

DiamondPier. FOUNDATION SYSTEM

BUILDER

TRAINING



Agenda

- Overview
- Advantages
- Soils
- Code Compliance
- Permit Process
- Applications
- What's Included
- Purchasing Diamond Pier
- Installation
- Warranty Info





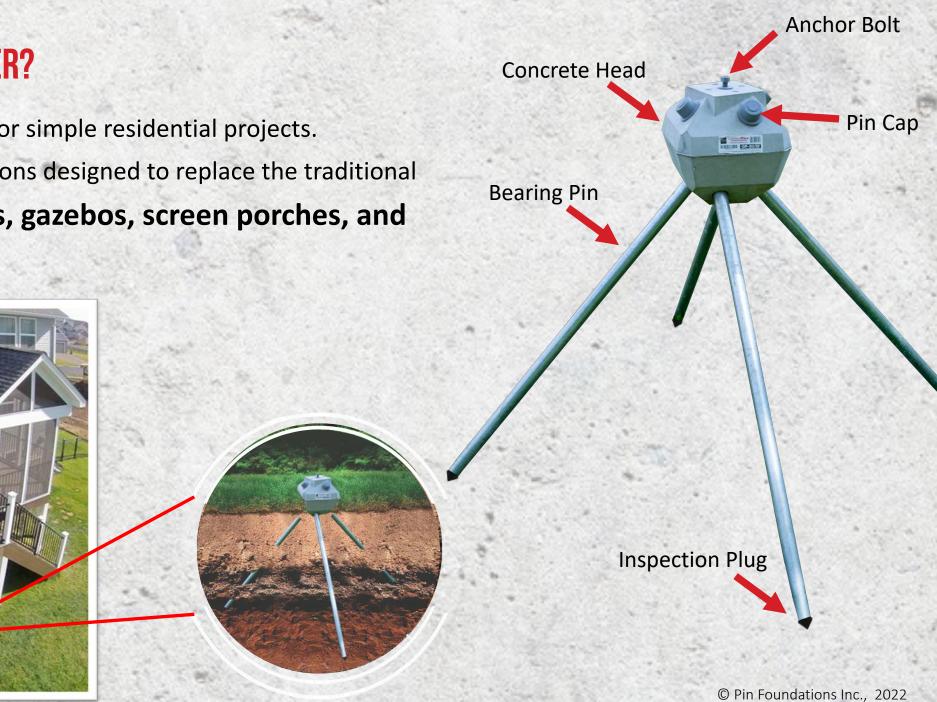
Watch the Video: https://vimeo.com/698612358

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WHAT IS A DIAMOND PIER?

A new concept in footings for simple residential projects. Diamond Piers are foundations designed to replace the traditional concrete footings on decks, gazebos, screen porches, and accessory structures.





OVERVIEW OF DIAMOND PIER

Diamond Pier utilizes the inherent strength of undisturbed soils.

Provides equivalent strength for:

- Bearing
- Uplift
- Lateral loads

Equivalency to Traditional Concrete Footings:

DP-75/63

Pin Pile Design Uplift & Lateral Uplift & Lateral Resistance **Distributes Loads** Resistance Over a Increased Increased Greater **Bearing Area** than Conventional Concrete Footings

Models:

DP-50/50 = Will support up to the <u>same load</u> as a 20" x 48" traditional concrete footing in 2000 psf soils.

DP-75/63 = Will support up to the <u>same load</u> as a 24" x 60' traditional concrete footing in 2000 psf soils.

ADVANTAGES OF DIAMOND PIER

Installs in Minutes

The Diamond Pier system can be installed in minutes, and you can frame immediately.

DECK PROJECT Seven foundations were installed in less than an hour and project completed in ONE DAY!

Footing inspections can be done after completion.



ADVANTAGES OF DIAMOND PIER

Frame Immediately

With Diamond Pier, builders can begin to frame immediately after installing the system.

- No Holes to Dig
- No Waiting for Concrete to Cure
- Complete Projects Days Faster



DIAMOND PIER AND SOIL TYPE

Sands or Clays

DiamondPier.

