INSTALLATION MANUAL

2012
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Reference: DP-50 Evaluation Services Report, ESR-1895

This installation document is also available on the Pin Foundations website, www.diamondpiers.com, or call (866) 832-7835
Foundation Engineering

At Pin Foundations Inc. we've been engineering foundations for over 25 years, and one thing has always driven our thinking - the soil is the true support - and it comes with plenty of strength and mass to do the job. Soil has an intact, in-place structure, based on the interaction of its tiny particles, and this structure is consolidated and fixed by the moisture that constantly moves through it, and by the weight, density and internal pressures that increase in it with depth.

The foundations that engineers design to be inserted or constructed in the soil, have two basic functions - properly transferring loads into the soil structure, and making a connection to the supported man-made structure above. There have always been two basic types of foundations: Deep Vertical Piling (banged in), or Shallow Spread Footings (dug in and buried). Piling keeps soil strength intact and is easy to install - if you don't have to go too deep. Footings spread the loads more widely, but the digging breaks apart the soil, weakening it and blocking or exaggerating water flow.

There is a third approach though that combines the best features of both, and results in an efficient and soil reinforcing foundation - this is Pin Pile Technology - and it's actually one of the oldest forms of foundations. By grouping short stiff piles, which are easily driven in penetrable soils, and setting them at angles to work more like a shallow footing - spread like a pyramid in the ground - an inexpensive foundation can be created, without digging*. The pile group resembles the roots of a tree, and can actually help to buttress the soil structure it's engaged in. Some of the oldest archeological roadways discovered were supported over soft soils in this way - with gangs of short driven timber posts - and in recent decades, it has become a reliable technology for complex, heavy-duty commercial applications. It is a state of the art technology, that does a superior job of transferring loads to the soil.

Our innovation is bringing Pin Pile technology into common use with a superior connector - the Diamond Pier. This high strength pre-cast concrete head is a driving guide, pin piling lock and structural connector all in one. As a guide, the pier sets the Pin angles and orientations so their capacity is definable and consistent: as a lock the pier is designed to increase its grip on the Pin cluster when loaded — up, down or sideways - getting stronger and tighter as the loads go higher: and as a connector, an embedded anchor bolt and variable, pre-cast, post matching shape make it a simple and proportional compliment to its supported structures. As a system, this hybrid of familiar concrete and steel materials provides a solid, stable foundation, which captures and amplifies the strength of the soil it's engaged in, and in turn, protects the permanent structures it supports.

Pre-Engineered Systems for Frost

If you ask people where the most severe Frost heave conditions are, they'll probably say Minnesota. That's where we decided a few years ago to introduce our residential Diamond Piers for decks - and it reflects how confident we are in this technology. Are there limits? Of course, but they are the same limits that affect all types of foundations. In frost zones, a properly drained soil with a conventional particle structure will freeze like a fortress, and hold its foundations tight. Most soils have this character, and most buildings are built in these areas. The retail versions of the Diamond Pier - the DP 50, DP 75 and DP 100 - are pre-engineered to perform as well or better than traditional deck foundations in frost zones with these soils - but you have to know your terrain. Unconventional soils are generally rare in nature, but a lot of weak soil and drainage issues can also be man-made. Pin Foundation Inc.'s commercial division has the resources and experience to analyze these non-conventional sites, and determine if a custom designed system may be applicable.

Most traditional foundations in frost zones rely on depth and gross weight as protections against frost heave. They use significant volumes of site poured concrete, with the potential for field variables and inconsistent mix designs. Installing these types of foundations also requires considerable digging, leaving substantial amounts of soil to be removed from a site, and inviting drainage problems. For Pin Pile Technology in frost zones, Pre-engineered Pin length for the retail Diamond Piers is based on providing sufficient bearing and resistance to uplift loads, rather than reaching a specific vertical depth - and of course keeping the soil structure and existing drainage intact with driven, rather than dug in, installation. Because of the unique design of the Diamond Pier Head, the Pins are also free to move along their axes, without compromising the position of the pier or its lock on the Pin cluster. This feature allows the Diamond Pier to absorb soil strains caused by frost or expansive conditions, without transferring these loads to the supported structure, keeping everything in line, and, again, protecting the structure by doing a superior job working with the soil.

