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LISTING INFORMATION OF

# Fox Blocks Insulating Concrete Form (ICF) Products - CCRR

SPEC ID: 32745

Fox Blocks, a Division of Airlite Plastics Co.
6110 Abbott Drive
Omaha, NE 68110-2805
United States

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# LISTING INFORMATION

**Fox Blocks ICFs**

Fox Blocks ICFs are Insulating Concrete Form (ICF) systems that are formed of expanded polystyrene with polypropylene plastic cross-ties. Fox Blocks ICFs are pre-assembled ICF forms with a reversible, interlocking connection design. The systems are available in the following sizes and configurations:

- 4" Straight
- 4" 90° Corner
- 4" 45° Corner
- 6" Straight
- 6" 90° Corner
- 6" 45° Corner
- 6" Corbel Ledge
- 6" Taper Top
- 6" T-Block  (Short)
- 6" T-Block (Long)
- 6" Radius Blocks (5',6',7',8',9' &10')
- 8" Straight
- 8" 90° Corner
- 8" 45° Corner
- 8" Corbel Ledge
- 8" Taper Top
- 8" T-Block  (Short)
- 8" T-Block (Long)
- 8" Curb Block
- 10" Straight
- 10" 90° Corner
- 12" Straight
- 12" 90° Corner
- High Extender

**Fox Blocks Compact ICFs**

Fox Blocks Compact ICFs are Insulated Concrete Form (ICF) systems that are formed of expanded polystyrene with polypropylene plastic cross-ties. Fox Blocks Compact ICFs are pre-assembled ICF forms with a reversible, interlocking connection design. The systems are available in the following sizes and configurations:

- 4" Straight
- 4" 90° Corner
- 4" Taper Top
- 6" Straight
- 6" 90° Corner
- 6" 45° Corner
- 6" Corbel Ledge
- 6" Taper Top
- 8" Straight
- 8" 90° Corner

- 8" 45° Corner
- 8" Corbel Ledge
- 8" Taper Top
- 10" Straight
- 10" Corbel Ledge
- 10" Taper Top
- 12" Straight
- 12" Corbel Ledge
- 12" Taper Top

**Fox Blocks Reveal ICFs**

Fox Blocks Reveal is a type of Fox Blocks ICFs which are insulating concrete form systems formed of expandable polystyrene, and with polypropylene plastic cross-ties. The Fox Blocks Reveal ICF has only one side of foam plastic panel, where the opposing side is a temporary plywood sheathing that is to be removed from installation site after curing of the concrete. The Fox Blocks Reveal products are available in the following configurations:

- 4" Straight
- 6" Straight
- 8" Straight
- 10" Straight
- 12" Straight

**Fox Blocks Compact Reveal ICFs**

Fox Blocks Compact Reveal is a type of Fox Blocks Compact ICFs which are insulating concrete form systems formed of expandable polystyrene, and with polypropylene plastic cross-ties. The Fox Blocks Compact Reveal ICF has only one side of foam plastic panel, where the opposing side is a temporary plywood sheathing that is to be removed from installation site after curing of the concrete. The Fox Blocks Compact Reveal products are available in the following configurations:

- 4" Straight
- 6" Straight
- 8" Straight
- 10" Straight
- 12" Straight

**Fox Blocks and Fox Blocks Reveal Ratings**

| Product/Assembly | Standard | Rating (if applicable) |
|---|---|---|
| Fox Blocks and Fox Blocks Reveal ICFs | ASTM E119 | Design No. FXB/ICF 240-01 |
| | ASTM E2634, including:<br>ASTM C578 (EPS)<br>ASTM D635 (cross-tie)<br>ASTM D638 (cross-tie)<br>ASTM D732 (cross-tie)<br>ASTM D1761 (cross-tie)<br>ASTM D1929 (cross-tie)<br>ASTM E84 (EPS)<br>UL 1715 (ICF) | Type II EPS<br>CC1 classification<br>Min. tensile strength: 32.3 kN/m$^2$ (675 lb/ft$^2$)<br>Min. shear strength: 3080 psi<br>Refer to Table 2 of CCRR-1010<br>Min. Ignition Temp. 350°C (662°F)<br>FSI ≤ 25, SDI ≤ 450<br>Meets ASTM E2634 Section 6.3.1 |

| | | |
|---|---|---|
| | ICC-ES AC353 | CCRR-1010 |
| | ASTM E283 (4” ICF) | Max air infiltration 0.02 cfm/ft$^2$ |
| | ASTM E331 (4” ICF) | No water leakage after 2 hours;<br>15 psf pressure differential |

**Fox Blocks Compact and Fox Blocks Compact Reveal Ratings**

| Product/Assembly | Standard | Rating (if applicable) |
|---|---|---|
| Fox Blocks Compact and Fox Blocks Compact Reveal ICFs | ASTM E119 | Design No. FXB/ICF 240-02 |
| | ICC-ES AC353 (2012)<br>ASTM C578 (EPS)<br>ASTM D635 (Cross-tie)<br>ASTM D1761 (Cross-tie)<br>ASTM D1929 (Cross-tie)<br>ASTM E84 (EPS)<br>UL 1715 (ICF) | CCRR-1010<br>Type II EPS<br>CC2 Classification<br>Refer to Table 2 of CCRR-1010<br>Min. Ignition Temp. 350°C (662°F)<br>FSI ≤ 25, SDI ≤ 450<br>Meets ICC-ES AC353 (2012), Section 3.4 |

**CODE COMPLIANCE RESEARCH REPORT**

| Evaluation Method | Building Code | CCRR Number |
|---|---|---|
| ICC-ES AC353 | 2024, 2021, 2018 IBC<br>2024, 2021, 2018 IRC<br>2025 CBC<br>2025 CRC<br>2025 CGBSC, Tile 24, Part 11 (CALGreen)<br>2023, 2020 LABC<br>2023, 2020 LARC | CCRR-1010 |

| Product | Product Approval No. |
|---|---|
| Fox Blocks, Fox Blocks Compact and Fox Blocks Reveal | FL # 7497 |

| Attribute | Value |
|---|---|
| Criteria | ICC-ES AC353 (2012) |
| Criteria | ASTM E119 (2020) |
| Criteria | ASTM E2634 (2018) |
| Criteria | ASTM C578:2019 |
| CSI Code | 03 11 19 Insulating Concrete Forming |
| Listing Section | CONCRETE FORMS |
| Spec ID | 32745 |

# DRAWING INDEX

FXB/ICF 240-01
FXB/ICF 240-02

# FXB/ICF 240-01

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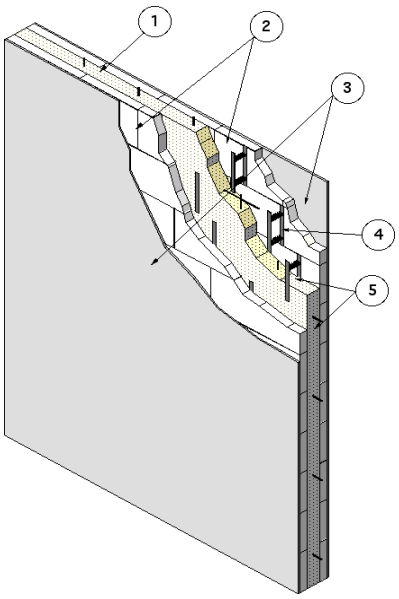
Division 03 – Concrete
03 11 00 Concrete Forming
03 11 19 Insulating Concrete Forming

**Airlite Plastics Co.**
**Design No. FXB/ICF 240-01**
**Fox Blocks and Fox Reveal Insulating Concrete Forms**
**ASTM E119, UL 263 and CAN/ULC-S101**
**Fire Rating Only - Load Rating Not Within the Scope of This Listing**
**Assembly Rating – 2 and 4 Hour**




| FORMED WALL THICKNESS | MAX FIRE RATING |
|---|---|
| 4 in. (102 mm) | 2 Hour |
| 6 in. (152 mm) | 4 Hour |
| 8 in. (203 mm) | 4 Hour |
| 10 in. (254 mm) | 4 Hour |
| 12 in. (305 mm) | 4 Hour |

1. **CONCRETE:** Pour normal weight concrete (density typically between 145-155 pcf) having a min. 21 MPa (3,000 psi) nominal compressive strength into the forming system.

