TECHNICAL SPECIFICATIONS



Updated 12/10/19

LOGIX INSULATED CONCRETE FORMS MATERIAL PROPERTY DATA SHEET

This document is intended for general information purposes only regarding specifications for Logix Insulated Concrete Forms (herein referred to as Logix ICF). Technical specification sheet, as per Construction Specifications institute (CSI) formatting, can be downloaded at www.logixicf.com.

1 PRODUCT DESCRIPTION

- Logix ICF consists of two flame-resistant EPS boards separated by polypropylene webs.
- Logix ICF consists of solid form units (LOGIX Pro Forms) or knock-down forms (LOGIX KD Forms) or a combination of both Logix form and Logix KD forms, referred to as LOGIX Hybrid Forms.
- The EPS foam boards are a minimum 70 mm (2.75 inch) thick. Increased EPS foam boards are available by utilizing D-Rv insert panels, which provides additional thickness in increments of 50 mm (2 inch).
- The webs separate the EPS boards to form 102 mm (4 inch), 159 mm (6.25 inc), 203 mm (8 inch), 254 mm (10 inch) and 305 mm (12 inch) cavities, which create the concrete wall thicknesses. With Logix Xtenders the concrete wall thickness can be increased to virtually any thickness.
- The webs are spaced every 203 mm (8 inch) on centre horizontally and 406 mm (16 inch) on centre vertically, and contain a 32 mm (1.25 inch) wide furring strip that extends the height of each ICF block. The furring strips shall facilitate fasteners for attachment of both exterior and interior finishes.
- A furring strip is located in the corners of corner forms. The furring strip consists of both a vertical and horizontal component. The vertical component extends nearly the full height of the form, extends a minimum of 64 mm (2.5 inches) from both sides of the corner, and a minimum of 5 mm (0.2 inches) thick. The horizontal component is a minimum 51mm (2 inches) in height, extend a minimum of 152 mm (6 inches) from both sides of the corner, and a minimum of 5 mm (0.2 inches) thick.
- The webs facilitate rebar placement in accordance with CAN/CSA A23.1, and ACI 318

8.1 – TECHNICAL SPECIFICATIONS CONTINUED



Updated 12/10/19

2 LOGIX PRODUCTS

Logix manufactures both assembled and unassembled insulated concrete form units. Logix assembled forms, known simply as “Logix PRO”, are delivered to the job site as assembled form blocks. Logix unassembled forms (or knock-down forms), known as “Logix KD”, are delivered to the job site in components that make up the form blocks - the form panels and KD Connectors. Logix KD are assembled on the job site.

Below is a summary of the types of Logix and Logix KD forms available.

LOGIX (assembled form blocks)

	Description
Logix Pro	White in color
Logix Pro Platinum ³	Grey in color. Offers higher R-value ¹ than Logix Pro.
Logix Pro TX	Logix Pro with termite resistant additive Preventol ² .
Logix Pro Platinum ³ TX	Logix Platinum with Preventol.

LOGIX KD (unassembled form blocks)

	Description
Logix KD	White in color
Logix KD Platinum ³	Grey in color. Offers higher R-value ¹ than LOGIX Pro.
Logix KD TX	Logix Pro with termite resistant additive Preventol ² .
Logix KD Platinum ³ TX	Logix Platinum with Preventol.

- Notes:
- 1. See Logix Design Manual, Section 8.5 for Logix R-values.
 - 2. Preventol is an effective termite resistant additive.
 - 3. Care should be taken to protect exposed foam surfaces from reflected sunlight and prolonged solar exposure until wall cladding or finish material is applied. Shade exposed foam areas, or remove sources of reflective surfaces, where heat buildup onto exposed foam might occur. For more information refer to BASF Technical Leaflet N-4 Neopor, “Recommendations for packaging, transporting, storing and installing building insulation products made from Neopor EPS foam.” (The BASF Technical Leaflet is attached to every bundle of LOGIX Platinum forms delivered to a job site).

8.1 – TECHNICAL SPECIFICATIONS CONTINUED



Updated 12/10/19

LOGIX INSULATED CONCRETE FORMS
GENERAL SPECIFICATIONS SHEET, CONT'D

3 CODE/CERTIFICATION APPROVALS

- QAI evaluation to IBC and IRC 2012
- Miami-Dade County Approval No.19-0925.02
- State of Florida Certification of Approval No.FL14469-R3
- Wisconsin Building Products Evaluation No.20199000
- City of New York Materials and Equipment Acceptance – MEA 273-04-M
- QAI listed QM0503
- ASTM E2634, Standard Specification for Flat Wall Insulating Concrete Form (ICF) Systems
- ASTM C578, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
- CAN/ULC S717, Standard for Flat Wall Insulating Concrete Form (ICF) Units - Material Properties
- CAN/ULC S701, Standard for Thermal Insulation, Polystyrene Boards

4 DESIGN/PERFORMANCE OF LOGIX ICF

A brief description of each test is outlined in the attached Appendix. Test reports are available upon request.