*The environmental advantages of minimizing excavation and reducing concrete volumes are far reaching and significant. Cement manufacture has the third largest carbon footprint in US Industry, and digging, whether for the mining of concrete constituents, or for the placing of deep monolithic concrete components, releases more carbon into the atmosphere.
Know your soils:
As with any foundation system it is important to first know your soils. Bearing strength varies with soil strength. It is important to know the bearing pressure of your soil in order to comply with most building codes. The ICC (International Code Council) defines soil types in Table R401.4.1 “Presumptive Load-Bearing Values of Foundation Materials.”

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.

![Table R401.4.1](image)

Your local building code official may provide information regarding soil types. If a home has already been constructed on the site with a conventional foundation system, the soil most likely met the minimum of 1500 PSF. The class of material and load bearing pressure may have already been determined and are on record. If instead, the project site has historically required additional measures to be engineered and built on, ask your local code official for this information. Historical soils information is also available at the US geological soil survey site managed by the United States Department of agriculture. Please visit [http://soils.usda.gov/](http://soils.usda.gov/).

The Diamond Pier system is engineered for use in soils with a minimum of 1500 PSF soils. The Diamond Pier foundation system is a structurally rated system per Pin Foundations, Inc.’s, Capacity Comparison Chart. Please refer to the chart below for this information.

![Load Bearing Capacity Comparison](image)
Check your site:
Do not install Diamond Piers on slopes greater than 2:1 (27 degree slope)

Check your site for any signs of unconventional soils.

Pin Foundations, Inc.’s definition of unconventional soils is:

“Unconventional soils include peats, unconsolidated or un-compacted fills, contaminated soils, highly organic wetland or “hydric” soils, and soils which are weaker than 1500 psf or have water problems; sites where traditional concrete piers, accepted by local codes, failed, or can potentially fail to provide adequate bearing to support the total load of the project or to protect the structure from the negative effects of frost heave.”

Unconventional soils that retain standing water can weaken soils or cause severe frost heave conditions. A site depression where there is standing water or where there is the potential for water to pond, pool or saturate the soil may be an indication of unconventional soils. Sites where downspouts discharge at or near the foundations may also cause complications in sites where unconventional soils exist. Drainage ditches, creeks or nearby ponds, may also indicate unconventional soils. The Diamond Piers should be set well away from these features.

Frost Heave
Frost Heave ratings are also defined in the Capacity Comparison Chart. The Capacity Comparison Chart shows the structural rating and a comparison to the equivalency of a traditional concrete pier footing. The DP-50 with 50” pins will resist frost heave in a 48” frost zone. The DP-75 with 63” pins will resist frost heave in a 60” frost zone. If there is a history of extreme frost heave or a specific project sites where traditional concrete footings, 48”-60” deep, have failed, or will likely fail to resist frost heave, and larger deeper concrete piers are required, these sites are classified by Pin Foundations Inc. as “unconventional soils”.

As we mentioned in page 1 in the paragraph titled Pre-Engineered Systems for Frost, the retail versions of the Diamond Pier -the DP 50, DP 75 and DP 100 - are pre-engineered to perform as well or better than traditional deck foundations in frost zones. Frost heave resistance for the Diamond Pier is based it’s equivalency to a conventional concrete footing depth shown in the frost zone rating line of our Capacity Comparison Chart. Due to a combination of non-draining soil types and extremely cold winters, the state of Minnesota experiences some of the most extreme frost heave conditions in the United States. When assessing project sites in Minnesota or other extreme frost areas, be aware of sites where traditional concrete footings, 48”- 60” deep, have failed, or will likely fail to resist frost heave, and larger deeper concrete piers are required. Project sites that require concrete footings deeper than 60” to resist frost heave exceed the capacity defined in our retail versions of the Diamond Pier. Contact Pin Foundation Inc.’s commercial division to determine if a custom designed system may be utilized in these sites.

Underground Obstacles
The same obstacles that conventional foundation systems face, such as rocks, tree roots, underground utility lines and other buried obstacles, also exist with the Diamond Pier system. Refer to the Installation Instructions below for handling buried obstacles. If an obstacle is encountered that cannot be passed using the breaker hammer while driving the pins, the pins may be removed and the concrete head can be rotated, allowing the pins to penetrate the soil in a different location. (Refer to the installation instructions below, Note 4)

