7.0 – EVALUATION REPORTS

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7.1 – US CODE REPORTS
7.1.1 – WISCONSIN BUILDING PRODUCTS EVALUATION

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.
• **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:

<table>
<thead>
<tr>
<th>Product</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>BFL-422</td>
<td>BASF Corporation (Beaver Plastics Ltd.)</td>
</tr>
</tbody>
</table>

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 ¼ inch and a minimum compressive strength of 2,500 psi.

**Reinforcement**: The concrete is reinforced with Nos. 3, 4, 5 and 6 deformed steel reinforcing bars, Type A615, Grade No. 40, with a minimum yield strength of 40,000 psi and Grade No. 60, with a minimum yield strength of 60,000 psi. All steel reinforcement shall be in accordance with IBC 1901.2 & ACI 318 as modified by IBC 1905.
Each pallet of Logix forms shall bear a label with the manufacturer’s name, and the quality control inspection agency.

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.

<table>
<thead>
<tr>
<th>Assembly Rating, hours</th>
<th>Minimum ICF Cavity Thickness, in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>6.25 (4-hr. rating with 5/8” drywall)</td>
</tr>
<tr>
<td>4</td>
<td>Greater than or equal to 8</td>
</tr>
</tbody>
</table>

**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”.

<table>
<thead>
<tr>
<th>Type</th>
<th>Test Result</th>
<th>Minimum Requirement</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type II</td>
<td>1.68</td>
<td>1.35 lbs/ft³</td>
<td>Complied</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Test Result</th>
<th>Minimum Requirement</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type II</td>
<td>24.5 psi</td>
<td>15.0 psi</td>
<td>Complied</td>
</tr>
</tbody>
</table>
**Flexural Properties:** ASTM C203-99 “Standard Test Method for Breaking Load and Flexural Properties of Block-Type Thermal Insulation”

<table>
<thead>
<tr>
<th>Type</th>
<th>Test Result</th>
<th>Minimum Requirement</th>
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<tr>
<td>SC Type II</td>
<td>44.9 psi</td>
<td>40.0 psi</td>
<td>Complied</td>
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</tbody>
</table>

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)


<table>
<thead>
<tr>
<th>Fastener Type</th>
<th>Withdrawal Max Load (lbs.)</th>
<th>Lateral Max Load (lbs.)</th>
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<tr>
<td>Average</td>
<td>Type ‘W’ Coarse Thread Drywall Screw</td>
<td>166</td>
</tr>
<tr>
<td>COV</td>
<td>Type ‘W’ Coarse Thread Drywall Screw</td>
<td>10.6 %</td>
</tr>
<tr>
<td>Average</td>
<td>Type ‘S’ Fine Thread Drywall Screw</td>
<td>169</td>
</tr>
<tr>
<td>COV</td>
<td>Type ‘S’ Fine Thread Drywall Screw</td>
<td>8.4 %</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Ultimate Tensile Strength (lbs.)</th>
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<tr>
<td>Average</td>
<td>842</td>
</tr>
<tr>
<td>COV</td>
<td>1.7 %</td>
</tr>
</tbody>
</table>

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

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

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

**CALCULATIONS:**

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

2. **Fastener Testing:**
   (A) **Withdrawal Resistance:**
   - Type “S” Screw: \( F_{\text{allow}} = 178 \text{ lbs.} + 5 = 35 \text{ lbs.} \)
   - Type “W” Screw: \( F_{\text{allow}} = 166 \text{ lbs.} + 5 = 33 \text{ lbs.} \)
   (B) **Lateral Resistance:**
   - Type “S” Screw: \( F_{\text{allow}} = F + 3.2 = 328 \text{ lbs.} + 3.2 = 102.5 \text{ lbs.} \)
   - Type “W” Screw: \( F_{\text{allow}} = F + 3.2 = 367 \text{ lbs.} + 3.2 = 114 \text{ lbs.} \)
**CONCLUSIONS:**

