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ICC-ES Evaluation Report

ESR-4237

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Issued 12/2018

This report is subject to renewal 12/2019.

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:

DECK POST: DP4430, DP4440, DP6630, DP6640, DP6430, DP6440



“2014 Recipient of Prestigious Western States Seismic Policy Council (WSSPC) Award in Excellence”



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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

ADDITIONAL LISTEE:

MIDWEST PERMA-COLUMN, INC.

EVALUATION SUBJECT:

DECK POST: DP4430, DP4440, DP6630, DP6640,
DP6430, DP6440

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's deck posts described in this report are used as embedded pre-cast concrete foundations for wooden posts supporting decks.

3.0 DESCRIPTION

3.1 General:

The Perma-Column deck posts are factory manufactured precast reinforced concrete posts with a steel "U" shaped bracket on the top for attaching deck posts. The deck post protrudes above finish grade, to allow for the attachment of a wood post. See Figure 1 for an illustration of a typical deck post.

3.2 Materials:

3.2.1 Concrete: The concrete used for the Perma-Column deck post 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 deck post is No. 4 ASTM A706 Grade 60 deformed rebar.

3.2.3 Bracket: The Perma-Column deck post bracket is manufactured from $\frac{1}{8}$ inch (3 mm) thick steel complying with ASTM A1018 SS Grade 40. The bracket is powder coated with an epoxy coating.

4.0 DESIGN AND INSTALLATION

Perma-Column's deck posts 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 deck posts must be placed directly into the ground with the end protruding above finish grade no more than 10 inches (254 mm) and the hole must be backfilled. See Table 1 and Figure 2 of this report for deck posts sizes, and design information.

5.0 CONDITIONS OF USE

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

- 5.1** The deck posts 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 deck post and the connection between the support column and the Perma-Column deck post are outside the scope of this report and must be justified to the satisfaction of the code official.
- 5.4** Use of Perma-Column deck posts with chemically treated wood is outside the scope of this report.
- 5.5** The Perma-Column deck posts 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 deck posts bear the name of the report holder (Perma Column, LLC) and listee (Midwest Perma-Column, Inc.), Model ID, date of manufacture, and the evaluation report number (ESR-4237).
- 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
sales@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
info@midwestperma.com

TABLE 1—DECK POSTS^{1,2,3}

LOAD AND RESISTANCE FACTOR DESIGN (LRFD)									
MODEL ID	WIDTH (in)	DEPTH (in)	LENGTH (in)	P _{LRFD} (lb)	M _{LRFD-x} (ft-lb)	M _{LRFD-z} (ft-lb)	V _{LRFD-x} (lb)	V _{LRFD-z} (lb)	T _{LRFD} (lb)
DP4430	3 ⁵ / ₈	3 ¹ / ₂	30	46,076	1456	1400	952	986	956
DP4440	3 ⁵ / ₈	3 ¹ / ₂	40	46,076	1456	1400	952	986	956
DP6630	5 ⁵ / ₈	5	30	101,268	2981	4048	2109	2900	1658
DP6640	5 ⁵ / ₈	5	40	101,268	2981	4048	2109	2900	1658
DP6430	6 ¹ / ₈	5	30	109,556	3215	4048	2297	3388	1289
DP6440	6 ¹ / ₈	5	40	109,556	3215	4048	2297	3388	1289
ALLOWABLE STRENGTH DESIGN (ASD)									
MODEL ID	WIDTH (in)	DEPTH (in)	LENGTH (in)	P _{ASD} (lb)	M _{ASD-x} (ft-lb)	M _{ASD-z} (ft-lb)	V _{ASD-x} (lb)	V _{ASD-z} (lb)	T _{ASD} (lb)
DP4430	3 ⁵ / ₈	3 ¹ / ₂	30	28,798	910	875	595	616	636
DP4440	3 ⁵ / ₈	3 ¹ / ₂	40	28,798	910	875	595	616	636
DP6630	5 ⁵ / ₈	5	30	63,293	1863	2530	1318	1813	1103
DP6640	5 ⁵ / ₈	5	40	63,293	1863	2530	1318	1813	1103
DP6430	6 ¹ / ₈	5	30	68,472	2009	2553	1436	2117	857
DP6440	6 ¹ / ₈	5	40	68,472	2009	2553	1436	2117	857

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

¹For biaxial bending: $\frac{m_x}{M_x} + \frac{m_y}{M_y} \leq 1$

²The 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.