Buried Utilities
WARNING – check for underground utilities. DO NOT INSTALL DIAMOND PIERS before all underground utility lines have been located and properly marked by your local official utility locating service and all privately run lines have been identified and located by the proper authority. If there are any electrical lines in the area, de-energize the power source prior to installing the Diamond Pier. Never allow body contact with un-insulated portions of the automatic breaker hammer. Wear properly rated rubber insulated gloves and boots. In, addition, if underground utilities are located on the site, check with your local utility locating service to confirm required safety zones, and refer to the table below “Horizontal Pin Distance” for the horizontal reach of the Diamond Pier pins, allowing for the proper horizontal clearance.
Check your layout:
In order to meet the loadbearing capacities shown in the capacity chart, the Diamond Piers must be spaced a minimum of 3 feet apart — center of bolt to center of bolt. They must also be set back the horizontal distance shown in the table above “Horizontal Pin Distance” from existing foundations or other buried obstacles. The piers should also not be installed in unconsolidated backfill, which often occurs around the excavated perimeter of basement or daylight basement foundations. Tributary Loads from the supported structure must be properly calculated, and the piers spaced accordingly, so that each pier is supporting only up to its designated allowable loads. See Pin Foundation’s load bearing capacity comparison chart.
Tools and Supplies
Check for cracked piers. Verify that you have the correct number of Diamond Piers with the corresponding number of Pins, Pin Caps, and Inspection Plugs, and that the anchor nuts thread properly on the pier anchor bolt.

Tools needed:
• Automatic driving hammer with 1 1/8” hex Diamond Pier driving bit
• Square spade shovel
• Sledgehammer
• Torpedo level
• Tape measure
• Pipe wrench
• Also, wear the proper safety goggles, ear protection, insulated gloves and clothing.

We recommend a minimum two person crew for installation.

(Do not use the Pin driving Bit as a hammering tool, or hammer against it with the sledge. It is to be used with the automatic hammer only.)

Setting the Concrete Head:
1. Dig a square hole tapered the same size and shape as bottom half of concrete pier. This creates a cradle to steady pier for leveling. Leave loose soils directly below the pier.
2. Following safe lifting procedures, carefully lift the concrete head, and position it in the hole to its midpoint*, level and centered on your alignment.
3. Replace some of the removed soils back around the sides of the pier at grade, lightly tamping to maintain level and alignment during Pin driving. See Pin driving notes below.
   *The pier may also be buried deeper for aesthetic considerations. Access to the Diamond Pier needs to be maintained. Be sure to keep top half of pier clean until caps are glued on.

Pin Driving:
Note: Verify locations of any Buried Utilities before Pin Driving.
1. Remove any dirt and debris from the Pins and check that they will fit easily in the driving holes the concrete heads. (If a cut or burr is restricting the fit, try the other end of the Pin)
2. Set the inspection plugs to the ends of the Pins that will go first into the pier.
3. Slide Pins through opposing holes in the concrete head, and make sure to support them.
4. Set the Pins 6 -12 inches into the soil using the sledgehammer until pier is locked into a level position.
5. Drive opposing Pins alternately in increments with the automatic hammer. Periodically check for plumb and alignment, and keep the weight of the auto-hammer from forcing the pin against the lower half of the driving hole, and impacting the pier.
6. Temporarily drive all pins down to (within) 6” from top of pier; this allows easier removal if an obstruction is encountered.
7. Finish driving the Pins with the automatic hammer, being careful not to damage the precast pier, or upper ends of the Pin, and leaving approximately 3/4”-of the Pin protruding from the top of the concrete.

Note 1: Do not attempt to drive the pins all the way down with just a sledge hammer, as this may damage the ends of the pins or crack the pier.
Note 2: Do not drive a Pin all the way down all at once if this causes the Pier to be pulled to one side. Continue to rotate around the Pier, driving the Pins in increments, until the growing strength in the pile group is sufficient to allow final driving. If driving a given Pin does not cause the pier to go out of level, the Pins may be driven all the way, one at a time.
**Note 3:** Do not continue to hammer away at a Pin which is bouncing or rattling against an impassable object, if it causes the Pier to ride up the Pin, pushes the pier to one side, or risks eccentrically stressing the pier. This may cause the pier to crack, and a cracked pier must be removed and replaced. Ensure that the pier will remain in place if encountering difficulties in the soil, and when following the steps in

**Note 4:** If pin stops moving when driving, STOP Automatic hammering.

Be sure other pins are at least half way in to stabilize pier. Continue to drive the obstructed pin with automatic hammer for approximately 20 to 30 seconds. Also, one firm square hit with the sledgehammer may drive the pin by the obstruction. Many small rocks will also roll allowing the pin to move past. If the pin moves slightly continue with the automatic hammer. If pin will not go in, remove pins, rotate pier around center and reinstall to avoid obstruction. The pier may also be relocated, within the parameters of your superstructure design, in order to avoid underground objects. If the obstruction is close enough to the surface, it may be dug up and removed. Once accomplished, re-compact the soils with the sledge hammer, and reset the pier.

