

# ICC-ES Evaluation Report

## ESR-1895

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

### REPORT HOLDER:

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### EVALUATION SUBJECT:

**DIAMOND PIER DP50 PRECAST CONCRETE PIER FOUNDATION ASSEMBLY**

### 1.0 EVALUATION SCOPE

#### Compliance with the following codes:

- 2009 *International Residential Code*® (2009 IRC)
- 2006 *International Residential Code*® (2006 IRC)

#### Property evaluated:

Structural

### 2.0 USES

The Diamond Pier DP50 precast concrete pier foundation assembly is used as a foundation for the support of gravity loads for exterior decks, including covered decks, elevated walkways and stairway constructions regulated by the IRC. The pier foundation assemblies are permitted for use in any of the weathering classifications defined in IRC Figure R301.2(3).

### 3.0 DESCRIPTION

#### 3.1 General:

The concrete pier foundation assembly consists of a factory-fabricated, diamond-shaped concrete pier that has a steel anchor bolt precast into the center of the top of the pier; and steel bearing pins which are jobsite-installed through holes precast in each pier, and driven into the soil. See Figure 1.

#### 3.2 Materials:

**3.2.1 Concrete Pier:** The concrete piers measure 10 inches (254 mm) by 10 inches (254 mm) by 11 inches (279 mm), weigh approximately 50 pounds (22.7 kg), and are formed from air-entrained, normal-weight concrete which contains steel fibers. The air-entrained concrete has a minimum compressive strength of 3500 psi (24.1 MPa) at

28 days, and a total air content (percent by volume of concrete) of not less than 5 percent nor more than 7 percent, in accordance with IRC Section R402.2.

**3.2.2 Precast Steel Anchor Bolt:** The steel anchor bolt that is precast into the center of the top of the pier measures  $\frac{1}{2}$  inch (12.7 mm) in diameter and complies with ASTM A 307 as Grade A.

**3.2.3 Steel Bearing Pins:** The four steel bearing pins supplied with each pier foundation assembly are made of Type E, Grade A (electric-resistance-welded), Schedule 40, galvanized steel pipe complying with ASTM A 53; have a nominal 1-inch diameter (25.4 mm) [1.315-inch (33.4 mm) outside diameter; 0.133-inch (3.38 mm) nominal wall thickness]; and have a minimum nominal length of 36 inches (0.91 m).

### 4.0 DESIGN AND INSTALLATION

#### 4.1 Design:

When installed in accordance with this report, each pier foundation assembly, installed with the minimum nominally 36-inch-long (910 mm) bearing pins, provides a 1.8-square-foot (0.17 m<sup>2</sup>) bearing area for supporting gravity loads in soils having an allowable 1500 psf (71.8 kPa) or 2000 psf (95.8 kPa) bearing capacity in accordance with IRC Table R401.4.1.

#### 4.2 Installation:

The site soil is prepared by digging a hole with a conical shape, approximately the shape of the base of the concrete pier and slightly deeper than the pier itself, leaving loose soils directly below the pier. The pier is positioned in the hole to its midpoint, and braced as needed to plumb. The bearing pins must then be slid through the holes in the pier, and driven into the soil as recommended in the Pin Foundations published installation instructions, leaving  $\frac{3}{4}$  inch (19.1 mm) of the pin protruding from the upper surface of the pier. Once the dead loads have been applied to the pier assembly, the length of the protruding bearing pin must be verified and adjusted as necessary to  $\frac{3}{4}$  inch (19.1 mm). The exposed end of the bearing pins must then be capped and sealed as recommended in the Pin Foundations published installation instructions. The minimum spacing of the installed pier foundation assemblies is 3 feet (0.91 m) on center.

