ICC-ES Evaluation Report

ESR-1269

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DIVISION: 03 00 00—CONCRETE
Section: 03 11 19—Insulating Concrete Forming

REPORT HOLDER:

AMVIC INCORPORATED

EVALUATION SUBJECT:

AMVIC STANDARD AND AMVIC PLUS 3.30 EXPANDED POLYSTYRENE INSULATING CONCRETE FORMS (ICFs)

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2018, 2015, 2012 and 2009 *International Building Code®* (IBC)
- 2018, 2015, 2012 and 2009 *International Residential Code®* (IRC)
- 2006 *International Building Code®* (2006 IBC)*
- 2006 *International Residential Code®* (2006 IRC)*

*****Codes indicated with an asterisk are addressed in Section 8.0.

- 2013 *Abu Dhabi International Building Code* (ADIBC)†

†The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

Properties evaluated:

- Structural
- Surface-burning characteristics
- Attic and Crawl space fire evaluation
- Types I-IV (Noncombustible) construction (for Amvic Standard ICFs only)
- Fire-resistance-rated construction

1.2 Evaluation to the following green code:

2019 California Green Building Standards Code (CALGreen), Title 24, Part 11

Attributes verified:

See Section 3.1

2.0 USES

Amvic Standard and Plus 3.30 Insulating Concrete Forms (ICFs) are used as stay-in-place forms for structural concrete, load-bearing and nonload-bearing, below-grade and above-grade walls. The forms are used in construction of plain and reinforced concrete beams, lintels, exterior and interior walls, and foundation and retaining walls. The forms remain in place after placement and curing of concrete and must be protected by approved interior and exterior finish materials as described in Sections 4.2.2 and 4.2.3, respectively. For use in fire-resistance-rated construction, installation must be in accordance with Section 4.3. For use in buildings of Types I, II, III and IV (noncombustible) construction, installation of the Amvic Standard ICFs must be in accordance with Section 4.4.

3.0 DESCRIPTION

3.1 General:

Amvic Standard and Plus 3.30 ICFs consist of two expanded polystyrene (EPS) foam plastic panels separated by injection-molded polypropylene cross-ties, which are pre-inserted in the EPS mold before molding so they are partially embedded into the EPS panels. The cross-ties of the Amvic Standard ICFs are spaced 6 inches (152 mm) on center horizontally, and maintain the EPS panels at a fixed clear distance of 4 inches (102 mm), 6 inches (152 mm), 8 inches (203 mm), 10 inches (254 mm) or 12 inches (305 mm). EPS panels for the Amvic Standard ICFs are 16 inches (406 mm) or 24 inches (610 mm) (for the 10 and 12 inch ICFs) high by 48 inches (1220 mm) long by 2.5 inches (64 mm) thick, measured at the center of the panel. The cross-ties of the Amvic Plus 3.30 ICFs are spaced 8 inches (203 mm) on center horizontally, and maintain the EPS panels at a fixed clear distance of 6 or 8 inches (152 or 203 mm). EPS panels for the Amvic Plus 3.30 ICFs are 16 inches (406 mm) high by 48 inches (1220 mm) long by 3.25 inches (83 mm) thick, measure at the center of the panel. When stacked in a running bond pattern, the Amvic Standard and Plus 3.30 ICFs create a cavity where steel reinforcement bars and concrete are placed to provide a solid monolithic concrete wall, which complies with the flat ICF wall system requirements in accordance with ASTM E2634 as specified in 2018 and 2015 IBC Section 1903.4, 2012 IBC Section 1903.3, 2018 and 2018 and 2015 IRC Sections R404.1.3.3.6.1 and R608.4.4, 2012 IRC Sections R404.1.2.3.6.1 and R611.4.4, and 2009 IRC Section R611.3.1. See Figures 1A and 1B of this report for typical dimensions.

The attribute of the Amvic ICF System has been verified as conforming to the provision of (i) CALGreen Sections A4.404.3.3 for premanufactured building systems. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes often provide supplemental information as guidance.

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3.2 Materials:

3.2.1 Foam Plastic: The EPS foam plastic panels have a flame-spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84. The foam plastic has a nominal density of 1.5 pcf (24 kg/m^3) and complies with ASTM C578, Type II.

3.2.2 Polypropylene Cross-ties: The polypropylene cross-ties are used to connect the EPS panels and for attaching interior and exterior finishes. The cross-ties have openings to permit concrete to pass through. The cross-ties vary in length and have $1^1/_2$-inch-wide-by-15-inch-high-by-0.118-inch-thick (38 mm by 292 381 mm by 3.0 mm) flanges for the 4-, 6- and 8-inch (102, 152, 203 mm) Amvic Standard and Plus 3.30 ICFs. The cross-ties are 22 inches (559 mm) high for the 10- and 12-inch (254 and 305 mm) Amvic Standard ICFs. The flange is embedded $^1/_2$ inch (12.7 mm) below the outside surface of the EPS panel.

3.2.3 Concrete: Concrete must be normal-weight concrete complying with the IBC, having a maximum $^3/_4$-inch (19.1 mm) aggregate and a minimum compressive strength of 2,500 psi (17 250 kPa) at 28 days except as indicated in note 1 of Table 2 when used for fire-resistance-rated construction. If construction of the ICF wall system is based on the IRC, the concrete must comply with 2018 and 2018 and 2015 IRC Sections R404.1 and R608.5.1, 2012 and 2009 IRC Sections R404.1 and R611.5.1.

3.2.4 Reinforcement: The deformed steel reinforcement bars must have a minimum yield stress of either 40 ksi (275 MPa) or 60 ksi (413 MPa), depending on the structural design, and must comply with Section 20.2.1.3 of ACI 318-14 under the 2018 and 2015 IBC (and Section 3.5.3.1 of ACI 318-11 under the 2012 IBC, as applicable), and IBC Section 1903. If construction of the ICF wall system is based on the IRC, reinforcement must comply with 2018 and 2015 IRC Sections R404.1.3.3.7 and R608.5.2, 2012 and 2009 IRC Sections R404.1.2.3.7 and R611.5.2, as applicable.