Test Description	Result	Pass/Fail Criteria	Referenced Standard Test Method
R-Value (Thermal Resistance) per inch (per 25.4mm)	R 4.13 (RSI 0.72)	Min. R 4.00 (RSI 0.70)	ASTM C518
Water Absorption	0.18%	Max. 3.0%	ASTM D2842
Water Vapor Presence	100.0ng/Pa-s-m2 (1.74perm-in.)	Max. 201 ng/Pa-s-m2 (3.5perm-in.)	ASTM E96
Compressive Strength	165kPa (23.9psi)	Min. 104kPa (15.0psi)	ASTM D1621 & ASTM C165
Flexural Strength	365kPa (53.0psi)	Min. 240kPa (35.0psi)	ASTM C203
Dimensional Stability – Thermal & Humid Aging	0.5%	Max. 2.0%	ASTM D2126
Density	27.5kg/m3 (1.72pcf)	Min. 22 kg/m3 (1.35pcf)	ASTM C1622 & ASTM C303
Dimensions	Min. length variation = 0.0% Max. length variation = 0.4% Min. width variation = 0.1% Max. width variation = 0.4% Min. thickness variation = -0.3mm Max. thickness variation = 0.9mm Max. squareness = 3mm	Min. -0.2% Max. 0.4% Min. -0.2% Max. 0.4% Max. -2mm Max. 4mm Max. 3mm	ASTM C303
Limiting Oxygen Index	29.1%	Min. 24.0%	ASTM D2863
Formaldehyde Emission	No formaldehyde detected	N/A*	AATTC-112
Fungi Resistance	No fungal growth detected	N/A*	ASTM G21
Flame Spread Rating	< 25	N/A*	ASTM E84/CAN ULC S102

LOGIX® INSULATED CONCRETE FORMS

All documents are downloadable at logixicf.com

8.1 – TECHNICAL SPECIFICATIONS CONTINUED



Updated 12/10/19

LOGIX INSULATED CONCRETE FORMS GENERAL SPECIFICATIONS SHEET, CONT'D

Test Description	Result	Pass/Fail Criteria	Referenced Standard Test Method
Smoke Developed Rating	< 450	N/A*	ASTM E84/CAN ULC S102
Fire Endurance Test	See Fire Resistance Rating table	N/A*	ASTM E119/CAN ULC S101
Standard Room Fire Test	w/in acceptable limits	Met conditions required for exposure to fire for 15 minutes.	UBC 26-3/CAN ULC 1715
Concrete Pour-in-place	Observations of deflection recorded.	N/A*	CCMC Masterformat 03131
Sound Transmission	STC 56 for 6.25" Logix wall system (2 layers of 5/8" drywall & 2x2 wood strips on one side, 1/2" drywall on the other side) STC 50 for 4" Logix wall system (1/2" drywall & 2x2 wood strips on one side, 1/2" drywall on the other side).	N/A*	ASTM E90
UPITT Toxicity	Pass	LC50 < 19.7g	University of Pittsburgh Toxicity Test

*Code body or referenced test standard required reporting test results only - no Pass/Fail criteria specified.



8.1 – TECHNICAL SPECIFICATIONS CONTINUED



Updated 12/10/19

LOGIX INSULATED CONCRETE FORMS
GENERAL SPECIFICATIONS SHEET, CONT'D

TESTS CONDUCTED ON POLYPROPYLENE WEB

Test Description	Result	US Requirements	Referenced Standard Test Method
Flammability	Flame Front Distance = 100mm (4") Avg. Linear Burn Rate = 17.9mm/min (0.70in/min)	Max. linear burn rate = 40.0mm/min (1.57in/min) for Flame Front Dist. = 100mm (4")	ASTM D635
Smoke Density Rating	19.1%	Max. 75%	ASTM D2843
Average Lateral Fastener Resistance of Drywall Screws	1.63kN (367lbs)	N/A*	ASTM D1761
Average Withdrawal Fastener Resistance of Drywall Screws	0.75kN (169lbs)	N/A*	ASTM D1761
Shear Strength of Polypropylene Web	26.1MPa (37.9psi)	N/A*	ASTM D732, CCMC Masterformat 03131
Average Tensile Strength of Polypropylene Web	3.75kN (842lbs)	N/A*	ASTM D638
Average Withdrawal Resistance of Staples 1.59mm 16ga.	105N (24lbs)	N/A*	ASTM D1761 (under cyclic temperatures)
Average Withdrawal Resistance of Plane Shank 1.5" long, 3/8" head	155N (35lbs)	N/A*	ASTM D1761 (under cyclic temperatures)
Average Withdrawal Resistance of Ring Shank 1.5" long, 3/8" head	431N (97lbs)	N/A*	ASTM D1761 (under cyclic temperatures)
Average Withdrawal Resistance of Spiral Shank 1.5" long, 3/8" head	135N (30lbs)	N/A*	ASTM D1761 (under cyclic temperatures)
Average Lateral Resistance of Staples 1.59mm 16ga.	169N (38lbs)	N/A*	ASTM D1761 (under cyclic temperatures)
Average Lateral Resistance of Plane Shank 1.5" long, 3/8" head	520N (117lbs)	N/A*	ASTM D1761 (under cyclic temperatures)
Average Lateral Resistance of Ring Shank 1.5" long, 3/8" head	378N (85lbs)	N/A*	ASTM D1761 (under cyclic temperatures)
Average Lateral Resistance of Spiral Shank 1.5" long, 3/8" head	200N (45lbs)	N/A*	ASTM D1761 (under cyclic temperatures)

