

Weight Redistribution Systems

By George Porter

A weight redistribution system is really a way of sending weight to other places, maybe even dividing it up over several locations. All big chain stores have large distribution centers that gather the product in a central place and then distribute it to the stores in the region. Weight is distributed in a very similar way within a home

A ridge beam does this by gathering the load in the roof of a manufactured home and sending it down a column on each end of the opening. We have covered this several times in the Journal before and will probably always have at least one article a year that deals with the subject.

Most people however, do not think of a footing as a weight distribution system. Well.. it certainly is, and a very important one too. When you ask installers why you need footings under a home many say "because you need a good place to put the piers". Very true, but what makes a footing "good"? If you are talking only about weight, then it is the footings ability to redistribute the weight on it to the soil beneath the home. Give this a moments thought, it is not just a flat place to put things on, it is a surface that will hold the weight in a stable position. It will not let that weight sink or tip or change position in any way, and it should continue to work like this for many, many decades.

For a home to perform as it was intended it requires footings in the right places (see manufacturer=s manual) and with the ability to hold a certain amount of weight (see manual again). The third part of this puzzle is the question, " what are we re-distributing this weight to?"

The answer is dirt and this story may help.

Let's go back to the distribution center for the large chain store. We will call our stores "WeightMart." Here at WeightMart we are unloading trucks with a small crane to people who will carry the boxes into the warehouse. The crane lifts the boxes off the truck and lowers them down to the waiting hands of the crew. The problem with our system is that the crane cable can't reach the ground so the unloading crew has to hold the load just above their heads as the crane operator releases the cable. The crew then carries the boxes into the warehouse. Got the picture? When the crane lets go the crew must hold the boxes, they are not allowed to drop them on the floor. If they do, WeightMart will fire them because they are not doing their job correctly! So.... what do they need to know to do their job right?

1. They need to know where to stand to get the box
2. They need to know how much each box weighs
3. They need to know how much weight a crew member can hold

This is what they need to know to be able to do the job right and they absolutely need all three parts.

Example 1. What if they knew everything except where they needed to stand? If they are not

directly under the box then the box falls to the floor when the crane guy lets go. Not good!

Example 2. What if they knew everything except how much each box weighs? Suppose one of the large boxes weighed 1000 lbs. and only two workers from the crew tried to hold it when the crane let go. Not good at all, plus a large insurance claim for the box and workers!

Example 3. What if they knew everything except how much a worker could hold? The boss at the center assumes all workers can hold 100 lbs., he never asked them, but it seemed about right to him. Unfortunately, two or three of the workers in the crew can only hold 70 lbs. due to medical problems. A crane lifts a box off the truck weighing 200 lbs. and delivers it to two average workers who can hold 100 lbs. apiece and they carry it away, no problem. The next box that comes off the truck also weighs 200 lbs, but it is delivered to two of the weaker workers who can only hold 70 lbs apiece. Same results as example 2. plus the boss gets fired for his silly assumption!

The 200 lb. box weight was redistributed among two workers and when they could hold 100 lbs. apiece it worked just fine, but when the two 70 pound capacity workers grabbed the box they were 60 pounds short of being able to hold the thing and dropped it. The 70 lb. guys are good workers, but it takes three of them, not two of them, to hold the 200 lb. box. When the weight of 200 lbs is redistributed over three workers who can hold 70 lbs. apiece, they can easily hold the load. In fact there is even an extra 10 lb. safety factor.

Moral of the story? When you assume the load bearing capacity of the soil you are doing exactly what our WeightMart boss did. Sometimes you'll be right and sometimes you won't. There is a fairly easy way to always get it right every time. There must be 500 places around the nation you can get a penetrometer and then you can do what it says in every single manufacturer's installation manual, determine the load bearing capacity of the soil. It's a whole lot easier than re-leveling homes and a hundred times faster.