3.2.5 Other Components: Wood members in contact with concrete for plates or window and door framing must be preservative-treated in accordance with the applicable code, or be of a natural durable species, and must be attached with hot-dipped galvanized steel fasteners in accordance with 2018 and 2015 IBC Section 2304.10.5, 2012 and 2009 IBC Section 2304.9.5 or IRC Section R317.3, as applicable. Materials other than wood, such as vinyl, are permitted for window and door framing if approved by the code official.

3.2.6 Standard, Plus 3.30 and Accessory Forms:

- 4-inch (102mm) Standard Straight Forms
- 4-inch (102mm) 90-Degree Corner Forms
- 4-inch (102mm) 45-Degree Corner Forms
- 6-inch (152mm) Standard Straight Forms
- 6-inch (152mm) 90-Degree Corner Forms
- 6-inch (152mm) 45-Degree Corner Forms
- 6-inch (152 mm) Tapered Top Forms
- 6-inch (152 mm) to 6-inch Brick Ledge Forms
- 6-inch (152 mm) T-Block (short and long leg)
- 6-inch (152mm) Plus 3.30 Straight Forms
- 6-inch (152mm) Plus 3.30 90-Degree Corner Forms
- 6-inch (152mm) Plus 3.30 45-Degree Corner Forms
- 6-inch (152 mm) Plus 3.30 Tapered Top Forms
- 6-inch (152 mm) to 6-inch Brick Ledge Forms
- 8-inch (203mm) Standard Straight Forms
- 8-inch (203mm) 90-Degree Corner Forms
- 8-inch (203mm) 45-Degree Corner Forms
- 8-inch (203 mm) T-Block (short and long leg)
- 8-inch (203 mm) Tapered Top Forms
- 8-inch (203 mm) to 6-inch Brick Ledge Forms
- 8-inch (203 mm) to 8-inch Brick Ledge Forms
- 8-inch (203mm) Plus 3.30 Straight Forms
- 8-inch (203mm) Plus 3.30 90-Degree Corner Forms
- 8-inch (203mm) Plus 3.30 45-Degree Corner Forms
- 8-inch (203 mm) Plus 3.30 Tapered Top Forms
- 10-inch (254 mm) Standard Straight Forms
- 10-inch (254 mm) 90-Degree Corner Forms
- 12-inch (305 mm) Standard Straight Forms
- 12-inch (305 mm) 90-Degree Corner Forms

4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 IBC Design, Including Alternative IBC Wind Design in Accordance with ICC 600: For buildings constructed under the provisions of the IBC, concrete walls formed by Amvic ICFs must be designed and constructed in accordance with IBC Chapters 16 and 19, as applicable. Footings and foundations must be designed and constructed in accordance with IBC Chapter 18.

Solid concrete walls formed by flat ICFs may be designed and constructed in accordance with the prescriptive provisions of Section 409 of the ICC Standard for Residential Construction in High Wind Regions (ICC 600-14) under the 2018 and 2015 IBC, or Section 209 of the ICC Standard for Residential Construction in High Wind Regions (ICC 600-2008) under the 2012 and 2009 IBC, as applicable, subject to the limitations found in IBC Section 1609.1.1 Exception 1 and Section 1609.1.1.1. Design and construction under the provisions of ICC 600-14 or 600-2008 are limited to the resistance of wind forces.

4.1.2 IRC Design Method: For buildings constructed under the provisions of the IRC, concrete walls formed by Amvic ICFs, which comply with the dimensional requirements found in 2018 and 2015 IRC Table R608.3 and Figure R608.3(1) or 2012 and 2009 IRC Table R611.3 and Figure R611.3(1), as applicable, must be designed and constructed in accordance with 2018 and 2015 IRC Sections R404.1.3 and R608, or 2012 and 2009 IRC Sections R404.1.2 and R611, as applicable, for flat wall systems. ICFs not complying with the dimensional requirements found in 2018 and 2015 IRC Table R608.3 or 2012 and 2009 IRC Table R611.3, as applicable, (i.e., solid concrete wall thicker than 10 inches) must be designed and constructed in accordance with the provisions in Section 4.1.1.

The 4-inch-thick (102 mm) concrete walls are limited to above-grade construction in accordance with 2018 and 2015 IRC Section R608 or 2012 and 2009 IRC Section R611, as applicable.

Footings and foundations must be designed and constructed in accordance with IRC Chapter 4.

4.1.3 Alternate IRC Design Method: When the Amvic ICFs are used to construct buildings under the IRC provisions that do not conform to the applicability limits of 2018 and 2015 IRC Sections R404.1.3 and R608.2 or 2012

and 2009 IRC Sections R404.1.2 and R611.2, as applicable, construction must be in accordance with the prescriptive provisions of the 2012 Prescriptive Design of Exterior Concrete Walls for One- and Two-family Dwellings (PCA 100-12) under the 2015 IBC (PCA 100-10 for the 2012 IBC, or PCA 100-07 for the 2009 IBC, as applicable), or the structural analysis and design of the concrete must be in accordance with ACI 318 and Chapters 16, 18 and 19 of the IBC.

4.2 Installation:

4.2.1 General: Amvic ICFs must be installed in accordance with the manufacturer's published installation instructions and this report. The manufacturer's published installation instructions and this report must be strictly adhered to, and a copy of the instructions must be available at the jobsite at all times during installation.

The ICFs and resulting concrete walls must be supported on concrete footings complying with IBC Chapters 18 and 19 and IRC Chapter 4, as applicable. Placement of the forms must begin at a corner and proceed around the building perimeter. The amount, placement and spacing of reinforcing required must be determined for each project, based on the approved plans and the applicable code. Vertical dowel bars embedded in the footing must extend into the footing and concrete walls with a minimum embedment length, and into concrete walls with a minimum lap splice length, conforming to Chapter 25 of ACI 318-14 under the 2018 and 2015 IBC or Chapter 12 of ACI 318-11 under the 2012 IBC, or Chapter 12 of ACI 318-08 under the 2009 IBC, or 2018 and 2015 IRC Section R608.5.4 or 2012 and 2009 IRC Section R611.5.4, as applicable. Additional reinforcement around doors and windows must be described in the approved plans. Concrete quality, mixing and placement must comply with IBC Chapter 19 or 2018 and 2015 IRC Sections R404.1.3.3 and R608.5.1 or 2012 and 2009 IRC Sections R404.1.2.3 and R611.5.1 as applicable. Window and door openings must be built into the forms, with wood or polyvinyl chloride plastic frames of the same dimensions as the "rough stud opening" specified by the window or door manufacturer, prior to the placement of the concrete. Connections of concrete walls to footings, floors, ceilings and roofs must be in accordance with 2018 and 2015 IRC Section R608.9 or 2012 and 2009 IRC Section R611.9, as applicable, or be engineered in accordance with the IBC. Anchor bolts used to connect wood ledgers or plates to the concrete must be cast in place, with the bolts sized and spaced as required by design and the applicable code. Details must be prepared to accommodate the specific job situation, in accordance with the applicable code and the requirements, subject to the approval of the code official.

