

# ICC-ES Evaluation Report

**ESR-4238**

Issued April 2019

Revised July 2019

*This report is subject to renewal April 2020.*

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**DIVISION: 03 00 00—CONCRETE**  
**Section: 03 48 00—Precast Concrete Specialties**

**DIVISION: 31 00 00—EARTHWORK**  
**Section: 31 60 00—Special Foundations and Load-Bearing Elements**

**REPORT HOLDER:**

PERMA-COLUMN, LLC

**LISTEES:**

MIDWEST PERMA-COLUMN, INC.

PERMA COLUMN EAST, LLC

TRI STATE PERMA-COLUMN

**EVALUATION SUBJECT:**

PERMA-COLUMN: PC6300, PC6400, PC6600, PC8300, PC8400, PC8500

**1.0 EVALUATION SCOPE**

**Compliance with the following codes:**

- 2018 and 2015 *International Building Code*® (IBC)
- 2018 and 2015 *International Residential Code*® (IRC)

**Property evaluated:**

- Structural

**2.0 USES**

Perma-Column columns described in this report are used as embedded pre-cast concrete foundations for vertical wood posts or laminated wood columns supporting post frame buildings.

**3.0 DESCRIPTION**

**3.1 General:**

The Perma-Column columns are factory manufactured precast reinforced concrete columns with a steel “U” shaped bracket on the top for attachment to a wood post or laminated wood column. The column protrudes above finish grade, to allow for the attachment of a wood post or laminated wood column. See Figure 1 for an illustration of a typical Perma-Column column.

**3.2 Materials:**

**3.2.1 Concrete:** The concrete used for the Perma-Column column complies with the requirements shown in Table 19.3.2.1 of ACI 318 for exposure classes F2 and C1, defined in Table 19.3.1.1 of ACI 318. The concrete has a minimum compressive strength ( $f'_c$ ) of 10,000 psi (70 MPa) at 28 days.

**3.2.2 Reinforcement:** The concrete reinforcement used in the Perma-Column column is No. 4 or No. 5 ASTM A706 Grade 60 deformed rebar.

**3.2.3 Bracket:** The Perma-Column column bracket is manufactured from  $\frac{1}{4}$  inch (6 mm) thick steel complying with ASTM A1018 SS Grade 40. The bracket has nominal dimensions equal to the concrete portion of the column it is mated with. The legs of the bracket are 13 inches (330 mm) or 18 inches (457 mm) long with pre-drilled holes for the placement of fasteners. The bracket is powder coated with an epoxy coating.

**4.0 DESIGN AND INSTALLATION**

Perma-Column columns must be installed in accordance with Perma-Column’s published installation instructions, the applicable code, the approved plans, and this report. If there is a conflict between the plans submitted for approval and this report, this report governs.

The Perma-Column columns must be placed directly into the ground with the end protruding above finish grade no more than 12 inches (305 mm), and the hole must be backfilled. See Tables 1 and 2, and Figure 1 of this report for columns sizes, and design information.

A maximum of four  $\frac{3}{16}$  inch (4.8 mm) diameter holes,  $1\frac{1}{4}$  inches (32 mm) deep may be post installed into the concrete portion of the Perma-Column column protruding from the ground. A minimum edge distance of  $1\frac{1}{2}$  inches (38 mm) must be provided, and the holes must be spaced at least  $2\frac{1}{2}$  inches (64 mm) apart.

**5.0 CONDITIONS OF USE**

The Perma-Column columns described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** The columns must be installed in accordance with the applicable code, the approved plans and this report.
- 5.2** Complete plans and calculations demonstrating compliance with this report must be submitted to the

code official for approval when required. The calculations and details must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

- 5.3 The interaction between the soil and the Perma-Column column and the connection between the support column and the Perma-Column column are outside the scope of this report and must be justified to the satisfaction of the code official.
- 5.4 Use of Perma-Column columns with chemically-treated wood is outside the scope of this report.
- 5.5 Other than as noted in Section 4.0, the Perma-Column columns must not be field modified (e.g. cut, drilled, torched, etc.) in any way.

