



*Most Widely Accepted and Trusted*

# ICC-ES Evaluation Report

## ESR-3466

ICC-ES | (800) 423-6587 | (562) 699-0543 | [www.icc-es.org](http://www.icc-es.org)

Reissued 08/2018  
This report is subject to renewal 08/2019.

**DIVISION: 03 00 00—CONCRETE**

**SECTION: 03 11 19—INSULATING CONCRETE FORMING**

**REPORT HOLDER:**

**SUPERFORM PRODUCTS LTD.**

**EVALUATION SUBJECT:**

**SUPERFORM INSULATING CONCRETE FORMS (ICFs)**



*“2014 Recipient of Prestigious Western States Seismic Policy Council (WSSPC) Award in Excellence”*



*ICC-ES Evaluation Reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this report, or as to any product covered by the report.*



# ICC-ES Evaluation Report

**ESR-3466**

Reissued August 2018

This report is subject to renewal August 2019.

[www.icc-es.org](http://www.icc-es.org) | (800) 423-6587 | (562) 699-0543

A Subsidiary of the International Code Council®

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

**REPORT HOLDER:**

**SUPERFORM PRODUCTS, LTD.**

**EVALUATION SUBJECT:**

**SUPERFORM INSULATING CONCRETE FORMS (ICFs)**

**1.0 EVALUATION SCOPE**

**1.1 Compliance with the following codes:**

- 2015 *International Building Code*® (2015 IBC)
- 2015 *International Residential Code*® (2015 IRC)
- 2012 *International Building Code*® (2012 IBC)
- 2012 *International Residential Code*® (2012 IRC)
- 2009 *International Building Code*® (2009 IBC)
- 2009 *International Residential Code*® (2009 IRC)

**Properties evaluated:**

- Structural
- Surface-burning characteristics
- Attic and crawl-space installation
- Types I through IV (noncombustible) construction

**1.2 Evaluation to the following green code:**

- 2016 California Green Building Standards Code (CALGreen), Title 24, Part 11

**Attributes verified:**

- See Section 3.1

**2.0 USES**

Superform 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 covered with approved interior and exterior finish materials as described in Sections 4.2.2 and 4.2.3, respectively. The forms may be used in Type V construction. For use in buildings of Types I, II, III and IV (noncombustible) construction, installation must be in accordance with Section 4.3.

**3.0 DESCRIPTION**

**3.1 General:**

The Superform ICFs consist of two expanded polystyrene (EPS) foam plastic panels, connected by injection-molded, virgin polypropylene plastic cross-ties, spaced 6 inches (152 mm) on center in the horizontal direction and are partially embedded into the EPS panels. The EPS panels are 48 inches (1219 mm) long, and 12 inches (305 mm) high. The cross-ties maintain the EPS panel facings at a clear distance of 4 inches (102 mm), 6 inches (152 mm), 6½ inches (165 mm) or 8 inches (203 mm). The nominal thickness of EPS panels is 2<sup>9</sup>/<sub>16</sub> inches (65 mm) for the 4-inch form, 2<sup>17</sup>/<sub>32</sub> inches (64 mm) for 6 inch form, and 2<sup>3</sup>/<sub>4</sub> inches (70 mm) for the 6½ inch and 8 inch forms. The Superform ICFs are filled at the jobsite with concrete to provide a solid monolithic concrete wall that complies with the flat wall system requirements in accordance with ASTM E2634 as specified in 2015 IBC Section 1903.4, 2015 IRC Sections R505.1.3.3.6.1 and R608.4.4, 2012 IBC Section 1903.3, 2012 IRC Sections R404.1.3.3.6.1 and R611.4.4, and the 2009 IRC Section R611.3.1. The forms with a 4, 6 and 8-inch clearance between the EPS panels create concrete walls that comply with the flat ICF wall system requirements specified in IRC Section R611.3.1. In addition to straight forms, Superform ICF components are also provided for assembly of 45-degree corner, 90-degree corner, taper top and T-block forms.

The attribute of the Superform Insulating Concrete Forms (ICFs) has been verified as conforming to the provision of 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 or standards often provide supplemental information as guidance.

**3.2 Materials:**

**3.2.1 Foam Plastic:** The EPS foam plastic panels are manufactured by injecting and expanding polystyrene beads into molds, as described in the approved quality-control manual. The resulting EPS foam plastic complies with ASTM C578, Type II, with a nominal density of 1.5 pcf (24.03 kg/m<sup>3</sup>). The EPS foam plastic has a flame-spread index of 25 or less, a smoke-developed index of 450 or less when tested in accordance with ASTM E84.