RESIDENTIAL DIAMOND PIER LOAD CHART

IAS-Accredited Third-Party Bearing, Uplift, and Lateral Field Tests²

Minimum 1500 psf

Silts/Clays (CL, ML, MH, CH)3

Model / Pin No. / Length	Bearing Load Capacity	Base Area	O Cylinder Comparison	Frost Zone	Uplift Load Capacity	Lateral Load Capacity
DP-50/36"	2700#	1.8 sf	18" dia	24"	600#	600#
DP-50/42"	* 3000#	2.0 sf	19" dia	36"	* 900#	* 600#
DP-50/50"	3300#	2.2 sf	20° dia	48"	1200#	600#
DP-75/50"	* 3750#	2.5 sf	21" dia	48"	* 1400#	* 600#
DP-75/63"	4200#	2.8 sf	22" dia	60"	1600#	600#
		Equivalency	to Traditional Conc	rete Footinas		

Equivalency to Traditional Concrete Footin

Minimum 2000 psf

Sands/Gravels (SW, SP, SM, SC, GM, GC)3

Model / Pin No. / Length	Bearing Load Capacity	Base Area	O Cylinder Comparison	Frost Zone	Uplift Load Capacity	Lateral Load Capacity
DP-50/36"	3600#	1.8 sf	18° dia	24"	600#	600#
DP-50/42"	* 4000#	2.0 sf	19" dia	36"	* 900#	* 600#
DP-50/50"	4400#	2.2 sf	20° dia	48"	1200#	600#
DP-75/50"	* 5600#	2.8 sf	22° dia	48"	* 1400#	* 600#
DP-75/63"	6400#	3.2 sf	24° dia	60"	1600#	600#
		Equivalency	o Traditional Conc	rete Footings	*interpolated fi	rom field test value

TABLE R401.4.1 PRESUMPTIVE LOAD-BEARING VALUES OF FOUNDATION MATERIALS^a

CLASS OF MATERIAL	LOAD-BEARING PRESSURE (pounds per square foot)
Crystalline bedrock	12,000
Sedimentary and foliated rock	4,000
Sandy gravel and/or gravel (GW and GP)	3,000
Sand, silty sand, clayey sand, silty gravel and clayey gravel (SW, SP, SM, SC, GM and GC)	2,000
Clay, sandy, silty clay, clayey silt, silt and sandy siltclay (CL, ML, MH and CH)	1,500 ^b

For SI: 1 pound per square foot = 0.0479 kPa.

- a. Where soil tests are required by Section R401.4, the allowable bearing capacities of the soil shall be part of the recommendations.
- b. Where the building official determines that in-place soils with an allowable bearing capacity of less than 1,500 psf are likely to be present at the site, the allowable bearing capacity shall be determined by a soils investigation.

MN Residential Code



ICC-ES CODE COMPLIANCE

Under the IRC & Wisconsin UDC



Approval # BP-012200001-BVP (Replaces DIS-122157650 & 201612-0)

Industry Services Division 4822 Madison Yards Way P.O. Box 7302 Madison, WI 53701-7302

Wisconsin **Building Product Evaluation**

Material	Diamond Pier® DP-50 & DP-75 Bearing Pin Concrete Pier Foundation	
Manufacturer	Pin Foundations, Inc. 321 Park Ave. River Forest, IL 60305	

SCOPE OF EVALUATION

The Diamond Pier® DP-50 & DP-75 precast concrete pier foundation assembly as manufactured by Pin Foundations, Inc. has been evaluated against the structural provisions of the current Wisconsin Uniform Dwelling Code (UDC). The Diamond Pier® DP-50 & DP-75 precast concrete pier foundation assembly has been evaluated for use as a foundation for the support of gravity loads, as well as specified lateral & uplift loads for exterior decks, covered enclosed porches, sunrooms as defined in the 2018 IRC R301.2.1.1.1 Categories I through IV [as noted below, but alsp see UDC Sunroom definition in SPS 320.06(17)], elevated walkways and stairways as regulated by the current Wisconsin Uniform Dwelling Code (UDC) and some site accessory detached structures not directly covered by the UDC rules. This approval is not for support of habitable enclosed dwelling areas. This approval is for installation of these anchors per the manufacturer's installation manual to support/resist loads as tested and published with the adjustments as noted below.