*Physical Properties of Polypropylene Reinforcing Webs*

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

\[ q_s = K \frac{v^2}{2} \]

where:  
\[ q_s = \text{wind pressure (lbs./ft}^2\text{)} \]
and:  
\[ v = \text{basic wind speed (mph)} \]
and:  
\[ K = 0.00256 \]

thus:  
\[ v = \left(\frac{q_s}{0.00256}\right)^{1/2} \]

given:  
\[ q_s = 99 \text{ lbs./ft}^2 \text{ (allowable negative withdrawal)} \]
then:  
\[ v = 197 \text{ mph} \]


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

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

**CONCLUSIONS:**

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

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

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

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

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

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

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

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

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

*Alternate Design:* In lieu of calculations, the structural design of reinforced concrete formed by Logix Insulated Concrete Form Wall System insulated concrete form blocks for residential construction is permitted to comply with the Prescriptive Design of Exterior Concrete Walls for One- and 2-Family Dwellings (PCA 100), published by the Portland Cement Association (PCA). Buildings constructed with the Logix Insulated Concrete Form Wall System insulated concrete form system and designed in accordance with the alternate design, will not exceed a height of two stories plus a basement, where the maximum unsupported wall height is 10 feet.
NOTE: The Logix Insulated Concrete Form Wall System was **not** evaluated for compliance with the thermal requirements of **IECC chapters C4 & R4**.

**Identification:** Each package bears a label specifying the name and address of the manufacturer (AMC Foam Technologies, Inc., Headingley, MB R4H0A8, Canada). Additionally, product 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
### 7.1.3 – STATE OF FLORIDA CERTIFICATE OF APPROVAL

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<tr>
<th>FL #</th>
<th>FL14469-R2</th>
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<td>Application Type</td>
<td>Revision</td>
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<tr>
<td>Code Version</td>
<td>2014</td>
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<tr>
<td>Application Status</td>
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</table>

**Comments**
- Archived

**Product Manufacturer**
- Logix Insulated Concrete Forms
  - Address/Phone/Email
    - 199-1917 West 4th Avenue
    - Vancouver, FL 33133
    - (866) 944-0153
    - francis@logixicf.com

**Authorized Signature**
- Francis Roma
  - francis@logixicf.com

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

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

**Category**
- Structural Components

**Subcategory**
- Insulation Form Systems

**Compliance Method**
- Certification Mark or Listing

**Certification Agency**
- Quality Auditing Institute Ltd.

**Validated By**
- Quality Auditing Institute Ltd.

**Referenced Standard and Year (of Standard)**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Year</th>
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<tbody>
<tr>
<td>ASTM C578-08b</td>
<td>2008</td>
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<tr>
<td>ASTM D1761-06</td>
<td>2006</td>
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<tr>
<td>ASTM D1929-96(2001)e01</td>
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<tr>
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**Equivalence of Product Standards Certified By**

https://www.floridabuilding.org/pr/pr_app_dtl.aspx?param=wGEVXQw1DogikHnpxAucu2ZbZM79cscpcqW9N2vMPCqMmAHnapzZE0FA%3d%3d
### Florida Building Code Online

Product Approval Method

Method 1 Option A

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<td>08/12/2015</td>
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<tr>
<td>Date Pending FBC Approval</td>
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<td>Date Approved</td>
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#### Summary of Products

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<th>Description</th>
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<tbody>
<tr>
<td>14469.1</td>
<td>Logix Insulated Concrete Forms</td>
<td>Insulated concrete forms</td>
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</tbody>
</table>

#### 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_R2_C_CAC_B1031-1 Edition 3 - LOGIX ICF - Listing Page.pdf
- FL14469_R2_C_CAC_Logix- Load Bearing Exterior Wall Assembly Design Listing.pdf

Quality Assurance Contract Expiration Date
- 01/01/2020

Installation Instructions
- FL14469_R2_II_LOGIX - Installation Instructions.pdf

Verified By: Quality Auditing Institute Ltd.

