

# Paving Brick Installation Instructions

## Introduction

These are general instructions for the installation of paving brick. Every project and situation is different and therefore, may require modifications or changes in the installation procedures. Before you begin your project, you should always check on local building codes (permits maybe needed and restrictions may apply), call **J.U.L.I.E. at 1-800-892-0123** in Illinois to locate in-ground utilities, and refer to the manufacturer's installation and reference documentation for the brick you plan to install. Large projects or load-bearing structures such as driveways, should be installed by a professional, because of the drainage and supporting foundations needed. We can recommend professional installers for your project.

## Why Paving Brick?

There are several very good reasons to use paving brick for your walk or patio other than its beauty and functionality. First, we live in an environment that has freezing and thawing. When the ground freezes, it expands and will move and heave your walk or patio. Solid structures like poured concrete will tilt or crack, leaving damage that is difficult if not impossible to repair. Paving brick float on their gravel base, as the ground freezes and expands, the individual brick can move upwards with no damage. When spring arrives and the ground thaws, the brick settle back into place with no cracks or breakage.

Secondly, most walks and patios are near the foundation of your house. When the house was built, this area was dug-up and then back-filled. The material in the refilled area will settle and this settling can continue for years and years. Depending on the amount and depth of the excavation that was done during the construction of your house, this settling can continue for up to 50 years. Like stated before, paving brick are not a fixed structure and can move when the ground moves. This makes paving brick idea to use in areas that may settle. If settling occurs, the brick can be removed in the afflicted area, the base material filled and leveled, and the brick returned, a simple fix that restores the beauty and functionality of your walk or patio.

Lastly, paving brick are not a permanent structure. This means that they can be moved or removed. As time passes, your needs or desires can change. Maybe you need a bigger patio, or a smaller one. Perhaps the tree next to your sidewalk has grown too big. Either you cut down the tree or just move the sidewalk. With paving brick, this is possible. Your walk or patio can be altered just by moving the brick.

## The Base!

The most important part of any project is the base. This supports your walk, drive or patio and anything that is placed on it. If your base fails, your brick project fails. Typically the base of any hardscape project consists of a crushed gravel topped by a leveling sand. In the case of paving brick, the gravel used is a  $\frac{3}{4}$ " crushed limestone, ranging from  $\frac{3}{4}$ " stone to dust size particles. The particles, called "fines," filter into the gaps between the stone creating a hard, solid surface. A thin layer of leveling sand is then placed over the compacted stone to smooth out the gravel and provide a level surface to place the brick on.

**Now that we covered some of the basics, we have five steps to finish our project.....**

**Let's get started!**

# Step 1

**The layout:** Paving brick come in a variety of shapes, colors, textures, sizes and thicknesses. These bricks can be used for a multitude of different projects and an even larger amount of design concepts. The choices are almost indefinite, but for the first time user, it is recommended that the Do-it-yourself homeowner follow these simple rules for easier installation:

1. Use a smaller squared and/or rectangular brick,
2. Design your project with straight edges, no curves (reduces cutting of the brick),
3. Choose brick that are all the same thickness (don't mix brick types),
4. Keep your overall design in square or rectangle shape.

The cutting of the paving brick can be difficult. The more cutting you have the longer and harder the installation will become. It is possible to minimize or even to completely eliminate the cutting of the brick by following the about suggestions.



