



Evaluation Report CCMC 12839-R

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BIGFOOT SYSTEMS®

1. Opinion

It is the opinion of the Canadian Construction Materials Centre (CCMC) that “BIGFOOT SYSTEMS®” when used as a casting product for concrete construction tube footings in accordance with the conditions and limitations stated in Section 3 of this Report, complies with the National Building Code 2005:

- Clause 1.2.1.1.(1)(b), Division A, as an alternative solution that achieves at least the minimum level of performance required by Division B in the areas defined by the objectives and functional statements attributed to the following applicable acceptable solutions:
 - Subsection 9.15.3. Footings

This opinion is based on CCMC's evaluation of the technical evidence in Section 4.1 provided by the Report Holder.

2. Description

“BIGFOOT SYSTEMS®” is an engineer–designed footing form made of light-weight, recycled, high-density polyethylene plastic that replaces the traditional wooden boxes. It is of bell-shaped construction, with an allowance for standard fibre construction tubes to be attached to its top. The product's footing forms come in four different models: BF20, BF24, BF28 and BF36. Model BF20 accepts 15-cm (6") and 20-cm (8") small, medium and large construction tubes. Model BF24 accepts 20-cm (8") and 25-cm (10") small, medium and large construction tubes. Model BF28 accepts 25-cm (10") and 30-cm (12") small, medium and large construction tubes. Model BF36 accepts 30-cm (12"), 35-cm (14"), 40-cm (16") and 45-cm (18") construction tubes.

Figure 1 indicates the shape of the product with generic dimensions. Table 1 provides specific dimensions for models BF20, BF24, BF28 and BF36. The top rings of the bell form are designed to accept construction tubes with various inside diameters. The side portion is ribbed to give added strength to resist distortion of the form from the backfill or poured concrete, and allows trapped air to escape. The sloped sides also have small vent holes to allow trapped air to escape when the footing is being poured with concrete, to prevent honeycombing of the concrete inside the form.