Created by Independent Third Party:
- Evaluation Reports

Contact Us
- 1940 North Monroe Street, Tallahassee FL 32399 Phone: 850-487-1824

- Privacy Statement
- Accessibility Statement
- Refund Statement

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Logix Insulated Concrete Forms
F.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 Insulated 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 Christopher W.C. Bowness, P.E., bearing the Miami-Dade County Product Control renewal 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 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 replaces NOA # 09-0714.03 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. Urrera, P.E.

NOA No 14-0715.04
Expiration Date: September 23, 2019
Approval Date: November 6, 2014
Page 1
### 7.1.4 – MIAMI-DADE COUNTY CONTINUED

Logix Insulated Concrete Forms

**NOTICE OF ACCEPTANCE:**  EVIDENCE SUBMITTED

### A. DRAWINGS

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

<table>
<thead>
<tr>
<th>Report</th>
<th>Test</th>
<th>Date</th>
<th>Signature</th>
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</thead>
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<tr>
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<td>10/23/14</td>
<td>C. Bowness, P.E.</td>
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</table>

*Submitted under NOA #03-0319.01*

<table>
<thead>
<tr>
<th>Report</th>
<th>Test</th>
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<tr>
<td>RAD-3015</td>
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<td>J. D. Waldman</td>
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<tr>
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<td>ASTM C518</td>
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<td>ASTM E96</td>
<td>April 2002</td>
<td>J. D. Waldman</td>
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<tr>
<td>RAD-3015</td>
<td>ASTM C272</td>
<td>April 2002</td>
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<td>RAD-2725</td>
<td>ASTM D1929</td>
<td>Feb 2001</td>
<td>M. L. Ziemann</td>
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<td>UL R-7503</td>
<td>ASTM E84</td>
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<tr>
<td>ETL 3050535</td>
<td>ASTM G21</td>
<td>03/17/04</td>
<td>S. J. Emerman, P.E.</td>
</tr>
</tbody>
</table>

### 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 2010 FBC issued by Christopher Bowness, P.E. Professional Engineering Services, dated 10/25/2014, signed and sealed by Christopher W.C. Bowness, P.E.

*Submitted under NOA #03-0319.01*

2. No financial interest letter issued by Applied Consumer Services, Inc on 07/15/2004, signed by R. Rahimi, P.E.

---

Carlos M. Utrera, P.E.
Product Control Examiner
NOA No 14-0715.04
Expiration Date: September 23, 2019
Approval Date: November 6, 2014
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:

<table>
<thead>
<tr>
<th>Description</th>
<th>Properties</th>
<th>Requirements</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. Density</td>
<td>1.35 psf</td>
<td>1.35 psf</td>
<td>ASTM C303</td>
</tr>
<tr>
<td>Flame Spread</td>
<td>5</td>
<td>Max. 75</td>
<td>ASTM E84</td>
</tr>
<tr>
<td>Smoke Development</td>
<td>400</td>
<td>Max. 450</td>
<td>ASTM E54</td>
</tr>
<tr>
<td>Self Ignition</td>
<td>830°F</td>
<td>Min. 850°F</td>
<td>ASTM D1920</td>
</tr>
<tr>
<td>Max. Thermal Conductivity per inch</td>
<td>0.237 Btu-in/hr-ft°F</td>
<td>0.25 Btu-in/hr-ft°F</td>
<td>ASTM C118</td>
</tr>
<tr>
<td>Odor Emission</td>
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<td>Not detected</td>
<td>AATCC-112</td>
</tr>
<tr>
<td>Water Vapor Transmission per inch</td>
<td>3.10 perms</td>
<td>Max. 3.5 perms</td>
<td>ASTM E96</td>
</tr>
<tr>
<td>Max Water Absorption</td>
<td>0.78% water abs by vol.</td>
<td>Max. 3.0%</td>
<td>ASTM C272</td>
</tr>
<tr>
<td>Fungus Resistance</td>
<td>No bacteria growth</td>
<td>No growth</td>
<td>ASTM S21</td>
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FORM SIZES