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

- P_{LRFD} = Maximum compression/gravity load capacity (ΦP_n) of the deck post based on Load and Resistance Factor Design (LRFD).
- P_{ASD} = Maximum compression/gravity load capacity (P_n/Ω) of the deck post based on Allowable Strength Design (ASD).
- M_{LRFD-x} = Maximum moment capacity (ΦM_n) of the deck post about the x-axis based on LRFD.
- M_{ASD-x} = Maximum moment capacity (M_n/Ω) of the deck post about the x-axis based on ASD.
- M_{LRFD-z} = Maximum moment capacity (ΦM_n) of the deck post about the z-axis based on LRFD.
- M_{ASD-z} = Maximum moment capacity (M_n/Ω) of the deck post about the z-axis based on ASD.
- V_{LRFD-x} = Maximum shear capacity (ΦV_n) of the deck post parallel to the x-axis based on LRFD.
- V_{ASD-x} = Maximum shear capacity (V_n/Ω) of the deck post parallel to the x-axis based on ASD.
- V_{LRFD-z} = Maximum shear capacity (ΦV_n) of the deck post parallel to the z-axis based on LRFD.
- V_{ASD-z} = Maximum shear capacity (V_n/Ω) of the deck post parallel to the z-axis based on ASD.
- T_{LRFD} = Maximum tension/wind uplift load capacity (ΦP_n) of the deck post based on LRFD.
- T_{ASD} = Maximum tension/wind uplift load capacity (P_n/Ω) of the deck post based on ASD.
- m = Design moment load.
- t = Design tension load.

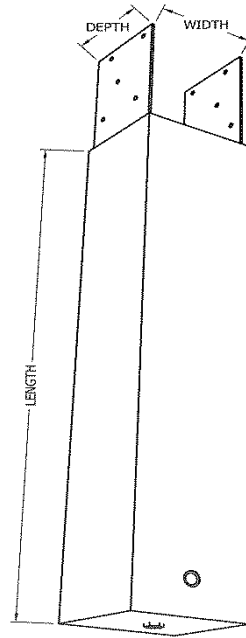


FIGURE 1—PERMA COLUMN DECK POST

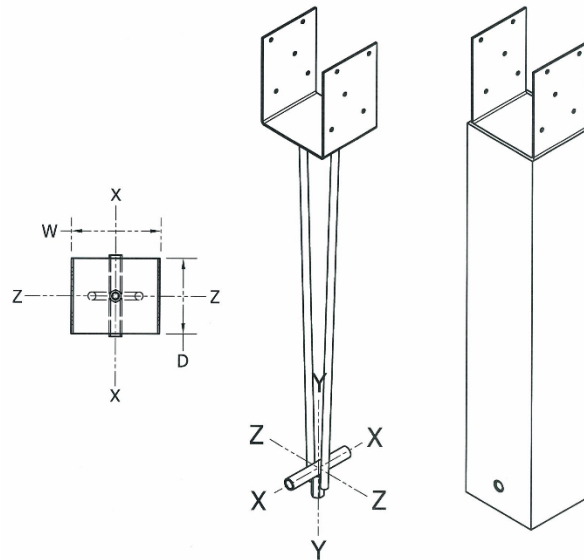


FIGURE 2—PERMA COLUMN DECK POST

ICC-ES Evaluation Report

ESR-4237 CBC and CRC Supplement

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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:

DECK POST: DP4430, DP4440, DP6630, DP6640, DP6430, DP6440

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Perma-Column Deck Post: DP4430, DP4440, DP6630, DP6640, DP6430, DP6440, recognized in ICC-ES master evaluation report ESR-4237, 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 Deck Post: DP4430, DP4440, DP6630, DP6640, DP6430, DP6440, described in Sections 2.0 through 7.0 of the master evaluation report ESR-4237, 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 Deck Post: DP4430, DP4440, DP6630, DP6640, DP6430, DP6440, 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 December 2018.

ICC-ES Evaluation Report

ESR-4237 FBC Supplement

Issued December 2018

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REPORT HOLDER:

PERMA-COLUMN, LLC

EVALUATION SUBJECT:

DECK POST: DP4430, DP4440, DP6630, DP6640, DP6430, DP6440

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Perma-Column Deck Post: DP4430, DP4440, DP6630, DP6640, DP6430, DP6440, recognized in ICC-ES master evaluation report ESR-4237, 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 Deck Post: DP4430, DP4440, DP6630, DP6640, DP6430, DP6440, described in Sections 2.0 through 7.0 of the master evaluation report ESR-4237, 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 Deck Post: DP4430, DP4440, DP6630, DP6640, DP6430, DP6440 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 December 2018.