

# ICC-ES Evaluation Report

**ESR-2148**

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This report is subject to re-examination in two years.

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**DIVISION: 02—SITE CONSTRUCTION**
**Section: 02450—Foundation and Load-Bearing Elements**
**REPORT HOLDER:**

**BIGFOOT SYSTEMS INC.**  
**6750 HIGHWAY #3, MARTINS POINT RR#2**  
**MAHONE BAY, NOVA SCOTIA B0J 2E0**  
**CANADA**  
**(902) 627-1600**  
[www.bigfootsystems.com](http://www.bigfootsystems.com)  
[info@bigfootsystems.com](mailto:info@bigfootsystems.com)

**EVALUATION SUBJECT:**
**BIGFOOT SYSTEMS® FOOTING FORM**
**1.0 EVALUATION SCOPE**
**Compliance with the following codes:**

- 2006 *International Building Code*® (IBC)
- BOCA® *National Building Code* 1999 (BNBC)
- 1999 *Standard Building Code*® (SBC)
- 1997 *Uniform Building Code*™ (UBC)

**Property evaluated:**

Structural—spread foundation and footings

**2.0 USES**

Bigfoot Systems® Footing Forms are bell-shaped forms for concrete spread foundations and footings.

**3.0 DESCRIPTION**
**3.1 General:**

The Bigfoot Systems® Footing Forms are formwork complying with Section 1906.1 of the UBC and with the IBC, BNBC, and SBC for concrete spread foundation and footings. The system consists of a construction tube attached, at the jobsite, to the top of the Bigfoot System® bell-shaped footing form. Except as noted in this report, the construction tube and Bigfoot Systems® Footing Form are permitted to remain in place after the concrete has cured.

The Bigfoot Systems® Footing Forms are available in four sizes, designated Model BF20, Model BF24, Model BF28, and Model BF36, which are for concrete footings with diameters, respectively, of 20, 24, 28 and 36 inches (508, 610, 711 and 914 mm). The sloped portion of the forms has ribs to stiffen the forms, and 1/4-inch-diameter (6.4 mm) holes to allow trapped air to escape. The top of each Bigfoot Systems® Footing Form is designed to accept

more than one diameter of construction tube, by the cutting and removing of rings from the top flange that are smaller than the largest diameter ring that fits inside the construction tube. Model BF20 is used with nominally 6- and 8-inch-diameter (152 and 203 mm) tubes. Model BF24 is used with nominally 8- and 10-inch-diameter (203 and 254 mm) tubes. Model BF28 is used with nominally 10- and 12-inch-diameter (254 and 305 mm) tubes. Model BF36 is used with nominally 12-, 14-, 16- and 18-inch-diameter (305, 356, 406 and 457 mm) tubes. See Table 1 for details on construction tube diameters and Bigfoot Systems® Footing Form top flange diameter.

The bottoms of the forms have a flange designed to fit flat on the excavated area. The flange has detents at the base of the ribs, to designate the locations for field-drilled holes that are required when the form is attached to the soil in above-grade applications.

**3.2 Materials:**

**3.2.1 Bigfoot Systems® Footing Form:** The form is manufactured from high-density, recycled polyethylene plastic.

**3.2.2 Construction Tube:** Construction tubes are cellulosic fiber construction tubes having a minimum thickness of 0.080 inch (2.0 mm) that are supplied by others, as recommended by Bigfoot Systems Inc. See Table 2 for construction tubes recommended by Bigfoot Systems Inc.

**3.2.3 Concrete:** Normal-weight concrete must have a minimum 28-day compressive strength of 3,000 psi (20.7 MPa), a maximum aggregate size of 3/4 inch (19.1 mm), and a minimum slump of 3 inches (76 mm) and a maximum slump of 4 inches (104 mm) in accordance with ASTM C 143.

**3.2.4 Design:** The design of the concrete footings and pier is beyond the scope of this report and must be in accordance with the applicable code.

**4.0 INSTALLATION**
**4.1 General:**

Rings on the top flange of the Bigfoot Systems® Footing Form that are smaller than the largest diameter ring that fits inside the construction tube being used must be cut and removed from the footing form. The construction tube must be installed over the top flange of the footing form, and must be attached to the form using 3/4- to 1-inch-long (19.1 to 25.4 mm), No. 8, corrosion-resistive wood screws. A minimum of four screws must be used with all footing forms, except that six screws must be used with Model BF36.

For grade-level installations, or below-grade-level installations in which the tube extends 3 feet (914 mm) or more above ground level, the top of the construction tube must be braced as shown in Figure 2, with four scab boards attached to the construction tubes by means of two or more screws per board, from inside the construction tubes.

After the concrete has cured, the wooden braces must be removed, and the upper end of the construction tube must be removed to a depth of 12 inches (305 mm) below the finished grade. The remainder of the construction tube and the plastic footing form are permitted to remain in place.