**3.2.2 Polypropylene Plastic Cross-ties:** The polypropylene plastic cross-ties connect the EPS foam

plastic panels at a fixed clear distance. The cross-ties consist of a flange that is embedded in the foam plastic panel during the foam plastic molding process, and a web that connects the two flanges and, therefore, the two foam panels. The cross-ties have openings to permit concrete placement, and have slots to support horizontal steel reinforcing bars. The plastic flanges are recessed 0.340, 0.375, 0.299 and 0.385 inch (8.6, 9.5, 7.6 and 9.8 mm) for a 4-, 6-, 6<sup>1</sup>/<sub>2</sub>- and 8-inch straight form, respectively, below the outer EPS surface and is used for attachment of exterior and interior finish materials. The flanges of the cross-ties are 1.715 inches wide by 0.317 inch thick (43.6 by 8.1 mm) for a 4-inch straight form; 1.370 inches wide by 0.220 inch thick (34.8 by 5.6 mm) for a 6-inch straight form; 1.670 inches wide by 0.281 inch thick (42.4 by 7.1 mm) for a 6<sup>1</sup>/<sub>2</sub>-inch straight form; and 1.670 inches wide by 0.290 inch thick (42.4 by 7.4 mm) for a 8-inch straight form.

**3.2.3 Concrete:** Concrete must be normalweight concrete complying with IBC Chapter 19, having a maximum aggregate size of <sup>3</sup>/<sub>4</sub> inch (19 mm) and a minimum specified compressive strength of 2,500 psi (17.2 MPa) at 28 days. Under the IRC, the concrete must comply with 2015 IRC Sections R404.1 and R608.5.1 and 2012 and 2009 IRC Sections R404.1 and R611.5.1.

**3.2.4 Reinforcement:** Deformed steel reinforcement bars must have a minimum specified 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 2015 IBC (and Section 3.5.3.1 of ACI 318-11 and -08 under the 2012 and 2009 IBC) and IBC Section 1903. If construction of the ICF walls is based on the IRC, reinforcement must comply with 2015 IRC Sections R404.1.3.3.7 and R608.5.2, and 2012 and 2009 IRC Sections R404.1.2.3.7 and R611.5.2.

**3.2.5 Other Components:** Wood members in contact with concrete for plates of window and door framing must be treated with an approved wood preservative or be of a naturally-durable species, and must be attached with hot-dipped galvanized steel fasteners complying with 2015 IBC Section 2304.10.5, 2012 and 2009 IBC Section 2304.9.5 or IRC Section R317.3, as applicable.

## 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 the Superform 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 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, subject to the limitations found in Exception 1 of IBC Sections 1609.1.1 and 1609.1.1.1. Design and construction under the provisions of ICC 600-14 or ICC 600-2008 are limited to resistance to wind forces.

**4.1.2 IRC Method:** For buildings constructed under the provisions of the IRC, 4-, 6- and 8-inch-thick (102, 152 and 203 mm) concrete walls formed by the Superform ICFs, which comply with the 2015 IRC Table R608.3 and Figure R608.3(1), or 2012 and 2009 IRC Section R611.3.1 and Figure R611.3(1) as flat concrete walls, must be designed

and constructed in accordance with 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. Concrete walls constructed from ICFs that do not comply with the dimensional requirements found in 2015 IRC Table R608.3 or 2012 and 2009 IRC Table R611.3 (i.e., a 6.5-inch thick solid concrete wall) 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 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 ICFs are used to construct buildings that do not conform to the applicability limits of 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, or the 2010 Prescriptive Design of Exterior Concrete Walls for One- and Two-family Dwellings (PCA 100-10) under the 2012 IBC (PCA 100-07 under the 2009 IBC, as applicable), or the structural analysis and design of the concrete must be in accordance with ACI 318 and IBC Chapters 16, 18 and 19.

### 4.2 Installation:

**4.2.1 General:** Installation of ICFs must comply with this report, the Superform ICF published installation instructions and the applicable code. Superform Products, Ltd. published installation instructions and this report must be strictly adhered to, and a copy of the Superform ICF's published installation instructions must be available at the jobsite at all times during installation.