**6.0 EVIDENCE SUBMITTED**

- 6.1 Manufacturer’s descriptive literature and installation instructions.
- 6.2 Engineering calculations in accordance with ACI 318 and AISC 360.
- 6.3 Quality documentation in accordance with ICC-ES Acceptance Criteria for Quality Documentation (AC10), dated January 2018.

**7.0 IDENTIFICATION**

- 7.1 The precast columns bear the name of the report holder (Perma-Column, LLC) and listee (Midwest Perma-Column, Inc., Perma Column East, LLC, or Tri State Perma-Column), Model ID, date of manufacture, and the evaluation report number (ESR-4238).

- 7.2 The report holder’s contact information is the following:

**PERMA-COLUMN, LLC**  
**400 CAROL ANN LANE**  
**OSSIAN, INDIANA 46777**  
**(260) 622-7190**  
[www.permacolumn.com](http://www.permacolumn.com)  
[info@permacolumn.com](mailto:info@permacolumn.com)

- 7.3 The Additional Listee’s contact information is the following:

**MIDWEST PERMA-COLUMN, INC.**  
**7407 NORTH KICKAPOO-EDWARDS ROAD**  
**EDWARDS, ILLINOIS 61528**  
**(309) 589-7949**  
[www.midwestpermacolumn.com](http://www.midwestpermacolumn.com)  
[info@midwestpermacolumn.com](mailto:info@midwestpermacolumn.com)

**PERMA COLUMN EAST, LLC**  
**POST OFFICE BOX 87**  
**LENHARTSVILLE, PENNSYLVANIA 19534**  
**(610) 562-7161**  
[www.permacolumneast.com](http://www.permacolumneast.com)  
[permacolumneast@verizon.net](mailto:permacolumneast@verizon.net)

**TRI-STATE PERMA-COLUMN**  
**2570 NORTH MAIN STREET**  
**CRAIGVILLE, INDIANA 46731**  
**(800) 276-7046**  
[www.tristatepc.com](http://www.tristatepc.com)  
[sales@tristatepc.com](mailto:sales@tristatepc.com)

**TABLE 1—COLUMNS<sup>1,2,3</sup>**

LOAD AND RESISTANCE FACTOR DESIGN (LRFD)							
MODEL ID	WIDTH (in)	DEPTH (in)	LENGTH <sup>4</sup> (in)	P <sub>LRFD</sub> (lb)	M <sub>LRFD-x</sub> (ft-lb)	M <sub>LRFD-z</sub> (ft-lb)	T <sub>LRFD</sub> (lb)
PC6300	5 <sup>3</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	59 <sup>3</sup> / <sub>4</sub>	113100	6517	6620	10320
PC6400	6 <sup>7</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	59 <sup>3</sup> / <sub>4</sub>	140100	9217	6723	9070
PC6600	6 <sup>3</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	59 <sup>3</sup> / <sub>4</sub>	131100	8317	6694	9360
PC8300	5 <sup>3</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	59 <sup>3</sup> / <sub>4</sub>	153100	9781	14545	15710
PC8400	6 <sup>7</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	59 <sup>3</sup> / <sub>4</sub>	188900	13966	14792	13590
PC8500	8 <sup>3</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	59 <sup>3</sup> / <sub>4</sub>	223000	17955	14945	12340
ALLOWABLE STRENGTH DESIGN (ASD)							
MODEL ID	WIDTH (in)	DEPTH (in)	LENGTH <sup>4</sup> (in)	P <sub>ASD</sub> (lb)	M <sub>ASD-x</sub> (ft-lb)	M <sub>ASD-z</sub> (ft-lb)	T <sub>ASD</sub> (lb)
PC6300	5 <sup>3</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	59 <sup>3</sup> / <sub>4</sub>	70700	4073	4137	6870
PC6400	6 <sup>7</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	59 <sup>3</sup> / <sub>4</sub>	87600	5761	4202	6030
PC6600	6 <sup>3</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	59 <sup>3</sup> / <sub>4</sub>	82000	5198	4184	6230
PC8300	5 <sup>3</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	59 <sup>3</sup> / <sub>4</sub>	95700	6113	9091	10450
PC8400	6 <sup>7</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	59 <sup>3</sup> / <sub>4</sub>	118100	8729	9245	9040
PC8500	8 <sup>3</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	59 <sup>3</sup> / <sub>4</sub>	139400	11222	9341	8210

For SI: 1 inch = 25.4 mm, 1 pound = 4.4482 N

<sup>1</sup>For biaxial bending:  $\frac{mx}{M_x} + \frac{mz}{M_z} \leq 1$

<sup>2</sup>The tabulated values account for combined axial compression load and bending moment load. No reduction in axial compression loads and bending moment loads for combined axial compression and bending moment is required.