The minimum ambient temperature during placement must be in accordance with ACI 306.

4.2.2 Interior Finish:

4.2.1.1 General: The installation details in this Section address compliance with The Amvic ICF exposed to the interior of the building must be finished on the interior of the building with an approved 15-minute thermal barrier, such as minimum $^1/_2$-inch-thick (12.7 mm) regular gypsum wall board complying with ASTM C36 or ASTM C1396, as required by IBC Section 2603.4 and IRC Section R316.4, as applicable. The gypsum wall board must be installed vertically or horizontally and attached to the flanges of the plastic webs with No. 6, $1^5/_8$-inch-long (41 mm), Type W, coarse-thread, or Type S, fine-thread gypsum wallboard screws spaced 12 inches (305 mm) on center in the field of the board, 8 inches (203 mm) on center on the side edges and 6 inches (152 mm) on center on the top and bottom edges. When used in fire-resistance-rated construction, the gypsum wallboard interior finish must be installed per Table 2. Gypsum wallboard joints must be taped and filled with joint compound in accordance with ASTM C840 or GA 216.

4.2.1.2 Attic and Crawl Space Installation: When the Amvic ICFs are used as walls of attics and crawl spaces and no ignition barrier is applied to the attic side or crawl space side of the foam plastic, all of the following conditions must be met:

1. Entry to the attic or crawl space is only to service utilities, and no storage is permitted.
2. There are no interconnected basement areas.
3. Air in the attic or crawl space is not circulated to other parts of the building.
4. Attic ventilation is provided when required by 2018 IBC Section 1202.2 [2015, 2012 and 2009 IBC Section 1203.2] or IRC Section R806, as applicable.
5. Under-floor (crawl space) ventilation is provided when required by 2018 IBC Section 1202.4 [2015 IBC Section 1203.4 (2012 and 2009 IBC Section 1203.3)] or IRC Section R408.1, as applicable.
6. Combustion air is provided in accordance with IMC (*International Mechanical Code*®) Section 701.

4.2.3 Exterior Finish:

4.2.1.3 Above Grade: The Amvic ICF wall system must be covered on the exterior with an approved wall covering in accordance with the applicable code or a current ICC-ES evaluation report. Under the IRC, the walls must be flashed in accordance with 2018 and 2015 IRC Section 703.4 and 2012 and 2009 IRC Section R703.8. The approved exterior wall covering must be attached to the cross-ties using either minimum No. 6, Type S, fine-threaded drywall screws, minimum No. 6, Type W, coarse-thread drywall screws, or minimum No. 8 wood screws. The allowable capacity of the screws are indicated in Tables 1A and 1B of this report. The fasteners must be corrosion-resistant and have a sufficient length to penetrate the flanges of the webs and the wall of the corner rods by a minimum of $^1/_4$ inch (6.4 mm). A continuous length of the Amvic corner rods must be field-installed in walls with a maximum total height of 25 feet (7620 mm) in the preformed slot of the 90-degree corner units.

The spacing of the screws must be designed to resist the gravity loads of the wall covering and to resist the negative wind pressures. Negative wind pressure capacity of the exterior wall covering must be the same as that recognized in the applicable code for the generic wall covering or as listed in the current ICC-ES evaluation report for proprietary materials.

4.2.1.4 Below Grade: For basement wall installations, Amvic form surfaces must be dampproofed or waterproofed in accordance with IBC Section 1805 or IRC Section R406, as applicable. The dampproofing and waterproofing materials must be approved by Amvic Incorporated and the code official, and must be free of solvents, hydrocarbons, ketones or esters that will adversely affect the EPS panels. Adherence is required to the foundation drainage requirements in IBC Section 1805.4 or IRC Section R405.1, as applicable. No backfill is permitted to be applied against the wall until the complete flooring system is in place, unless the wall is designed as a freestanding wall that does not rely on the flooring system for structural support.

4.2.4 Foundation Walls: The ICF wall system is permitted to be used as a foundation stem wall when supporting wood-framed construction provided the forms are supported by

approved concrete footings complying with the applicable code. Design and installation of the Amvic ICF system as foundation stem walls must comply with IBC Section 1807.1.5, or IRC Sections R404 and 2018 and 2015 IRC Section R404.1.3, 2012 or 2009 R404.1.2, as applicable. For concrete foundation walls under the IRC, vertical reinforcement size and spacing must be in accordance with IRC Tables R404.1.2(2), R404.1.2(3), R404.1.2(4) and R404.1.2(8). For concrete foundation walls in accordance with the IBC, vertical reinforcement size and spacing must be in accordance with IBC Table 1807.1.6.2. Alternative design and construction may be in accordance with ACI 318, ACI 332 or PCA 100 (see 2015 IRC Section R404.1.3 or 2012 and 2009 IRC Section R404.1.2, as applicable) for buildings under the IRC.

4.2.5 Retaining walls: The ICF systems, with reinforcement designed in accordance with accepted engineering principles, Section 4.1 and the applicable code, may be used as a retaining wall.

4.2.6 Protection Against Termites: Where the probability of termite infestation is defined as "very heavy" by the code official, the foam plastic must be installed in accordance with 2018, 2015 and 2009 IBC Section 2603.8 or 2012 IBC Section 2603.9, or IRC Section R318.4, as applicable. Areas of very heavy termite infestation must be determined in accordance with 2018, 2015 and 2009 IBC Figure 2603.8, 2012 IBC Figure 2603.9, or IRC Figure R301.2 (6), as applicable.