### 5.0 CONDITIONS OF USE

The Diamond Pier DP50 precast concrete pier foundation assemblies described in this report comply with, or are suitable alternatives to what is specified in, the code indicated in Section 1.0 of this report, subject to the following conditions:

- 5.1 The pier foundation assemblies must be installed in accordance with the Pin Foundations published installation instructions, the IRC and this report. In the event of a conflict between this report and the Pin Foundations published installation instructions, this report governs.
- 5.2 Wood in contact with the concrete pier and precast steel bolt must be protected against decay and subterranean termites in accordance with 2009 IRC Sections R317 and R318, and 2006 IRC Sections R319 and R320, as applicable. Compatibility of the concrete pier and precast steel bolt with wood treatments not described in 2009 IRC Sections R317 and R318; and 2006 IRC Sections R319 and R320, as applicable must be established based on a current ICC-ES evaluation report on the wood treatment.
- 5.3 In areas requiring frost protection, pier foundation assemblies used as described in Section 2.0 may be connected to and supported by a dwelling when approved by the code official.
- 5.4 The bearing capacity of the site soil must be determined in accordance with IRC Table R401.4.1. If presumptive soil capacity cannot be assumed in accordance with the IRC Table R401.4.1, the code official may request a soils report.
- 5.5 The capacity of the pier foundation assembly to resist lateral and/or uplift loads was not evaluated for this report.

5.6 Use of the pier foundation assemblies where soil constituents, changing water levels or other factors indicate possible deleterious effects on the pier foundation assembly, is beyond the scope of this report.

5.7 Use of the pier foundation assemblies is limited to structures regulated by the IRC.

## 6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Precast Concrete Pier Foundation Assemblies (AC336), dated October 2005 (editorially revised December 2009).

## 7.0 IDENTIFICATION

Each pallet of Diamond Pier DP50 precast concrete piers is labeled with the Pin Foundations, Inc., name and address; the product name (Diamond Pier DP50); the evaluation report number (ESR-1895); the manufacturing date and lot number; and the phrase, "For Use with One- and Two-Family Dwelling Construction Only."

Each bundle of bearing pins is labeled with the Pin Foundations, Inc., name and address; the product name (Diamond Pier DP50); the evaluation report number (ESR-1895); and the phrase, "For Use with One- and Two-Family Dwelling Construction Only."

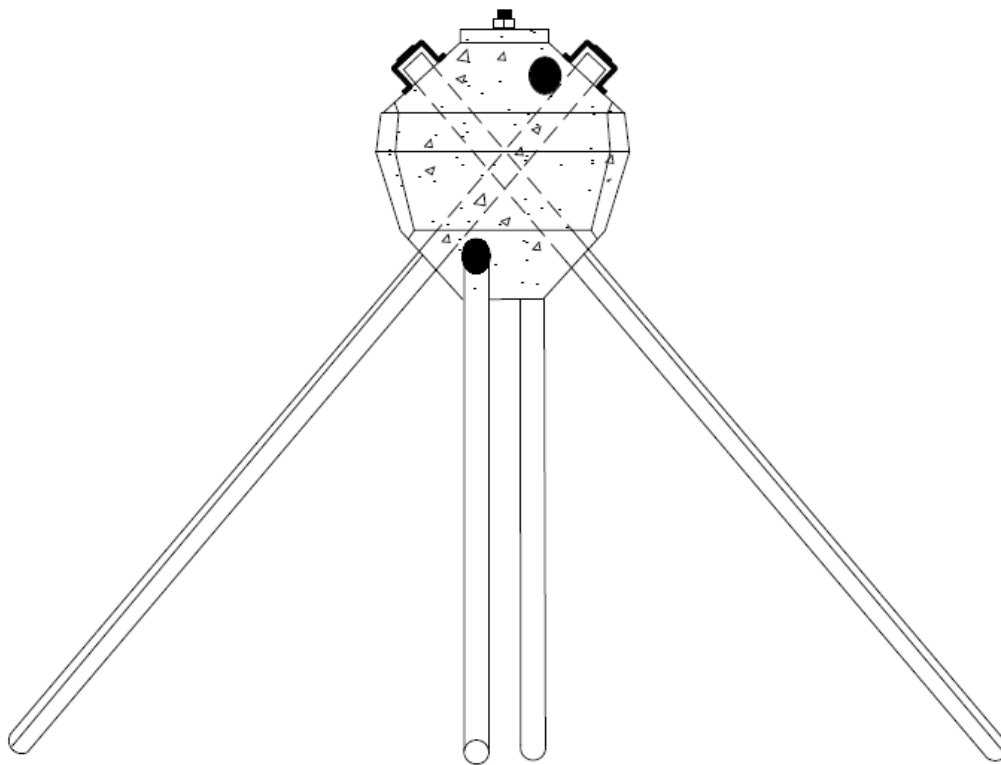


FIGURE 1—DIAMOND PIER DP-50