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<tr>
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<th>4&quot;</th>
<th>6.25&quot;</th>
<th>8&quot;</th>
<th>10&quot;</th>
<th>12&quot;</th>
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<td>A</td>
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<td>6.25&quot;</td>
<td>8&quot;</td>
<td>10&quot;</td>
<td>12&quot;</td>
</tr>
<tr>
<td>B</td>
<td>9.5&quot;</td>
<td>11.75&quot;</td>
<td>13.5&quot;</td>
<td>15.5&quot;</td>
<td>17.5&quot;</td>
</tr>
</tbody>
</table>

NOTES:
1. 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.
2. The forming system shall comply with ACI 347.
3. The concrete walls shall comply with the requirements of ACI 318.
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.


**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.

<table>
<thead>
<tr>
<th>Form Size (Wall Thickness)</th>
<th>Fire Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>4”</td>
<td>2 hours</td>
</tr>
<tr>
<td>6.25”</td>
<td>3 hours</td>
</tr>
<tr>
<td>8” and larger</td>
<td>4 hours</td>
</tr>
</tbody>
</table>
7.1.5 – CITY OF NEW YORK - MEA (MATERIALS & EQUIPMENT ACCEPTANCE) CONTINUED

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, Saima Dastgiridam

MEA 273-04-M
Page 2 of 2
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.
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.
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: ____________________   Reviewed By: _____________________
Kal Kooner, EIT Peter Gildenstern, AScT
Engineer, Building Products Asst. Mgr., Engineering Services
7.1.7 – 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.
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)
- 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."
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
7.2 – CANADIAN CODE REPORTS
7.2.1 – NON-COMBUSTIBLE CONSTRUCTION
(NATIONAL BUILDING CODE OF CANADA)

Intertek Testing Services, an independent, nationally accredited testing agency, conducted a fire evaluation and determined the products listed below meets clause 3.2.3.8 when used with LOGIX for exterior walls for building over 3 storeys.

Copies of the evaluation reports can be downloaded at www.logixicf.com.

Products evaluated:
- Dryvit Exsulation 2000 System
- Dryvit Infinity System
- Dryvit Exsulation 2000 System
- Dryvit Fedderlite 2000 System
- Dryvit Outsulation System
- Dryvit Outsulation MD System
- Sto EIFS
- Sto Signature System
- Sto CLASSIC NExT
- Sto CLASSIC NExT NC
- Sto SIGNATURE SYSTEM NC
- Standard ADEX System
- Standard ADEX RF System
- Durock ICF Finish System
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.

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- 2005 National Building Code (NBC)
- Intertek Test Report 3048347 dated October 14, 2003
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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.”
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
### 7.2.3 – VAPOUR BARRIER
(NATIONAL BUILDING CODE OF CANADA) CONTINUED

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<th>SUMMARY</th>
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</thead>
<tbody>
<tr>
<td>February 1, 2007</td>
<td>Added additional reference to 2005 NBC and maximum permeance requirements</td>
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## 7.3 – LEED V4 EVALUATION