A Subsidiary of the International Code Council®

Reissued December 2021

ICC-ES Evaluation Report ESR-1895

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

REPORT HOLDER:

PIN FOUNDATIONS, INC.

EVALUATION SUBJECT:

DIAMOND PIER® DP-50 & DP-75 FOR BEARING PIN

1.0 EVALUATION SCOPE

Compliance with the following codes:

2018, 2015, 2012, 2009 and 2006 International Residential

Property evaluated:

Structural

2.0 USES

The Diamond Pier DP-50 and DP-75 bearing pin piers are used as foundations for the support of gravity loads for exterior decks, including covered decks, exterior porch decks, elevated walkways, stairway construction and accessory structures as defined in the IRC. The bearing pin piers are permitted for use in any of the weathering classifications defined in 2018 IRC Figure R301.2(4) or 2015, 2012, 2009 and 2006 IRC Figure R301.2(3). 3.0 DESCRIPTION

3.1 General:

The bearing pin piers consist of a factory-fabricated, precast, diamond-shaped concrete head that has a galvanized steel anchor bolt precast into the center of the top of the head; and galvanized steel bearing pins which are jobsiteinstalled through holes precast in the head, and driven into the underlying soil. See Figure 1.

3.2 Materials:

3.2.1 Concrete Head: The DP-50 concrete head measures 10 inches (254 mm) by 10 inches (254 mm) by 11 inches (279 mm) tall, weighs approximately 50 pounds (22.7 kg), and is formed from air-entrained, normal-weight concrete. The DP-75 concrete head measures 11 inches (279 mm) by 11 inches (279 mm) by 12 inches (305 mm) tall, weighs approximately 75 pounds (34.0 kg), and is formed from air-entrained, normalweight concrete. The air-

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This report is subject to renewal December 2022. entrained concrete has a minimum compressive strength of 5500 psi (37.9 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

3.2.2 Precast Galvanized Steel Anchor Bolt: The galvanized steel anchor bolt that is precast into the center of the top of the DP-50 concrete head measures a minimum 1/2 inch (12.7 mm) in diameter and complies with ASTM A307 as Grade A. The galvanized steel anchor bolt that is precast into the center of the top of the DP-75 concrete head measures a minimum 5/8 inch (15.9 mm) in diameter and complies with ASTM A307 as Grade A

3.2.3 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. For the DP-50, 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 36 inches (914 mm) or 50 inches (1270 mm). For the DP-75 the pins have a nominal 11/4-inch diameter [1.66-inch (42.2 mm) outside diameter with a 0.140 nominal wall thickness]; and have a minimum nominal length of 50 inches.

4.0 DESIGN AND INSTALLATION 4.1 Design:

When installed in accordance with this report in minimum allowable 1500 psf (71.8 kPa) soils per IRC Table R401.4.1, the DP-50 bearing pin pier with 36 inch (915 mm) pins provides a 1.8 square foot (0.17 m²) bearing area for supporting gravity loads; the DP-50 bearing pin pier with 50 inch (1270 mm) pins provides a 2.4 square foot (0.23 m²) bearing area for supporting gravity loads; and the DP-75 bearing pin pier with 50 inch (1270 mm) pins provides a 2.8 square foot (0.26 m²) bearing area for supporting gravity

When installed in accordance with this report in minimum allowable 2000 psf (95.8 kPa) soils per IRC Table R401.4.1, the DP-50 bearing pin pier with 36-inch (915 mm) pins provides a 1.8-square-foot (0.17 m²) bearing area for supporting gravity loads; the DP-50 bearing pin pier with 50-inch (1270 mm) pins provides a 2.2-square-foot (0.20 m²) bearing area for supporting gravity loads; and the DP-75 bearing pin pier with 50-inch (1270 mm) pins provides a 3.2-square-foot (0.30 m²) bearing area for supporting gravity loads.

