



Evaluation Report CCMC 12839-R BIGFOOT SYSTEMS®

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1. Opinion

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

National Building Code (NBC) of Canada 2015:

- Clause 1.2.1.1.(1)(b) of 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

Ontario Building Code 2012:

- 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

British Columbia Building Code 2012:

- 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 provided by the Report Holder.

2. Description

The product is an engineer-designed footing form made of lightweight, recycled, high-density polyethylene plastic that replaces traditional wooden boxes. The product is bell-shaped, which allows 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 in.) and 20-cm (8 in.) small, medium and large construction tubes.
- Model BF24 accepts 20-cm (8 in.) and 25-cm (10 in.) small, medium and large construction tubes.
- Model BF28 accepts 25-cm (10 in.) and 30-cm (12 in.) small, medium and large construction tubes.
- Model BF36 accepts 30-cm (12 in.), 35-cm (14 in.), 40-cm (16 in.) and 45-cm (18 in.) construction tubes.

Figure 1 illustrates the shape of the product with generic dimensions. Table 2.1 provides specific dimensions for each model. 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.

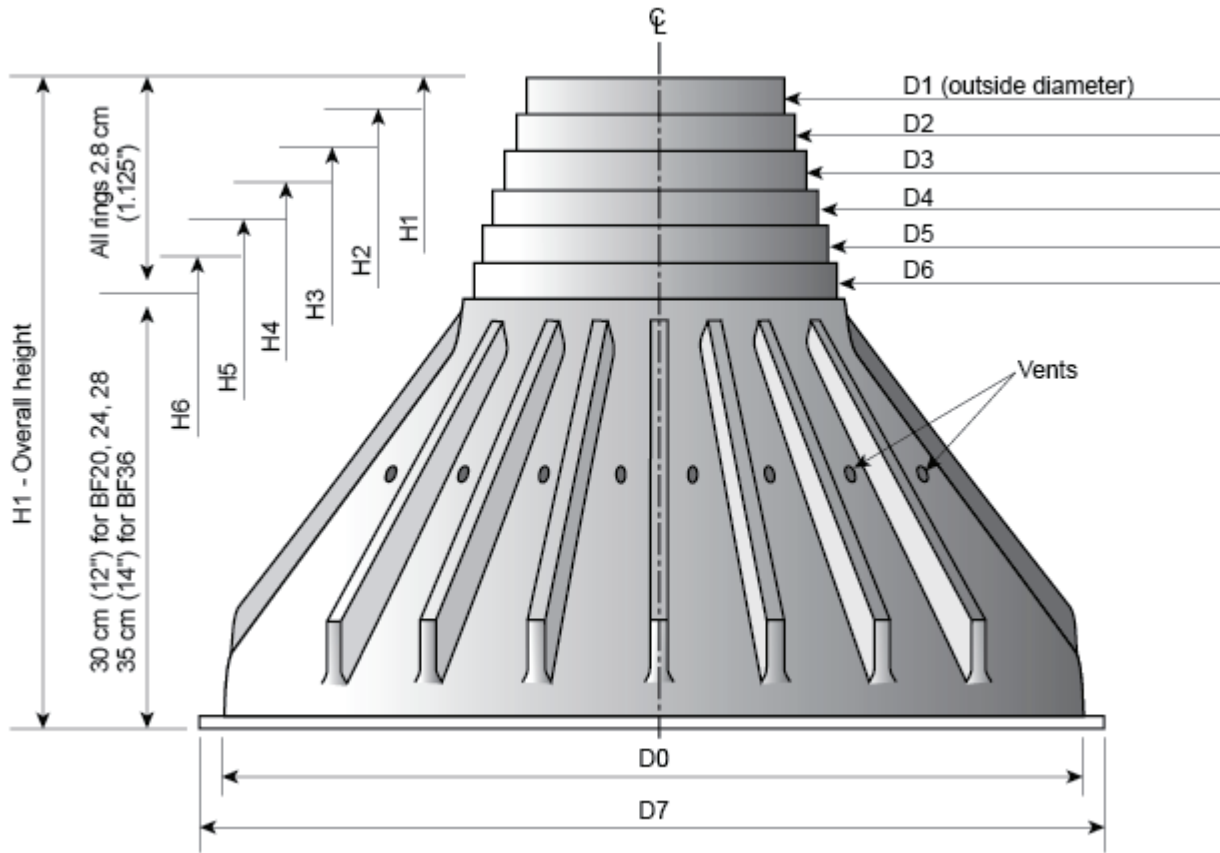


Figure 1. Footing form of the product

Table 2.1 Dimensions of the Product

Ring Diameter	BF20 cm (in.)	BF24 cm (in.)	BF28 cm (in.)	BF36 cm (in.)	Ring Height	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 thickness	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 in applications such as cottages, gazebos, storage sheds, sunrooms, screen rooms, additions, pole barns, carports, verandas, 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 the scope of this Report, 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 in order 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 #4 or #5 rebars 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 CSA A23.1, “Concrete Materials and Methods of Concrete Construction.” Concrete must have a minimum compressive strength of 20.7 MPa (3 000 psi) at 28 days and consist of not more than 19-mm aggregate. Concrete must be placed in 25-cm to 40-cm lifts (maximum 40.6 cm) with #4 or #5 rebars 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 proposed footing form.