### POTENTIAL LEED POINTS CONTRIBUTION WITH LOGIX

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<thead>
<tr>
<th>Sustainable Sites</th>
<th>Applicable Building Types</th>
<th>Maximum Points Contribution</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protect or Restore Habitat</td>
<td>All</td>
<td>2 (1 for healthcare)</td>
<td>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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy &amp; Atmosphere</th>
<th>Applicable Building Types</th>
<th>Maximum Points Contribution</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Energy Performance</td>
<td>All</td>
<td>n/a (required)</td>
<td>The continuous insulation and air barrier properties of Logix can help meet required minimum levels of efficiency for the building.</td>
</tr>
<tr>
<td>Optimize Energy Performance</td>
<td>All</td>
<td>18 except Schools and Healthcare (16 for Schools, 20 for Healthcare)</td>
<td>The continuous insulation and air barrier properties of Logix can help achieve the levels of energy performance that go beyond the prerequisite standard.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Material &amp; Resources</th>
<th>Applicable Building Types</th>
<th>Maximum Points Contribution</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction and Demolition Waste</td>
<td>All</td>
<td>n/a (required)</td>
<td>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.</td>
</tr>
<tr>
<td>Management Planning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building Life-cycle Impact Reduction</td>
<td>All</td>
<td>3</td>
<td>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.</td>
</tr>
<tr>
<td>Building Product Disclosure &amp;</td>
<td>All</td>
<td>1</td>
<td>Can help contribute 1 point under “Option 1. Environmental Product Declaration (EPD).” Logix uses EPS which carries EPD documents, which conform to ISO 14025.</td>
</tr>
<tr>
<td>Optimization - Environmental Product</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Declarations.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building Product Disclosure &amp; Optimization - Sourcing of Raw Materials.</td>
<td>All</td>
<td>2</td>
<td>Logix products are made with up to 10% recycled pre-consumer EPS.</td>
</tr>
<tr>
<td>Building Product Disclosure &amp; Optimization - Material Ingredients.</td>
<td>All</td>
<td>1</td>
<td>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).</td>
</tr>
</tbody>
</table>
### Material & Resources

<table>
<thead>
<tr>
<th>Applicable Building Types</th>
<th>Maximum Points Contribution</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction &amp; Demolition Waste Management</td>
<td>All</td>
<td>2</td>
</tr>
</tbody>
</table>

### Indoor Environmental Quality

<table>
<thead>
<tr>
<th>Applicable Building Types</th>
<th>Maximum Points Contribution</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Acoustic Performance</td>
<td>Schools</td>
<td>N/a (required)</td>
</tr>
<tr>
<td>Low-emitting Materials</td>
<td>All</td>
<td>3</td>
</tr>
<tr>
<td>Thermal Comfort</td>
<td>All except Core &amp; Shell</td>
<td>1</td>
</tr>
<tr>
<td>Acoustic Performance</td>
<td>All except Core &amp; Shell</td>
<td>1</td>
</tr>
</tbody>
</table>

The 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](http://www.usgbc.org) or [www.cagbc.org](http://www.cagbc.org).
7.4 – QAI FIRE RESISTANCE RATING


<table>
<thead>
<tr>
<th>Rating</th>
<th>Product Density</th>
<th>Maximum Cavity Width</th>
<th>Maximum Panel Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Hour</td>
<td>1.35 pcf</td>
<td>4 inches</td>
<td>2 3/4 inches</td>
</tr>
<tr>
<td>3-Hour</td>
<td>1.35 pcf</td>
<td>6 1/8 inches</td>
<td>2 3/4 inches</td>
</tr>
<tr>
<td>4-Hour</td>
<td>1.35 pcf</td>
<td>8 inches</td>
<td>2 3/4 inches</td>
</tr>
</tbody>
</table>

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.


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.

December 6, 2010

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7.5 – GREENGUARD INDOOR AIR QUALITY CERTIFIED

Certificate of Compliance

Certificate Details:

Certificate No: 938-00
Status: Certified
Period: 11/2010 - 10/2011
Restrictions: NONE

LOGIX Platinum Series
LOGIX Insulated Concrete Forms, Ltd.

This product has been certified according to the GREENGUARD Indoor Air Quality (IAQ) Certification Program for Low Emitting Products.

Reference Standard: GGPS.001 GREENGUARD IAQ Standard for Building Materials, Finishes, and Furnishings

Product Type: Insulation and HVAC Products

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Allowable Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TVOC¹</td>
<td>≤ 0.5 mg/m³</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>≤ 0.05 ppm</td>
</tr>
<tr>
<td>Total Aldehydes²</td>
<td>≤ 0.1 ppm</td>
</tr>
<tr>
<td>Individual VOCs³</td>
<td>≤ 0.1 TLV</td>
</tr>
<tr>
<td>Respirable Particles (PM₁₀) (mg/m³)</td>
<td>≤ 0.05 mg/m³</td>
</tr>
</tbody>
</table>

List of measured carcinogens and reproductive toxins as identified by California Proposition 65, the U.S. National Toxicology Program (NTP), and the International Agency on Research on Cancer (IARC) must be provided.