ANAB

Page 1 of 3

PERMIT PROCESS

Apply for your permit from your municipality and provide the following documentation:

- ESR 1895 Diamond Pier code compliant document
- Detailed drawings of your project
- A copy of the Diamond Pier residential load chart; (found on page 6 of the Diamond Pier Installation Manual)
- Make sure to locate all underground utility lines prior to any digging.



Compliance with International Codes Compliance with State Codes www.icc-es.org | (800) 423-6587 | (562) 699-0543 A Subsidiary of the International Code Council® ICC-ES Evaluation Report ESR-1895 Reissued December 2021 This report is subject to renewal December 2022. DiamondPier. I concrete has a minimum compressive strength of (37.9 MPa) at 28 days, and a total air content FOUNDATION SYSTEM y volume of concrete) of not less than 5 percent than 7 percent, in accordance with IRC Section ast Galvanized Steel Anchor Bolt: The RESIDENTIAL DIAMOND PIER LOAD CHART d steel anchor bolt that is precast into the center of the DP-50 concrete head measures a minimum IAS-Accredited Third-Party Bearing, Uplift, and Lateral Field Tests² (12.7 mm) in diameter and complies with ASTM Grade A. The galvanized steel anchor bolt that is to the center of the top of the DP-75 concrete head Minimum 1500 psf a minimum ⁵/a inch (15.9 mm) in diameter and Silts/Clays (CL, ML, MH, CH)3 ith ASTM A307 as Grade A Bearing Load el Bearing Pins: The four steel bearing ping Base Area O Cylinde S Frost with each pier are made of Type E, Grade A DP-50/36" Uplift Load Capacity Lateral Load Capacity 2700# 1.8 sf sistance-welded), Schedule 40, galvanized steel DP-50/42" 18" dia 24" * 3000# 600# lying with ASTM A53. For the DP-50, pins have a 2.0 sf 600# 19' dia 36" 3300# -inch diameter [1.315-inch (33.4 mm) outside * 900# 2.2 sf * 600# 20" dia 0.133-inch nominal wall thickness]; and have 48" * 3750# 1200# 2.5 sf 600# um nominal length of 36 inches (914 mm) or 21" dia 48" 4200# 1400# 2.8 st * 600# s (1270 mm). For the DP-75 the pins have a 22" dia 60 1600# Equivalency to Traditional Concrete Footings 11/4-inch diameter [1.66-inch (42.2 mm) outside 600# with a 0.140 nominal wall thickness]; and have a Minimum 2000 psf nominal length of 50 inches. Sands/Gravels (SW, SP, SM, SC, GM, GC) GN AND INSTALLATION Bearing Load Base Area O Cylinder B Fros Uplift Load Capacity Lateral Load Capacity 3600# 1.8 sf 18" dia

24"

36"

48°

48"

60"

19" dia

20° dia

22" dia

24" dia

Equivalency to Traditional Concrete Footings

exceeding, the stated capacities, it is not intended for structures with asymmetrical, rotational, overturning, or dynamic exceeding, the stated capacities, it is not interned for sources with asymptotic stream, organized, overlashing, or symptotic forces, intended uses are described in section 2.0 of ICC-ES prescriptive bearing evaluation report ESR-1895, For torces, internord uses are ureaching in section 2.0 or non-corporationary examination report core room projects that exceed the capacities or limitations defined herein, or the intended uses described in ESR-1895, contact

PFI for additional information or site-specific capacity evaluation. See also the Use and Applications download at

2 Capacities shown are tested to a Factor of Safety of 2, and are applicable in properly drained, normal sound soils only,

with minimum soil bearing capacities as indicated. Copies of the field test reports are available from PFI upon reque

applicable 1500 psf and 2000 psf soil types. For soils below 1500 psf, or soils with unknown characteristics, additional

4. All capacities use four pins of the specified length per foundation. Pin length includes that portion of the pin embedded

PIN FOUNDATIONS INC

An expensive use four prior or are operated renger per non-Nerver. I'll engin includes use, person or are performente within the concrete head. See "Check Your Layout" in the Diamond Pier Installation Manual for more information on

3. See IRC Table R401.4.1, "Presumptive Load-Bearing Values of Foundation Materials," for a full description of

spenard design analysis is required. For soils above 2000 psf, the values in this chart shall apply.