<sup>3</sup>For combined tension loads and bending moment loads:  $\frac{t}{T} + \frac{m}{M} \leq 1$

<sup>4</sup>Length is measured from the top of the concrete to the bottom of the concrete.

- P<sub>LRFD</sub> = Maximum compression/gravity load capacity (ΦP<sub>n</sub>) of the column based on Load and Resistance Factor Design (LRFD).
- P<sub>ASD</sub> = Maximum compression/gravity load capacity (P<sub>n</sub>/Ω) of the column based on Allowable Strength Design (ASD).
- M<sub>LRFD-x</sub> = Maximum moment capacity (ΦM<sub>n</sub>) of the column about the x-axis based on LRFD.
- M<sub>ASD-x</sub> = Maximum moment capacity (M<sub>n</sub>/Ω) of the column about the x-axis based on ASD.
- M<sub>LRFD-z</sub> = Maximum moment capacity (ΦM<sub>n</sub>) of the column about the z-axis based on LRFD.
- M<sub>ASD-z</sub> = Maximum moment capacity (M<sub>n</sub>/Ω) of the column about the z-axis based on ASD.
- T<sub>LRFD</sub> = Maximum tension/wind uplift load capacity (ΦP<sub>n</sub>) of the column based on LRFD.
- T<sub>ASD</sub> = Maximum tension/wind uplift load capacity (P<sub>n</sub>/Ω) of the column based on ASD.
- m = Design moment load.
- t = Design tension load.