8.1 – TECHNICAL SPECIFICATIONS CONTINUED



Updated 12/10/19

LOGIX INSULATED CONCRETE FORMS
GENERAL SPECIFICATIONS SHEET, CONT'D

Test Description	Result	US Requirements	Referenced Standard Test Method
Average Withdrawal Resistance of Corrosion Resistance No.8-18 x 0.323 HD x 1.5/8"	567N (127lbs)	N/A*	ASTM D1761
Average Withdrawal Resistance of Corrosion Resistance 6d (0.113" shank x 0.267 HD x 2" long)	93N (21lbs)	N/A*	ASTM D1761
#6 Coarse Drywall Screw, 1-5/8" long**	787N (177lbs)	N/A*	ASTM D1761
#6 Fine Drywall Screw, 1-5/8" long**	765N (172lbs)	N/A*	ASTM D1761
16ga. Staple, 1-1/2" long**	124N (28lbs)	N/A*	ASTM D1761
Galvanized Ringed Wallboard Nail, 1-1/2" long**	462N (104lbs)	N/A*	ASTM D1761
Hot-dipped Galvanized Spiral Nail, 2" long**	226N (51lbs)	N/A*	ASTM D1761
#8 Wood Screw, 2" long**	920N (207lbs)	N/A*	ASTM D1761
#8 Exterior Deck Screw, 2" long**	934N (210lbs)	N/A*	ASTM D1761
#10 Wood Screw, 2" long**	880N (198lbs)	N/A*	ASTM D1761

*Code body or referenced test standard required reporting test results only - no Pass/Fail criteria specified.

**Applicable to corner web only.

FIRE RESISTANCE RATING

Form Size (Concrete Wall Thickness)	Rating with ½" drywall
100mm (4")	2hrs
159mm (6.25")	3hrs (4hrs if 5/8" drywall used)
203mm (8") and above	4hrs

*Bearing load applied to wall = 360,000lbs (360kips)

8.2 – MATERIAL SAFETY DATA SHEET



Safety Data Sheet - Expanded Polystyrene (EPS)
in Logix® Insulated Concrete Forms

Issue Date: Oct 30, 2018

SAFETY DATA SHEET

Safety Data Sheet – Expanded Polystyrene (EPS) in Logix® Insulated Concrete Forms

SECTION 1 - IDENTIFICATION		
Product identifier:	Logix® Insulated Concrete Forms, Logix® Pro Buck, Logix® XP-1	
Other means of identification:	Logix ICF	
Recommended use:	Stay-In-Place Insulated Concrete Forms	
Company:	Logix Insulated Concrete Forms Ltd. PO Box 162 Port Hope, Ontario L1A 3W3 1-866-944-0153	
Emergency telephone number:	Francis Roma 1-866-944-0153	
SECTION 2 – HAZARDOUS IDENTIFICATION		
GHS classification:	None	
Label elements:	None	
Signal word:	None	
Hazard statements:	None	
Precautionary statements:	Keep away from heat/sparks/open flames/hot surfaces. - No smoking Avoid breathing dust/fume/gas/mist/vapours/spray. Wash thoroughly after handling Wear respiratory protection.	
Other hazards:	May accumulate combustible dust particles when sanding or sawing in restricted or confined spaces. Residual off-gassing of blowing agent may occur in low toxicity levels under normal use conditions.	
SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS		
Chemical Name	CAS No.	Content
Benzene Ethenyl-Homopolymer (Common Name: Polystyrene)	9003-53-6	> 90%
Pentane	109-66-0	>1% - <5.0%
Isopentane	78-78-4	<1.0%

Page 1 of 5

8.2 – MATERIAL SAFETY DATA SHEET CONTINUED



Safety Data Sheet - Expanded Polystyrene (EPS)
in Logix® Insulated Concrete Forms