2. **FORMING SYSTEM:** The Fox Blocks ICF and Fox Reveal ICF forming system consists of Type 2 (CAN/ULC-S701) or Type II (ASTM C578) molded expanded polystyrene (EPS) foam panels with embedded polypropylene ties that come preassembled to form nominal concrete core thicknesses of 4 in. (102 mm), 6 in. (152 mm), 8 in. (203 mm), 10 in. (254 mm), and 12 in. (305 mm).

# FXB/ICF 240-01 (2 OF 2)



The Fox Blocks and Fox Reveal ICFs are produced in 48 in. length x 16 in. height (1220 mm x 410 mm) for all core thicknesses. The EPS panels have a nominal thickness of 2-5/8 in. (66.7 mm). The top and bottom of the EPS panels have an interlocking system which aligns the forms together as they are stacked.

Fox Blocks ICF systems have polypropylene ties spaced at 8 in. (203 mm) on center (oc) in the cavity of the ICF that include flanges acting as furring strips for mechanical fastening.

Fox Reveal ICFs have one EPS panel of the above-mentioned type and thickness on one side, and one plywood panel on the opposing side, forming nominal concrete core thicknesses of 6-5/8 in. (168 mm), 8-5/8 in. (219 mm), 10-5/8 in. (270 mm), 12-5/8 in. (321 mm), and 14-5/8 in (371 mm). The plywood panel is to be removed after the concrete is cured. The concrete is either left exposed or is covered as described in Item 3.

3. **SHEATHING AND EXTERIOR FINISHES (Optional):** Not required for the fire resistance ratings described in this listing.

   An approved thermal barrier may be installed subject to the requirements of the applicable Building Code.

   When desired, exterior finishes may be applied to the exterior side of the forming system wall assembly without diminishing the assembly rating. Exterior Insulation Finish System (EIFS), any exterior stucco, brick or brick veneer, non-combustible fiber cement, stone or stone veneer, cultured stone, and siding made from vinyl, aluminum, wood, or steel may be used. Apply exterior finishes in accordance with the manufacturer's instructions.

4. **POLYPROPYLENE FORM TIES:** Each 48 in. (1220 mm) length of ICF has six polypropylene ties. The polypropylene ties are spaced nominally 8 in. (203 mm) oc. The polypropylene ties are open to allow concrete to flow easily, and to allow seating for the placement of horizontal and vertical rebar placement.

5. **STEEL REINFORCEMENT:** Place the steel reinforcement before filling the forming system with concrete. The rebar used is to be designed and placed per the applicable Code requirements and approved by a registered design professional with the appropriate license for the Authority Having Jurisdiction.

6. **WALL ASSEMBLY:** The ICF wall assembly may be used as either an interior or exterior wall. ICFs exposed to the interior of a building shall have a thermal barrier attached. Exterior walls are only required to have a thermal barrier on the side facing the interior of the building. The fire resistance rating is applicable to the ICF wall assembly from either side.

*Consult the listing report on the Directory of Building Products (https://bpdirectory.intertek.com) for the edition of the standard(s) evaluated.*

*Compliance of the assembly described in this Design Listing with the referenced standard relies on verification that the assembly constructed in the field is consistent with that described herein. Intertek certified products may be verified by the approved Intertek label; other products must be verified by the Authority Having Jurisdiction as meeting the specifications stated herein.*

# FXB/ICF 240-02

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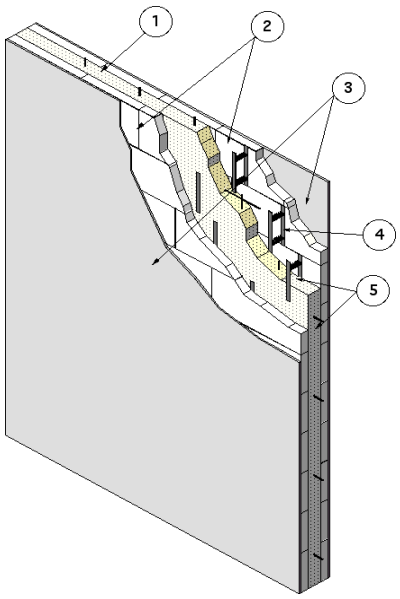
Division 03 – Concrete
03 11 00 Concrete Forming
03 11 19 Insulating Concrete Forming

**Airlite Plastics Co.**
**Design No. FXB/ICF 240-02**
**Fox Blocks Compact Insulating Concrete Forms**
**ASTM E119, UL 263 and CAN/ULC-S101**
**Fire Rating Only - Load Rating Not Within the Scope of This Listing**
**Assembly Rating – 2 and 4 Hour**




| FORMED WALL THICKNESS | MAX FIRE RATING |
|---|---|
| 4 in. (102 mm) | 2 Hour |
| 6 in. (152 mm) | 4 Hour |
| 8 in. (203 mm) | 4 Hour |
| 10 in. (254 mm) | 4 Hour |
| 12 in. (305 mm) | 4 Hour |

1. **CONCRETE:** Pour normal weight concrete (density typically between 145-155 pcf) having a min. 21 MPa (3,000 psi) nominal compressive strength into the forming system.

2. **FORMING SYSTEM:** The Fox Blocks Compact ICF forming system consists of Type 2 (CAN/ULC-S701) or Type II (ASTM C578) molded expanded polystyrene (EPS) foam panels with embedded polypropylene ties that come preassembled to form nominal concrete core thicknesses of 4 in. (102 mm), 6 in. (152 mm), 8 in. (203 mm), 10 in. (254 mm), and 12 in. (305 mm). The Fox Blocks Compact ICFs are produced in 48 in. length x

# FXB/ICF 240-02 (2 OF 2)

Division 03 – Concrete
03 11 00 Concrete Forming
03 11 19 Insulating Concrete Forming

16 in. height (1220 mm x 410 mm) for all core thicknesses. Fox Blocks Compact ICFs have an EPS panel thickness of 2-5/8 in. (63.5 mm). The top and bottom of the EPS panels have an interlocking system which aligns the forms together as they are stacked. The Fox Blocks Compact ICF system has polypropylene ties spaced at 8 in. (203 mm) on center (oc) in the cavity of the ICF that include flanges acting as furring strips for mechanical fastening.

3. **SHEATHING AND EXTERIOR FINISHES:** An approved thermal barrier must be installed in accordance with the applicable Building Code.

   When desired, exterior finishes may be applied to the exterior side of the forming system wall assembly without diminishing the assembly rating. Exterior Insulation Finish System (EIFS), any exterior stucco, brick or brick veneer, stone or stone veneer, cultured stone, and siding made from vinyl, aluminum, wood, or steel may be used. Apply exterior finishes in accordance with the manufacturer's instructions.

4. **POLYPROPYLENE FORM TIES:** Each 48 in. (1220 mm) of length of Fox Blocks Compact ICFs have six polypropylene ties. The polypropylene ties are spaced nominally 8 in. (203 mm) oc. The polypropylene ties are open to allow the flow around of concrete, and to allow seating for the placement of horizontal and vertical rebar placement.

5. **STEEL REINFORCEMENT:** Place the steel reinforcement before filling the forming system with concrete. The rebar used is to be designed and placed per the applicable Code requirements and approved by a registered design professional with the appropriate Authority Having Jurisdiction.

6. **WALL ASSEMBLY:** The ICF wall assembly may be used as either an interior or exterior wall. ICFs exposed to the interior of a building shall have a barrier attached. Exterior walls are only required to have a thermal barrier on the side facing the interior of the building. The fire resistance rating is applicable to the ICF wall assembly from either side.