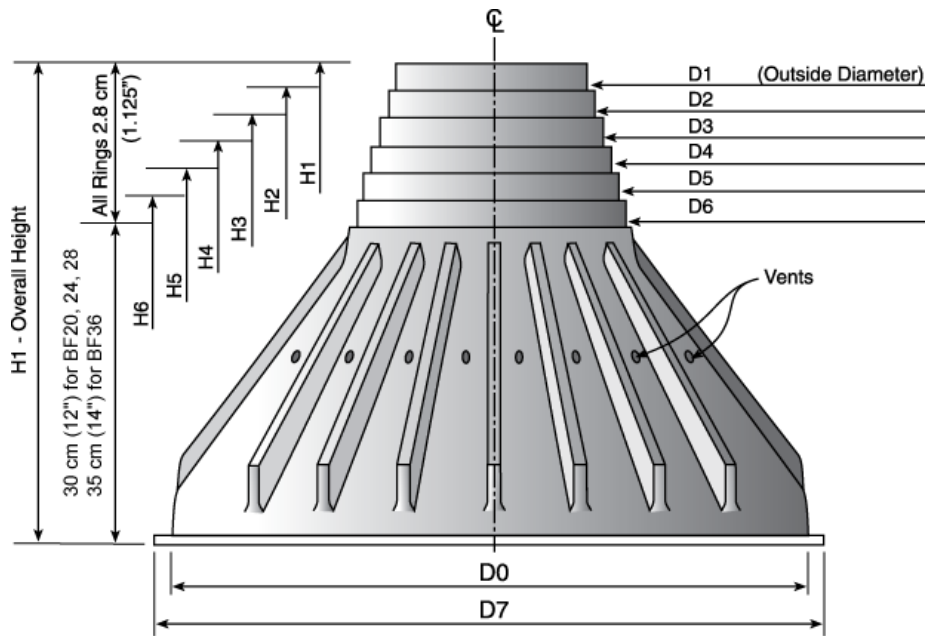


Figure 1. "BIGFOOT SYSTEMS®" footing form

Table 1. “BIGFOOT SYSTEMS®” Footing Form

Ring Diameter					Ring Height				
	BF20 cm (in.)	BF24 cm (in.)	BF28 cm (in.)	BF36 cm (in.)		BF20 cm (in.)	BF24 cm (in.)	BF28 cm (in.)	BF36 cm (in.)
D1	13.97 (5.50)	19.05 (7.50)	24.13 (9.50)	30.48 (12.00)	H1	39.37 (18.00)	47.63 (18.75)	47.63 (18.75)	58.42 (23.0)
D2	15.29 (6.02)	20.37 (8.02)	25.45 (10.02)	35.56 (14.00)	H2	43.18 (17.00)	44.77 (17.625)	44.77 (17.625)	52.07 (20.5)
D3	16.46 (6.48)	21.39 (8.42)	26.47 (10.42)	40.64 (16.00)	H3	40.64 (16.00)	41.91 (16.5)	41.91 (16.5)	45.72 (18.0)
D4	19.05 (7.50)	24.13 (9.50)	29.21 (11.50)	45.72 (18.00)	H4	38.10 (15.00)	39.05 (15.375)	39.05 (15.375)	39.37 (15.5)
D5	20.37 (8.02)	25.45 (10.02)	30.53 (12.02)	–	H5	35.56 (14.00)	36.20 (14.25)	36.20 (14.25)	–
D6	21.39 (8.42)	26.47 (10.42)	31.55 (12.42)	–	H6	32.02 (13.00)	33.34 (13.125)	33.34 (13.125)	–
D7	54.61 (21.50)	64.01 (25.20)	75.18 (29.60)	92.42 (36.40)	Wall Thick- ness	0.239 (0.094)	0.239 (0.094)	0.239 (0.094)	0.47625 (0.200)
D0	50.80 (20.00)	60.96 (24.00)	71.12 (28.00)	91.44 (36.00)	–	–	–	–	–

3. Conditions and Limitations

CCMC's compliance opinion in Section 1 is bound by the “BIGFOOT SYSTEMS®” being used in accordance with the conditions and limitations set out below.

- The product may be used as a casting for concrete footings for applications such as cottages, gazebos, storage sheds, sunrooms, screen rooms, additions, pole barns, carports, verandahs, raised decks, gate posts, front porches, jack posts, fence posts, permanent and portable signs, wharves, moorings, capitals for columns, footings for mobile homes, satellite dishes and telecommunication towers. The product can also be used as a funnel for pouring.
- For applications beyond this scope, footing size and spacing will have to be carried out by a registered professional engineer skilled in such design and licensed to practice under the appropriate provincial or territorial legislation.
- Excess rings should be cut off at the top of the ring being used and should be removed.
- For below-grade applications, the product must be placed on undisturbed ground or on 100 mm to 150 mm of compacted crushed stone, and then backfilled according to the suggested depth before pouring concrete so as to prevent the footing from rising when concrete is being poured.

- For above-grade applications, the product must be anchored to the ground with 30-cm (12-in.) spikes driven in at a 45° angle. Drill 10-mm holes on a 45° angle in the product as indicated by the markings on the flange area at each rib location to accommodate the spikes.
- The construction tube must be screwed to the footing with four 25-mm (1-in.) screws, except for the BF36, which requires eight 25-mm (1-in.) screws.
- The hole must be backfilled according to the suggested depths before pouring concrete.
- For additional stability after the concrete has been poured, three to four number 4 or 5 rebar rods may be placed in the centre of the construction tube, down to the bottom of the footing form, ensuring not to strike the sides of the product.
- Concrete must be designed, mixed, placed, cured and tested in accordance with CAN/CSA-A438-M84, “Concrete Construction for Housing and Small Buildings.” Concrete shall have not less than 20.7-MPa (3000 psi) compressive strength at 28 days and consist of not more than 19-mm aggregate. Concrete shall be placed in 25-cm to 40-cm lifts (maximum 40.6 cm) with number 4 or number 5 rebar rods thrust 10 to 12 times per concrete lift. Rods should be in the centre and not around the perimeter. Stripping of the forms is not necessary with the “BIGFOOT SYSTEMS®” footing form.
- For most applications, the product may be installed according to Figure 2.

