

You've Got To Do The Dirt

By George Porter

In the last five years the installation business has changed drastically. It is no longer just hard work and good intentions, it is a science. The truth is it always was but it was not as critical as it is today. Homes today weigh two or three times as much as they did twenty years ago and it is necessary that you "do the science" if you want them to "be all they can be".

The easiest science is the load bearing capacity of soil. (When you are talking about science you should call the dirt soil, it makes you seem smarter) Some kinds of soil have a good perk rate for septic systems and some kinds don't. Certain soils can grow good tomatoes and other kinds can't. Not all dirt is the same and one of the many differences is load bearing capacity. This is a measure of how much weight the soil can hold per square foot before it collapses and lets the weight sink into the ground.

"Before Science" is also known as "BS". Back then you would simply drive your truck on the lot and see what happened. If your truck got stuck then you knew the ground was soft and you had to put more blocks under the home than usual so it would not settle out of level too fast. With any luck it might stay fairly level for the whole warranty period, if not then the deal would be that you would re-level the home one time only for free, this is BS.

Can you name another building industry that says such things?, in writing no less! If you contracted for a new skyscraper would you be happy with such a contract? You don't want to have to re-level skyscrapers, or high schools, or bridges. Can you imagine how much trouble that would be? Actually you would never have the problem because no buyer would ever accept such a contract. The builders plan to get it right the first time and never have to go back and waste their money and time messing with it. They use science and have done so for thousands of years, it is time for us to do the same thing and it is easy.

Step one is to stop thinking in terms of BS and decide that it is a new world and you are going to be part of it.

Step two is to get a Pocket Penetrometer. Nearly every factory manual mentions one and how to use it and without it you have no idea of the load bearing capacity of the soil. The device could not be easier to use, just follow the directions that come with it and stick it in the dirt. when you read the scale on the side of the instrument it will tell you the load bearing capacity of the soil. All this takes about five to ten seconds and can not be called too much trouble, it's a lot easier than re-leveling a home.

Of course you can do this wrong so here are a few things to watch for:

1. Make sure that the soil you are testing is in the same condition that it will be under the home. Do not test soil that is baked by the sun, the sun doesn't shine under the home. You should dig down a few inches until there are some signs of a stabilized moisture content. This is usually indicated by a slight change in color and is probably no more than six inches under the surface.

2. You have to test the soil that is holding the home. If you have a footing that is three feet deep then you have to test the soil in the bottom of the three foot hole. If you test the soil at the top then shovel it out you have accomplished nothing.
3. The soil must be undisturbed or compacted fill, not just freshly dumped dirt with a few truck tracks in it. Testing five feet of loose fill is a waste of time. The whole five feet will settle and you are only testing the top 1/4 inch, you're not supposed to put a home on that stuff anyway. This is an excellent example of Before Science (BS).
4. You have to have site preparation with proper drainage. If you don't do this you can forget the whole thing. Dirt that gets flooded with water is called mud and it won't hold a thing.
5. The Pocket Penetrometer will not measure sand. Sand has a load bearing capacity of 1500 pounds per square foot. The tool only measures cohesive soils, this means dirt that will sort of stick together, like clay. Most of the dirt in the world is like this.

OK, so we followed the directions and we found out that the dirt where we are going to put the home has a load bearing capacity of 2000 lbs/ft, what does that mean?

It means that you can put 2000 pounds on one square foot of it and it won't sink, unless something changes the dirt, like water.

Now here's the hard part; If you have to hold 4000 lbs. how many square feet would you have to cover? If one square foot will hold 2000 lbs. then you will need to have 2 of them to hold 4000 lbs. The answer is 2 sq. ft. or about 17 inches x 17 inches. Now that didn't hurt did it?

Just to be sure that you understand that it really is very simple, suppose you have a load bearing capacity of 1500 lbs./ft. (sand) and you need to hold 4500 lbs. If one square foot can hold 1500 lbs. then divide 1500 into 4500 and you get 3, that's how many square feet of footing you need. 3 sq/ft is a footing that measures about 21 inches x 21 inches. Do this and the pier will never settle, it is one of the laws of nature.

You have just performed the craft of the ancient Roman and Greek engineers who built structures that are still standing today after thousands of years. How do you know how much weight you have to hold? That is the topic of another article, this time we are just doing the dirt.