Any pollutant regulated as a primary or secondary outdoor air pollutant must meet a concentration that will not generate an air concentration greater than that promulgated by the National Ambient Air Quality Standard (U.S. EPA, code of Federal Regulations, Title 40, Part 50).

See referenced standard for a complete technical explanation.

¹ Defined to be the total response of measured VOCs falling within the C₆–C₁₆ range, with responses calibrated to a toluene surrogate.

² Defined to be the total response of a target list of aldehydes (2-butenal; acetaldehyde; benzaldehyde; 2, 5-dimethylbenzaldehyde; 2-methylbenzaldehyde; 3-and/or 4-methylbenzaldehyde; butanal; 3-methylbutanal; formaldehyde; hexanal; pentanal; propanal), with each individually calibrated to a compound specific standard.

³ Any pollutant not listed must produce an air concentration level no greater than 1/10 the Threshold Limit Value (TLV) industrial work place standard (Reference: American Conference of Government Industrial Hygienists, 6500 Glenway, Building D–7, Cincinnati, Ohio 45211–4438).

⁴ Particles are applicable to fibrous, particle-releasing products with exposed surface area in air streams.

GREENGUARD Certification affirms that products meet the criteria of the referenced standard and the requirements of the specific certification program. Certification testing is conducted according to a consistent, defined protocol. The testing does not evaluate emissions under usage conditions other than those defined in the protocol and does not address potential environmental impact other than chemical and particle emissions.

The GREENGUARD Environmental Institute (GEI) is an industry independent, third-party certification organization that qualifies products for low chemical emissions. GREENGUARD Certification programs use defined product standards, test methodologies, product sample collection and handling procedures, program application processes and on-going verification procedures. GREENGUARD standards, methods, and procedures are available at www.GREENGUARD.org.
7.6 – GREenguARD ChildREN
AND SCHOOLS CERTIFIED

Certificate of Compliance

Certificate Details:

Certificate No: 938-00
Status: Certified
Period: 11/2010 - 10/2011
Restrictions: NONE

LOGIX Platinum Series
LOGIX Insulated Concrete Forms, Ltd.

This product has been certified according to the
GREenguARD Children & Schools Certification Program
for Low Emitting Products

Reference Standard: GGps.002 GREenguARD Children & Schools™ Standard

Product Type: All Products

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Allowable Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual VOCs¹,²</td>
<td>≤ 1/100 TLV and ≤ ½ CA chronic REL (Office Seating ≤ 1/100 TLV and ≤ ¼ CA CREL)</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>≤ 0.0135 ppm /13.5 ppb (Office Seating ≤ 0.0675 ppm /6.75 ppb)</td>
</tr>
<tr>
<td>TVOC³</td>
<td>≤ 0.22 mg/m³</td>
</tr>
<tr>
<td>Total Aldehydes⁴</td>
<td>≤ 0.043 ppm /43 ppb</td>
</tr>
<tr>
<td>Total Phthalates⁵</td>
<td>≤ 0.01 mg/m³</td>
</tr>
<tr>
<td>Total Particles⁶</td>
<td>≤ 0.02 mg/m³</td>
</tr>
</tbody>
</table>

See referenced standard for a complete technical explanation.

¹Any VOC not listed must produce an air concentration level no greater than 1/100 the Threshold Limit Value (TLV) industrial work place
criterion (Reference: American Conference of Government Industrial Hygienists, 6500 Glenway, Building D-7, Cincinnati, Ohio 45211-4438)
and no greater than 1/2 the CA Chronic Reference Exposure Level (CREL) http://www.oehha.ca.gov/air/chronic_rels/AllChrels.html - (CRELs)
Adopted by the State of California Office of Environmental Health Hazard Assessment (OEHHAA), December 2008).