Issue Date: Oct 30, 2018

SECTION 4 – FIRST AID MEASUREMENTS

Inhalation:	When hot-knifing vapors may cause irritation to nose and throat. Dizziness may occur in poorly ventilated areas when hot-knifing. Remove affected individual into fresh air and keep the person calm. If difficulties occur, seek medical attention.
Skin contact:	This material is not considered to be a skin irritant. In cases where irritation may occur to extra sensitive skin, wash with soap and water for several minutes. Get medical attention if skin irritation develops or persists.
Eye contact:	Flush eyes with water for several minutes. Get medical attention if eye irritation persists or particulates are difficult to remove from the eye.
Ingestion:	This material is not considered to be hazardous when ingested but may cause blockage of air passage if large pieces are ingested. Get medical attention and apply proper first aid for persons with air passage blocked.
Physical state:	Solid
Odour & appearance:	Slight hydrocarbon odour, White in color

SECTION 5 – FIRE-FIGHTING MEASURES

Suitable extinguishing media:	Use water spray, dry chemical, foam or carbon dioxide to extinguish flames.
Special protective equipment and precautions for fire-fighters:	Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.
Flash Point:	175 – 185 °C (347 – 365 °F), ASTM D3278
Autoignition:	285 °C (571 °F), DIN 51794
Lower explosion limit:	1.4 % (V) (air)
Upper explosion limit:	8.3 % (V) (air)
Flammability:	Not highly (UN Test N.1 (ready combustible solids))
Self-ignition temperature:	Not self-igniting
Further information:	Fire gives off black smoke consisting of carbon monoxide (< 10ppm), carbon dioxide (500ppm), oxides of nitrogen (4ppm), including trace of amounts of pentane, aldehydes and ketones. Fire hazards increase with presence of ignition sources or high concentrations of dust from work sites.

8.2 – MATERIAL SAFETY DATA SHEET CONTINUED



Safety Data Sheet - Expanded Polystyrene (EPS)
in Logix® Insulated Concrete Forms

Issue Date: Oct 30, 2018

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Personal precautions:	Sources of ignition should be kept well clear. Maintain proper ventilation in areas prone to static discharge (high dust environment) or products prone to combustion.
Environmental precautions:	Do not allow to enter drains or waterways.
Methods and materials for containment and cleaning up:	Loose material can be vacuumed or swept and placed in disposal containers. This material can be disposed of in accordance with local, state/provincial and federal regulations. This material is not considered a hazardous waste.

SECTION 7 – HANDLING AND STORAGE

Precautions for safe handling:	Take special precautions in handling and unloading product onto the construction site. When loading or unloading from trucks use either proper lifting equipment or use a minimum of 2 persons when manually loading or unloading pallets from trucks.
Conditions for safe storage (including incompatible materials):	Storage locations should be in an area that will minimize damage or soiling to products. Products can be exposed to UV or freezing rain or snow for prolonged periods. However, protection is recommended in cases where stored or installed products are exposed for more than 4 weeks. Keep products away from heat, sparks, flames or other ignition sources.

SECTION 8 – EXPOSURE CONTROL/PERSONAL PROTECTION

Eye protection:	Approved safety goggles when applying fasteners, sanding or sawing.
Skin protection:	Approved gloves and/or sleeves should be worn if sensitive to material composition of products.
Respiratory protection:	Approved dust mask when sanding, sawing or when working in high dust/particulates environment. In areas of high dust, vapor or mist content exceeding safe exposure limits use NIOSH or MSHA approved air purifiers or air supplied respirators.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Rigid cellular foam blocks and shapes. White in color.
Odour:	Faint odour.
Odour threshold:	N/A
pH:	N/A
Melting point/freezing point:	Softens at approximately 70 °C (160 °F)
Initial boiling point/boiling range:	N/A
Evaporation rate:	N/A
Flammability (solid, gas):	> 24% oxygen index (ASTM D2863)

Page 3 of 5

8.2 – MATERIAL SAFETY DATA SHEET CONTINUED



Safety Data Sheet - Expanded Polystyrene (EPS)
in Logix® Insulated Concrete Forms

Issue Date: Oct 30, 2018

Vapour pressure:	N/A
Vapour density:	N/A
Solubility:	Insoluble in water. Soluble with materials containing primarily of hydrocarbons, aldehydes, esters and amines.
Partition coefficient – n-octanol/water:	N/A
Viscosity:	N/A

SECTION 10 – STABILITY AND REACTIVITY

Reactivity:	Products react to high temperatures and strong oxidizers.
Chemical stability:	Stable under normal use conditions.
Possibility of hazardous reactions:	None.
Conditions to avoid:	Avoid all sources of ignition, such as heat, sparks, open flame. Unstable when exposed to high temperatures. Recommended maximum use temperature of 60°C (166°F).
Incompatible materials:	Not compatible with materials containing primarily of hydrocarbons, aldehydes, esters and amines.
Hazardous decomposition products:	High heat or combustion produces black smoke consisting of carbon monoxide (< 10ppm), carbon dioxide (500ppm), oxides of nitrogen (4ppm), including trace of amounts of pentane, aldehydes and keytones.

