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Legacy report on the BOCA® National Building Code/1999

DIVISION: 06—WOOD AND PLASTICS

Section: 06500—Structural Plastics

EVALUATION SUBJECT:

POLY-CLASSIC® FRP COLUMNS

REPORT HOLDER:

CASCADE OHIO, INC. dba CW OHIO, INC.
1209 MAPLE AVENUE
CONNEAUT, OHIO 44030

EVALUATION SCOPE

Compliance with the following code:

BOCA® National Building Code/1999

Section 1604.1 Safe support required

Section 2203.1 General

1.0 DESCRIPTION OF EVALUATION

This report evaluates rotocast fiberglass reinforced polymer columns as structural columns supporting vertical concentric and eccentric compression loads.

2.0 DESCRIPTION AND USE OF PRODUCT

2.1 GENERAL DESCRIPTION

Poly-Classic® FRP Columns are available in fluted and non-fluted round, tapered shafts in sizes ranging from 6 inches (152 mm) to 24 inches (460 mm) in diameter with lengths ranging from 8 feet (2.44 m) to 24 feet (7.32 m), in round non-tapered columns from 8 inches (203 mm) to 14 inches (356 mm) in diameter ranging from 10 feet (3.05 m) to 14 feet (4.27 m) long, and in square, non-tapered columns from 6 inches (152 mm) to 12 inches (305 mm) square ranging from 8 feet (2.44 m) to 16 feet (4.88 m) long. The columns are of a single piece construction and are trimmed with either a Tuscan Cap and Base or with an optional Attic Base installed around the column (see manufacturer's literature for examples of cap and optional base). Structural load bearing columns are limited to the size and dimensions shown in Tables 1. Non-load-bearing columns are permitted in any size and length produced.

2.2 USE AND APPLICATION

Poly-Classic® FRP Columns are used as exterior and interior columns, both load-bearing and non-load-bearing, in buildings of combustible construction.

2.2.1 Structural

The Poly-Classic® FRP Columns are capable of supporting the respective concentric and eccentric axial loads provided in Table 1 of this report. Allowable design capacities for the structural columns are based upon proper installation as described in the manufacturer's published installation instructions and this report. For the concentric loads shown in Table 1 of this report, the column shall be installed with a bearing top plate that symmetrically distributes the load across the entire cross-section of the column. Where the eccentric loading values shown in Table 1 of this report are utilized, the beam shall bear directly on both walls of the column with a maximum offset of "e" as shown in the table. The base of the column shall bear entirely on a flat surface that provides suitable anchorage for the column and is capable of transferring all loads to the foundation. Where the installation instructions differ from this report, the performance of the structural column is outside the scope of this report. Non-structural columns shall be installed in accordance with the manufacturer's published installation instructions.

2.2.2 Surface-Burning Characteristics

The Poly-Classic® FRP Columns with a minimum thickness of $\frac{3}{8}$ inch (9.5 mm) have a flame spread index of less than 25 and a smoke-developed index of less than 450.

3.0 CONDITIONS OF USE

This report is limited to the applications and products as stated in this report. The ICC-ES Subcommittee on National Codes intends that the report be used by the code official to determine that the report subject complies with the code requirements specifically addressed, provided that this product is installed in accordance with the following conditions:

3.1 Allowable design capacities for the Poly-Classic® FRP Columns are based upon installation as described in the manufacturers published installation instructions and this report. Where the installation instructions differ from this report, the performance of the structural column is outside the scope of this report. Non-structural columns shall be installed in accordance with the manufacturer's published installation instructions.

3.2 Permit applications specifying the Poly-Classic® FRP Columns shall be accompanied by structural calculations which indicate that the concentric or eccentric axial applied load exerted on the columns is less than or equal to the allowable axial capacity specified in Table 1 of this report. The individual preparing such

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documents shall be competent and qualified in the application of the structural design principles involved, and shall possess the registration or license in accordance with the professional registration laws of the state in which the project is constructed.

- 3.3 Poly-Classic® FRP Columns have not been evaluated for decay resistance. The ability of this product to resist decay is outside the scope of this report.
- 3.4 Design loads shall be determined using Chapter 16 of BOCA® *National Building Code/1999*. The columns have been evaluated for gravity loads only. Other loads, such as lateral loads, applied in shear to the column are outside the scope of this evaluation report.
- 3.5 Loads for a given column length shall not exceed the allowable design loads given in Table 1 of this report.
- 3.5 The maximum amount of eccentricity for an axial applied load is limited to the values shown in Table 1 of this report. Eccentricities larger than this are outside the scope of this report.
- 3.7 Installations of Poly-Classic® FRP Columns, which will be directly exposed to the weather, shall receive an additional coat of paint, enamel or other approved protective coatings.
- 3.8 The Poly-Classic® FRP Columns shall be limited to use with buildings of Type 5 construction which do not exceed three stories or 40 feet in height.
- 3.9 Special Inspections of the structural column installation shall be provided for columns used other than in Use Group R-3 buildings. The inspections shall be conducted by a special inspector provided by the owner of the building under construction. The special inspector shall be qualified to perform the inspections and approved by the code official. The inspections shall be of a nature, and conducted at such frequency, as is necessary to ensure the Poly-Classic® FRP Columns compliance with the requirements of Code Section 1705.1.2 of the BOCA® *National Building Code/1999*.
- 3.10 This report is subject to periodic re-examination. For information on the current status of this report, contact the ICC-ES.

