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ICC-ES Evaluation Report

Reissued August 2023

This report is subject to renewal August 2024.

ESR-4404

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

REPORT HOLDER:

NCP INDUSTRIES

EVALUATION SUBJECT:

HANDI PIER® HP-R

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2018, 2015, 2012, 2009 and 2006 *International Residential Code®* (IRC)

Property evaluated:

Structural

2.0 USES

The HANDI Pier® HP-R bearing pin pier for use as the foundation of exterior porch deck, elevated walkway, stairway construction and accessory structures as defined in the IRC for the support of gravity loads when installed in soils. The bearing pin piers are permitted for use in any of the weathering classifications defined in IRC Figure R301.2(3).

3.0 DESCRIPTION

3.1 General:

The HANDI Pier® HP-R bearing pin piers consist of a factory-fabricated, pre-cast concrete head that has a steel sleeved insert and a galvanized steel ½ inch (12.7 mm) diamater anchor bolt in the center of the top of the head; and 1 inch (25.4 mm) galvanized steel bearing pins which are jobsite installed through the steel sleeved insert in the head, and driven into the underlying soil. See Figure 1 for illustration of HANDI Pier® HP-R.

3.2 Materials:

3.2.1 Concrete Head: The HANDI Pier® HP-R concrete head measures 10 inches (254 mm) in diameter and 11 inches (279 mm) tall, weighs approximately 50 pounds (22.7 kg), and is formed from air-entrained, fiber-reinforced normal-weight concrete. The air-entrained concrete has a minimum compressive strength of f'c = 6,000 psi (41.5 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 Steel Sleeved Insert: The steel insert is precast into the concrete head and holds the proper angles needed for the bearing pins. The steel material complies with ASTM A513.

3.2.3 Precast Galvanized Steel Anchor Bolt: The galvanized steel anchor bolt that is precast into the center of the top of the concrete head measures a minimum $^1/_2$ inch (12.7 mm) in diameter and complies with ASTM A307 as Grade A.

3.2.4 Steel Bearing Pins: The four steel bearing pins supplied with each pier are made of Type E, Grade A (electric-resistance-welded), Schedule 40, galvanized steel pipe complying with ASTM A53. The pins have a nominal 1-inch diameter [1.315-inch (33.4 mm) outside diameter; 0.133-inch nominal wall thickness]; and have a minimum nominal length of 50 inches (1270 mm).

4.0 DESIGN AND INSTALLATION

4.1 Design:

When installed in accordance with this report in minimum allowable presumptive soil load-bearing value of 1,500 psf (71.8 kPa) per IRC Table R401.4.1, the HANDI Pier® HP-R bearing pin pier provides a 2.2 square foot (0.20 m2) of bearing area for a 3,400 lbs of gravity load bearing capacity for supporting gravity loads.

When installed in accordance with this report in minimum allowable presumptive soil load-bearing value of 2,000 psf (95.8 kPa) per IRC Table R401.4.1, the HANDI Pier® HP-R bearing pin pier provides a 2.2-square-foot (0.20 m^2) of bearing area for a 4,400 lbs of gravity load bearing capacity.

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 head and approximately 6 to 8 inches (152 to 203 mm) deep, leaving loose soils directly below the head. The head 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 concrete head, and driven into the soil using an automatic hammer as recommended in the HANDI Pier® HP-R published installation instructions, leaving 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, the length of the protruding bearing pin must be verified and adjusted as necessary to 3/4 inch (19.1 mm). The exposed end of the bearing pins must then be capped and sealed as recommended in the HANDI Pier® HP-R published installation instructions. The minimum spacing of the installed bearing pin piers is 3 feet (0.91 m) on center.

5.0 CONDITIONS OF USE

The HANDI Pier® HP-R bearing pin piers 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 bearing pin piers must be installed in accordance with the HANDI Pier® HP-R published installation instructions, the IRC and this report. In the event of a conflict between this report and the HANDI Pier® HP-R published installation instructions, this report governs.

5.2 Wood in contact with the concrete head and precast galvanized steel bolt must be protected against decay and subterranean termites in accordance with 2018, 2015, 2012 and 2009 IRC Sections R317 and R318, and 2006 IRC Sections R319 and R320, as applicable. Compatibility of the concrete head and precast galvanized steel bolt with wood treatments not described in 2018, 2015, 2012 and 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, exterior decks on bearing pin piers as described in Section 2.0 may be connected to and supported by a dwelling when approved by the code official. See IRC Section R403.1.4.1, Exception 3, as applicable.

5.4 Frost protection for accessory structures defined by the IRC is beyond the scope of this report, except free-standing accessory structures constructed in accordance with IRC Section R403.1.4.1, Exceptions 1 or 2, where frost protection is not required.

5.5 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.

5.6 The capacity of the bearing pin piers to resist lateral and/or uplift loads was not evaluated for this report.

5.7 Use of the bearing pin piers 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.

5.8 Use of the bearing pin piers is limited to structures regulated by the IRC.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Bearing Pin Piers (AC336), dated June 2016 (Editorially revised April 2019).

7.0 IDENTIFICATION

7.1 Each pallet of HANDI Pier® HP-R precast concrete heads is labeled with the NCP Industries name and address; the product name (HANDI Pier® HP-R); the evaluation report number (ESR-4404); 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 NCP Industries name and address; the product name (HANDI Pier® HP-R); the evaluation report number (ESR-4404); the manufacturing date and lot number; and the phrase, "For Use with One- and Two-Family Dwelling Construction Only."

7.2 The report holder's contact information is the following:

NCP INDUSTRIES
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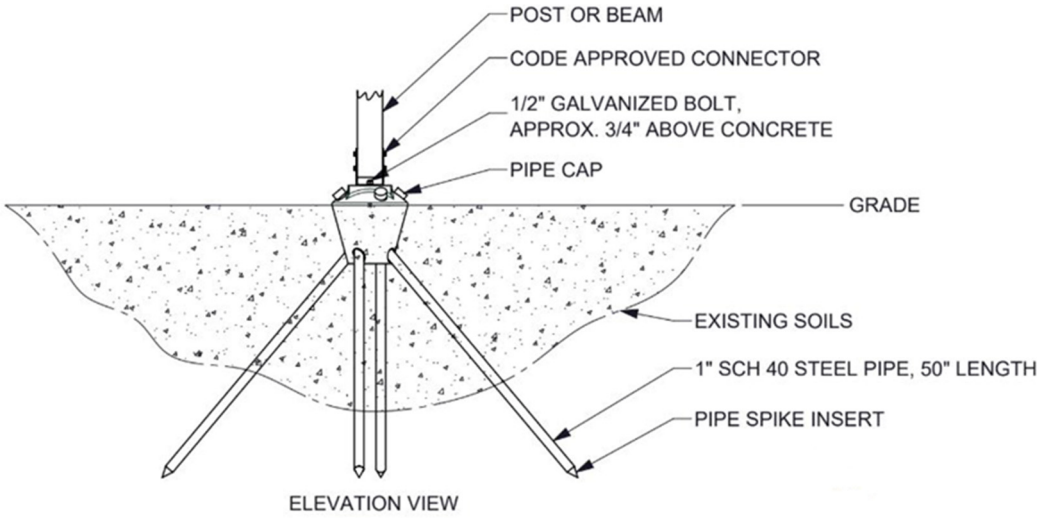

FIGURE 1—HANDI PIER® HP-R