SECTION 11 – TOXICOLOGICAL INFORMATION

Primary route of entry:	Eyes, skin and inhalation.
Effects of Acute Exposure:	
Eyes:	When hot-knifing material, vapors may cause irritation to eyes.
Skin:	This material is not considered to be a skin irritant. Products may contain small particulates of dust accumulated naturally from surrounding environment, which may cause skin irritation with possible mild discomfort on extra sensitive skin.
Inhalation:	When hot-knifing vapors may be cause irritation to nose and throat. Dizziness may occur in poorly ventilated areas when hot-knifing.
Effects of chronic exposure:	Exposure to vapors may aggravate existing respiratory conditions, such as asthma, bronchitis and inflammatory or fibrotic respiratory disease.

SECTION 12 – ECOLOGICAL INFORMATION

Non-biodegradable.

SECTION 13 – DISPOSAL CONSIDERATIONS

Loose material can be vacuumed or swept and placed in disposal containers.

This material can be disposed of in accordance with local, state/provincial and federal regulations. This material is not considered a hazardous waste.

8.2 – MATERIAL SAFETY DATA SHEET CONTINUED



Safety Data Sheet - Expanded Polystyrene (EPS)
in Logix® Insulated Concrete Forms

Issue Date: Oct 30, 2018

SECTION 14 – TRANSPORT INFORMATION

N/A

SECTION 15 – REGULATORY INFORMATION

All ingredients listed with TSCA and DSL (Toxic Substances Control Act and Domestic Substances List, respectively)

EPCRA 311-312 (Emergency Planning and Emergency Right-to-Know Act): Not hazardous

Classified as non-hazardous with WHMIS.

SECTION 16 – OTHER INFORMATION

SDS updates: October 30, 2018

TO THE BEST OF OUR KNOWLEDGE THE INFORMATION CONTAINED HEREIN IS BELIEVED TO BE ACCURATE. HOWEVER, NEITHER THE ABOVE NAMED MANUFACTURER OR SUPPLIER NOR ANY OF ITS SUBSIDIARIES ASSUMES ANY LIABILITY WHATSOEVER FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION CONTAINED HEREIN. FINAL DETERMINATION OF SUITABILITY OF ANY MATERIAL IS THE SOLE RESPONSIBILITY OF THE USER. ALL MATERIALS MAY PRESENT UNKNOWN HAZARDS AND SHOULD BE USED WITH CAUTION. ALTHOUGH CERTAIN HAZARDS ARE DESCRIBED HEREIN, WE CANNOT GUARANTEE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

8.3 – RECOMMENDED INDUSTRY PRACTICE FOR PLACING REINFORCING BARS

Reprinted from: THE MANUAL OF STANDARD PRACTICE by the Concrete Reinforcing Steel Institute, January 1997.

RECOMMENDED INDUSTRY PRACTICE FOR PLACING REINFORCING BARS*

1. Introduction

These recommendations for placing reinforcing bars are partially based upon the ACI Building Code.

2. General

Reinforcing bars should be accurately placed in the positions shown on the placing drawings and adequately tied and supported before concrete is placed, and secured against displacement within the tolerances recommended in Section 8.

Welding of crossing bars (tack welding) should not be permitted for assembly of reinforcement unless authorized by the Architect/Engineer.

3. Surface Condition of Reinforcement

At the time of concrete placement, all reinforcing bars should be free of mud, oil, or other deleterious materials. Reinforcing bars with rust, mill scale, or a combination of both should be considered as satisfactory, provided the minimum dimensions, weight, and height of deformations of a hand-wire-brushed test specimen are not less than the applicable ASTM specification requirements.

4. Bending

Reinforcing bars should not be bent or straightened in a manner that will injure the material. Bars with kinks or improper bends should not be used. Except for realignment of #7 through #18 rebar up to about 30° bend and #3 through #6 rebar up to about a 45° bend, no bars partially embedded in concrete should be field bent, except as shown on the project drawings or permitted by the Architect/Engineer.

5. Spacing of Reinforcement

The clear distance between parallel reinforcing bars in a layer should not be less than the nominal diameter of the bars, nor 1 in. Clear distance should also not be less than one and one-third times the nominal maximum size of the coarse aggregate, except if in the judgement of the Architect/Engineer, workability and methods of consolidation are such that concrete can be placed without honeycomb or voids.

Where parallel reinforcement is placed in two or more layers, the bars in the upper layers should be placed directly above those in the bottom layer with the clear distance between layers not less than 1 in.