*Consult the listing report on the Directory of Building Products (https://bpdirectory.intertek.com) for the edition of the standard(s) evaluated.*

*Compliance of the assembly described in this Design Listing with the referenced standard relies on verification that the assembly constructed in the field is consistent with that described herein. Intertek certified products may be verified by the approved Intertek label; other products must be verified by the Authority Having Jurisdiction as meeting the specifications stated herein.*

# Code Compliance Research Report
# CCRR-1010

**Issue Date: 03-01-2014**
**Revision Date: 04-24-2026**
**Renewal Date: 04-30-2027**

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

**REPORT HOLDER:**
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**Omaha, Nebraska 68110**
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**REPORT SUBJECT:**
**Fox Blocks Insulating Concrete Forms**
**Fox Blocks Compact Insulating Concrete Forms**
**Fox Blocks Reveal Insulating Concrete Forms**
**Fox Blocks Compact Reveal Insulating Concrete Forms**

## 1.0 SCOPE OF EVALUATION

**1.1** This Research Report addresses compliance with the following Codes:

- 2024, 2021, 2018 *International Building Code®* (IBC)
- 2024, 2021, 2018 *International Residential Code®* (IRC)
- 2025, 2022 *California Building Code®* (CBC)
- 2025, 2022 *California Residential Code®* (CRC)
- 2025, 2022 *California Green Building Standards Code®*, Title 24, Part 11 (CALGreen)
- 2023, 2020 *City of Los Angeles Building Code*
- 2023, 2020 *City of Los Angeles Residential Code*

Storm Shelters:

- 2023, 2020 ICC 500 Standard for the Design and Construction of Storm Shelters
- FEMA P-361 (2021) Safe Rooms for Tornadoes and Hurricanes

NOTE 1: This report references the most recent version of the codes cited. Earlier versions of the codes may have different section numbers.

NOTE 2: As the CBC and CRC are based on the IBC and IRC, IBC and IRC Code sections referenced within this CCRR are the same as that of the CBC and CRC.

**1.2** The Fox Blocks, Fox Blocks Compact, Fox Blocks Reveal, and Fox Blocks Compact Reveal systems have been evaluated for the following properties (see Table 1):

- Physical properties
- Surface-burning characteristics
- Attic and crawl space fire evaluations
- Fire-resistance-rated construction
- Exterior walls in Types I, II, III, IV and V construction
- Loads on Tornado Shelters

**1.3** The Fox Blocks, Fox Blocks Compact, Fox Blocks Reveal, and Fox Blocks Compact Reveal systems have been evaluated for the following uses:

- Use as stay-in-place formwork for structural concrete load-bearing and non-load-bearing exterior and interior walls, concrete beams, lintels, foundation walls, and retaining walls
- Use in attics and crawl spaces without a covering on the interior side when installed in accordance with Section 4.3.2
- Use in fire-resistance-rated construction, provided installation is in accordance with Section 4.8
- Use in Types I, II, III, or IV (noncombustible) construction, provided installation is in accordance with Section 4.9
- Use in tornado shelters, provided installation is in accordance with Section 4.10 and Table 4

## 2.0 STATEMENT OF COMPLIANCE

The Fox Blocks, Fox Blocks Compact, Fox Blocks Reveal, and Fox Blocks Compact Reveal systems comply with the Codes listed in Section 1.1, for the properties stated in Section 1.2, and uses stated in Section 1.3, when installed as described in this report, including the Conditions of Use stated in Section 6.

**2.1 2024 IBC and IRC Evaluation Reports:** The Intertek CCRR is an Evaluation Report for approval of an alternate material, design, or method of construction in accordance with Section 104.2.3.6.1 of the 2024 IBC and Section R104.2.2.6.1 of the 2024 IRC.

## 3.0 DESCRIPTION

**3.1 Fox Blocks:** The Fox Blocks forms consist of two 2.625-inch-thick expanded polystyrene (EPS) foam plastic panels, separated by injection-molded polypropylene plastic cross-ties that are partially embedded into the EPS panels. The cross-ties maintain the EPS panel facings at a clear distance of 4, 6, 8, 10, or 12 inches. The Fox Blocks form system complies with ASTM E2634 and is a flat ICF system as defined in IBC Section 1903.3 and IRC Section R608.3. In addition to straight forms, 45-degree angle, 90-degree corner, corbel ledge, taper top, T-block, curb, and 6-inch radius forms are also available. See Figure 1 for an illustration of the forms.

**3.2 Fox Blocks Compact:** The Fox Blocks Compact forms consist of two 2.625-inch-thick expanded polystyrene (EPS) foam plastic panels, and injection-molded polypropylene plastic cross-ties that are connected at the job site to "grippers", which are molded into the EPS panels. The cross-ties maintain the EPS panel facings at a clear distance of 4, 6, 8, 10, or 12 inches. If a larger cavity is desired, a polypropylene web extension gripper is used to connect two cross-ties to form 14-, 16-, 18-, 20-, 22-, or 24-inch-wide cavities. The Fox Blocks Compact system is a flat ICF system as defined in IBC Section 1903.3 and IRC Section R608.3. In addition to straight forms, corbel ledge, and taper top forms are also available. See Figure 1 for illustrations of the forms.

**3.3 Fox Blocks Reveal:** The Fox Blocks Reveal forms consist of one 2.625-inch-thick expanded polystyrene (EPS) foam plastic panel and one 3/4-inch-thick plywood panel, separated by injection-molded polypropylene plastic cross-ties that are partially embedded into the EPS and plywood panels. The plywood panel is for temporary use and is to be removed after curing of the concrete core by removing the fastener that connects the cross-tie flange to the plywood panel. The cross-ties maintain the EPS and plywood panel facings at a clear distance of 6-5/8, 8-5/8, 10-5/8, 12-5/8, or 14-5/8 inches. The Fox Blocks Reveal ICF system complies with ASTM 2634 and is a flat ICF system as defined in IBC Section 1903.3 and IRC Section R608.3. It is available in straight forms only.

**3.4 Fox Blocks Compact Reveal:** The Fox Blocks Compact Reveal forms consist of one 2.625-inch-thick expanded polystyrene (EPS) foam plastic panel and one 3/4-inch-thick plywood panel, separated by injection-molded polypropylene plastic cross-ties that are connected at the job site to "grippers", which are molded into the EPS and attached to plywood panels with fasteners. The plywood panel is for temporary use and is to be removed after curing of the concrete core by removing the fastener that connects the gripper to the plywood panel. The cross-ties maintain the EPS panel facings at a clear distance of 4, 6, 6-5/8, 8, 8-5/8, 10, 10-5/8, 12, 12-5/8 or 14-5/8 inches. The Fox Blocks Compact Reveal ICF system complies with ASTM E2634 and is a flat ICF system as defined in IBC Section 1903.3 and IRC Section R608.3. It is available in straight forms only.

**3.5 Foam Plastic Panels:** The EPS foam plastic panels have a nominal density of 1.5 pcf, 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 complies with Type II requirements when tested in accordance with ASTM C578. The EPS panels have a thermal resistance of R=10.6 for a 2.625-in.-thick panel.

**3.6 Cross-ties:** The polypropylene cross-ties for the Fox Blocks and Fox Blocks Reveal forms are spaced 8 inches on-center and connect the EPS panels or plywood at a fixed clear distance. The cross-ties consist of a flange that is embedded in the foam plastic panel during the molding process, and a web that connects the two flanges. The cross-ties have openings to permit concrete placement and have slots to support horizontal steel reinforcing bars. The plastic flange, which is recessed 0.625 inches below the outer EPS surface, is used to attach exterior and interior finish materials. The flange is 1-1/2 inches wide by 16 inches high by 0.23 inches thick.