4.3 Fire-resistance-rated construction:

Amvic ICFs may be used to construct fire-resistance-rated wall assemblies as shown in Table 2. The normal-weight concrete must have a minimum 28-day compressive strength of 4000 psi (27.6 MPa). The minimum size reinforcement bars and spacing must be designed and placed in accordance with ACI 318. For the 6-inch (152.4 mm) ICFs, the maximum axial compressive load must be 10,000 pounds per lineal foot (146 kN/m). Loads are based on a 10-foot (3.05 m) wall height.

4.4 Installation in Buildings of Types I, II, III and IV Construction (IBC):

4.4.1 General: Exterior walls constructed with Amvic Standard ICFs for use in buildings of any height required to be Types I, II, III and IV construction (IBC), must comply with the applicable conditions cited below:

4.4.1.1 Interior Finish: The EPS foam plastic insulation must be separated from the building interior with an approved 15-minute thermal barrier, such as minimum $^1/_2$-inch-thick (12.7 mm) regular gypsum wallboard installed as specified in Section 4.2.2.1.

4.4.1.2 Exterior Finish – EIFS: Dryvit Systems, Inc., Outsulation EIFS (ESR-1232), may be installed over the exterior of the forms when applied using the reinforcing fabric or lath, base coat and finish coat materials described in ESR-1232.

4.4.1.3 Exterior Finish - Exterior Plaster: Metal lath and exterior cement plaster must comply with the applicable code, and the exterior plaster must be a minimum of $^7/_8$ inch (22.2 mm) thick. The lath must be attached to the flanges of the cross-ties with fasteners as described in Section 4.2.3.1.

4.4.1.4 Exterior Finish – Brick Veneer: Anchored brick veneer must be attached to the flanges of the cross-ties with fasteners as described in Section 4.2.3.1. Installation of the 4-inch-thick (102 mm) brick veneer must comply with the applicable code and must be installed with a minimum 1-inch (25.4 mm) air gap between the face of the exterior EPS formwork and the brick. The brick must be installed with a steel shelf angle attached to the concrete and installed at each floor line and at the top of each window and door opening.

4.4.1.5 Fireblocking: For applications on buildings of any height, foam plastic on the interior must be discontinuous at floor lines, on the interior side of exterior walls and both side of interior walls. Floor-to-wall intersections must be fireblocked in accordance with the IBC to prevent the passage of flame, smoke and hot gasses from one floor to another. See Figure 2 for typical details.

4.4.2 One-story Buildings: As an alternate to the installation requirements in Section 4.4.1, one-story buildings may be installed with the following conditions:

4.4.2.1 Fire Sprinklers: The building must be equipped throughout with an automatic sprinkler system in accordance with IBC Section 903.3.1.1.

4.4.2.2 Exterior Finish: The exterior of the ICF wall must be covered with metal of a thickness of not less than 0.032 inch (0.81 mm), or aluminum or corrosion-resistant steel having a base-metal thickness of 0.016 inch (0.41 mm)

4.4.2.3 Interior Finish: The forms must be finished on the interior with an approved 15-minute thermal barrier such as $^1/_2$-inch-thick (12.7 mm) gypsum board. The gypsum board must be installed as described in Section 4.2.2.1.

4.5 Special Inspection:

4.5.1 IBC: Special inspection is required as noted in 2018, 2015 and 2012 IBC Section 1705 (or 2009 IBC Section 1704) for placement of reinforcing steel and concrete, and for concrete cylinder testing. When an EIFS wall covering is applied, special inspection in accordance with 2018, 2015 IBC Sections 1704.2 and 1705.16, 2012 IBC Sections 1704.2 and 1705.15 or 2009 IBC Sections 1704.1 and 1704.14, as applicable, is required, and the duties of the special inspector include verifying field preparation of materials, expiration dates, installation of components, curing of components, treatment of joints and application of sealants.

4.5.2 IRC: For walls constructed in accordance with Section 4.1.2 or PCA 100 as described in Section 4.1.3, special inspection is not required. For walls designed for use under the IRC, in accordance with the IBC, as described in Sections 4.1.1 and 4.1.3, special inspection in accordance with Section 4.5.1 of this report is required.

5.0 CONDITIONS OF USE

The Amvic Insulating Concrete Forms described in this report comply with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 subject to the following conditions:

5.1 The ICF units are manufactured, identified and installed in accordance with this report and the manufacturer's published installation instructions. If there is a conflict between the Amvic's published installation instructions and this report, this report governs. The forms must be separated from the building interior, as described in Section 4.2.2, with an approved 15-minute thermal barrier, except for attic and crawl space construction as described in Section 4.2.2.2 of this report.

5.2 The Amvic ICF system is limited to buildings of combustible Type V (IBC), construction as defined in IBC Chapter 6, and to construction in accordance with the IRC, as applicable, except as described in Section 4.4 of this report.

5.3 For fire-resistance-rated construction, the conditions in Section 4.3 apply.

5.4 Special inspection must be provided as described in Section 4.5 of this report.

5.5 When use is in buildings required to be of noncombustible construction, as described in Section 4.4, the forms must have at least one label as described in Section 7.0 visible in every 160 square feet (15 m^2) of wall area, prior to the application of the wall covering.

5.6 When required by the code official, calculations showing compliance with the design requirements of Section 4.1.1 of this report must be submitted to the code official for approval, except that calculations are not required when the building design is based on the prescriptive provisions in Section 4.1.2 and 4.1.3, or when foundation design is based on the prescriptive provisions in Section 4.2.4. The calculations and details must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.7 Concrete quality, mixture design and placement must comply with Section 4.2.1 of this report.

5.8 In areas where the probability of termite infestation is defined as "very heavy" and when insulation boards are used with wood construction, the foam plastic must be installed in accordance with Section 4.2.6.

5.9 When required by the code official, calculations showing compliance with 2015 IRC Sections R404.1.3.3.6 and R608.5.3, or 2012 and 2009 IRC Sections R611.5.3 and R404.1.2.3.6, as applicable, must be submitted to the code official for approval. The calculations and details, establishing that the ICFs provide sufficient strength to contain concrete during placement and that the cross-ties are capable of resisting the forces created by fluid pressure of fresh concrete, must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.10 Plastic cross-ties must be stored indoors away from direct sunlight.