- For most applications, the product may be installed according to Table 3.1.

Table 3.1 Allowable Bearing Pressures and Loads for “The BIGFOOT SYSTEMS Tube”

Soil Type	Maximum Allowable Bearing Pressure psf (kPa)	Model BF20 Allowable Loads lbs (kN)	Model BF24 Allowable Loads lbs (kN)	Model BF28 Allowable Loads lbs (kN)	Model BF36 Allowable Loads lbs (kN)
Soft clay	835.42 (40.0)	1 822.59 (8.1)	2 624.54 (11.7)	3 572.29 (15.9)	5 905.21 (26.3)
Loose sand or gravel	1 044.27 (50.0)	2 278.24 (10.1)	3 280.67 (14.6)	4 465.36 (19.9)	7 381.51 (32.8)
Firm clay	1 566.41 (75.0)	3 417.37 (15.2)	4 921.01 (21.9)	6 698.04 (29.8)	11 072.26 (49.3)
Dense or compact silt	2 088.54 (100.0)	4 556.49 (20.3)	6 561.34 (29.2)	8 930.71 (39.7)	14 763.02 (65.7)
Dense or compact sand or	3 132.81 (150.0)	6 834.73 (30.4)	9 842.01 (43.8)	13 396.07 (59.6)	22 144.53 (98.5)
Stiff clay	3 132.81 (150.0)	6 834.73 (30.4)	9 842.01 (43.8)	13 396.07 (59.6)	22 144.53 (98.5)
Till	4 177.08 (200.0)	9 112.97 (40.5)	13 122.68 (58.4)	17 861.43 (79.5)	29 526.04 (131.3)
Clay shale	6 265.62 (300.0)	13 669.46 (60.8)	19 684.02 (87.6)	26 792.14 (119.2)	4 4289.06 (197.0)
Sound rock	10 442.70 (500.0)	22 782.44 (101.3)	32 806.71 (145.9)	44 653.57 (198.6)	73 815.09 (328.3)

- The product must be installed according to the manufacturer's instructions.

4. Technical Evidence

The Report Holder has submitted technical documentation for CCMC's evaluation. Testing was conducted at laboratories recognized by CCMC. The corresponding technical evidence for this product is summarized below.

4.1 General

Table 4.1 Results of Testing of Stability Properties for the Product

Test	Requirement	Result
Buoyancy	The top of each construction tube must 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 unit walls after backfilling	The sloping sides of the footing base must 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 must be no air pockets or honeycombing in any of the products tested.	Well-consolidated concrete with no voids or honeycombing.

Report Holder

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