4.0 INFORMATION SUBMITTED

- 4.1 A Southwest Research Institute report titled, *Investigation of the Surface Burning Characteristics of a 0.375 Inch Thick Polyester Resin Column Castings, Tested over 1.0 inch wide Flat Metal Bars Every 24 Inches*, Report No. 01.04913.01.154a, dated March 4, 2002.
- 4.2 Architectural Testing, Inc. Report No. 01-43277.02, dated November 10, 2003, titled *Performance Test Report*, and contains test results establishing the effects on the flexural strength of the columns as a result of extreme temperature ranges and 2000 hours of accelerated weathering.
- 4.3 Metals & Materials Engineer Test Report No. 12262 for CW Ohio, titled *Report of Fiberglass Column Characterization for Accreditation Through the ICC*, dated November 28, 2003 containing various testing for Freeze-Thaw resistance and Fastener Withdrawal.
- 4.4 American Testing Laboratory, Inc. Test Report titled *Load Testing of Columns*, dated June 3, 2003, containing axial load compression test results.

- 4.5 Cerny & Ivey Engineers, Inc. Test Report titled *Concentric Compression Testing Round Composite Columns*, Report No. 23397-2, dated December 3, 2003.
- 4.6 Cerny & Ivey Engineers, Inc. Test Report titled *Eccentric Compression Testing Round Composite Columns*, Report No. 23397-1, dated December 3, 2003.
- 4.7 CW Ohio, Inc. Quality Control Manual with revision date February 24, 2004.
- 4.8 Signed third-party testing agreement between CW Ohio and Intertek Test Services NA, Ltd. (Warnock Hersey) dated January 20, 2004, effective April 5, 2004.

5.0 INFORMATION REQUIRED ON CONSTRUCTION DOCUMENTS

To aid in the use of this report, the following represents the minimum level of information to be reflected on construction documents in order to determine compliance with this report.

- 5.1 The language, "See ICC-ES Legacy Report No. 22-26."
- 5.2 All permit applications utilizing Poly-Classic® FRP Columns shall be accompanied by structural calculations performed by a registered design professional. The calculations shall include, but not be limited to, the following:
 - 5.2.1 The applied loads imposed upon the column by the components it supports.
 - 5.2.2 The ability of the Poly-Classic® FRP Columns to sustain the applied loads consistent with Table 1 of this report.
 - 5.2.3 The ability of all connections between the column and the components framing into it to properly bear on the Poly-Classic® FRP Columns and transfer all the imposed applied loads from the components supported by the column to the column, and from the column to its supporting footing.
 - 5.2.4 The design of the footing which will support the Poly-Classic® FRP Columns.
- 5.3 Satisfactory evidence that the Poly-Classic® FRP Columns have been installed with the appropriate special inspection described in Section 3.9 of this report.
- 5.3 The manufacturer shall provide the user of this report with complete instructions on the proper installation of Poly-Classic® FRP Columns.

6.0 PRODUCT IDENTIFICATION

All Poly-Classic® FRP Columns manufactured in accordance with this report or the column packaging shall be labeled at the plant with the manufacturer's name and/or trademark, the product identification, the and the identifying language "See ICC-ES Legacy Report No. 22-26." Additionally, each Poly-Classic® FRP Column or column packaging shall have a permanent label containing the mark of the third-party inspection agency, Intertek Testing Services NA, Ltd (Warnock Hersey).

TABLE 1—ALLOWABLE LOADS POLY-CLASSIC COLUMNS

Columns Type and Nominal Size (in) ¹	Maximum Lenth (ft-in)	Allowable Load (lbf) Concentric ²	Eccentric Loadings	
			Maximum "e" (in) ³	Allowable Load (lbf)
6 - Round	8 - 0	6000	$\frac{3}{4}$	6000
8 - Round	10 - 0	10000	$1\frac{5}{8}$	6600
10 - Round	12 - 0	14000	$2\frac{5}{8}$	10720
12 - Round	16 - 0	18000	$3\frac{3}{8}$	13200
14 - Round	16 - 0	20000	4	11520
16 - Round	20 - 0	20000	$4\frac{1}{4}$	13200
18 - Round	24 - 0	20000	$4\frac{1}{4}$	9040
20 - Round	20 - 0	20000	$4\frac{1}{4}$	18960
24 - Round	20 - 0	20000	$4\frac{1}{4}$	13200
8 - Round non-tapered	10 - 0	10000	$2\frac{1}{8}$	8240
10 - Round non-tapered	10 - 0	14000	3	11520
12 - Round non-tapered	12 - 0	18000	$4\frac{1}{8}$	11520
14 - Round non-tapered	14 - 0	20000	5	18120
6 × 6 Square	10 - 0	6000	$1\frac{1}{4}$	6000
8 × 8 Square	10 - 0	10000	$2\frac{1}{4}$	10000
10 × 10 Square	10 - 0	12800	$3\frac{1}{4}$	12800
12 × 12 Square	16 - 0	18000	$4\frac{1}{4}$	17320

SI Units: 1 inch = 25mm; 1 lbf = 4.45 N

Notes to Table 1:

1. Round columns include plain and fluted.
2. For the concentric loads, the column shall be installed with a bearing top plate which symmetrically distributes the load across the entire cross-section of the column.
3. Maximum "e" (in) is eccentricity measured from the centerline of the top of the column. The eccentric load simulated a nominal 4-inch (102 mm) wide wood beam ($3\frac{1}{2}$ -inch (89 mm) actual width) bearing on a top plate offset at the top end.