The Superform ICFs and resulting concrete walls must be supported on concrete footings complying with IBC Chapters 18 and 19 and IRC Chapter 4, as applicable. The amount, placement and spacing of reinforcing required must be determined for each project, based on the approved plans and the applicable code. Vertical reinforcement bars embedded in the footing must extend into the base of the wall system the minimum development length necessary for compliance with Chapter 25 of ACI 318-14 under the 2015 IBC or Chapter 12 of ACI 318-11 or -08 (2012 or 2009 IBC) or 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 ACI 318-14 as referenced in 2015 IBC Section 1901, ACI 318-11 as referenced in 2012 IBC Section 1901 (2009 IBC Section 1905) or 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 frames of the same dimensions as the "rough stud opening" specified by the window or door manufacturer, prior to the placement of concrete. Connections of concrete walls to footings, floors, ceilings and roofs must be in accordance with 2015 IRC Section R608.9, or 2012 and 2009 IRC Section R611.9, as applicable, or be engineered in accordance with the IBC, whichever code is applicable. Anchor bolts used to connect wood ledgers and 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 of this report, subject to the approval of the code official.

#### 4.2.2 Interior Finish:

**4.2.2.1 General:** The installation details in this section (Section 4.2.2) address compliance with the thermal barrier and interior finish requirements of the codes. Superform ICFs exposed to the interior of the building must be finished with an approved 15-minute thermal barrier, such as minimum 1/2-inch-thick (12.7 mm) gypsum board complying with ASTM C1396, as required by IBC Section 2603.4 and IRC Section R316.4, as applicable. The gypsum board must be installed vertically and attached to the cross-tie flanges with minimum No. 8, 1 1/4 inch-long (31.75 mm) drywall screws spaced 12 inches (305 mm) on center horizontally and vertically, except spaced 6 inches (152 mm) on center at top and bottom edges of gypsum boards. The screws must penetrate through the flange a minimum of 1/4 inch (6.4 mm). Gypsum wallboard joints and screw heads must be taped and finished with joint compound in accordance with ASTM C840 or GA 216. See Section 4.2.2.2 for installation details for attic and crawl space applications without an ignition barrier on the interior face.

**4.2.2.2 Attic and Crawlspace Installation:** When the Superform ICFs are used as walls of attics and crawlspace and the side of the foam plastic is installed without an ignition barrier, all of the following conditions must be met:

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

#### 4.2.3 Exterior Finish:

**4.2.3.1 Above Grade:** The exterior surface of the Superform ICFs must be covered with an approved exterior 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 2015 IRC Section R703.4 or 2012 and 2009 IRC Section R703.8, as applicable. Approved exterior wall coverings must be attached to the cross-tie flanges with the fasteners described in Table 1. The fasteners must be corrosion-resistant and have sufficient length to penetrate through the cross-tie flange as required in Table 1. The fasteners have allowable withdrawal and lateral capacities as shown in Table 1. The fastener spacing must be designed to support the gravity loads of the wall covering and resist the negative wind pressures. The negative wind pressure capacity of the exterior finish material must be the same as that recognized in the applicable code for generic materials, or that recognized in a current ICC-ES evaluation report for proprietary materials.

**4.2.3.2 Below Grade:** For basement wall installations, the ICF surfaces must be dampproofed and/or waterproofed in

accordance with IBC Section 1805 or IRC Section R406, as applicable. The Dampproofing and waterproofing materials must be specified by Superform Products, Ltd., and must comply with the applicable code or a current ICC-ES evaluation report, and must be compatible with ICF foam plastic forms. Foundation drainage must be provided in accordance with IBC Section 1805.4 or IRC Section R405.1, as applicable. No backfill may be applied against the wall until the complete floor system is in place, unless the wall is designed as a freestanding wall that does not rely on the floor system for structural support.

**4.2.4 Foundation Walls:** Concrete walls constructed from the ICFs are permitted to be used as a foundation stem wall when supporting wood-framed or concrete construction and when the structure is supported on concrete footings complying with the applicable code. Design and installation of Superform ICFs as foundation stem walls must comply with IBC Section 1807.1.5 or IRC Sections R404 and 2015 IRC Section R404.1.3, or 2012 and 2009 IRC Section 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) and R404.1.2(8). For concrete foundation walls under 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 ICFs may be used to construct a retaining wall, provided the wall is designed in accordance with accepted engineering principles, Section 4.1 and the applicable code.

**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 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 2015 and 2009 IBC Figure 2603.8 or 2012 IBC Figure 2603.9 or IRC Figure R301.2(6), as applicable.

#### 4.3 Installation in Buildings Required to Be of Types I, II, III or IV Construction (IBC):

**4.3.1 General:** Exterior walls constructed with Superform ICFs for use in buildings required to be Types I, II, III and IV construction (IBC), must comply with the applicable conditions cited below:

**4.3.2 Interior Finish:** The EPS foam plastic insulation must be separated from the building interior in accordance with Section 4.2.2.1.