Groups of parallel reinforcing bars bundled in contact, assumed to act as a unit, not more than four in any one bundle may be used only when stirrups or ties enclose the bundle. Bars larger than #11 should not be

bundled in beams or girders. Individual bars in a bundle cut off within the span of flexural members should terminate at different points with at least 40 bar diameters stagger. Where spacing limitations and minimum clear cover are based on bar size, a unit of bundled bars should be treated as a single bar of a diameter derived from the equivalent total area.

In walls and slabs other than concrete joist construction, the principal reinforcement should not be spaced farther apart than three times the wall or slab thickness, nor more than 18 in.

In spirally reinforced and tied columns, the clear distance between longitudinal bars should not be less than one and one-half times the nominal bar diameter, nor 1½ in.

The clear distance limitation between bars should also apply to the clear distance between a contact lap splice and adjacent splices or bars.

6. Splices in Reinforcement**

6.1 General

Splicing of reinforcing bars should be either by lapping, mechanical connections, or by welding.

Splices of reinforcing bars should be made only as required or permitted on the project drawings or in the project specifications, or as authorized by the Architect/Engineer. All welding should conform to the current edition of "Structural Welding Code—Reinforcing Steel" (ANSI/AWS D1.4).

6.2 Lap Splices

Lap splices of #14 and #18 bars should not be used, except in compression only to #11 and smaller bars.

Lap splices of bundled bars should be based on the lap splice length recommended for individual bars of the same size as the bars spliced, and such individual splices within the bundle should not overlap each other. The length of lap should be increased 20 percent for a 3-bar bundle and 33 percent for a 4-bar bundle.

Bar laps placed in contact should be securely wired together in such a manner as to maintain the alignment of the bars and to provide minimum clearances.

Bars spliced by noncontact lap splices in flexural members should not be spaced transversely farther apart than one-fifth the required length of lap nor 6 in.

*For more complete recommendations on bar placement, see *Placing Reinforcing Bars* available from the Concrete Reinforcing Steel Institute.

**See *Reinforcement: Anchorages, Lap Splices and Connections* by the Concrete Reinforcing Steel Institute.

8.4 – STANDARD PRACTICE - SPLICING & DOWELS

Lap Splices

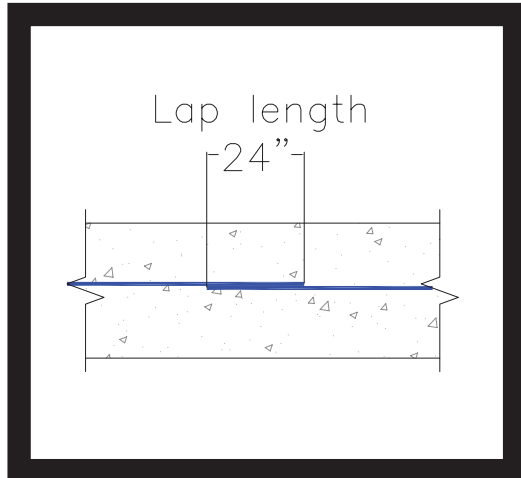


Figure 1a: Contact lap splices

A lap is when two pieces of rebar overlap to form a continuous line. This helps transfer loads properly throughout the structure. There are two types of lap splices: contact lap and non-contact lap splices (see Figure 1a and 1b). The lapped sections of contact lap splices are wired together. Lapped sections of non-contact lap splices do not touch and are permitted in practice provided the distance between lap sections meet the specified code requirements.

When using LOGIX ICFs non-contact lap splices can be used in lieu of contact lap splices.

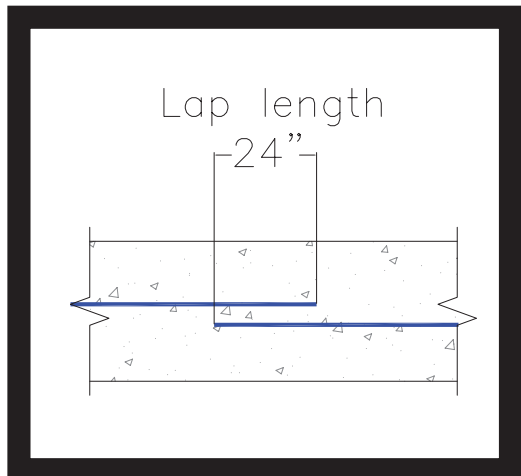


Figure 1b: Non-contact lap splices

Lap Splices in Horizontal Rebar

In traditional construction methods, contact lap splices are more commonly used because it offers the most reliable method of ensuring the lapped sections are secure against displacement, especially during concrete pours. LOGIX ICFs can accommodate contact lap splices. However, the rebar slots in the LOGIX webs are also designed to accommodate non-contact lap splices,

