

Ask Jon Eakes

# Avoiding common errors with paving stones & Asphalt driveways

Last Updated: Monday, April 30th, 2018, Created: Saturday, October 25th, 2008

It is frustrating when walkway or driveway paving stones heave with frost, or drop with erosion. If properly built, this doesn't happen. Actually what I have written here about paving stones applies to asphalt driveways as well.

## A GOOD COMPACT SUBSTRATE IS ESSENTIAL IN A COLD CLIMATE

You need to layer and compact all the layers below the stones themselves. Inadequate foundation preparation will always cause problems on the surface. The first step is to excavate deep enough. You need to decide where you want the top of the stones, taking into account the slope you will need for water to run off and away from the house foundation. Then you need to dig deep enough to account for the thickness of your particular paving stones, and about an inch of screening sand just under the stones, and with the all important road gravel layer below that. For a walkway, the road gravel should be 4 to 6 inches deep, for a regular driveway, 6 to 12 inches deep. If you are parking a truck or an RV on this driveway, the road gravel layer should be 18 inches thick.

## COMPACTING 0-3/4 GRAVEL

Road Gravel is not just any gravel. It is a mixture of very fine sand, not so fine sand, small rocks and rocks up to 3/4 inch in size -- sometimes called 0-3/4. This mixture of sizes does something very different than the 3/4 inch clean gravel that we use for drainage around the foundation of the house. Because of all the different sizes, it is possible to compact this gravel very solidly. In fact, this is what is used under our roads. You need to compact the construction of a walkway or driveway at every step of the way. In the second photo, you see a piece of plywood on the end of a 4x4 as a tamping tool for small patches. For a full sized walkway you would definitely need to rent a gas powered compactor. You fill a couple inches of material and then compact. If you fill too much and try to compact too much at a time, it doesn't get compacted on the bottom and that will eventually cause sinkage -- a common problem with fly-by-night contractors in a rush. It takes a very large commercial compactor, like you see being used on highway construction, to compact more than two inches at a time. This compacted 'bed' is what carries the weight of whatever is going to be on top.

## GEOTEXTILE

Before putting down an inch or two of screening sand, many people like to put down some kind of filter cloth that will prevent the screening sand from filtering down and eroding the support under the paving stones. Screening sand is primarily a fine sand with some rocks. Whereas, road gravel is composed mostly of rocks with enough fine sand to fill in between the rocks. The purpose of the screening layer is to allow the precise levelling or sloping of the surface under the paving stones. This layer, too, needs to be compacted. It needs to be just thick enough to get the precise surface you want.

## RETAINING GUARD

A common error in laying paving stones is to lay the stones without a retaining guard on the outside edge. Without this retaining guard the stones on the edge eventually tip outward. Note that preparation of the sub-surface should be several inches wider than the finished paving stones. This gives good support to the outside stones, as well as to their retaining guard.

After the stones are placed, a very fine fill sand, called a jointing sand, is swept into all the cracks and a final pass with the compactor helps to settle that sand tightly between all the stones.

## CHOOSING A JOINTING SAND

Once all the stones are in place you will need to fill the spaces between stones with sand. A simple fine sand can work, but often the sand filters down under the bricks, even into the substrate if there is no geotextile. You can get sand with polymers added that make the sand particles bond to each other and a bit to the bricks. There are a lot of critiques of using the polymer added sand as it tends to crack and stay open, like cracked mortar in a brick wall.

One rather amazing jointing sand that I have now tested for several years is Envirobond. This rather impressive product is applied as easily as regular fine sand -- simply poured over the cracks and swept in. Run a vibrator over the top if you still have the one you rented for compacting the substrate. Then you can either sprinkle it with water, or wait for the rain. The water will cause it to swell, tightly filling all the space between stones and then dry in that expanded position. If cracks show up because of stones moving -- from settling or from heavy use -- the next time it rains, the material expands again, self-healing any cracks. It is not available everywhere so check their website for where to purchase it in your area before starting to hunt for it.

They say no plants will grow but that is not entirely true. Plants are greatly slowed down, but mother nature is stronger than anything made by man, so they will eventually grow through -- but less so than with regular sand, even less so than polymer added sand. I have had great success in controlling all growth through the stones by simple pouring ordinary white vinegar on any green growth. That changes the PH of the plant enough to kill anything and it will take whole new roots for something new to grow back again.

We tend to concentrate on laying the pattern of stones. Instead, we should really be concentrating on building a properly compacted substrate that is deep enough to carry the load that will be on top. This way, your carefully laid pattern will remain as beautiful as when it was first laid.

## RESETTING STONES TO REPAIR SETTLING OR CHANGE THE SLOPE

If erosion or settling is causing problems, understand and if possible, solve the problem causing the erosion first -- like redirecting rain gutter downspouts. Sometimes you need to lift stones near the house or create a series of slopes that direct the water towards the street.

Start by taking pictures both far-back and close-up so you have a clear plan as to how the stone pattern goes back together. This is especially important for all the cut or trimmed stones on edges. Then pull the stones out one by one and set them aside in the same pattern. Stacking stones leads to never getting them back in the same pattern.

Then if you are really correcting a deep problem, shovel off the sand and put in more road gravel. Don't forget to compact, although in a small area the 4x4 with a plywood plate shown above will do the compacting job. You should have an inch or so of sand on the top for shaping and leveling. Use a long straight 2x4 to check the slope, even use it as an oversized scraper to shape the sand. Compact and check again until you have exactly the landscaping shape you need.

Then place the stones back. You can make them tighter or looser, a small change between stones makes a lot of difference 3 feet later. Only after everything fits and the slopes are perfect, sweep in the filler sand. Pounding again with the tamping rod will shake the sand into filling the cracks. Sweep at an angle to the cracks to push sand into the cracks, not have the broom dig it out.

## GETTING OIL SPILLS OFF OF PAVING STONES

When you get some oil on those stones, you really should try the rather remarkable Oil Lift with Flubber Dust. It really works.

### **Keywords:**

Stone, Landscaping, Drainage, Patterns, Brick, Filters, Asphalt, Paving, Foundation, Driveway, Tip, Moving, Support,

Products, Sand, Gravel, Settling, Rock, Frost, Walkway, Cracks, Techniques, Problems

**Article 1933**  
[www.joneakes.com](http://www.joneakes.com)