*A cross-section of a typical brick installation*

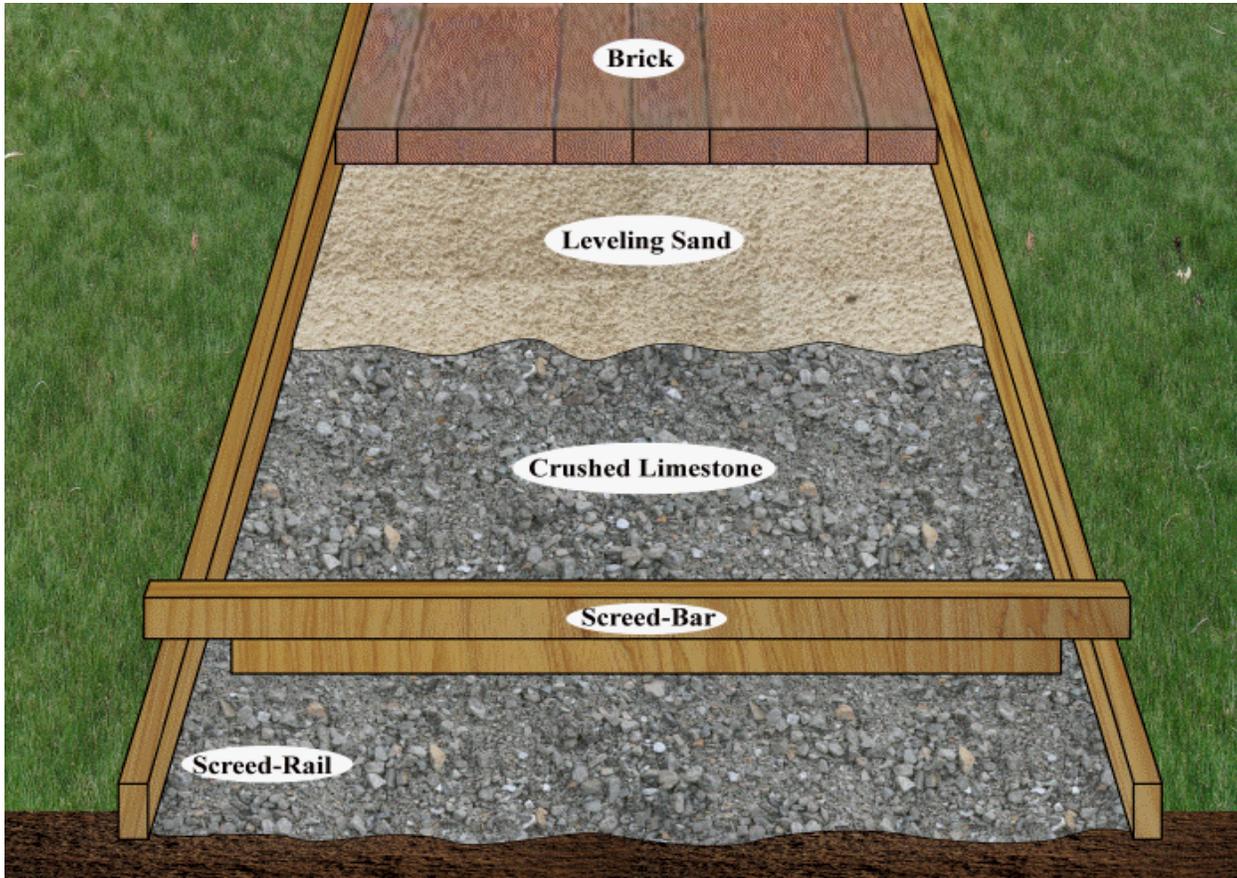
**The Excavation:** The most common problem when excavating the area for your project is that most people dig to deep. This causes two big problems, what to do with all the dirt you remove and two, now you have to buy more base gravel to fill the deeper excavation. The typical base for a walk or patio is from 4 to 6 inches of crushed gravel. This of course can vary depending on each projects individual conditions and circumstances, but still, most people will conclude that if they have a 3 inch thick brick, 1 inch of leveling sand, and 6 inches of gravel, they need to excavate 10 inches or more. This will place the top of the brick even with the top of the ground.

This is good, right? Not really, the project will have settling. Ever notice that the ground around your driveway or walk seems to get higher every year? What is really happening is that your drive is sinking. Each spring, the ground under your drive or walk gets super saturated with water. This liquefies the ground and with the weight of the drive above pushing down, forces the ground to ooze out from under your drive. This settling can range from no movement to 1/8" of an inch each year (depending on the soil conditions and amount of water). If we install our patio so that it is even with the surrounding ground, it is possible that in a few years it will have settled below ground level and now, each time it rains, it holds water and has dirt washing on to it. To solve this problem, we raise the brick higher than the surrounding ground, reducing the amount of dirt we need to excavate and allowing for settling.