8.4 – STANDARD PRACTICE - SPLICING & DOWELS CONTINUED

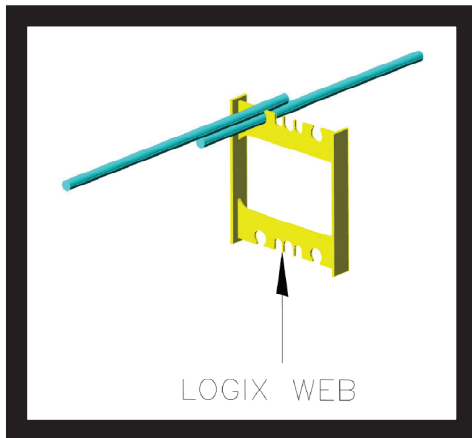


Figure 2a: Contact lap splices

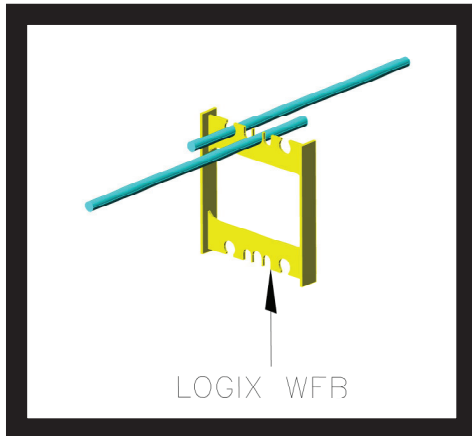


Figure 2b: Non-contact lap splices

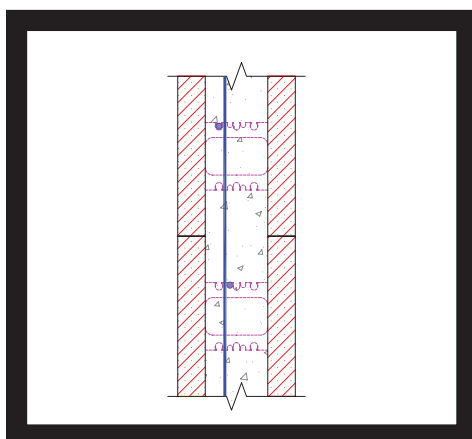


Figure 3: Vertical rebar in LOGIX ICF wall system

ensuring the horizontal rebar stays in place (see **Figure 2a** and **2b**). This minimizes the need to wire tie lapped sections and reduces labor.

The length of a lapped section (or lap length) varies depending mainly on the loading conditions, rebar size, rebar spacing, rebar grade and concrete strength. As a general rule, LOGIX recommends a lap length of 40d or 24", whichever is greater, for residential construction (see **Figure 1a** and **1b**).

Lap Splices in Vertical Rebar

For the same reason as horizontal rebar, contact lap splices are also more commonly used in traditional construction methods. However, contact lap splices are not necessary when using LOGIX ICFs. The LOGIX web ties, which are spaced horizontally every 8" (203mm) and about 5.25" (133mm) vertically per block, provides enough stability for placement of vertical rebar. Vertical rebar can be further secured if it is slid through a staggered pattern of horizontal rebar. The slots in the webs have been designed to accommodate this (see **Figure 3**).

8.4 – STANDARD PRACTICE - SPLICING & DOWELS CONTINUED

Footing Dowels

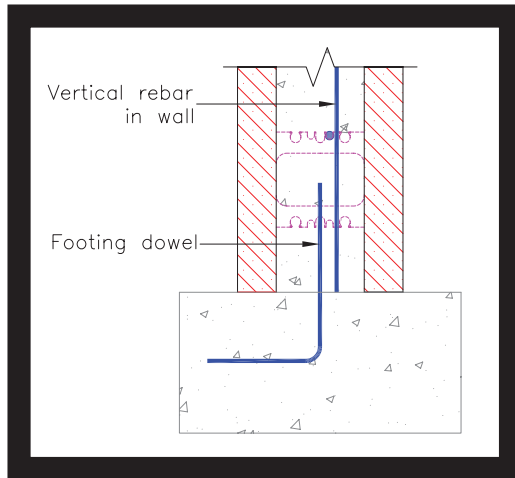
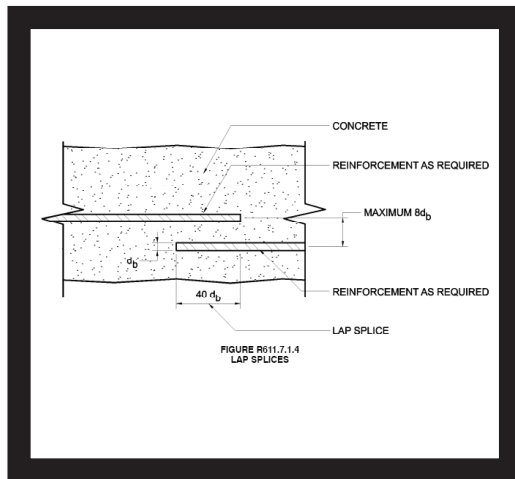


Figure 4: Wall/Footing connection

Footing dowels connects the wall to the footing (see **Figure 4**). This prevents wall movement at the wall/footing joint caused mainly by soil loads. In residential construction, the vertical rebar in the wall itself does not contribute to the strength of the wall/footing connection and hence is not required to splice with the footing or match the spacing of the footing dowels. In cases, where lap splice may be required, non-contact lap splices are permitted.