**NOTE:** The square top of pier does not have to align exactly with the square post as long as the bracket being used is near the center of pier and allows proper weight distribution.

**Removing Pins**
A pipe wrench can be used to turn pipe while corkscrewing them upward... See "Pin Removal" video on the website- or Jacking method below.

**The Jacking Method**
This method is the easiest way to remove pins, and requires approximately 6" of pipe to first be extended out from the pier.

1. Use a pin with an inspection plug as a pry bar.
2. Place the pry bar flat against concrete angle at outer edge of pier, and perpendicular to the pin to be removed using your right hand.
3. With your left hand, place the pipe wrench on pin (which) and slide it down tight to the pry bar. Pipe wrench handle should be pointing up slightly, perpendicular to the pry bar, allowing the pipe wrench to turn the pin as it is pried.
4. Pull up on pipe wrench handle to lock
5. Then, pull up pry bar with right hand to move pin out approximately 1 to 2 inches.
6. Slide pry bar back to flush with concrete angle on pier.
7. Repeat lock and jack until pin can be pulled by hand.

**Capping the Pins:**
Set the caps loosely on the ends of the Pins, so they can be removed for Pin length inspection. Set brackets, and posts or beams, and frame and complete the supported structure. Once these framing material loads have been applied, pull the caps off and re-verify the length of the protruding pins, adjusting as necessary by tapping with the small sledge hammer. Apply an adhesive caulk around the lip of the caps, and seal over the ends of the Pins, tapping the caps down tight to the concrete with the small hammer. We recommend using a 50 year, adhesive caulk, or equal, and following the caulk manufacturers application guidelines.

These Installation Instructions are for Residential Retail applications of the Diamond Piers only.
Post/Beam Brackets

The bracket needed to make the connection from the Diamond Pier to the superstructure can be purchased separately from a local lumberyard. The DP-50 pier has a 1/2" galvanized bolt embedded in the top of the pier (nut provided), and this bolt will connect to a Simpson Strong-Tie® bracket — model ABW - or similar approved post base. Check with your jurisdiction to verify which post bases are acceptable in your area, and make sure to match the post size and loads on the post with the appropriate bracket size and bracket load ratings. Typically these brackets come with a "standoff" design that separates the wood from contact with the base of the bracket, and eliminates the need to drill into the bottom of the lumber to compensate for the raised anchor bolt.

The DP-75 and DP-100 piers have 5/8" diameter bolts at the top of the pier, and this corresponds to the Simpson Strong Tie ABU bracket - or similar approved post base. Horizontal beams may also be set directly in an appropriate bracket for direct connection to the Diamond Pier when constructing low profile structures. If you are using 6x6 posts with the DP-50 pier, make sure to ask your dealer for the DP-50 for 6x6 model.

The proper bracket coating or finish should be chosen based on the lumber to be used and the treating specifications of the project superstructure. If stainless steel is chosen, the embedded galvanized bolt must be protected from contact with the stainless bracket with the addition of a plastic or rubber bushing (not supplied), or the piers must be special ordered with stainless steel bolts.

Most post-base brackets have a wide hole in the base that allows some horizontal adjustment of the final bracket location.

Breaker Hammers and Driving Bits

Automatic breaker hammers used for installing the Diamond Pier Pins are listed below. The bits for these automatic hammers all use 1-1/8" hex shafts, and can be rented through a local rental yard, purchased through your lumber dealer, or purchased from Diamond Pier online. Most of the rental yard bits are produced by Bruner & Lay of Chicago (847) 678-3232, and distributed through various rental companies throughout the US - bit model # B 31-861.

Only automatic breaker hammers should be used to install the Diamond Pier Pins, and the bits are meant to be used with these automatic hammers only. The bits are not to be used with, or as, a sledge hammer.

Automatic Hammers for Diamond Pier® installation

The electric hammers listed have a range of impact energies from 20 to 44 foot/lbs. Soft or loose soils will allow for the use of lighter, lower energy hammers. Stiff or dense soils will require electric hammers in the higher impact range, or standard jackhammers driven by compressed air. In most cases the DP-50 is installed with smaller electric hammers, and the DP-75, & DP-100 with larger electric or compressed air hammers, regardless of soil strength. Roto-hammers are not adequate.