**The following guidelines should be considered when excavating for your project:**

1. Try to remove all loose soil,
2. Excavate to undisturbed soil,
3. Never replace removed soil (it will settle),
4. Excavate six inches farther than the end of your patio (edges always settle, by extending the base farther, you reduce the chance that the edge of the patio will collapse downward).

## Step 2



*Spending a little extra time by installing 2x4 screed-rails will make it easier to level your base and give you a much more level project.*

**The Base:** Now that we have the area excavated, it is time to prepare the area for the gravel base. The simplest method is to place screed-rails on each side of your work space. These are used to smooth out and level your leveling sand. Straight 2x4s on edge can be used for this. They are placed on the outside of the work area with the top of the 2x4 set to the pitch and height of where you want the top of your patio or walk. They should run parallel to each other. These will be removed after the brick are installed.

A third 2x4 will be used as a screed-bar. This will also need to be straight and be long enough to sit on top both screed-rails when placed perpendicular to them. Lastly, a fourth 2x4 will be striped to the thickness of the brick that you will be installing and cut to fit in between the screed-rails. This will be attached to the bottom of the screed-bar and used for leveling.

When the screed-rails are firmly installed, it is time to start filling the excavation with the crushed gravel. The gravel should be placed in the excavation in layers that are about 1 to 1½" inches thick and then compacted. All too often, the excavation is filled and when compacted only the top is firm, the gravel underneath is still loose, allowing for settling. It is very important that all of the base is compacted. Installing the gravel in layers and compacting each layer will ensure a solid base with complete compaction.

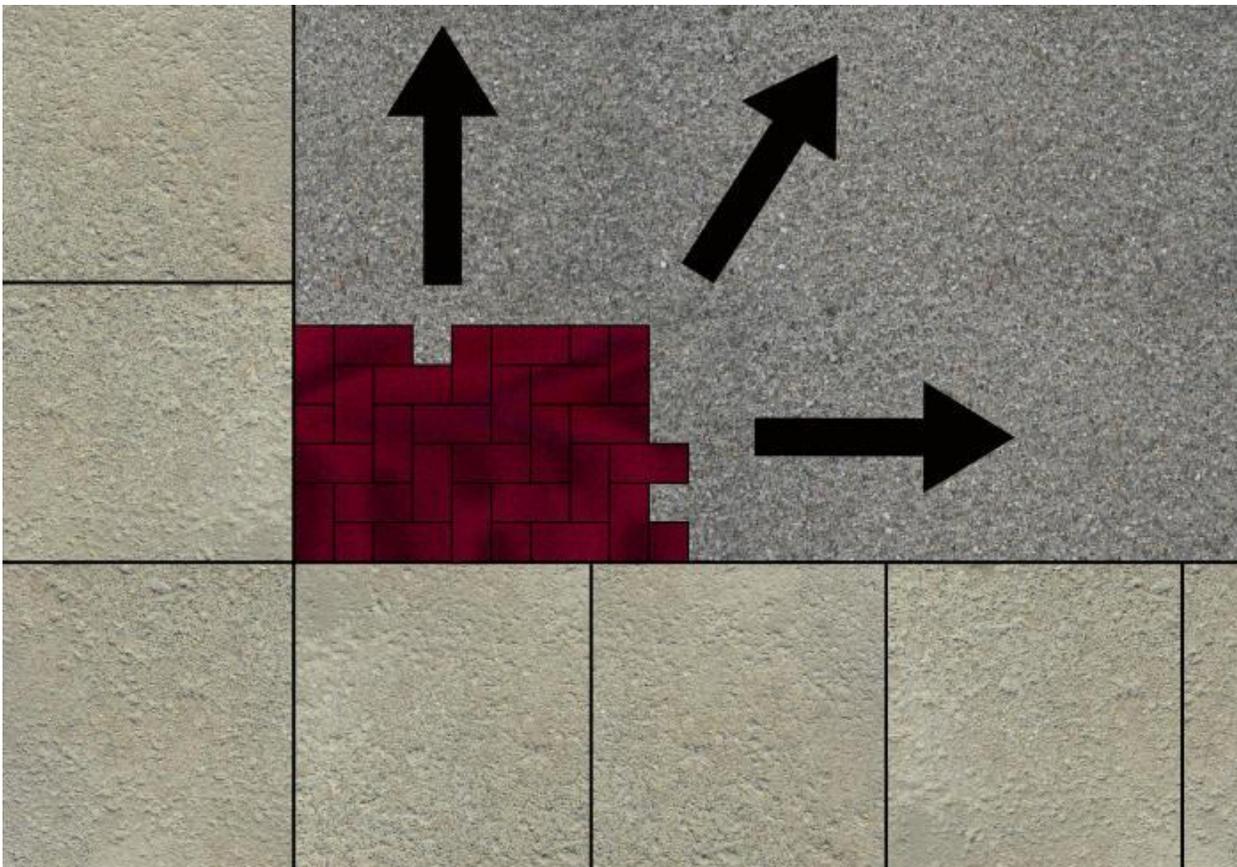
For small projects, the gravel can be compacted with a hand-tamper, but for larger projects it is recommended to rent a plate compactor. If the crushed gravel is dry, dampening the gravel with a garden hose will also help it compaction. Don't add too much water, just dampen the gravel.

