

REDIBASE FOOTING FORM REVIEW

Date: August 18, 2011

No. of Pages: 4+2

Project: Redibase Footing Form

Project. No.: TE-19628-11

Client: Redibase Inc.

Dist.: Morris Croghan

Redibase Inc.

redibase.form@sympatico.ca

Background:

Tacoma Engineers was retained by Redibase Inc. to complete a review of the Redibase Construction Tube Footing Form. The purpose of this review is to determine the maximum Redibase footing spacing based on allowable bearing pressures set out in the Ontario Building Code 2006. This report is valid for support of residential floors and roofs.

Description:

The Redibase Construction Tube Footing Form is a tapered pedestal type circular footing form. The minimum footing thickness is 5 ½" sloping to a maximum thickness of 9". The circular base is 22 ½" in diameter and the top of the footing accepts 8", 10" or 12" diameter pier forms.

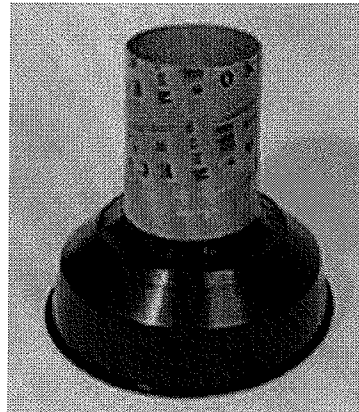


Photo 1: Redibase Construction Tube Footing Form with Pier Form Installed.

Comments:

The unfactored design loads used in the review include:

1. Deck Live Load = 1.9 kPa (40 psf)
2. Deck Dead Load = 0.4 kPa (8 psf)
3. Roof Snow Load = $S_s(C_b) + S_r$
Table 3: 2.0 kPa(0.55) + 0.4 kPa = 1.5 kPa
Table 4: 3.0 kPa(0.55) + 0.4 kPa = 2.1 kPa
Table 5: 4.0 kPa(0.55) + 0.4 kPa = 2.6 kPa
4. Roof Dead Load = 0.6 kPa (12.5 psf)

The following assumptions were made:

1. Footing shall support gravity loads only
2. Concrete strength $f'_c = 20$ MPa at 28 days
3. Underside of footing shall be located 4'-0" minimum below grade or as required by local By-laws

Table 1 outlines different types and conditions of soils and the respective maximum bearing pressures. Soil types are assumed to be representative of soils underlying the footing. The table has been copied from O.B.C. 2006 Table 9.4.4.1.

Table 1: Allowable Bearing Pressure: (kPa)

Type and Condition of Soil	Maximum Allowable Bearing Pressure (kPa)
Dense or compact sand or gravel	150
Stiff clay	150
Dense or compact silt	100
Firm clay	75
Loose sand or gravel	50
Soft clay	40

Reference has been made to J.W. Welder and Associates Ltd. test report dated January 7, 1999. This report indicates the allowable working load for the Redibase form system to be 44.8 kN. (See attached test report)

Table 2 provides the maximum Redibase construction tube footing form spacing based on varying widths of supported floor and the allowable bearing pressures.

Table 2: Maximum Redibase Form Construction Tube Footing Spacing:

Width of Floor Supported	Allowable Soil Bearing Pressure kPa (psf)			
	150 (3000)	100 (2000)	75 (1500)	50 (1000)
3.0 m (9'-10")	4.4 m (14'-5")	2.9 m (9'-6")	2.2 m (7'-3")	1.5 m (4'-11")
4.0 m (13'-2")	3.3 m (10'-10")	2.2 m (7'-3")	1.6 m (5'-3")	1.1 m (3'-7")
5.0 m (16'-5")	2.6 m (8'-6")	1.8 m (5'-11")	1.3 m (4'-3")	0.9 m (2'-11")
6.0 m (19'-8")	2.2 m (7'-3")	1.5 m (4'-11")	1.1 m (3'-7")	0.7 m (2'-4")

Table 3 through Table 5 provide the maximum Redibase construction tube footing form spacing based on varying widths of supported floor, 4.5 m of supported roof and the allowable bearing pressures.

Table 3: Maximum Redibase Form Construction Tube Footing Spacing With Ground Snow Load $S_s = 2.0$ kPa.

Width of Floor Supported	Allowable Soil Bearing Pressure kPa (psf)			
	150 (3000)	100 (2000)	75 (1500)	50 (1000)
3.0 m (9'-10")	2.3 m (7'-7")	1.5 m (4'-11")	1.1 m (3'-7")	0.8 m (2'-7")
4.0 m (13'-2")	2.0 m (6'-7")	1.3 m (4'-3")	1.0 m (3'-4")	-
5.0 m (16'-5")	1.8 m (5'-11")	1.2 m (3'-11")	0.9 m (2'-11")	-
6.0 m (19'-8")	1.6 m (5'-3")	1.1 m (3'-7")	0.8 m (2'-7")	-

Table 4: Maximum Redibase Form Construction Tube Footing Spacing With Ground Snow Load $S_s = 3.0$ kPa.