R611.7.1.4

Lap Splices –Building & Design Code References

International Building Code 2003 (IBC 2003),
R611.7.1.4:

“R611.7.1.4 Lap Splices. Where lap splicing of vertical or horizontal reinforcing steel is necessary, the lap splice shall be in accordance with Figure R611.7.1.4 and a minimum of $40d_b$, where d_b is the diameter of the smaller. The maximum distance between noncontact parallel bars at a lap splice shall not exceed $8d_b$.”

National Building Code 1995 (NBC 1995), 4.3.3.1:

Clause 4.3.3.1 references concrete design code, CSA A23.3 (specifically CSA A23.3, 12.14.2.3):

“12.14.2.3

Bars spliced by lap splices in flexural members shall have a transverse spacing not exceeding the lesser of one-fifth of the required lap splice length or 150mm.”

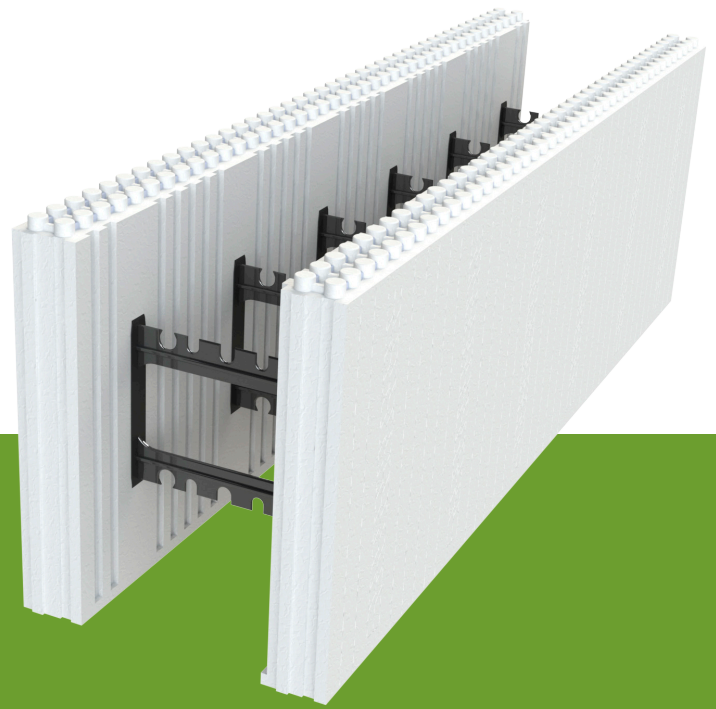
LOGIX® INSULATED CONCRETE FORMS

All documents are downloadable at logixicf.com

8.5 – LOGIX R-VALUES

LOGIX FORM PANELS	STANDARD	TAPER TOP	BRICK LEDGE
STANDARD			
	LOGIX R1/R2 (RSI) ¹	LOGIX R1/R2 (RSI) ¹	LOGIX R1/R2 (RSI) ¹
	23/24 (4/4.25)	26/27 (4.56/4.81)	23/24 (4/4.25)
TAPER TOP			
	LOGIX R1/R2 (RSI) ¹	LOGIX R1/R2 (RSI) ¹	LOGIX R1/R2 (RSI) ¹
	23/24 (4/4.25)	26/27 (4.56/4.81)	23/24 (4/4.25)
BRICK LEDGE			
	LOGIX R1/R2 (RSI) ¹	LOGIX R1/R2 (RSI) ¹	LOGIX R1/R2 (RSI) ¹
	23/24 (4/4.25)	26/27 (4.56/4.81)	23/24 (4/4.25)

1. R1 denotes total R-value of form panels only (per ASTM C518 at average mean temperature of 75deg F.). R2 denotes total R-value of a wall assembly consisting of form panels, 4 inch concrete core, 1/2 inch drywall and interior airfilm. R1 and R2 are based on imperial units. R-values are based on independent testing conducted by Intertek Testing Services.



Connect with a Local Manufacturer

888.838.5038

330 Cain Drive
Haysville, KS 67060-2004

888.453.5961

11581-272 St.
Acheson, AB T7X 6E9

888.706.7709

840 Division St.
Cobourg, ON K9A 5V2

888.453.5961

6333 Unsworth Rd.
Chilliwack, BC V2R 5M3

877.789.7622

35 Headingley Rd.
Headingley, MB R4H 0A8



info@LogixICF.com
LogixICF.com