The polypropylene cross-ties and grippers for the Fox Blocks Compact and Fox Blocks Compact Reveal forms are spaced horizontally at 8 inches on-center and connect the EPS panels or plywood at a fixed clear distance. The cross-ties fit into the polypropylene grippers, have openings to permit concrete placement, and have slots of support horizontal steel reinforcing bars. The plastic flange of the polypropylene grippers, which is recessed 0.625 inches below the outer EPS surface in the EPS panel, or is attached to the plywood with fasteners, is used to attach exterior and interior finish materials. The flange is 1.44 inches wide by 16 inches high by 0.23 inches thick.

**3.7 Concrete:** Concrete must be normal-weight concrete complying with the IBC, with a maximum 3/4-inch aggregate size. Concrete must have a minimum compressive strength of 3000 psi at 28 days except as required for fire-resistance-rated construction described in Section 4.8. Under the IRC, concrete must comply with IRC

Sections R404.1 (foundation walls and retaining walls) and R608.5.1 (walls), as applicable.

**3.8 Reinforcement:** Deformed steel reinforcement bars must have a minimum yield stress of either 40 ksi or 60 ksi, depending on the structural design. Under the IBC, the deformed steel bars must comply with Section 3.5.3.1 of ACI 318 and IBC Section 1903. If construction is based on the IRC, reinforcement must comply with IRC Sections R404.1.3.3 (foundation walls and retaining walls) and R608.5.2 (walls).

**3.9 Additional Standards:**

**3.9.1** The Fox Blocks, Fox Blocks Compact, Fox Blocks Reveal, and Fox Blocks Compact Reveal systems conform to the standard requirements of ASTM E2634-18 "Standard Specification for Flat Wall Insulating Concrete Form (ICF) Systems". See Intertek Listing "Fox Blocks Insulating Concrete Forms Products".

**3.9.2** The Fox Blocks, Fox Blocks Compact, Fox Blocks Reveal, and Fox Blocks Compact Reveal systems meet the tornado shelter impact requirements of ICC-500, as required by IBC Sections 423 and 1604.10 and IRC Section R307.

## 4.0 INSTALLATION

**4.1 General:**

Design and installation of the Fox Blocks, Fox Blocks Compact, Fox Blocks Reveal, and Fox Blocks Compact Reveal forms must comply with this report, the applicable Code, and the manufacturer's published installation instructions, which must be available on the jobsite during installation.

**4.2 Design:**

**4.2.1 IBC Method:** Solid concrete walls must be designed and constructed in accordance with IBC Chapters 16 and 19, as applicable. Footings and foundations must be designed in accordance with IBC Chapter 18.

**4.2.2 Alternative IBC Wind Design Method:** Solid concrete walls may be designed and constructed in accordance with the provisions of Section 209 of ICC 600, subject to the limitations found in IBC Section 1609.1.1.1 in accordance with Exception 1 to Section 1609.1.1. Design and construction under the provisions of ICC 600 are limited to resisting wind forces.

**4.2.3 IRC Method:** Solid concrete walls, footings, and foundations must be designed in accordance with IRC Sections R608 and R404.1.3, as applicable for flat wall systems.

**4.2.4 Alternative IRC Methods:** When used to construct buildings that do not conform to the applicability limits of IRC Sections R404.1.3 and R608, construction must be in accordance with the prescriptive provisions of the 2017 Prescriptive Design of Exterior Concrete Walls for One-and Two-family Dwellings (PCA 100), or the structural analysis and design of the concrete must be in accordance with ACI 318, ACI 332, and IBC Chapters 16, 18, and 19.

**4.3 Interior Finish:**

**4.3.1 General:** ICF units exposed to the building interior must be finished with an approved 15-minute thermal barrier, such as minimum 1/2-inch-thick regular gypsum wallboard complying with ASTM C1396, installed horizontally or vertically, and attached to the cross-tie flanges with minimum 1-1/2 inch long, No. 6, Type S, fine-thread gypsum board screws spaced a maximum of 12 inches on center vertically and 16 inches on center horizontally. The screws must penetrate a minimum of 1/4 inch through the flange. Gypsum board joints and screw heads must be taped and finished with joint compound in accordance with ASTM C840 or GA216. In multi-story buildings of Type V construction, when the foam plastic is continuous between floors on the interior side of the wall, the thermal barrier is not required to be carried through the floor cavity provided the thermal barrier is continuous on both the interior side of the exterior wall and the underside of the ceiling (See Figure 7). In buildings required to be of Types I, II, III, or IV construction, the thermal barrier need not extend to the floorline (see Figure 6) provided the thermal barrier is continuous on the wall and ceiling and, there are no combustible materials on the interior face of the ICF wall in the floor/ceiling space. See Section 4.3.2 for installation details for crawl space applications without an ignition barrier on the interior face.

**4.3.2 Attic and Crawl Space Installations:** When the ICFs are used for walls of attics or crawl spaces, an ignition barrier complying with IBC Section 2603.4.1.6, or IRC Sections R303.5.3 or R303.5.4, is required, except when all of the following conditions are met:

- Entry to the attic or crawl space is only to service utilities, and no storage is permitted

- There are no interconnected attic or basement areas
- Air in the attic or crawl space is not circulated to other parts of the building
- Under-floor (crawl space) ventilation is provided that complies with IBC Section 1202.4 or IRC Section R408.1, as applicable
- Attic ventilation is provided when required by IBC Section 1202 or IRC Section R806, as applicable
- Combustion air is provided in accordance with IMC (*International Mechanical Code*) Section 701
- The ICFs must have at least one label as described in Section 7.0 visible in every 160 square feet of wall area

**4.4 Exterior Finish:**

**4.4.1 Above Grade:** The exterior surface of the ICF must be covered with an approved wall covering in accordance with the applicable Code or a current evaluation report. A water-resistant exterior wall envelope is not required for concrete walls complying with IBC Section 1402.2, Exception 1, and IRC Section R703.1.1, Exception 1. Concrete walls are deemed to comply with the air barrier requirements of IECC Section C402.6 and R402.5 provided joints are sealed.

When the wall covering is mechanically attached to structural members, the wall covering must be attached to the flanges of the embedded cross-ties with fasteners, described in Table 2, having sufficient length to penetrate through the flange a minimum of 1/4 inch. The fasteners have an allowable fastener withdrawal and lateral shear strength as noted in Table 2.

The fastener spacing must be designed to support the gravity loads of the wall covering and to 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 evaluation report for proprietary materials and must not exceed the maximum withdrawal capacity of the fasteners listed in Table 2.

Wall coverings attached to the exposed concrete side of the Fox Blocks Reveal or Fox Blocks Compact Reveal systems must be designed using approved fasteners.

**4.4.2 Below Grade:** Materials used to dampproof or waterproof basement walls must be acceptable to Airlite Plastics Co., the designer, or the contractor, and must comply with the applicable Code or a current evaluation report. The material must be compatible with the ICF foam plastic units, and free of solvents that will adversely affect the EPS foam plastic panels. Dampproofing, waterproofing, and drainage requirements must comply with the applicable Code. No backfill may be applied against the wall until the complete floor system is in place or the wall is adequately braced unless the wall is designed as a freestanding wall that does not rely on the floor system for structural support.

**4.5 Foundation Walls:** The ICF system may be used as a foundation stem wall when supporting wood-framed construction, provided the structure is supported on concrete footings complying with the applicable Code. For jurisdictions adopting the IRC, compliance with Section R404 is required.

**4.6 Retaining Walls:** The ICF system may be used to construct retaining walls, with reinforcement designed in accordance with accepted engineering principles, Section 4.2 of this report and the applicable Code.

**4.7 Protection Against Termites:** Where the probability of termite infestation is defined by the Code official as "very heavy", the foam plastic must be installed in accordance with IBC Section 2603.8 or IRC Section R305.4, as applicable. Areas of very heavy termite infestation must be determined in accordance with IBC Figure 2603.8 or IRC Figure R305.4.