For professional engineers designing for short-term transient loads, contact PFI for further information

1. This load chart is intended for simple structures supported by columns, posts, and beams loaded up to, but not

600#

* 900#

1200#

1400#

1600#

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600#

* 600#

600#

* 600#

600#

terpolated from field test values

Toll Free: 866-255-9478 Main Office: 253-858-8809

eral Email: info@diamondoiere

No. / Lenc

DP-50/50"

DP-75/50"

DP-75/63"

Model / Pin No. / Length

DP-50/36"

DP-50/42"

DP-50/50"

DP-75/50"

DP-75/63"

Notes

4810 Pt Fosdick Dr NW, PMB 60 Gig Harbor, Washington 98335 www.pinfoundations.com

* 4000#

4400#

* 5600#

6400#

2.0 sf

2.2 sf

2.8 sf

3.2 sf

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zily addressed, nor are they to be construed luation Service, LLC, express or implied, as Page 1 of 3

FROST STUDY

10-year Frost Study data shows:

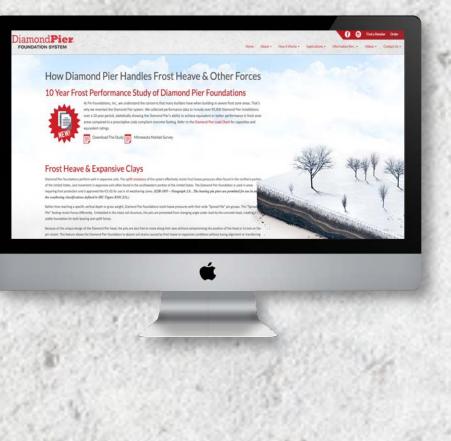


of all Diamond Pier installations resisted frost in severe Minnesota frost

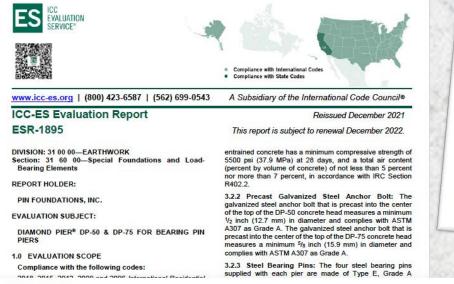
- 24" ------

Download a copy at: www.DiamondPiers.com/frost-study

DP75-63" is equal up to a 24" diameter footing 60" deep! DP-75/63



APPLICATIONS



2.0 USES

The Diamond Pier DP-50 and DP-75 bearing pin piers are used as foundations for the support of gravity loads for exterior decks, including covered decks, exterior porch decks, elevated walkways, stairway construction and accessory structures as defined in the IRC. The bearing pin piers are permitted for use in any of the weathering classifications defined in 2018 IRC Figure R301.2(4) or 2015 2012, 2009 and 2006 IRC IRC e sigurs R301.2(3). Measures to inches (254 mm) by to meters (254 mm) by measures to inches (254 mm) by to meter (254 mm) by to meter

3.2.1 L He. The control for a second second

pins provides a 1.8-square-foot (0.17 m²) bearing area for supporting gravity loads; the DP-50 bearing pin pier with 50-inch (1270 mm) pins provides a 2.2-square-foot (0.20 m²) bearing area for supporting gravity loads; and the DP-75 bearing pin pier with 50-inch (1270 mm) pins provides a 3.2-square-foot (0.30 m²) bearing area for supporting gravity loads.

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ONE COMPLETE SYSTEM

The Diamond Pier system come with all the components a customer needs to start a project.

For decks, covered decks, porch decks, walkways, stairway and accessory structures as defined by the International Residential Code (IRC).

Diamond Piers must be installed as a system (Diamond Pier Head with 4 Diamond Pier Pins) for structurally rated performance and in accordance with the ICC-ES ESR-1895 report, Diamond Pier residential load chart and Diamond Pier Installation Manual.