Add the gravel and then compact each layer until you get near the top of your excavation. When sliding the screed-bar across the rails, you should have about a half-inch gap between the screed-bar and gravel. If the gap is bigger, add more gravel and compact again. If the gravel touches the screed-bar, remove some gravel and compact again.

When the crushed gravel is firm and to the correct height, it is time for the leveling sand. Contractors like to use torpedo sand for leveling. When the sand is in, they will take their plate compactor and force the brick into the sand by running the plate compactor over the top of the brick. This is not advised for the homeowner. It is too easy to scuff the face of the brick and ruin its finish. Rather, for the homeowner, we recommend using limestone screenings, sometimes referred to as paver base. This is a crushed limestone that is screened to the size of sand. It is flakes of stone that interlock and provide a stronger and firmer surface to lay your brick on.

Place some screenings on top of the crushed gravel base. Working from one end, slide the screed-bar from left to right while pulling it forward. This will level and smooth the limestone screenings. This should leave you about a half-inch layer of screenings over your crushed gravel base. Now, compact the screenings. Again, add some more screenings and screed them smooth. Compact again. Repeat this procedure until the screenings is firm, level and you have no gaps under the screed-bar when it is slid across the rails.

### Step 3



*Work from fixed objects, like concrete sidewalks, out towards the open yard.*

**Laying the Brick:** It is important that you don't walk on the leveled screenings. The smoother the screenings, the tighter the brick will fit and the easier the installation. Leave the screed-rails in place for now so you can re-level the screenings if you accidentally step on or drop something on them. You will start laying the brick from any fix location you have, like a concrete patio, sidewalk or deck. As stated earlier, your base is larger

than your project by six inches on each side. By working from any fixed sides out towards the open yard, you can adjust the project size to accommodate full bricks, minimizing the amount of bricks you need to cut.

Place the brick directly on the limestone screenings. Most paving brick have built-in spacerbars and should be placed tight against its neighbor. A rubber mallet can be used to move them tight but is usually not needed. Once you have some brick down and in place, you can stand on these brick to install more brick farther into you project. Continue placing the brick. If you need to cut a brick, just leave a gab and continue placing full bricks. Once the full bricks are all down, now you can rent a saw and cut any brick you need, placing them into the gabs you left.

Once completed, it is time to remove your screed-rails and install your brick edging (if needed). If the rails are below grade, fill the gap with crushed gravel and compact. Level with some limestone screenings and compact. Install your brick edging to contain your project and backfill with some dirt to hide the edging.

## **Step 4**

Almost done! The last step is to take some fine mason sand and sweep it into the cracks between the brick. You may have to do this two or three times. The sand will filter down between the brick and lock the brick in place.