**4.8 Fire-resistance-rated Construction:** The forms may be used to construct fire-resistance-rated wall assemblies as described in Intertek Design Listings FXB/ICF 240-01 for Fox Blocks and Fox Blocks Reveal forms, and FXB/ICF 240-02 for Fox Blocks Compact and Fox Blocks Compact Reveal forms. See Intertek Listing "Fox Blocks Insulating Concrete Forms Products" at https://bpdirectory.intertek.com for current details.

**4.9 Use in Buildings Required to be of Types I, II, III, and IV Construction:**

**4.9.1 General:** Exterior walls constructed with the ICFs for use in buildings required to be of Type I, II, III, or IV construction must comply with the applicable conditions cited in Sections 4.9.2 through 4.9.4.

**4.9.2 Interior Finish:** The ICFs must be finished on the interior with an approved 15-minute thermal barrier, such as 1/2-inch-thick gypsum board, as required by the IBC. The

gypsum board must be installed and attached as described in Section 4.3.1.

**4.9.3 Exterior Finish:**

**4.9.3.1 Buildings of Any Height:** The ICFs must be finished on the exterior with materials described in Sections 4.9.3.1.1, 4.9.3.1.2, 4.9.3.1.3, and 4.9.1.3.4. The ICFs must have at least one label as described in Section 7.0 visible in every 160 square feet of wall area prior to applying the wall covering.

**4.9.3.1.1 Exterior Finish – EIFS and One-coat Stucco:** EIFS and one-coat stucco wall coverings may be applied over the ICF, provided the wall covering system is recognized in a current evaluation report and is recognized for use in Types I, II, III, and IV construction, based on testing conducted in accordance with NFPA 285. The wall covering system must be installed in accordance with the respective evaluation report and the maximum EPS mass per wall surface area (in lbs/ft$^2$) qualified in the wall covering evaluation report must be greater than 0.328 lbs/ft$^2$ (which is the maximum-tolerance mass of the EPS panel on the exterior side of the concrete wall). Acceptable EIFS wall coverings include the following:

- Dryvit Systems, Inc. Outsulation® System, ESR-1232;
- Sto Corp. StoTherm Classic Premier and Essence, ESR-1720;
- Sto Corp. StoTherm® ci®, ESR-1748;
- Sto Corp., Sto Rainscreen and Sto Rainscreen II, ESR-1030;
- Parex USA, Inc. Parex Water Master GX, Parex Standard WaterMaster, LaHabra Insul-Flex WaterMaster, El Rey Insul-Flex WaterMaster, Parex USA Masonry Veneer System, ESR-2562;
- Master Builder Solutions US, LLC, Senergy Senerflex, ESR-1878;

**4.9.3.1.2 Exterior Plaster:** Exterior plaster must comply with the applicable Code, and the exterior plaster must be a minimum of 7/8 inch thick. The lath must be attached to the flanges of the cross-ties with fasteners described in Section 4.4.1.

**4.9.3.1.3 Exterior Finish – Brick Veneer:** Anchored brick veneer must be attached with one of the following options: (1) approved cast-in-place concrete anchors; (2) approved post-installed concrete anchors; or (3) to the flanges of the cross-ties with fasteners as described in Section 4.4.1. The 4-inch-thick brick veneer must comply with the IBC and must be installed with a minimum 1-inch air gap between the face of the exterior EPS panel 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.

**4.9.3.1.4 Other Exterior Wall Coverings:** Other wall coverings must be demonstrated to the satisfaction of the building official as meeting the requirements of IBC Section 2603.5. Assemblies tested in accordance with NFPA 285 must include EPS having a maximum mass per wall surface area (in lbs/ft$^2$) greater than 0.328 lbs/ft$^2$ (1.76 kg/m$^2$) (which is the maximum-tolerance mass of the EPS panel on the exterior side of the concrete wall).

**4.9.4 Fireblocking:** Foam plastic on the interior side of exterior walls and on both sides of interior walls must be discontinuous at floor lines. The intersections must be constructed to prevent the passage of flame, smoke, and hot gases from one floor to another.

**4.10 Use in Storm Shelters:** The Fox Blocks ICFs must be configured as described in Table 4 for impact resistance. ICFs must be designed to resist the tornado loads ($W_T$) by a licensed structural engineer in accordance with ICC 500, Section 304.

**4.11 Special Inspection:**

**4.11.1 IBC:** Special inspection is required as noted in IBC Section 1705 for placement of reinforcing steel and concrete, and for concrete cylinder testing. When an EIFS wall covering is applied, special inspection in accordance with IBC Sections 1704.1 and 1705.17 is required.

**4.11.2 IRC:** For walls designed in accordance with Section 4.2.3 or PCA 100 (Section 4.2.4), special inspection is not required. When walls are designed in accordance with the IBC, as described in Section 4.2.4, special inspection is required as described in Section 4.11.1.

## 5.0 CONDITIONS OF USE

**5.1** The ICFs must be manufactured, identified, and installed in accordance with this Research Report, the manufacturer's published installation instructions, and the applicable Code. The provisions in this report take precedence over the provisions in the manufacturer's instructions.

**5.2** When required by the Code official, calculations showing compliance with the general design requirements of the applicable Code must be submitted to the building official. The calculations and details must be prepared by a registered design professional except where sealed calculations are not required under IRC Section R608.1. Sealed calculations shall be provided where required by the statutes of the jurisdiction in which the project is to be constructed.

**5.3** When required by the Code official, calculations and details showing compliance with IRC Section R08.5.3 and R404.1.3.3.6 must be submitted, establishing that the ICFs provide sufficient strength to contain concrete during placement and the cross-ties are capable of resisting the forces created by fluid pressure of fresh concrete. 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.

**5.4** The ICFs must be separated from the building interior with an approved 15-minute thermal barrier, except for attic and crawl space construction as described in Section 4.3.2.

**5.5** The plastic cross-ties must be stored indoors away from direct sunlight.

**5.6** Special inspection must be provided in accordance with Section 4.11 of this report.

**5.7** The Fox Blocks forms are manufactured by Airlite Plastics Co. in Anchorage, AK; Bruce, AB; Cap-Pelé, NB; Colorado Springs, CO; Huron, SD; Nazareth, PA; New Bern, NC; Omaha, NE; Phoenix, AZ; Piqua, OH; Post Falls, ID; Sainte-Marie, QC, Starbuck, MB; Vaudreuil-Dorion, QC. The Fox Blocks Reveal, Fox Blocks Compact, and Fox Blocks Compact Reveal forms are manufactured by Airlite Plastics Co. in Nazareth, PA; Omaha, NE. The forms are produced under a quality control program with inspections conducted by Intertek Testing Services NA Inc.

## 6.0 SUPPORTING EVIDENCE

**6.1** 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.

**6.2** Data in accordance with ASTM E2634-18, ASTM E96, ASTM E119, UL 263, NFPA 285 and CFR Title 16, Part 460.

**6.3** Impact resistance data in accordance with the 2023 and 2020 editions of ICC-500, ICC/NSSA Standard for the Design and Construction of Storm Shelters.

**6.4** Intertek Listing Report "Fox Blocks Insulating Concrete Form (ICF) Products".

## 7.0 IDENTIFICATION

The Fox Blocks, Fox Blocks Compact, Fox Blocks Reveal, and Fox Blocks Compact Reveal forms are identified by a marking bearing the report holder's name (Airlite Plastics Co.), the product name, the manufacturing location, the serial number, the Intertek Mark, and the Code Compliance Research Report number (CCRR-1010).

When use is in an attic or crawl space without an ignition barrier, as described in Section 4.3.2, one label bearing the evaluation report number and the phrase "Acceptable for use in attics and crawl spaces" must be visible in every 160 square feet of exposed wall area.

When use is in buildings required to be of Type I, II, III, or IV construction, one label must be visible in every 160 square feet of wall area.

## 8.0 OTHER CODES

**8.1 California Building Code:** The Fox Blocks ICFs described in Sections 2.0 through 7.0 of this report comply with the *California Building Code®*, *California Residential Code®*, and *California Green Building Standards Code®*, for the editions cited in Section 1.1 of this Report.