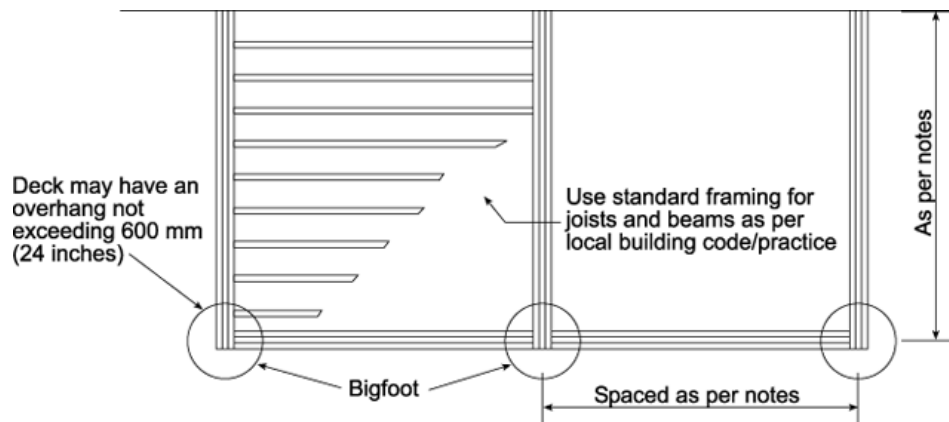


Figure 2. Spacing of “BIGFOOT SYSTEMS®” for decks

Notes to Figure 2:

- (1) The allowable loads shall meet or exceed the requirements of Article 9.4.4.1., Allowable Bearing Pressures, of Division B of the NBC 2005.
 - (2) Gravity loads include only dead loads (weight of construction materials) and service loads, such as snow loads and rain loads.
 - (3) Piers requiring design for earthquake loads shall be designed by a professional engineer.
 - (4) “BIGFOOT SYSTEMS®” footing form is not intended as a substitute foundation system for the full foundations commonly used under residential housing, unless it has been designed for this application by a qualified professional engineer.
 - (5) Framing shall be in accordance with local building codes and regulations.
 - (6) Maximum spacing for BF20, BF24 and BF28 is 1.5 m (5'), 2.2 m (7') and 3.0 m (9'10") respectively.
- The product must be installed according to the manufacturer's instructions.

4. Technical Evidence

CCMC's Technical Guide for "BIGFOOT SYSTEMS®" sets out the nature of the technical evidence required by CCMC to enable it to evaluate a product as an acceptable or alternative solution in compliance with the NBC 2005. The Report Holder has submitted test results for CCMC's evaluation. Testing was conducted at independent laboratories recognized by CCMC. The corresponding test results for "BIGFOOT SYSTEMS®" are summarized below.

4.1 NBC 2005 Compliance Data for "BIGFOOT SYSTEMS®" on which CCMC Based its Opinion in Section 1

4.1.1 General

Table 4.1.1 Stability test results for the "BIGFOOT SYSTEMS®"

Tests	Requirements	Results
Buoyancy	The top of each construction tube shall remain within 10 mm (both horizontally and vertically) of its original position.	The top of the construction tube remained stationary during the test with no measurable movement.
Compression of the unit walls after backfilling	The sloping sides of the footing base shall not be deformed by more than 10 mm after backfilling.	The units completely filled with concrete and maintained their original shape. There was no appreciable change in dimensions.
Air pockets and honeycombing	There shall be no air pockets or honeycombing in any of the products tested.	Well-consolidated concrete with no voids or honeycombing.

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