**4.3.3 Exterior Finish—EIFS:** The following EIFS lamina 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 their respective evaluation reports:

- Sto Corp. StoTherm Essence as described in [ESR-1720](#).
- Sto Corp. StoTherm Classic NExT as described in [ESR-1748](#).
- Dryvit Systems, Inc. Dryvit Outsulation EIFS as described in [ESR-1232](#).

**4.3.4 Exterior Finish—Exterior Plaster:** Metal lath and exterior 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 plastic cross-ties with fasteners as described in Section 4.2.3.1.

**4.3.5 Exterior Finish—Brick Veneer:** Anchored brick veneer must be attached to the flanges of the plastic cross-ties with fasteners as described in Section 4.2.3.1. The brick veneer must comply with the IBC and must be installed with a minimum 1-inch (25.4 mm) air gap between the exterior face of the EPS and the brick. The brick must be supported on a steel shelf angle attached to the concrete at each floor line and at the top of each window and door opening, in accordance with the IBC.

**4.3.6 Fireblocking:** For applications on buildings of any height, foam plastic must be discontinuous at floor lines, on the interior side of the exterior walls and on both sides of interior walls. Floor-to-wall intersections must be fireblocked in accordance with the IBC to prevent the passage of flame, smoke and hot gases from one story to another. See Figure 1 for a typical illustrative detail.

#### 4.4 Special Inspections:

**4.4.1 IBC:** Special inspection is required in accordance with 2015 and 2012 IBC Section 1705 (2009 IBC Section 1704) for concrete construction, including placement of reinforcing steel and concrete, and for concrete cylinder testing. Special inspection in accordance with 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 when an EIFS wall covering is applied. Duties of the special inspector include verifying field preparation of materials, expiration dates, installation of components, curing of components, and installations of joints and sealants.

**4.4.2 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 in accordance with the IBC for use under the IRC, as described in Sections 4.1.2 and 4.1.3 of this report, special inspection in accordance with Section 4.4.1 is required.

#### 5.0 CONDITIONS OF USE

The Superform ICFs described in this report comply with, or are suitable alternatives 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 Superform Products, Ltd. published installation instructions. If there is a conflict between the Superform Products, Ltd., published installation instructions and this report, the most restrictive requirements govern.
- 5.2 ICF units must be separated from the building interior as described in Section 4.2.2.1 with an approved 15-minute thermal barrier, except for attic or crawl space construction as described in Section 4.2.2.2.
- 5.3 Except as described in Section 4.3, concrete walls formed by the forms are limited to buildings of combustible construction as defined in IBC Chapter 6, and to construction in accordance with the IRC.
- 5.4 When use is in buildings required to be of noncombustible construction, as described in Section 4.3, the forms must have at least one label as described in Section 7.0 visible in every 160 square feet (15m<sup>2</sup>) of wall area, prior to the application of the wall covering.
- 5.5 When required by the code official, calculations and details showing compliance with the requirements of IBC Chapters 16, 18 and 19, and 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 or 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.

- 5.6 Concrete quality, mixing and placement must comply with Section 4.2.1 of this report.
- 5.7 Special inspection must be provided as described in Section 4.4 of this report.
- 5.8 In areas where the probability of termite infestation is defined as "very heavy" and when ICFs 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 and details 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 ICFs are manufactured by Superform Products, Ltd. in Pincher Creek, Alberta Canada under a quality-control program with inspections conducted by ICC-ES.

#### 6.0 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 2012, editorially revised October 2015 for the 2015 and 2012 IBC/IRC (dated October 2010 for the 2009 IBC/IRC).

#### 7.0 IDENTIFICATION

- 7.1 Each pallet of Superform ICFs bears a label that includes the company name (Superform Products, Ltd), the product name, the manufacturing location (Pincher Creek, AB Canada) and the evaluation report number (ESR-3466); and the phrase "Acceptable for use in attic and crawl-spaces." Additionally, one ICF on each pallet is labeled on the outer sides of the ICF with the same information.

When use is in buildings required to be of Type I, II, III or IV construction, as described in Section 4.3, or when use is in an attic or crawl space without an ignition barrier, as described in Section 4.2.2.2, one label as described in this section must be visible in every 160 square feet (14.7 m<sup>2</sup>) of wall area.