The Fox Blocks ICFs comply with CBC amended Chapter 19 and CBC Chapter 19A, with the following limitations:

- Where adopted by OSHPD-1 and -4, ICF systems are not permitted in accordance with CBC Section 1903A.4
- Where adopted by OSHPD-1R, -2 and -5, ICF systems are not permitted in accordance with CBC Section 1903.4
- Adoption of amended Chapter 19 and Chapter 19A is provided in Table 3

Design, installation, and inspection of the ICFs must be in accordance with CBC Chapters 16, 16A, 17, 17A, 18, 18A, and 26, as applicable.

The Fox Blocks ICFs comply with Section 5.407.1 of the *California Green Building Standards Code*.

The Fox Blocks, Fox Blocks Compact, Fox Blocks Reveal, and Fox Blocks Compact Reveal are permitted under the *California Green Building Standards Code®*, Title 24, Part 11, Section A4.404.3, Item 3 as premanufactured building systems used to eliminate solid sawn lumber.

**8.2 City of Los Angeles Building Code:** The Fox Blocks ICFs described in Sections 2.0 through 7.0 of this report comply with the *City of Los Angeles Building Code* and *City of Los Angeles Residential Code*, for the editions cited in Section 1.1 of this Report.

Design, installation, and inspection of the ICFs must be in accordance with CBC Chapters 16, 16A, 17, 17A, 18, 18A, 19, 19A and 26, as applicable.

## 9.0 CODE COMPLIANCE RESEARCH REPORT USE

**9.1** Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

**9.2** Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

**9.3** Reference to https://bpdirectory.intertek.com is recommended to ascertain the current version and status of this report.

**TABLE 1A – PROPERTIES EVALUATED UNDER IBC AND IRC**

| PROPERTY | IBC SECTION[1] | IRC SECTION[1] |
|---|---|---|
| Physical Properties | 1903.4 | R404.1.3.3.6.1 and R608.4.4 |
| Surface Burning Characteristics | 2603.3 | R303.3 |
| Attic and Crawl Space Applications | 2603.4.1.6 and 2603.9 | R303.5.3, R303.5.4 and R303.6 |
| Fire Resistance | 703.2 | R302.1 |
| Exterior Walls in Types I – IV Construction | 2603.5 | N/A |
| Tornado Shelters | 423<br>1604.10 | R307 |

[1]2024 Code sections are shown. Section numbers in earlier versions may differ.

**TABLE 1B – PROPERTIES EVALUATED UNDER CBC, CRC, LABC, AND LARC**

| PROPERTY | CBC/LABC SECTION | CRC/LARC SECTION |
|---|---|---|
| Physical Properties | 1903.3 / 1903.4 | R404.1.3.3.6.1 and R608.4.4 |
| Surface Burning Characteristics | 2603.3 | R316.3 |
| Attic and Crawl Space Applications | 2603.4.1.6 and 2603.9 | R316.5.3, R316.5.4 and R316.6 |
| Fire Resistance | 703.2 | R302.1 |
| Exterior Walls in Types I – IV Construction | 2603.5 | N/A |
| Tornado Shelters | 423<br>1604.10 | R307 / R323.1 |

**TABLE 2 – ALLOWABLE WITHDRAWAL AND LATERAL CAPACITIES OF FASTENERS IN CROSS-TIE FLANGES**

| FASTENER[1] | ALLOWABLE LOAD CAPACITY (lbf) | |
|---|---|---|
| | Lateral | Withdrawal |
| $2^1/_2$-inch-long, No.10 wood screw | 68 | 38 |
| $1^5/_8$-inch-long, No. 6 coarse-thread drywall screw | 45 | 29 |
| $1^5/_8$-inch-long, No. 6 fine-thread drywall screw | 37 | 32 |
| 2-inch-long, 0.098-inch-diameter ring shank drywall nail | 19 | 16 |
| 2-inch-long, No. 8 saw tooth-thread exterior deck screw | 71 | 36 |

[1]Fasteners must be of sufficient length to penetrate through the flange a minimum of 1/4 inch

**TABLE 3 – STATE AGENCY ADOPTION OF THE CALIFORNIA BUILDING CODE**

| State Agency | Amended Ch. 19 | Ch. 19A | Amended Ch. 16 | Ch 16A | Amended Ch. 17 | Ch. 17A | Amended Ch. 18 | Ch. 18A |
|---|---|---|---|---|---|---|---|---|
| OSHPD-1 | -- | NP | -- | x | -- | x | -- | x |
| OSHPD-1R | NP | -- | x | -- | x | -- | x | -- |
| OSHPD-2 | NP | -- | x | -- | x | -- | x | -- |
| OSHPD-4 | -- | NP | -- | x | -- | x | -- | x |
| OSHPD-5 | NP | -- | x | -- | x | -- | x | -- |
| DSA-SS | x | -- | -- | x | -- | x | -- | x |
| DSA-SS/CC | -- | x | x | -- | -- | x | -- | x |

NP – Use of ICF is not permitted per CBC Sections 1903.3 and 1903A.3.

**TABLE 4 – TORNADO SHELTER IMPACT PERFORMANCE**

| Construction | | | | Impact Performance | |
|---|---|---|---|---|---|
| Product | Minimum Concrete Strength | Reinforcing Bars | | Minimum Wall Length (Ft.) | Impact Rating |
| | | Specification | Spacing | | |
| 4", 6", 8", 10" and 12" Fox Blocks ICF RC Wall | 3,000 psi | #4 Bar, Grade 60 KSI | 16 inches o.c. horizontally and 16 inches o.c. vertically | 8 | 15 lb 2x4 at 100 mph |