MAKITA mm# HM1307CB 1-1/8" Hex 35 Lb. Demolition Hammer
Bit Type: 1-1/8" Hex

HITACHI model #H65SD2 1-1/8" Hex 40 Lb. Demolition Hammer
Bit Type: 1-1/8" Hex

BOSCH model# 11335K Jack 15 Amp Breaker Hammer Bit Type: 1-1/8" Hex

MILWAUKEE mm# 5338 Breaker Hammer Bit Type: 1-1/8" Hex
TROUBLE SHOOTING

Cracked Pier Always inspect materials when received from supplier. Do not install a pier that has a crack or fissure running internally into the pier. Slight flaking or chipping does not constitute a crack.

Concrete Flaking While installing, pins rubbing against the pier may cause superficial flaking of concrete around the driving hole. This will not affect the structural strength. However, if a crack or fissure develops during installation, the integrity of the pier has been compromised and the pier must be removed and replaced.

Hitting an Obstruction If an obstruction is encountered, the pins may be removed and the Diamond Pier repositioned. If the obstruction is dug out and removed, soil must be re-compacted per the Installation Instructions. Do NOT cut pins. See Pin Driving Notes in the Installation Instructions.

Pier will not Stay Level when Installing Your hole for setting the pier may be too big. Only dig a hole the size of the pier being used, and be sure to put all pins in the pier before setting them. With all the pins sticking up from the pier, one person can also push or pull on the pins to manipulate the leveling process, and guide or steer the pier to a level position, being careful not to wrench on the pier and cause a crack.

Pier Installed out of Level If a pier is more than 5 degrees out of level, this may compromise the symmetry of the bearing Pins, and it should be removed and repositioned. Re-install the pins slowly at first, checking level constantly, and if one Pin is not going in straight and is causing the pier to tip, install the other Pins first, then carefully finish driving this last Pin.

Pins have Risen Slightly Out of the Concrete Head This may occur when extreme loads have been applied to the pier, but the system is designed to relieve pressure in this way. The Pins may simply be tapped back to their original position with a small hammer.

Pins will not Fit into the Pier Make sure Pins fit into the pier before inserting the inspection plugs. Be sure Pins and Piers are free of dirt and check both ends for fit. Always transport and store in a clean environment. Measure Pin diameter to be sure the proper Pins have been supplied for your pier model. (DP50 - 1" nominal pin is 1.315" actual outside diameter. DP75 -1 1/4" nominal pin is 1.67" actual OD, DP100 - 1 2/"nominal pin is 1.9" actual OD). If pins still do not fit, contact your supplier.

Caps will not Fit over the Driven Pins Check to be sure proper cap size was supplied (see Pin outside diameters above), and that your caps are pliable and not frozen. Caps should be tapped on with a small hammer. If they still will not go on, check the Pin ends for any extreme deformations that may have occurred while driving. File or grind off any damage to re-establish the original diameter, and apply the cap.

Post Looks too Big for the Top of the Pier 4x4 and 4x6 posts can be used on all Diamond Pier sizes, and 6x6 posts can be used on the DP-100, DP-75 and DP-50/6x6 models. When installing, be sure the loads of all post sizes are properly transferred to the top of the concrete with appropriate brackets. If you have a DP-50/4x4 model pier already installed, and you're planning to put a 6x6 post on it, the bracket may need to be blocked with composite or pressure treated wood between the base of the bracket and the underside of the standoff fitting. If you haven't installed the pier(s) yet, ask your dealer for the DP50 for 6x6 model instead.

Diamond Pier is Not Approved Yet in your Jurisdiction Make sure to include the Diamond Piers on your permit application along with the ESR1895 report for the DP-50, the Frost Performance Reports and Alternate Methods cover letter. (Go to www.diamopndpiers.com for downloadable cover letter text) Make sure that you are applying for only the allowable Diamond Pier uses (decks, covered decks, stairs, and walkways), and that the designed loads to be supported are within the allowable capacities of the Diamond Pier model indicated for the soils on your site. If the Building Official is still denying the product, request a written explanation of how the Diamond Pier does not meet the intent of code in their jurisdiction, and forward this request and the Building Official's response to Pin Foundations, Inc.
**Field Inspection**

*Note:* Diamond Pier foundation inspection can take place at any time after installation, and can be combined with the superstructure framing inspection as each jurisdiction warrants.

