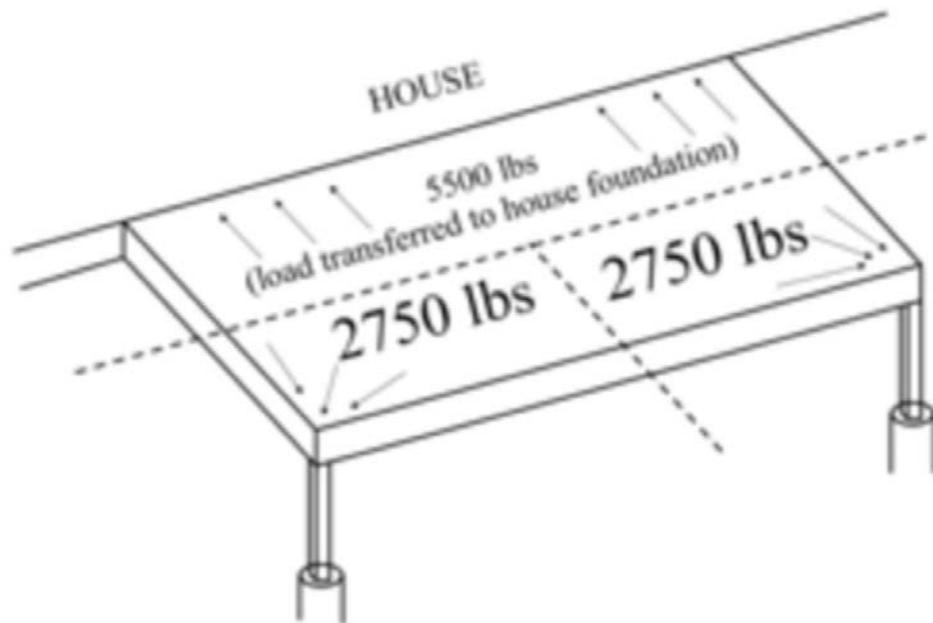


## Footing Size for Pier Foundations

The footing size seems to be the biggest stumbling block for most people building a deck. Hopefully this article will shed some much needed light on the subject.

First we need to start with a virtual deck. Ours will be 10' x 20'. To determine the proper footing size we need to figure out the load, or weight, on each post. The deck needs to be constructed to support 40 lb/sf of live load, such as people and furniture, and the dead load, which is the weight of the building materials. We will use 15 lbs/sf for the dead load. So our total load is 55 lbs/sf.

Now we need to figure out how many pounds each post is going to have to support. First, we draw a line across the middle of the deck between the house and deck posts. All of the deck area closest to the house (100 sf) will be supported by the house foundation through the transfer of load at the ledger board. Then we draw another line between the two posts in the area away from the house. Each of these two sections is 50 sf.



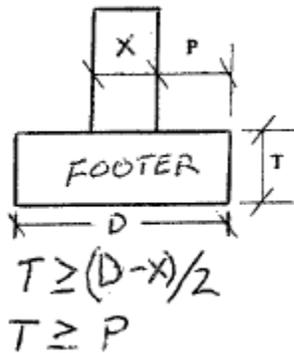
Now we can take each section and multiple it by our total load of 55lbs/sf which means each post is carrying 2750 lbs.

In order to properly determine the size of the footing we must also consider the soil type which our footings are sitting on. There are three common soils: gravel, sand, and clay, each with a progressively lower load capacity.

Using the table provided, our deck footings would need to be 14" in gravel, 17" in sand, or 19" in clay. The minimum diameter footing that can be used is 12". The minimum thickness of a footing is 6" but it also must at least as thick as the distance the footer extends beyond the face of the post resting on it. Ex: A deck requires a 20" diameter footer and is using a 4" support post;  $20-4=16$  and  $16/2=8$  represent the extension on each side of the post; therefore the footer thickness in this case is required to be 8". If you want to use a smaller size footing, you would have to add more posts to reduce the load on each post.

Obviously this is a very simple example but the logic works for any deck of any shape. Keep in mind that footing size is not the only consideration for the number and spacing of your posts. You'll also have to review lumber spans and the allowable load for your wood post size.

The thickness of the footer "T" must be a minimum of 6" but must also meet the equations below:



Maximum Allowable Load for Post Footings			
Soil Type	Gravel	Sand	Clay
(Allowable Pressure)	3000 lbs/sf	2000 lbs/sf	1500 lbs/sf
Footing Diameter	Maximum Load of Post Footing(lbs)		
12"	2300	1500	1100
13"	2700	1800	1300
14"	3200	2100	1600
15"	3600	2400	1800
16"	4100	2700	2000
17"	4700	3100	2300
18"	5300	3500	2600
19"	5900	3900	2900
20"	6500	4300	3200
21"	7200	4800	3600
22"	7900	5200	3900
23"	8600	5700	4300
24"	9400	6200	4700