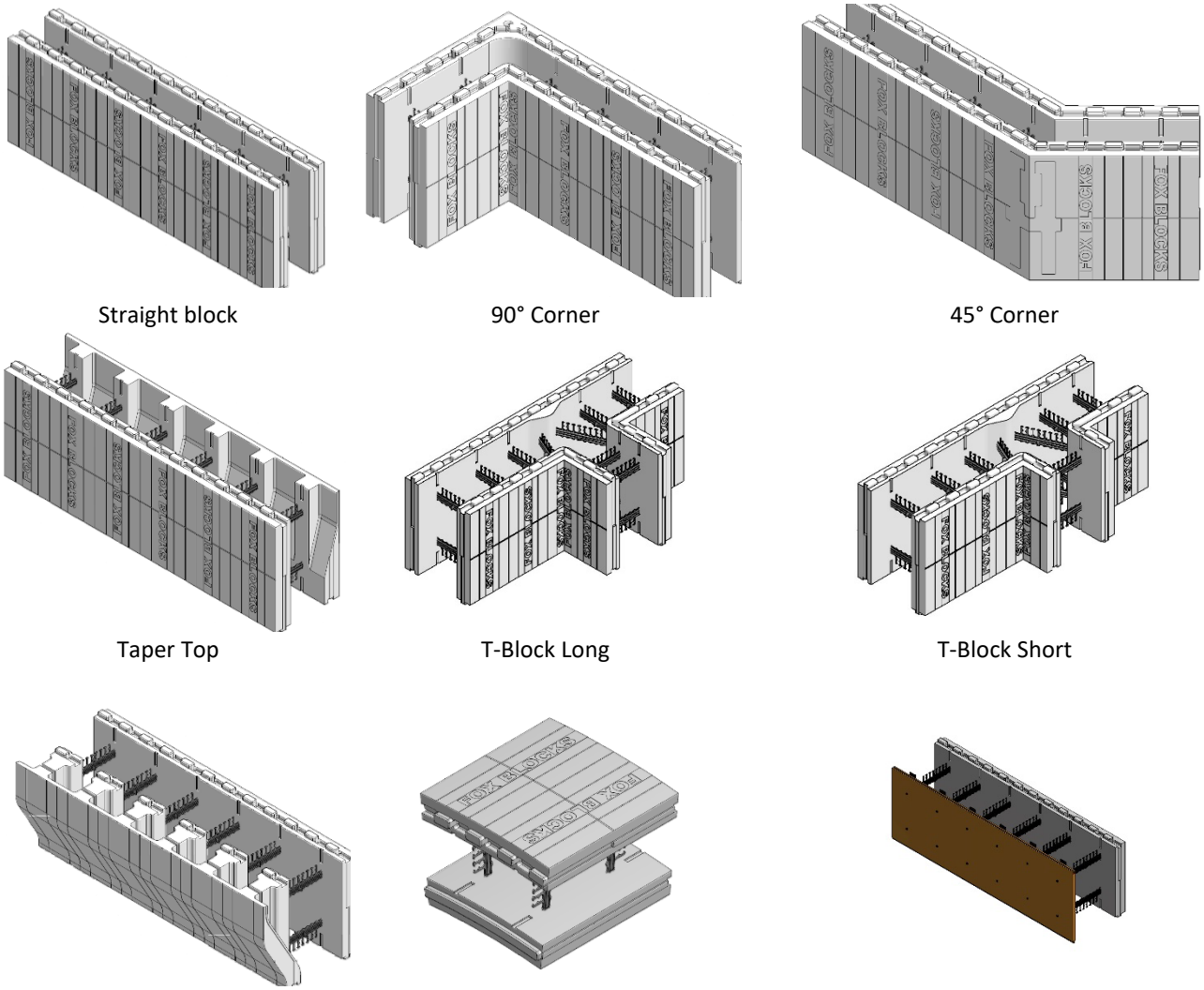
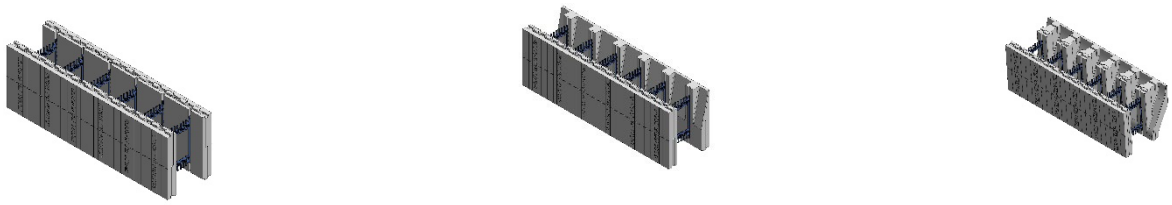