²1-Methyl-2-Pyrrolidinone must be ≤ 0.16 mg/m³ for Office Furniture or ≤ 0.080 mg/m³ for Office Seating.

³Defined to be the total response of measured VOCs falling within the C₆–C₁₆ range, with responses calibrated to a toluene surrogate.

⁴Defined to be the total response of a target list of aldehydes (2-butenal; acetaldehyde; benzaldehyde; 2, 5-dimethylbenzaldehyde,
2-methylbenzaldehyde; 3-and/or 4-methylbenzaldehyde; butanal; 3-methylbutanal; formaldehyde; hexanal; pentanal; propanal), with each
individually calibrated to a compound specific standard.

⁵Total phthalates include dibutyl (DBP), diethylhexyl (DEHD), diethyl (DEP), butylbenzyl (BBP), di-octyl (DOP), and dimethyl (DMP) phthalates.

⁶Particles are only applicable to fibrous, particle-releasing products with exposed surface area in air streams.

Emissions from Indoor Sources Using Environmental Chambers” Version 1.1 (CA section 01350)

GREenguARD Certification affirms that products meet the criteria of the referenced standard and the
requirements of the specific certification program. Certification testing is conducted according to a consistent,
defined protocol. The testing does not evaluate emissions under usage conditions other than those defined in
the protocol and does not address potential environmental impact other than chemical and particle emissions.
The GREenguARD Environmental Institute (GEI) is an industry independent, third-party certification
organization that qualifies products for low chemical emissions. GREenguARD Certification programs use
defined product standards, test methodologies, product sample collection and handling procedures, program
application processes and on-going verification procedures. GREenguARD standards, methods, and procedures
are available at www.GREenguARD.org.
BUILDING PRODUCTS LISTING PROGRAM

Class: Insulation

Customer: LOGIX Insulated Concrete Forms, Ltd.
Location: 199-1917 West 4th Avenue, Vancouver, BC V6J 1M7

Listing No.: B1031
Effective Date: September 27, 2010
Last Revised: October 15, 2010
Expires: N/A

Product: Insulated Concrete Forms (ICFs) with expanded polystyrene (EPS) panels and polypropylene web tie connectors.

Bead Types: Only approved bead types meeting certification requirements

Label: Product units are marked with the following: Manufacturer’s Name, Trademark or other recognized symbol of identification, Model Designation, Month and Year of Manufacture or equivalent, QAI logo with the “US” and “C” identifier, listing number, and the standard numbers and ratings.


Ratings: Component Product Density Maximum Thickness Flame Spread Index (FSI) Smoke Developed Index (SDI)

 EPS Panels 1.35 pcf 2.75 inches 25 450


ASTM C578 Ratings:
EPS Panels Type II
CAN/ULC S701 Ratings:
EPS Panels Type 2

May 18th, 2011

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Standards:


<table>
<thead>
<tr>
<th>Rating</th>
<th>Product Density</th>
<th>Maximum Cavity Width</th>
<th>Maximum Panel Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Hour</td>
<td>1.35 pcf</td>
<td>4 inches</td>
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</tr>
<tr>
<td>3-Hour</td>
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</tr>
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</tr>
</tbody>
</table>

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

Assembly Details:

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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.
7.7 – QAI LISTING REPORT CONTINUED

|-----------|-----------------------------------------------------------------------|

<table>
<thead>
<tr>
<th>Component</th>
<th>Allowable cladding pressures (based on fastener withdrawal values)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM D1761</td>
<td>ICF System As per tables below</td>
</tr>
</tbody>
</table>