### Pin Length

Diamond piers are designed to be inspected from above grade, after they have been installed. Provided the builder uses the inspection plugs at the lower (driven) end of the Pin to keep soils from moving up inside it, a tape measure can be slid down from the top of the installed Pin to verify its length.

*Note:* If framing members will be too close to the top of the pier to allow the tape measure to be inserted, this inspection should be done before this framing is in place. Also, if the builder has not used inspection plugs, pins may also be twisted or jacked out with a pipe wrench to verify their length. They may then be re-driven in the same soil cavity. Pins are to be their full specified length (length tolerance is +/- 1/2”). A Pin that has been cut in the field will have an irregular, rough end at the cut.

**Pin Specification** — Pins are to be schedule 40 galvanized pipe, electric resistance welded, with no threads. This also can be verified from the top of the pier. With the rubber cap removed, the weld can be verified on the inside wall of the Pin, and the wall thickness can be checked. If the wall thickness is thinner than specified, the Pins have been substituted with a lower schedule pipe or conduit, and must be replaced with the properly specified Pins. 1” nominal, schedule 40 pipe has a wall thickness of 0.133 inches (just over 1/8”). 1-1/4” nominal, schedule 40 pipe has a wall thickness of 0.140 inches, and 1-1/2” nominal, schedule 40 pipe has a wall thickness of 0.145 inches. The wall thickness tolerance is +/- 12%.

### Pier Integrity

If the Installation Instructions are properly followed, the piers should be level (within a 5 degree tolerance), and they should not have structural cracks as a result of improper handling or driving. (Surface spalls or chips may occur during driving or handling, but these are not structural, and will not affect the pier.) A structural crack is perpendicular to the outer face of the pier and heads inward to the core. This can weaken the pier strength, and/or allow water to penetrate and cause freeze/thaw problems in the concrete. If a pier is more than 5 degrees out of level, the symmetry of the Pin pairs may be compromised, and the pier should be removed and correctly re-installed. If a pier has a structural crack, it should NOT be patched. It should be removed and replaced.

### Allowable Capacity

The piers should not be overloaded. The total load on any specific pier is based on the individual tributary loads of the structure, supported by the corresponding post or beam connected to the pier. This weight is a combination of either snow or people (live load), and the weight of the deck structure itself (dead load). The total tributary load — area x psf (LL+DL) - should not exceed the published capacity of the pier.

### References/Standards

A. ASTM A 53 - Pipe, Steel, Black and Hot dipped, Zinc-coated  
B. ASTM A153 - Zinc coating (hot-dip) on Steel Hardware  
C. ASTM, ACI and CRSI standards for precast concrete products

### Delivery/Storage and Handling

A. Contractor shall protect the materials from damage.

### Pins

A. Four pins per pier. All Pins to be galvanized steel pipe with butt cut driving ends, schedule 40 – Grade A, Type E electric resistance welded -Pins to be capped with UV resistant vinyl caps, and sealed.

### Connections/Posts/Beams

A. Diamond Pier connection to be galvanized steel post base (by others) attached to pier with single cast-in galvanized anchor bolt.

### Site

A. Alteration of site soils or vegetation to be kept to a minimum to avoid erosion, drainage issues, or the need for re-vegetation.

### Installation

A. Contractor shall verify superstructure layout, spans and resulting loads for consistency with the manufacturer’s published capacities,  
B. Pins to be full length as specified before driving. No coupled or welded pins are to be used.  
C. Follow Manufacture’s Installation Instructions
INSPECTION PLUGS

These hard plastic plugs keep soil from moving up the inside of the Diamond Pier® Pins, allowing inspectors to slide a tape measure down the Pin from above to verify its length. If you have Pins with an interior weld bead, align the slot in the plug with the weld before inserting. The allowable tolerance in Pin wall thickness means that some plugs will fit high in the end of the Pins, and some will fit down almost to the plug shoulder. In either case, tap the point of the plug with a hammer to seat it firmly enough in the end of the Pin, so that it will not drop out as you slide it through the Pier sleeves. Don’t worry that tapping the end of the plug with the hammer will blunt the point. This would happen anyway as the plug is driven into the soil.

Point
Shoulder
Slot

Plug Sits High in Pin
Thick Wall Pin

Plug Sits Low in Pin
Thin Wall Pin

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