**Figure 1 – FOX BLOCKS AND FOX BLOCKS REVEAL SYSTEM TYPICAL ILLUSTRATIONS**



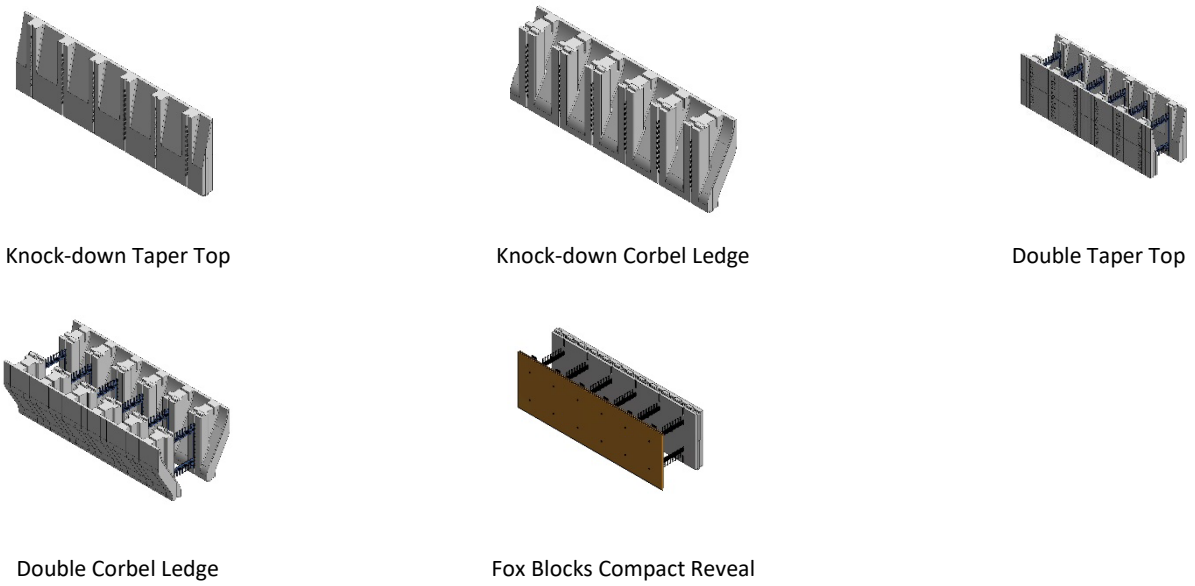



**Figure 2 – FOX BLOCKS COMPACT AND FOX BLOCKS COMPACT REVEAL SYSTEM TYPICAL ILLUSTRATIONS**

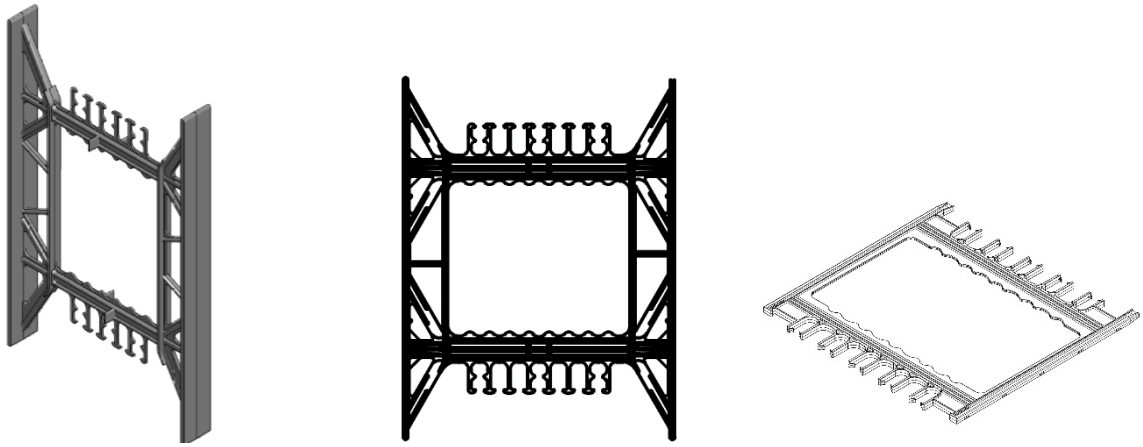


**Figure 3 – FOX BLOCKS, FOX BLOCKS COMPACT, FOX BLOCKS REVEAL, AND FOX BLOCKS COMPACT REVEAL SYSTEM CROSS-TIES**

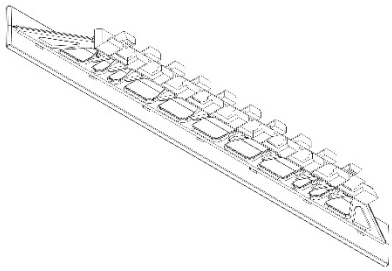


**Figure 4 – FOX BLOCKS COMPACT AND FOX BLOCKS COMPACT REVEAL SYSTEM CROSS-TIE GRIPPERS**

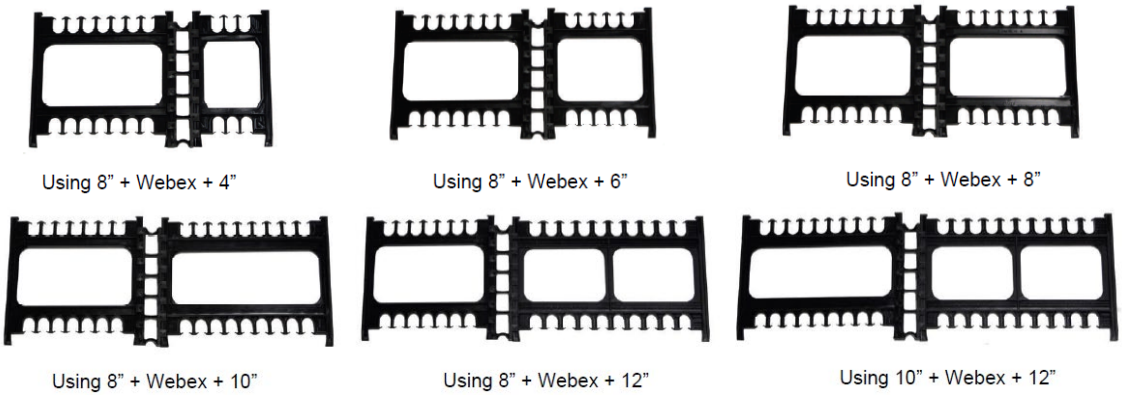



**Figure 5 – FOX BLOCKS COMPACT SYSTEM CROSS-TIE EXTENSION CONFIGURATIONS**

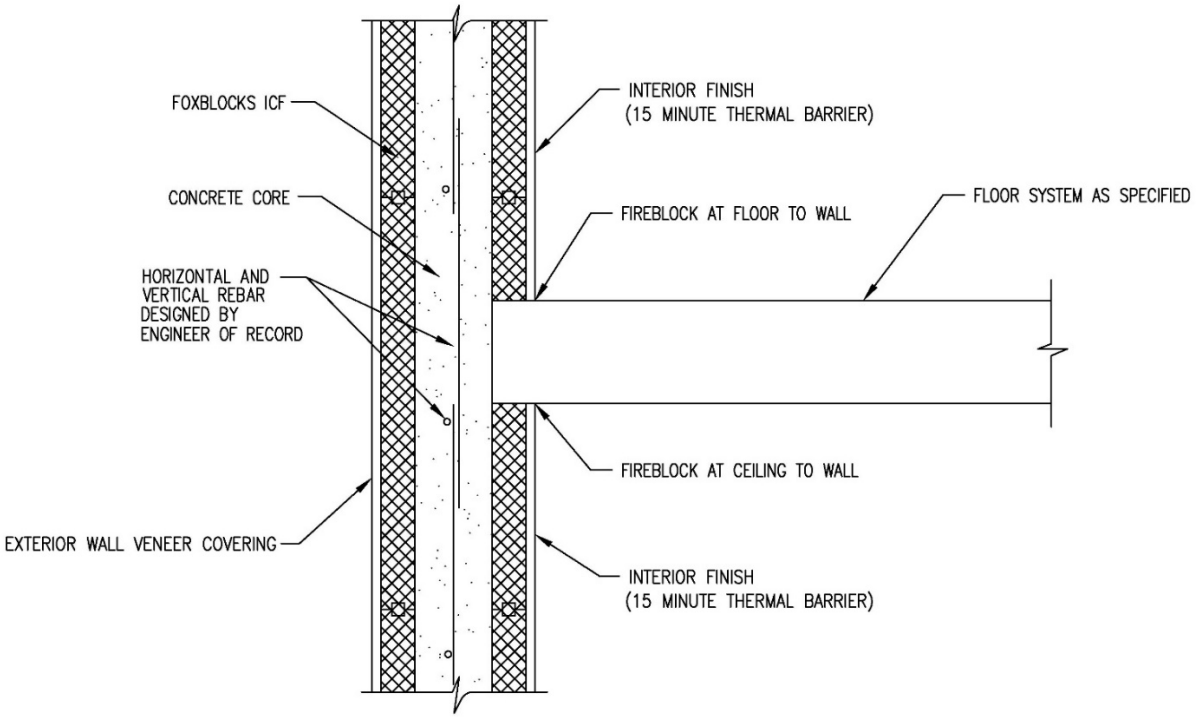



**Figure 6 – TYPICAL WALL-TO-FLOOR INTERSECTION FOR TYPES I, II, III, AND IV CONSTRUCTION**

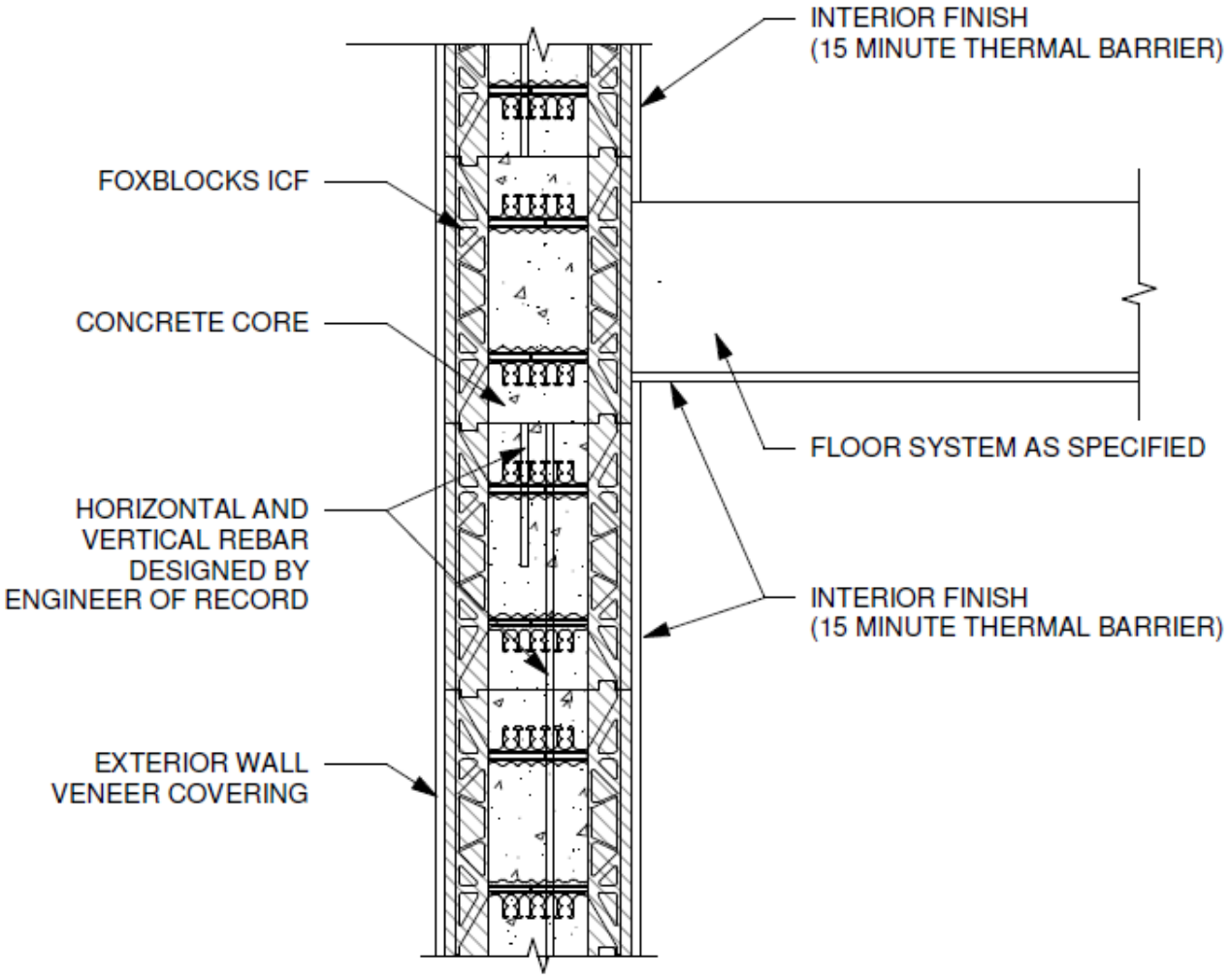



**FIGURE 7 - TYPICAL WALL-TO-FLOOR INTERSECTION FOR TYPE V CONSTRUCTION**