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

**SUPERFORM PRODUCTS, LTD.  
1065 WILLOW STREET  
PINCHER CREEK, ALBERTA T0K 1W0  
CANADA  
(403) 627-3555**

TABLE 1—ALLOWABLE CAPACITIES OF FASTENERS IN CROSS-TIE FLANGES<sup>1</sup>

FASTENER	ALLOWABLE LOAD CAPACITY (lbf)	
	Lateral	Withdrawal
No. 6 coarse-thread drywall screw by minimum 1¼ inches	64	39
No. 10 wood screw by minimum 1¼ inches	66	44
No. 14 wood screw by minimum 1½ inches	63	58
16 gauge ½ inch crown staple by minimum 1½ inch	12	8

For SI: 1 lbf = 4.45 N; 1 inch = 25.4 mm.

<sup>1</sup>Fasteners must be corrosion-resistant and have sufficient length to penetrate the flanges of cross-ties.

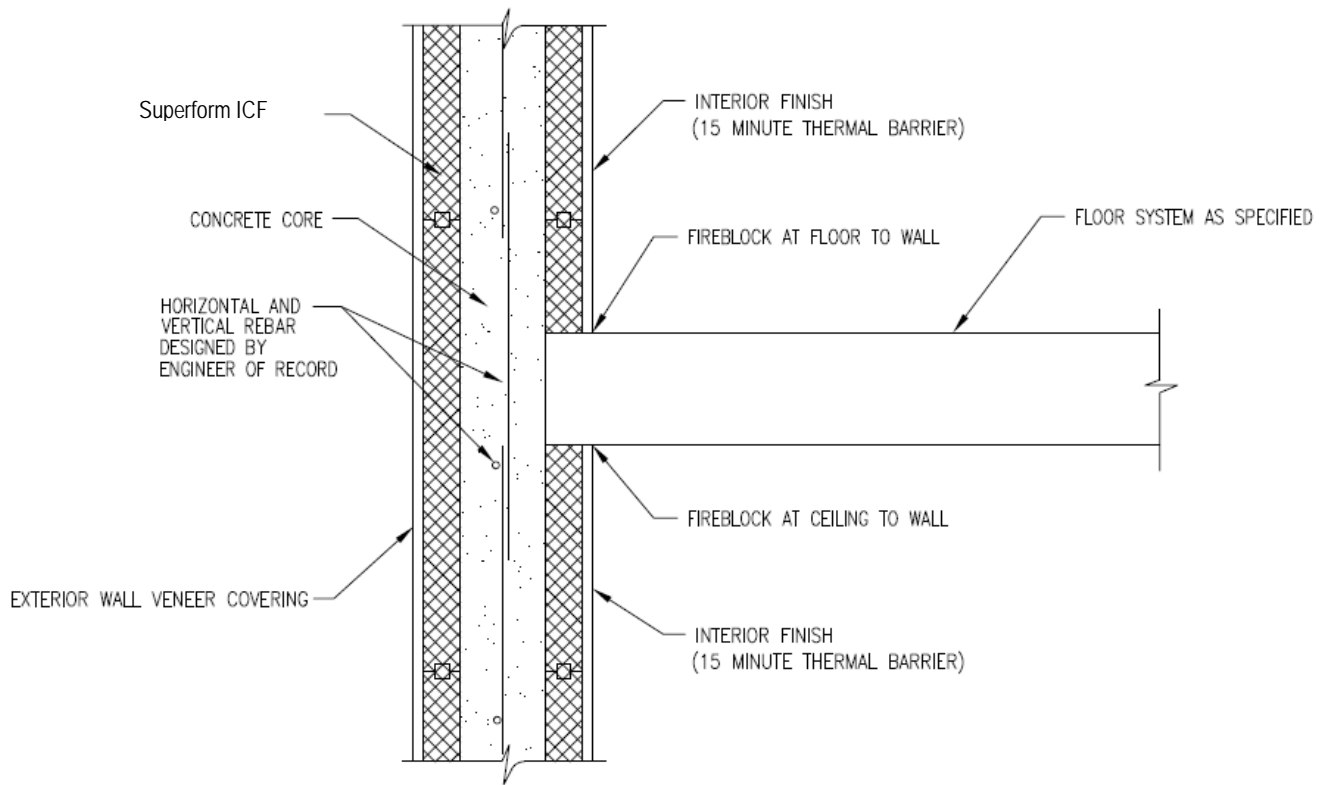


FIGURE 1—TYPICAL WALL-TO-FLOOR INTERSECTION FOR TYPES I, II, III AND IV CONSTRUCTION (IBC)