Diamond Pier System Includes:

- 1 Concrete Head
- 4 Steel Pins
- 1 bag of Tips & Caps (4 each)

Official Diamond Pier concrete heads come with individual 14-digit QC tracking barcodes.

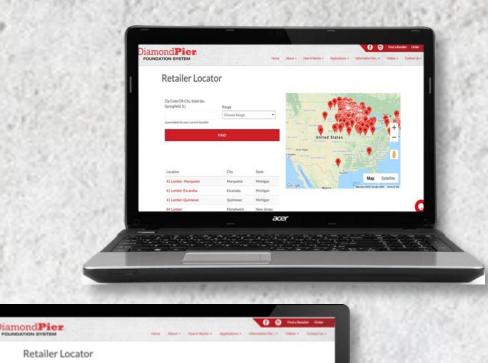
PURCHASING DIAMOND PIER

Diamond Piers are sold to contractors through retail lumber yards and building supply stores.

To find your nearest retail store, visit our Retail Locator page on the Diamond Pier website.

Find Your Nearest Stocking Dealer www.DiamondPiers.com/retailer-locator

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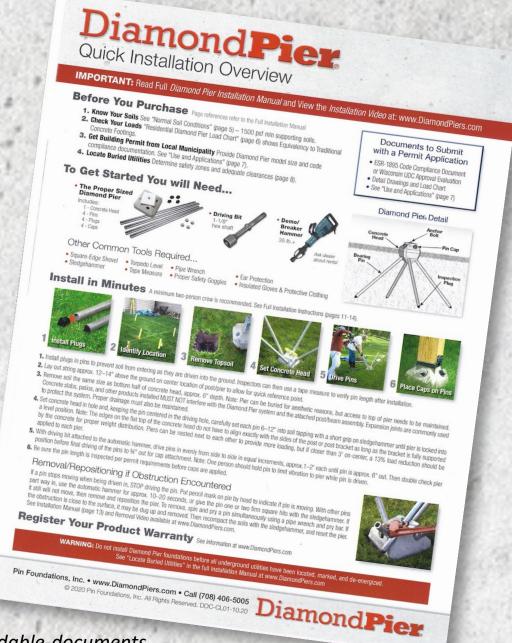


PRIOR TO PLACING THE PINS INTO THE CONCRETE HEAD, ALWAYS INSERT THE TIPS INTO THE END OF EACH PIN.

The tips block dirt from entering the hollow pins. This allows the building inspector to measure the length of pipe after installation.



Building inspector needs access to the installed Diamond Pier to complete inspection.



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Download all installation guides at www.DiamondPiers.com/downloadable-documents

Common Tools Required

- Proper Safety Goggles
- Insulated Gloves & Protective Clothing
- Ear Protection
- Square-Edge Shovel
- Sledgehammer
- Torpedo Level
- Tape Measure
- Pipe Wrench



A minimum two-person crew is recommended. See Full Installation Instructions pages (11-14).

Models: DP-75/63" and DP-50/50"

Note: Anytime a pin length exceeds 50", the diameter must increase to 1 ¼" nominal in order to achieve the proper deflection values.



Some builders might try to substitute a 1" diameter pin, longer than 50" into the DP50 head to achieve what they *perceive* as better frost protection. However, this is a misunderstanding of the engineering principles; *Long slender pins can overstress and bend permanently*, <u>which could result in a possible failure of the</u> *application*.



Visit our website to download the full Installation Manual.

Watch our Instructional How-To videos



www.DiamondPiers.com



INSTALLATION MANUAL

Pin Foundations, Inc. Gig Harbor, Washington Toll Free: 866-255-9478 / Main Office: 253-858-8809 Toll Free: 866-255-9478 / Main Office: 253-858-8809 www.pinfoundations.com or www.diamondpiers.com



1-1/8" hex shaft driving bit

HOMEOWNER LIFETIME WARRANTY

Diamond Pier provides the homeowner with a limited lifetime warranty (parts & labor).

The homeowner can register for the warranty at <u>www.DiamondPiers.com</u>

For more information on the warranty see: <u>https://www.diamondpiers.com/diamond-pier-warranty</u>





THANK YOU

DiamondPier. FOUNDATION SYSTEM