**ASTM D1761 Allowable fastener values (psf) per fastener spacings for LOGIX ICFs:**

<table>
<thead>
<tr>
<th>Fastener Type</th>
<th>Fastener Length</th>
<th>Withdrawal Resistance with Factor of Safety of 3.0</th>
<th>8” Hor. / 12” Vert.</th>
<th>8” Hor. / 16” Vert.</th>
<th>16” Hor. / 16” Vert.</th>
</tr>
</thead>
<tbody>
<tr>
<td>#6 Coarse Drywall Screw</td>
<td>1 5/8 in.</td>
<td>59 lbs</td>
<td>88.5</td>
<td>66.4</td>
<td>33.2</td>
</tr>
<tr>
<td>#6 Fine Drywall Screw</td>
<td>1 5/8 in.</td>
<td>57 lbs</td>
<td>86.0</td>
<td>64.5</td>
<td>32.3</td>
</tr>
<tr>
<td>16 gauge staple</td>
<td>1 1/2 in.</td>
<td>9 lbs</td>
<td>14.0</td>
<td>10.5</td>
<td>5.3</td>
</tr>
<tr>
<td>#8 Wood Screw</td>
<td>2 in.</td>
<td>69 lbs</td>
<td>103.5</td>
<td>77.6</td>
<td>38.8</td>
</tr>
<tr>
<td>#8 Exterior Deck Screw</td>
<td>2 in.</td>
<td>70 lbs</td>
<td>105.0</td>
<td>78.8</td>
<td>39.4</td>
</tr>
<tr>
<td>#10 Wood Screw</td>
<td>2 in.</td>
<td>66 lbs</td>
<td>99.0</td>
<td>74.3</td>
<td>37.1</td>
</tr>
</tbody>
</table>

**ASTM D1761 Allowable fastener values (kPa) per fastener spacings for LOGIX ICFs:**

<table>
<thead>
<tr>
<th>Fastener Type</th>
<th>Fastener Length</th>
<th>Withdrawal Resistance with Factor of Safety of 3.0</th>
<th>200 mm Hor. / 305 mm Vert.</th>
<th>200 mm Hor. / 400 mm Vert.</th>
<th>400 mm Hor. / 400 mm Vert.</th>
</tr>
</thead>
<tbody>
<tr>
<td>#6 Coarse Drywall Screw</td>
<td>41.3 mm</td>
<td>26.8 kg</td>
<td>4.24</td>
<td>3.18</td>
<td>1.59</td>
</tr>
<tr>
<td>#6 Fine Drywall Screw</td>
<td>41.3 mm</td>
<td>26.0 kg</td>
<td>4.12</td>
<td>3.09</td>
<td>1.54</td>
</tr>
<tr>
<td>16 gauge staple</td>
<td>38.1 mm</td>
<td>4.2 kg</td>
<td>0.67</td>
<td>0.50</td>
<td>0.25</td>
</tr>
<tr>
<td>#8 Wood Screw</td>
<td>50.8 mm</td>
<td>31.3 kg</td>
<td>4.96</td>
<td>3.72</td>
<td>1.86</td>
</tr>
<tr>
<td>#8 Exterior Deck Screw</td>
<td>50.8 mm</td>
<td>31.8 kg</td>
<td>5.03</td>
<td>3.77</td>
<td>1.89</td>
</tr>
<tr>
<td>#10 Wood Screw</td>
<td>50.8 mm</td>
<td>29.9 kg</td>
<td>4.74</td>
<td>3.56</td>
<td>1.78</td>
</tr>
</tbody>
</table>

May 18th, 2011

Go to TABLE OF CONTENTS
Standards:  

<table>
<thead>
<tr>
<th>Component</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM D635 Polypropylene Web Ties</td>
<td>HB (Horizontal Burning)</td>
</tr>
<tr>
<td>ASTM D1929 Polypropylene Web Ties</td>
<td>Pass</td>
</tr>
</tbody>
</table>

Notes: Also meets Florida Building Code (FBC) High Velocity Hurricane Zone (HVHZ) requirements as per Chapter 26 of the FBC.

These products are subjected to limitations as specified above and must be installed in accordance with the manufacturers’ instructions. Authorities having jurisdiction should be consulted regarding allowable applications. See manufacturer’s listings for other standards listed under QAI certification programs.