5.11 The forms are manufactured by Amvic Incorporated in Toronto, Ontario, Canada; Calgary, Alberta, Canada; Nixa Missouri, and Salt Lake City, Utah, under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

6.1 For recognition under the 2018, 2015 and 2012 IBC and IRC: Data in accordance with the ICC-ES Acceptance Criteria for Stay-in-place, Foam Plastic Insulating Concrete Form (ICF) Systems for Solid Concrete Walls (AC353), dated October 2012 (editorially revised December 2018).

6.2 For recognition under the 2009 IBC and IRC: Data in accordance with AC353 dated October 2010.

7.0 IDENTIFICATION

7.1 Each pallet of Amvic ICFs are labeled with the Amvic name, the product name, the manufacturing date, the lot number, the manufacturing location (Toronto, Ontario; Calgary, Alberta; Nixa, Missouri; Salt Lake City, Utah), the evaluation report number (ESR-1269), and the phrase, "Acceptable for use in attic and crawl spaces". Additionally, one ICF on each pallet must be labeled on both sides of the form with the same information.

One label as described above must be visible in every 160 square feet (14.9 m^2) of wall area.

7.2 The report holder's contact information is the following:

AMVIC INCORPORATED

501 McNICOLL AVENUE

TORONTO, ONTARIO M2H 2E2

CANADA

(877) 470-9991

www.amvicsystem.com

8.0 OTHER CODES

8.1 Scope:

In addition to the codes referenced in Section 1.0 of this report, the products described in this report were evaluated for compliance with the 2006 *International Building Code*® (2006 IBC) and the 2006 *International Residential Code*® (2006 IRC).

8.1 USES:

See Section 2.0

8.2 DESCRIPTION:

Same as Section 3.0 except:

- Section 3.1 is revised to say that Amvic ICFs are flat ICF wall systems in accordance with Section R611.3 of the 2006 IRC.
- Section 3.2.3 is revised to say that if construction of the ICF wall system is based on the 2006 IRC, the concrete must comply with Sections R404.4 and R611.6.1.
- Section 3.2.4 is revised to say that if construction of the ICF wall is based on the 2006 IRC, reinforcement must comply with Sections R404.4.6 and R611.6.2.
- Section 3.2.5 is revised to say that wood members in contact with concrete must comply with Section R319.3 of the 2006 IRC.

8.3 DESIGN AND INSTALLATION:

8.3.1 Design:

8.3.1.1 2006 IBC Design: See Section 4.1.1 except that concrete walls formed by the Amvic ICFs must be designed and constructed in accordance with 2006 IBC Chapters 16 and 19, as applicable. Footings and foundations must be designed and constructed in accordance with 2006 IBC Chapter 18.

8.3.1.2 IRC Design: See Section 4.1.2 except that concrete wall design and construction is in accordance with 2006 IRC Sections R404.4 and R611 for flat ICF wall systems. Footings and foundations must be designed and constructed in accordance with 2006 IRC Chapter 4.

8.3.1.3 Alternate IRC Design: When buildings constructed under the 2006 IRC provisions do not conform to the applicability limits of 2006 IRC Sections R404.4.1 and R611.2, the structural analysis and design of the concrete must be in accordance with ACI 318 and Chapter 19 of the 2006 IBC. The empirical design approach specified in ACI 318 Section 14.5 is applicable to the design of concrete walls formed by the Amvic flat wall forms.

8.3.2 Installation: See Section 4.2 except:

- In Section 4.2.1, concrete quality, mixing and placement must comply with 2006 IBC Section 1905 or 2006 IRC Section R611.6.1. Anchorage of wood ledger boards supporting bearing ends of

joists or trusses to flat ICF walls must be in accordance with IRC Section R611.8.2, or be engineered in accordance with the IBC.

- In Section 4.2.2.2, combustion air is provided in accordance with 2006 IMC Sections 701 and 703.
- In Section 4.2.3.2, compliance is required with the drainage requirements in 2006 IBC Section 1807.4 or 2006 IRC Section R405.1, as applicable
- In Section 4.2.4, design and installation of Amvic ICFs as foundation stem walls must comply with Section 1805.5 of the 2006 IBC, or Sections R404 and R404.1.2 of the 2006 IRC, as applicable.
- In Section 4.2.6, where the probability of termite infestation is defined as "very heavy" by the code official, the foam plastic must be installed in accordance with 2006 IBC Section 2603.8 or 2006 IRC Section R320.5, as applicable.

8.3.3 Fire-resistance-rated Construction: See Section 4.3.

8.3.4 Types I-IV (Non-combustible) Construction: See Section 4.4.

8.3.5 Special Inspection:

8.3.5.1 IBC: Special inspection is required as noted in 2006 IBC Section 1704 for placement of reinforcing steel and concrete, and for concrete cylinder testing. Special inspection, in accordance with 2006 IBC Sections 1704.1 and 1704.12, is required when an EIFS wall covering is applied. Duties of the special inspector include verifying field preparation of materials, expiration treatment of joints and application of sealants.

8.3.5.2 IRC: For walls designed and constructed in accordance with Section 8.4.1.2, special inspection is not required. For walls designed for use under the 2006 IRC, in accordance with Section 8.4.1.3 of this report, special inspection in accordance with Section 8.4.5.1 is required.

8.4 Conditions of Use:

Same as Section 5.0 except:

- See Section 5.5 except that special inspection must be in accordance with Section 8.4.5.
- See Section 5.7 except that, when required by the code official, calculations showing compliance with the design requirements of Section 8.4.1.1 of this report must be submitted to the code official for approval, except calculations are not required when the building design is based on the prescriptive method noted in Section 8.4.1.2. The calculations and details must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- See Section 5.8 except that concrete quality, mixing and placement must comply with 2006 IBC Section 1905 or 2006 IRC Section R611.6.1, as applicable.
- See Section 5.9 except that in areas where the probability of termite infestation is defined as "very heavy" and when insulation boards are used with wood construction, the foam plastic must be installed in accordance with Section 8.4.2.
- Section 5.10 is not applicable

8.5 Evidence Submitted:

Data in accordance with the ICC-ES Acceptance Criteria for Stay-in-place, Foam Plastic Insulating Concrete Form (ICF) Systems for Solid Concrete Walls (AC353), dated October 2000 (editorially revised April 2008).