TABLE 2—SHEAR CAPACITIES<sup>1</sup>

LOAD AND RESISTANCE FACTOR DESIGN (LRFD)												
P (lb)	PC6300		PC6400		PC6600		PC8300		PC8400		PC8500	
	V <sub>LRFD-x</sub> (lb)	V <sub>LRFD-z</sub> (lb)	V <sub>LRFD-x</sub> (lb)	V <sub>LRFD-z</sub> (lb)	V <sub>LRFD-x</sub> (lb)	V <sub>LRFD-z</sub> (lb)	V <sub>LRFD-x</sub> (lb)	V <sub>LRFD-z</sub> (lb)	V <sub>LRFD-x</sub> (lb)	V <sub>LRFD-z</sub> (lb)	V <sub>LRFD-x</sub> (lb)	V <sub>LRFD-z</sub> (lb)
10000	3722	3706	4610	4977	4314	4556	5121	4640	6386	6305	7592	7878
9000	3668	3652	4555	4918	4260	4498	5063	4587	6327	6247	7533	7817
8000	3614	3598	4501	4860	4205	4441	5004	4534	6269	6190	7475	7756
7000	3559	3544	4447	4801	4151	4384	4946	4481	6210	6132	7416	7695
6000	3505	3490	4392	4742	4097	4326	4887	4428	6151	6074	7357	7634
5000	3451	3436	4338	4684	4042	4269	4828	4375	6093	6016	7299	7573
4000	3397	3382	4284	4625	3988	4212	4770	4321	6034	5958	7240	7513
3000	3342	3328	4229	4566	3934	4154	4711	4268	5976	5900	7181	7452
2000	3288	3274	4175	4507	3879	4097	4653	4215	5917	5843	7123	7391
1000	3234	3220	4120	4449	3825	4039	4594	4162	5858	5785	7064	7330
0	3180	3166	4066	4390	3771	3982	4535	4109	5800	5727	7005	7269
-1000	2963	2950	3849	4155	3553	3753	4301	3897	5566	5495	6771	7026
-2000	2746	2734	3631	3921	3336	3523	4067	3684	5331	5264	6536	6782
-3000	2528	2518	3414	3686	3119	3294	3832	3472	5097	5033	6301	6539
-4000	2311	2302	3196	3451	2901	3064	3598	3260	4862	4801	6067	6295
-5000	2094	2086	2979	3216	2684	2835	3363	3047	4628	4570	5832	6051
ALLOWABLE STRENGTH DESIGN (ASD)												
P (lb)	PC6300		PC6400		PC6600		PC8300		PC8400		PC8500	
	V <sub>ASD-x</sub> (lb)	V <sub>ASD-z</sub> (lb)	V <sub>ASD-x</sub> (lb)	V <sub>ASD-z</sub> (lb)	V <sub>ASD-x</sub> (lb)	V <sub>ASD-z</sub> (lb)	V <sub>ASD-x</sub> (lb)	V <sub>ASD-z</sub> (lb)	V <sub>ASD-x</sub> (lb)	V <sub>ASD-z</sub> (lb)	V <sub>ASD-x</sub> (lb)	V <sub>ASD-z</sub> (lb)
6250	2326	2316	2881	3111	2696	2847	3201	2900	3991	3941	4745	4924
5625	2292	2283	2847	3074	2662	2812	3164	2867	3954	3905	4708	4886
5000	2259	2249	2813	3037	2628	2776	3128	2834	3918	3869	4672	4848
4375	2225	2215	2779	3001	2594	2740	3091	2800	3881	3832	4635	4810
3750	2191	2181	2745	2964	2560	2704	3054	2767	3845	3796	4598	4771
3125	2157	2148	2711	2927	2526	2668	3018	2734	3808	3760	4562	4733
2500	2123	2114	2677	2891	2492	2632	2981	2701	3771	3724	4525	4695
1875	2089	2080	2643	2854	2458	2596	2944	2668	3735	3688	4488	4657
1250	2055	2046	2609	2817	2425	2561	2908	2635	3698	3652	4452	4619
625	2021	2013	2575	2780	2391	2525	2871	2601	3662	3615	4415	4581
0	1987	1979	2541	2744	2357	2489	2835	2568	3625	3579	4378	4543
-625	1852	1844	2405	2597	2221	2345	2688	2435	3478	3435	4232	4391
-1250	1716	1709	2270	2450	2085	2202	2542	2303	3332	3290	4085	4239
-1875	1580	1574	2134	2304	1949	2058	2395	2170	3186	3145	3938	4087
-2500	1445	1439	1998	2157	1813	1915	2249	2037	3039	3001	3792	3934
-3125	1309	1303	1862	2010	1677	1772	2102	1905	2893	2856	3645	3782

For **SI**: 1 inch = 25.4 mm, 1 pound = 4.4482 N

<sup>1</sup>The tabulated shear values are for columns with axial compression or axial tension load (ACI 318-14 Eq. 22.5.6.1 and 22.5.7.1 respectively)

- P = Axial design load (negative value represents axial compression, positive value represents axial tension)
- V<sub>LRFD-x</sub> = Maximum shear capacity ( $\Phi V_n$ ) of the column parallel to the x-axis based on LRFD.
- V<sub>ASD-x</sub> = Maximum shear capacity ( $V_n/\Omega$ ) of the column parallel to the x-axis based on ASD.
- V<sub>LRFD-z</sub> = Maximum shear capacity ( $\Phi V_n$ ) of the column parallel to the z-axis based on LRFD.
- V<sub>ASD-z</sub> = Maximum shear capacity ( $P_n/\Omega$ ) of the column parallel to the z-axis based on ASD.