Width of Floor Supported	Allowable Soil Bearing Pressure kPa (psf)			
	150 (3000)	100 (2000)	75 (1500)	50 (1000)
3.0 m (9'-10")	1.8 m (5'-11")	1.2 m (3'-11")	0.9 m (2'-11")	-
4.0 m (13'-2")	1.6 m (5'-3")	1.1 m (3'-7")	0.8 m (2'-7")	-
5.0 m (16'-5")	1.5 m (4'-11")	1.0 m (3'-4")	-	-
6.0 m (19'-8")	1.4 m (4'-7")	0.9 m (2'-11")	-	-

Table 5: Maximum Redibase Form Construction Tube Footing Spacing With Ground Snow Load $S_s = 4.0$ kPa.

Width of Floor Supported	Allowable Soil Bearing Pressure kPa (psf)			
	150 (3000)	100 (2000)	75 (1500)	50 (1000)
3.0 m (9'-10")	1.5 m (4'-11")	1.0 m (3'-4")	-	-
4.0 m (13'-2")	1.4 m (4'-7")	0.9 m (2'-11")	-	-
5.0 m (16'-5")	1.3 m (4'-3")	0.8 m (2'-7")	-	-
6.0 m (19'-8")	1.2 m (3'-11")	-	-	-

Please contact the undersigned with any questions regarding the information provided in this report.

Per:



D. Tyler Griffith, B.A.Sc., E.I.T.
 Tacoma Engineers Inc.

Encl.:

J.W. Wedler & Associates Ltd. Test Report (2 pages)





TEST REPORT

Date: January 7, 1999

Reference No: C6-1734

To: Robert Delmas Design and Drafting Service

Re: Redibase Foundation Forms - Load Test

Test Significance: The Redibase is a moulded plastic form, 22.5 inches (0.57 metres) in diameter, designed to act as a form for poured in-place concrete foundation pads for small structures. The Redibase form is typically placed on the foundation soil and a concentric pier is extended vertically from the base using a circular cardboard form tube 6 inches or 10 inches (250mm or 250mm) in diameter. The concrete within the completed form is generally unreinforced, although vertical reinforcing and anchor bolts can be placed within the stem.

Verification of the load-carrying capability of a typical unreinforced, hardened concrete foundation, cast within a Redibase form, was requested.

Test Procedure: Two prefabricated Redibase pad/piers were tested using a hydraulic prestressing jack to provide a concentric load. The base of each pad was supported on a grillage of 2 layers of 2 inch (nominal) lumber, and the load was applied to the top of the stems through a 1 inch (nominal) lumber shim under a 3/4 inch thick steel plate. Concrete having a nominal 28-day concrete strength of 20 MPa was used for the test samples.

Test Results: A total load of 112 kN (25,170 lb) was applied in approximately 10 kN (2,250 lb) increments to each pier. No cracking, or other indications of failure of the concrete was apparent. Testing was discontinued at the safe working limit of the test apparatus.

Conclusions: The test loads indicated an ultimate load capacity not less than 112 kN. Allowing for a material resistance factor of 0.60 and an ultimate load factor of 1.5, the safe working load = $112 \times 0.60 / 1.5 = 44.8 \text{ kN}$ (10,000 lb) (5.00 tons)

Or, Allowable Bearing Pressure = 175 kPa (3,600 psf) (1.8 tsf)

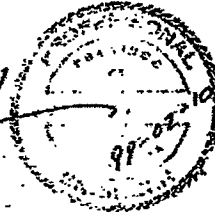
Under the B.C. Building Code, the normal requirement for Allowable Bearing Pressure for foundations not specifically designed is for a minimum capacity of 60 kPa (1,200 lb/sq ft) (0.6 tons/sq ft) and Table 9.4.4.1 of the Canadian Building Code sets out other Allowable Bearing Pressures for different types of soils.

Yours truly,

J. W. Wedler & Associates Ltd.

Per:

A. Kirkness, P.Eng.





Test Certificate

This is to Certify that

Redibase Construction Tube Footing

Was tested under our supervision and performed satisfactorily, as
set out in J.W. Wedler & Associates Ltd Test Report dated
January 7th, 1999, Reference No. C8-1734.

February 10, 1999

Signed  A.J. Kirkness, P.Eng.