#### 4.2 Grade-level Installations:

For installations of Model BF20, Model BF24 and Model BF28 footing forms at ground level, the length of the construction tubes must be such that the combined height of the pier and footing does not exceed 5 feet (1524 mm). The footing forms must be placed on level, undisturbed soil. To prevent movement of the footing forms during concrete placement, steel spikes must be driven into the soil at a 45-degree angle, through  $\frac{3}{8}$ -inch-diameter (9.5 mm) holes that are field-drilled at a 45-degree angle, at the detents on the flange area adjacent to each rib. Eight, fourteen and sixteen spikes are used, respectively, for the Model BF20, Model BF24 and Model BF28 footing forms. The spikes must be a minimum of 12 inches (305 mm) long, with a shank diameter of  $\frac{3}{8}$  inch (9.5 mm) and a head diameter of  $\frac{5}{8}$  inch (15.9 mm).

#### 4.3 Below-grade-level Installations:

For below-grade-level applications, the length of 6-inch-diameter (152 mm) construction tubes used with Model BF20 must be such that the combined height of the pier and footing does not exceed 8 feet (2438 mm), with a maximum aboveground concrete height of 3 feet (914 mm). The length of 8-inch-diameter (203 mm) construction tubes used with Model BF20 must be such that the combined height of the pier and footing does not exceed 9 feet (2743 mm), with a maximum aboveground concrete height of 4 feet (1219 mm). For Model BF24, the length of 8-inch-diameter (203 mm) construction tubes must be such that the combined height of the pier and footing does not exceed 9 feet (2743 mm), with a maximum aboveground concrete height of 4 feet (1219 mm). The length of the 10-inch-diameter (254 mm) construction tubes on Model BF24 must be such that the combined height of the pier and footing does not exceed 13 feet (3962 mm), with a maximum aboveground concrete height of 8 feet (2438 mm). For Model BF28, the length of 10- or 12-inch-diameter (254 or 305 mm) construction tubes must be such that the combined height of the pier and footing does not exceed 13 feet (3962 mm), with a maximum aboveground

concrete height of 8 feet (2438 mm). For Model BF36, the length of 12-, 14-, 16- or 18-inch-diameter (305, 356, 406 or 457 mm) construction tubes must be such that the combined height of the pier and footing does not exceed 13 feet (3962 mm), with a maximum aboveground concrete height of 8 feet (2438 mm).

The footing form must be placed on level, undisturbed soil or on 4 to 6 inches (102 to 152 mm) of compacted crushed stone or gravel. The footing form and construction tube must be aligned plum with bracing as shown in Figure 2. Backfill must be placed over the footing form to a minimum height of 2 feet (610 mm) above the bottom of the footing form, not to exceed 5 feet (1524 mm) from the bottom of the footing form, prior to concrete placement. The backfill must be of sufficient height to prevent movement of the footing form. Backfill must be clean and free of rocks and other deleterious materials. Any additional backfilling is completed after the concrete has been placed. The backfill must be placed in 8- to 12-inch (203 to 305 mm) lifts and compacted between each lift. The concrete must be placed in lifts that are 10 to 16 inches (254 to 406 mm) in height, with the concrete being consolidated after each lift.

### 5.0 CONDITIONS OF USE

The Bigfoot Systems® Footing Form described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The footing form system must be installed in accordance with this evaluation report and the manufacturer's published installation instructions. In the event of a conflict between the manufacturer's published installation instructions and this report, this report governs.
- 5.2 The footing and pier must be designed in accordance with the applicable code.
- 5.3 Special inspection must be provided in accordance with Section 1704 of the IBC, Section 1701 of the UBC, and Section 1705 of the BNBC, as applicable.

### 6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Plastic Footing Form Systems (AC292), dated February 2005.

### 7.0 IDENTIFICATION

Each Bigfoot System® Footing Form covered by this report must be labeled with the manufacturer's name (Bigfoot Systems Inc.), address and telephone number; the product trade name; and the evaluation report number (ESR-2148).

TABLE 1—DIAMETERS OF CONSTRUCTION TUBE AND BIGFOOT SYSTEMS® FORMS TOP FLANGE

CONSTRUCTION TUBE			BIGFOOT SYSTEMS FORM FLANGE DIAMETER (inches)
Nominal Diameter (inches)	Size	Inside Diameter (inches)	
6	Small	5.50	5.50
	Medium	6.02	6.02
	Large	6.48	6.48
8	Small	7.50	7.50
	Medium	8.02	8.02
	Large	8.42	8.42
10	Small	9.50	9.50
	Medium	10.02	10.02
	Large	10.42	10.42
12	Small	11.50	11.50
	Medium	12.02	12.02
	Large	12.42	12.42
14	—	14.00	14.00
16	—	16.01	16.01
18	—	18.00	18.00

For SI: 1 inch = 25.4 mm.