8.6 Identification:

See Section 7.0.

TABLE 1A—ALLOWABLE WITHDRAWAL AND LATERAL RESISTANCE LOAD CAPACITIES OF SCREWS FOR AMVIC STANDARD ICFS

SCREW TYPE	CAPACITY (lb)	
	Withdrawal	Lateral Resistance
No. 6, Type S, fine-thread, corrosion-resistant drywall screw	27	55
No 6, Type W, coarse-thread, corrosion-resistant drywall screw	29	73
No 8, Type W, coarse-thread, corrosion-resistant drywall screw	35	85

For **SI:** 1 lbf = 4.45 N.

TABLE 1B—ALLOWABLE WITHDRAWAL AND LATERAL RESISTANCE LOAD CAPACITIES OF SCREWS FOR AMVIC PLUS 3.30 ICFS

SCREW TYPE	CAPACITY (lb)	
	Withdrawal	Lateral Resistance
No. 6, Type S, fine-thread, corrosion-resistant drywall screw	22	40
No 6, Type W, coarse-thread, corrosion-resistant drywall screw	24	43
No 8, Type W, coarse-thread, corrosion-resistant drywall screw	23	63
No. 8 corrosion-resistant wood screws	26	52

For **SI:** 1 lbf = 4.45 N.

TABLE 2—FIRE-RESISTANCE-RATED WALL ASSEMBLIES[4]

FIRE-RESISTANCE RATING[3]	OVERALL ICF THICKNESS	NOMINAL CONCRETE CORE THICKNESS[1]	MAXIMUM AXIAL COMPRESSION LOAD BEARING CAPACITY[7]	INTERIOR WALL FINISH
2-Hour	9 inches	4 inches	N/A[5]	1-layer $^5/_8$ in. gypsum board - fasten 12 in. o.c.horizontally and 8 in o.c. vertically[6]
3-Hour	11 inches	6 inches	10,000 lbs/ft[8]	1-layer $^1/_2$ in. gypsum board - fasten 12 in. o.c.horizontally and 16 in o.c. vertically[2]

For **SI:** 1 inch = 25.4 mm, 1 lb/ft = 14.6 N/m.

[1]Concrete must be normal-weight concrete [150-155 lb/ft^3) (2403-2483 kg/m^3)] with a minimum 28-day compressive strength of 4000 psi (27,000 kPa).
[2]See Section 4.2.2.1 of this report for type of fastener.
[3]Exterior finishes are not required, in order to achieve assembly rating.
[4]The wall assembly may be used as either an interior or exterior wall. When used as an interior wall, both sides of the form must be protected with the interior wall finish as noted in the table. Concrete walls must be designed and installed in accordance with this report.
[5]Limited to nonload-bearing assemblies only.
[6]No 8 coarse-thread, $2^5/_8$-inch-long (66 mm) drywall screws required.
[7]Load is based on a 10-foot wall height.
[8] Steel reinforcing bars are not required to achieve assembly rating. Concrete must be reinforced per ACI 318, as required for the applied load. See Section 3.2.4.