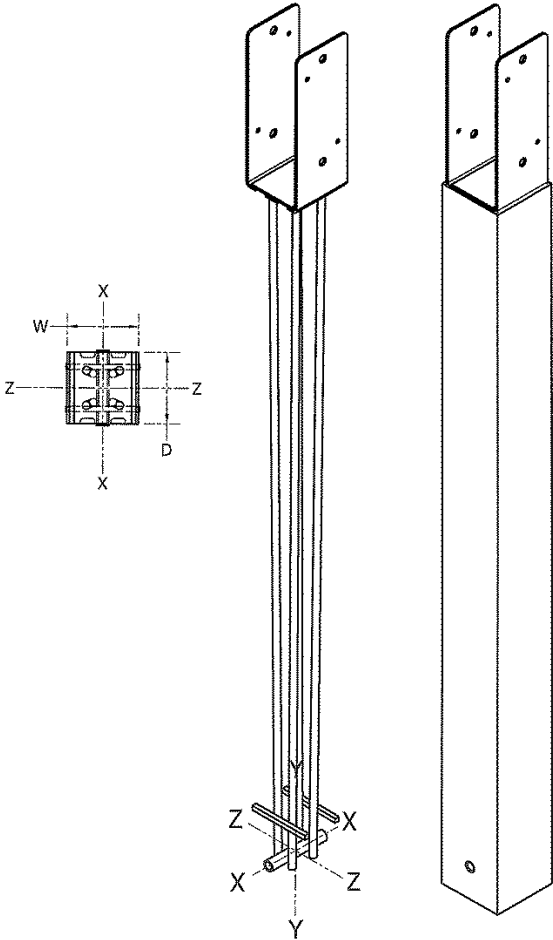


FIGURE 1—PERMA-COLUMN COLUMN

## ICC-ES Evaluation Report

## ESR-4238 CBC and CRC Supplement

Issued April 2019

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This report is subject to renewal April 2020.

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**DIVISION: 03 00 00—CONCRETE**

**Section: 03 48 00—Precast Concrete Specialties**

**DIVISION: 31 00 00—EARTHWORK**

**Section: 31 60 00—Special Foundations and Load-Bearing Elements**

**REPORT HOLDER:**

**PERMA-COLUMN, LLC**

**EVALUATION SUBJECT:**

**PERMA-COLUMN: PC6300, PC6400, PC6600, PC8300, PC8400, PC8500**

### 1.0 REPORT PURPOSE AND SCOPE

**Purpose:**

The purpose of this evaluation report supplement is to indicate that Perma-Column: PC6300, PC6400, PC6600, PC8300, PC8400, PC8500, recognized in ICC-ES master evaluation report ESR-4238, has also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2016 *California Building Code* (CBC)
- 2016 *California Residential Code* (CRC)

### 2.0 CONCLUSIONS

The Perma-Column: PC6300, PC6400, PC6600, PC8300, PC8400, PC8500, described in Sections 2.0 through 7.0 of the master evaluation report ESR-4238, complies with CBC Chapters 19 and 19A and CRC Section R301.1.3 provided the design and installation are in accordance with the 2015 *International Building Code*® (IBC) provisions noted in the master report and the additional requirements of the CBC Chapters 16, 16A, 17, 17A, 18, 18A, 19 and 19A, as applicable.

### 3.0 CONDITIONS OF USE

The Perma-Column: PC6300, PC6400, PC6600, PC8300, PC8400, PC8500, described in this evaluation report must comply with the following conditions:

- The ASD capacities described in the master evaluation report must not be increased for seismic or wind load combinations.

This supplement expires concurrently with the master report, issued April 2019 and revised July 2019.

## ICC-ES Evaluation Report

## ESR-4238 FBC Supplement

Issued April 2019

Revised July 2019

This report is subject to renewal April 2020.

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Section: 31 60 00—Special Foundations and Load-Bearing Elements

### REPORT HOLDER:

PERMA-COLUMN, LLC

### EVALUATION SUBJECT:

PERMA-COLUMN: PC6300, PC6400, PC6600, PC8300, PC8400, PC8500

## 1.0 REPORT PURPOSE AND SCOPE

### Purpose:

The purpose of this evaluation report supplement is to indicate that Perma-Column: PC6300, PC6400, PC6600, PC8300, PC8400, PC8500, recognized in ICC-ES master evaluation report ESR-4238, has also been evaluated for compliance with the codes noted below.

### Applicable code editions:

- 2017 *Florida Building Code—Building*
- 2017 *Florida Building Code—Residential*

## 2.0 CONCLUSIONS

The Perma-Column: PC6300, PC6400, PC6600, PC8300, PC8400, PC8500, described in Sections 2.0 through 7.0 of the master evaluation report ESR-4238, complies with the *Florida Building Code—Building* and *Florida Building Code—Residential*, provided the design and installation are in accordance with the 2015 *International Building Code*® provisions noted in the master report.

Use of the Perma-Column: PC6300, PC6400, PC6600, PC8300, PC8400, PC8500 has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and *Florida Building Code—Residential*.

For products falling under Florida Rule 9N-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the master report, issued April 2019 and revised July 2019.