TABLE 2—BIGFOOT SYSTEMS INC. RECOMMENDED CONSTRUCTION TUBES

CONSTRUCTION TUBE COMPANY	CONSTRUCTION TUBE NAME <sup>1</sup>
Sonoco	Builder Tubes
Smurfit Stone Corp.	Standard Wall
Perma Tube Ltd.	Handiform, Redline, Blueline
Caraustar Industrial & Consumer Products Group	Kolumn Form™
Crown Fibre Tube Corp.	Econo Fibre Forms
Newark Paperboard Products	Redline, Heavy Wall
Mayers Fibre Tube & Core	Easy Pour, Light Wall

<sup>1</sup>Minimum acceptable name.

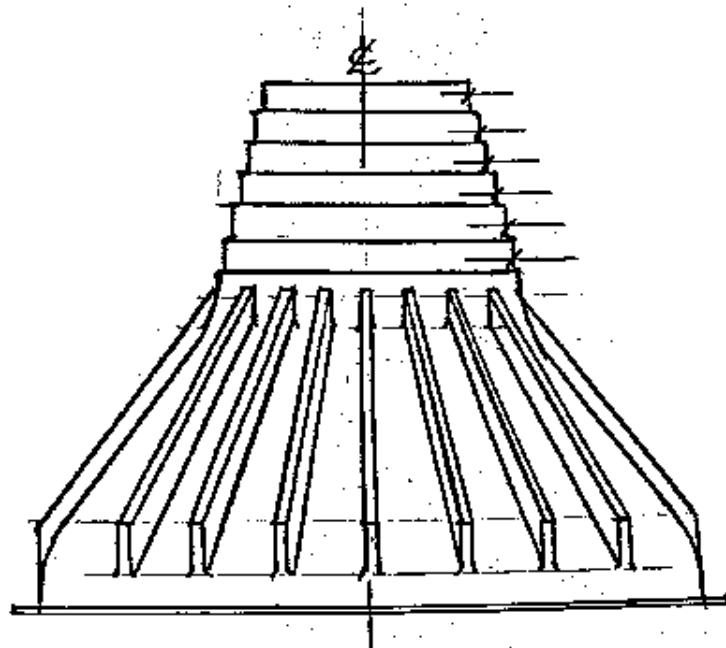
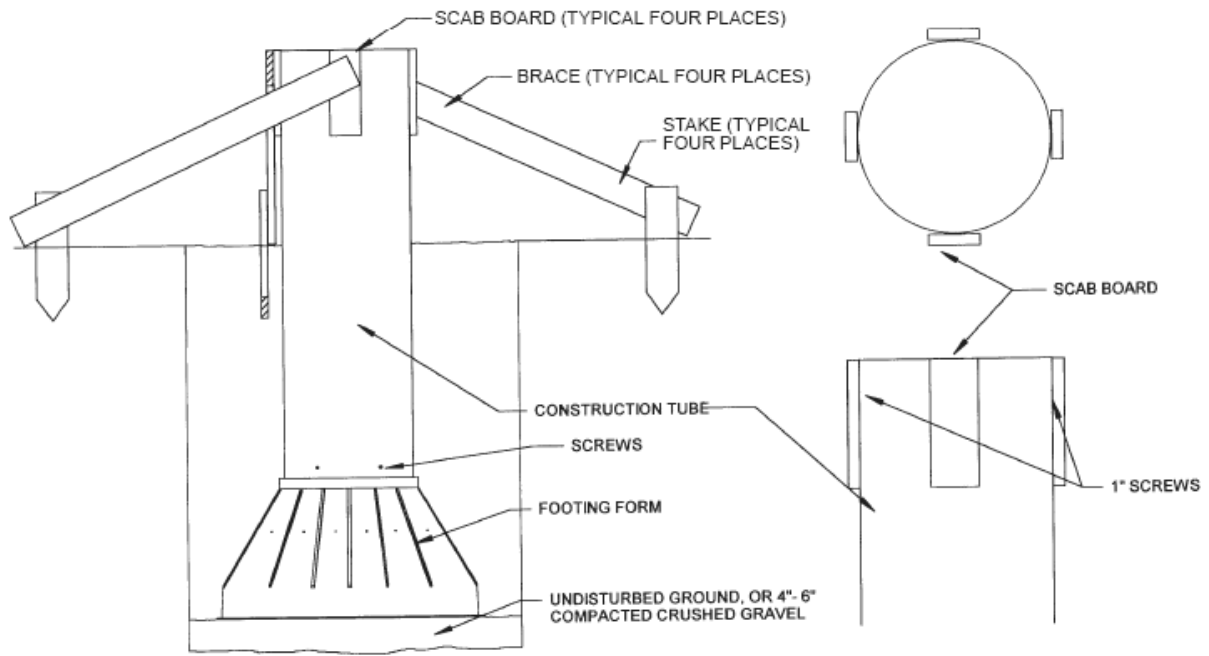


FIGURE 1—BIGFOOT SYSTEMS® FOOTING FORM



For SI: 1 inch = 25.4 mm.

FIGURE 2—TYPICAL BRACING DURING CONSTRUCTION