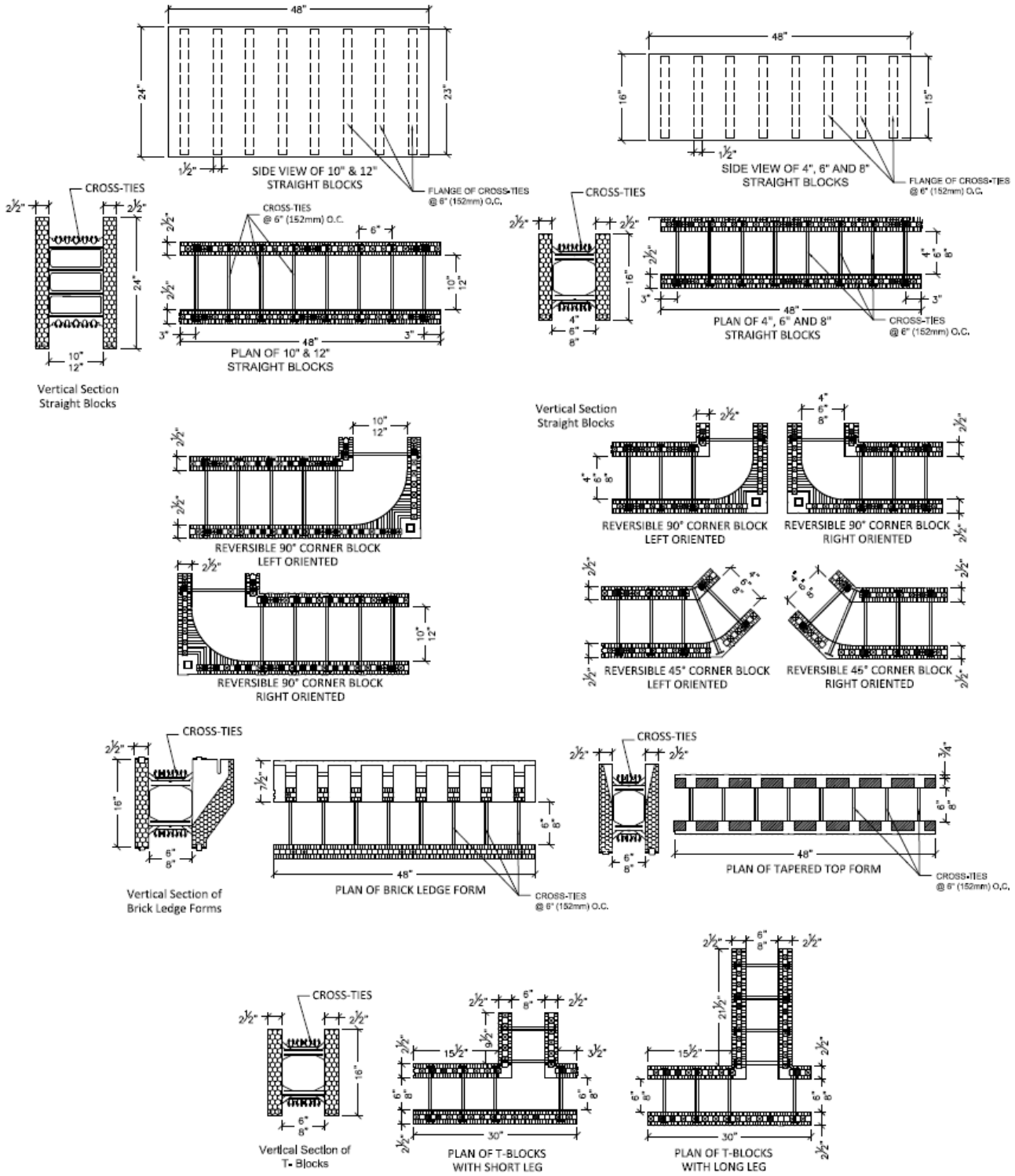

FIGURE 1A—AMVIC STANDARD FORM SHAPES

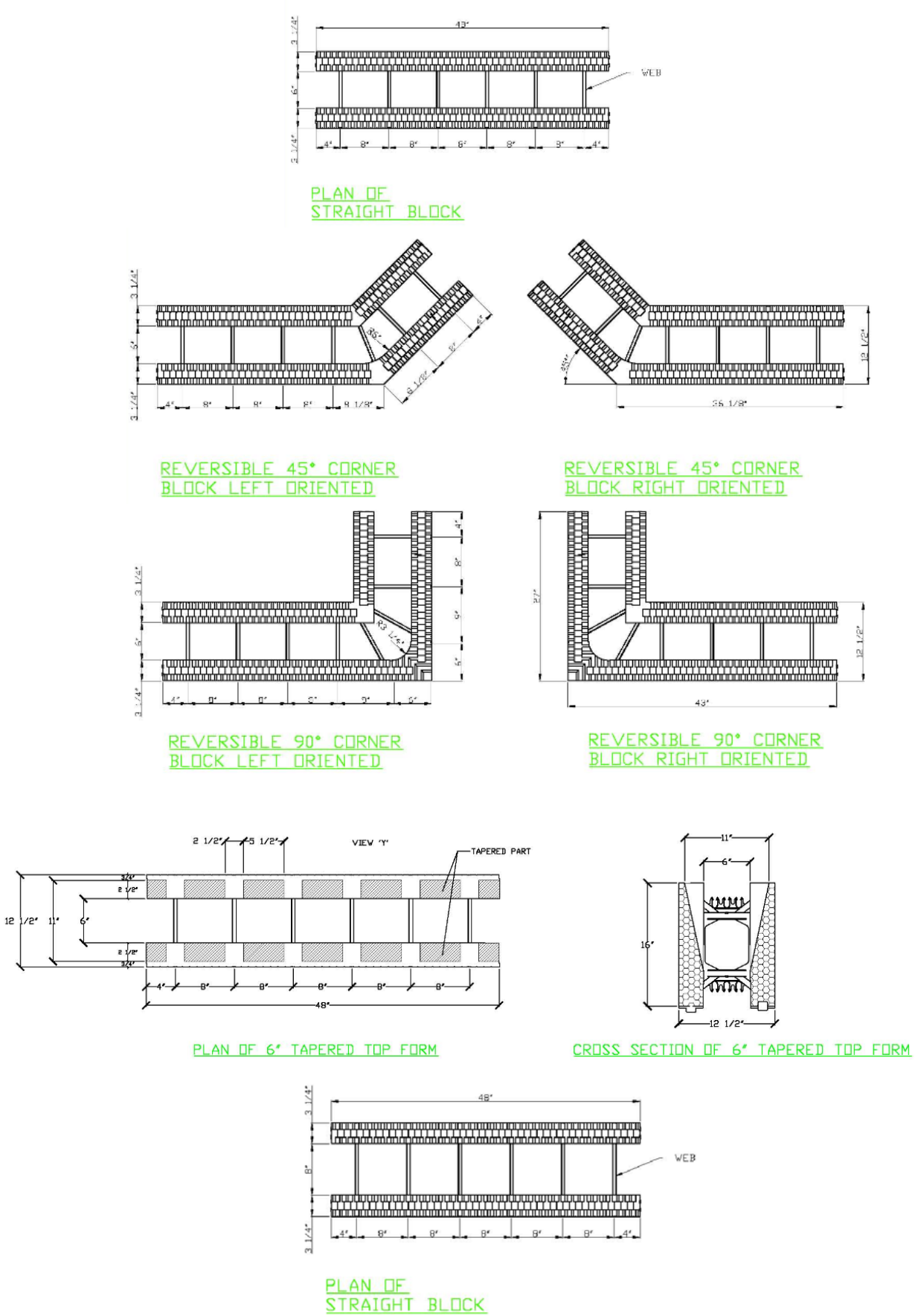

FIGURE 1B—AMVIC PLUS 3.30 FORM SHAPES

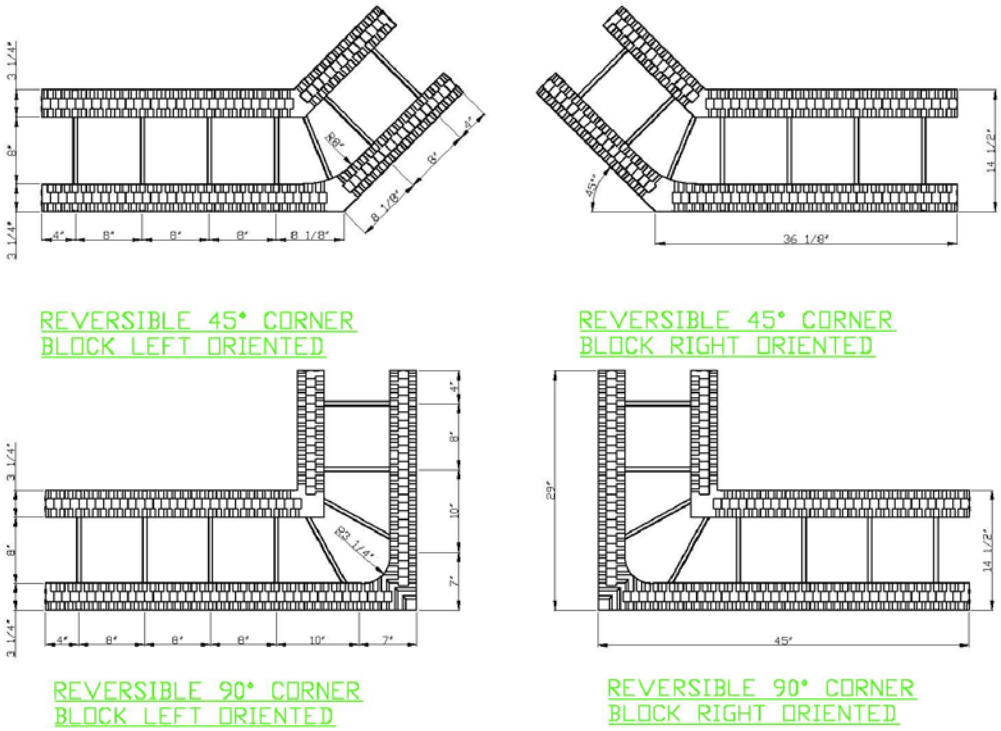

FIGURE 1B—AMVIC PLUS 3.30 FORM SHAPES (Continued)

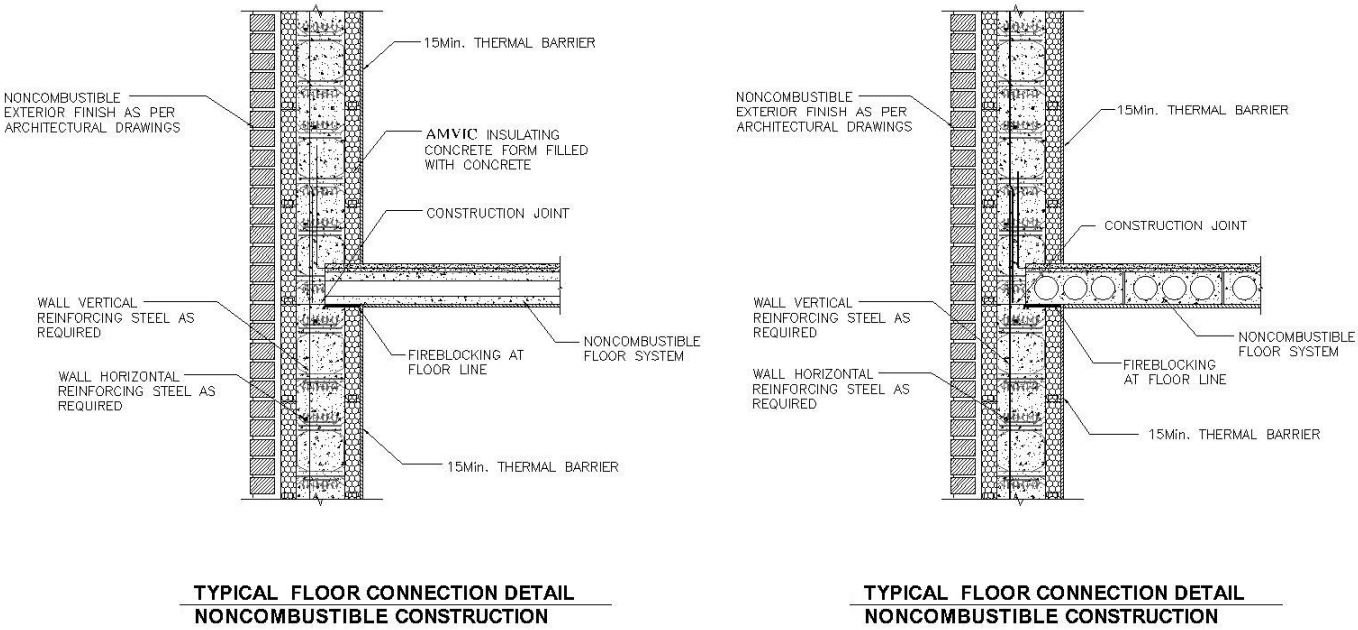

FIGURE 2—NONCOMBUSTIBLE CONSTRUCTION DETAILS

DIVISION: 03 00 00—CONCRETE
Section: 03 11 19—Insulating Concrete Forming

REPORT HOLDER:

AMVIC INCORPORATED

EVALUATION SUBJECT:

AMVIC STANDARD AND AMVIC PLUS 3.30 EXPANDED POLYSTERENE INSULATING CONCRETE FORMS (ICFs)

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Amvic Standard and Amvic Plus 3.30 ICFs, described in ICC-ES evaluation report ESR-1269, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2020 *Florida Building Code—Building*
- 2020 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The Amvic Standard and Amvic Plus 3.30 ICFs, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-1269, complies with the *Florida Building Code—Building* and *Florida Building Code—Residential,* provided the design requirements are determined in accordance with the *Florida Building Code-Building* or the *Florida Building Code-Residential,* as applicable. The installation requirements noted in ICC-ES evaluation report ESR-1269 for the 2018 *International Building Code*® meet the requirements of the *Florida Building Code-Building* or the *Florida Building Code-Residential,* as applicable, with the following conditions:

- In Section 4.1 of the evaluation report, for applications subject to the *Florida Building Code—Building,* Chapters 16, 18, and 19 of the *Florida Building Code—Building* are used in lieu of Chapters 16, 18, and 19 of the 2018 IBC, as applicable. For applications subject to the *Florida Building Code—Residential,* Section R608 of the *Florida Building Code—Residential* is used in lieu of Section R608 of the 2018 IRC, as applicable.
- In Section 4.2 of the evaluation report, for applications subject to Chapters 12, 18, Chapter 19, and Section 2603.8 of the *Florida Building Code—Building* are used in lieu of Chapters 12, 18 and 19, and Section 2603.8 of the 2018 IBC, as applicable. For applications subject to Section R318, Chapter 4, Section R608, R703.8, and R806 of the *Florida Building Code—Residential* are used in lieu of Chapter 4, Section R608, R703.4, and R806 of the 2018 IRC, as applicable.

Use of the Amvic Standard and Amvic Plus 3.30 ICFs has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code-Building* or the *Florida Building Code-Residential*, provided the Amvic Standard and Amvic Plus 3.30 ICFs are covered with an approved exterior veneer.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report reissued May 2020, revised March 2021.

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