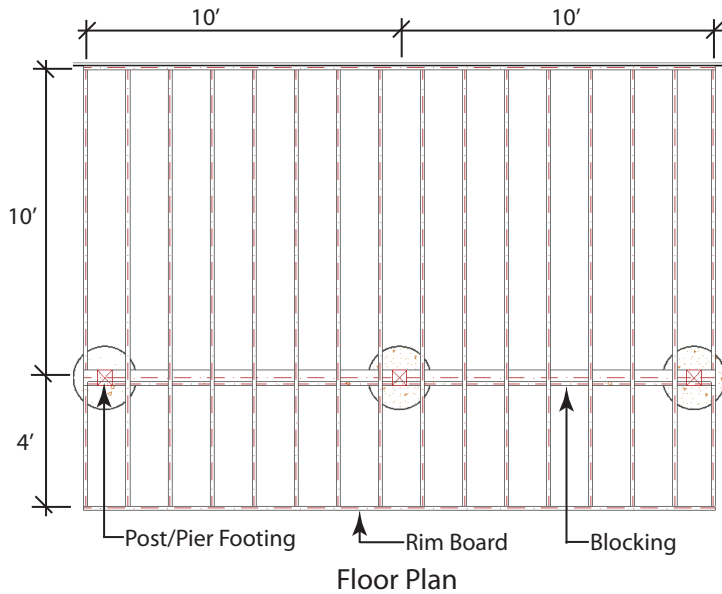# Pier Footing
Deck Footing [USA Pier Footing]

See how you can design a Deck Pier Footing to code requirements!

Learn how to translate your CAD Plan and Elevation directly to a ClearCalcs Calculation!

Post/Pier Footing — Rim Board — Blocking

Floor Plan

DESIGN CRITERIA

Footing Diameter: 24" — (A)

Concrete Strength: 2500 psi — (B)

Post Type: Post with Bracket — (C)

Soil Bearing Capacity: 4000 psf — (D)

Deck Loading (Load Linked) — (E)

Dead: 10 psf   Snow: 40 psf

Live: 60 psf

*60 psf is typical for a deck except in the IRC where it is 40 psf. California Residential Code also amends the IRC to use 60 psf

Post Bracket

6"

18"

24"

Footing Section

3D Model
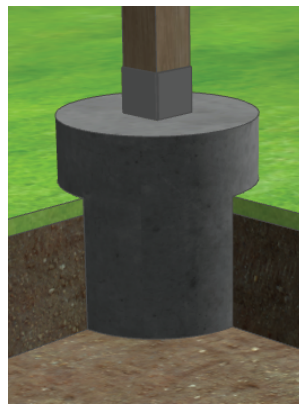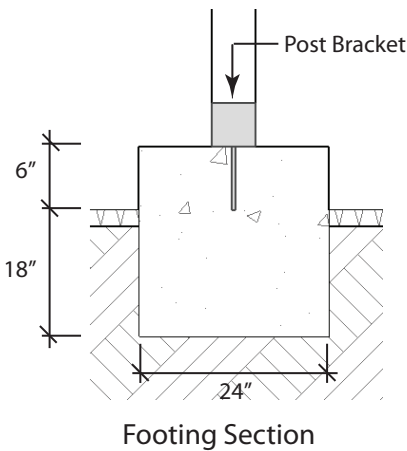
The International Building Code (Cl. 1806.2) provides presumptive values for soil bearing capacity for gravel and sandy gravel at 4000 psf. For lateral loads, the allowable lateral pressure typically range from 30 - 100 psf/ft

Soil Properties

Allowable Soil Gross Bearing Capacity	$q_a =$ 4000	psf
Allowable Lateral Pressure per Unit Depth	$S =$ 100	psf/ft

— (D)

Applied Loads — (E)

Height Above Ground of Lateral Load Application	$h =$ 0.5	ft

Axial, Shear, & Moment Loads about X-axis $V, P, M =$

Label	Location z (ft)	Axial Eccentricity y (ft)	Load Magnitudes V, P, M	
Dead + Occupancy	0	0	D, L, S	Edit... Link
			D, L	Edit... Link

Axial, lateral, and moment loads can be manually entered into the loads table. There is no shear or moment as only gravity loads are being considered for this design

Load Magnitudes

Load Type	Lateral Shear Load V_{ua} (lb)	Vertical Load P, (lb)	Moment Load M_{ua} (lb·in)	
(D) Dead Load	0	1590	0	
(L) Live Load	0	6800	0	
(S) Snow Load	0	4530	0	

Close

Pier Properties

Min. embedment depth based on local frost line

Pier Diameter	$b =$ 24	in
Embedment Depth	$d =$ 1.5	ft
Height of Pier Above Ground	$h_g =$ 0.5	ft
Total Pier Length	$L_{pier} =$ 2 ft, 0 in	
Lateral Constraint at Ground Surface	● Nonconstrained ○ Constrained	

— (A)

Lateral constraint not required when there are no lateral loads

Min. 2500 psi concrete strength required per most building codes

Concrete Properties

Concrete Strength	$f'_c =$ 2500	psi
Concrete Weight Classification	Normalweight	

— (B)

A nominal 6x6 wood post will have a design dimension of 5.5" x 5.5"

Post connected to pier footing via bracket or bearing plate

Post Properties

Post and Connection Type	Post + Bracket / Bearing Plate	
Bracket Bearing Width	$b_{bracket} =$ 5.5	in
Bracket Bearing Length	$\ell_{bracket} =$ 5.5	in
Bearing Area Diagonal Length	$\ell_{diag} =$ 7.78 in	

— (C)

Alternatively, consider using ClearCalcs' Load Linking function to quickly and more accurately link loads from the deck post to the pier footing!

Axial, Shear, & Moment Loads about X-axis $V, P, M =$

Label	Location z (ft)	Axial Eccentricity y (ft)	Load Magnitudes V, P, M	
Support Column Main-1	0	0	D, L, S	View... Link
			D, L	Edit... Link

— (E)

Use Reduced Companion Live Load?	○ Yes ● No	
Consider Self Weight?	● Yes ○ No	

Generally no changes required for typical structure

This design example is part 4 of 4 examples in our "Deck Design Series." For additional information regarding load linking and the other design examples available in this series, please visit the ClearCalcs Support Center.