The Best Path to a Better Walkway

Careful base prep is what keeps pavers in place

BY MIKE GUERTIN

The concrete walkway to the front door was past its prime. The poorly prepared, uneven base led to extensive cracks with vertical displacement; water undermined the concrete in several spots; and the surface was pitted and spalling. Rather than replace the walkway with another of poured concrete, the homeowners and I opted to install concrete pavers. Pavers are widely available, highly durable, and most important, more visually interesting than an ordinary poured-concrete surface.

Concrete pavers are also easy to work with, but the key to a successful project is in the prep. Set on a well-prepared base, a paver walkway can easily last 50 years or more. Cut corners on the preparation, however, and a year or two later, you'll be pulling out the pavers—and your hair.

There are two base layers to prep: the subbase and the setting base. The subbase can be either existing well-drained gravel 6 in. to 12 in. deep, or processed stone or gravel brought in to replace unsuitable soil. On top of the subbase is a setting base of coarse stone dust between 1 in. and 4 in. deep. Grading, compacting, and regrading each layer in succession accounts for three-quarters of the work of building a new walkway. But the extra effort you put into this part of the project that no one ever sees gives you a stable foundation for a durable installation. It also makes the remaining 25% of the work of setting the pavers a cinch.

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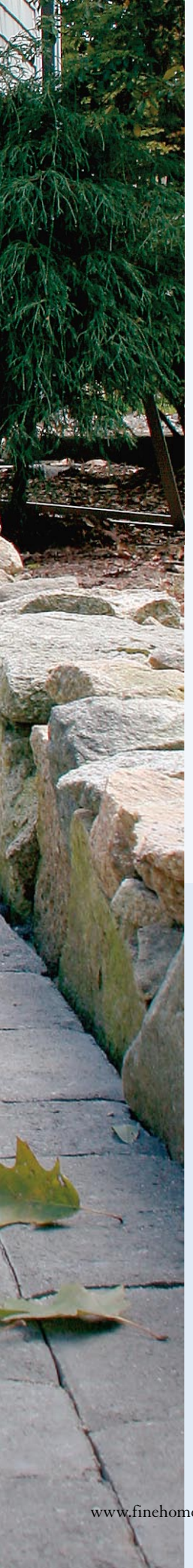
Photo this page: Debra Silber

STEP 1 REMOVE OLD WALKWAY

Tools: sledgehammer, pry bar, circular saw outfitted with diamond blade

Space sledgehammer whacks about a foot apart to fracture the concrete into medium-size chunks. Let the sledgehammer do the work. Lift the head high, and help to accelerate it on the way down; but don't swing it as you would a regular hammer. Lift the pieces with a pry bar.

Break thick concrete by scoring it. Cut 1-in.- to 2-in.-deep kerfs through the sidewalk with a diamond blade at 1-ft. increments (below left). Drive a heavy pry bar along the cutlines to break pieces cleanly (below right). When a slab is 6 in. or thicker or has embedded steel, you may need more power—from an electric breaker hammer or pneumatic jackhammer—to break it up.



STEP 2 EVALUATE EXISTING SOIL

Tools: shovel, wheelbarrow, pick

Clay, silt, and organic soils are unsuitable as a paver subbase. They hold water, are unstable, and are prone to frost-heaving in cold climates. One quick and dirty way to evaluate soil is to saturate a sample and try packing it into a ball. If it sticks and holds together, it's no good. Remove any unsuitable soil to a depth of about 8 in., and replace it with well-drained gravel or processed ⅜-in. to ¾-in. stone.

If you've got good soil (such as the soil shown here), comb through 6 in. deep with a pick, and pull out any stones 3 in. or larger in dia. (photo left). Large stones interfere with compacting and can cause the paver surface to displace over time.

As they grow, tree roots also can heave a walkway. Paths that pass under a tree crown are likely to have large roots beneath. It's best either to locate walks away from trees, to remove the trees, or to resign yourself to resetting pavers heaved upward by the roots every few years.

STEP 3 GRADE THE SUBBASE

Tools: concrete drag, garden rake, string, level

To rake the subbase to an even plane, set a stringline down the center of the walkway several inches higher than the level you're trying to achieve, and use a gauge block or measure to check the distance between the line and the surface as you work along the length of the walkway. I use a concrete drag (rake) that has a solid-steel blade to grade the earth, but a tined garden rake used upside down also works (photo above).

It's hard to gauge by eye how level a walkway base is across its width. Avoid a roll in the walkway by leveling (or slightly pitching) the walkway side to side with a level. I use a level slightly shorter than the width of the walkway to check and carve the rough subbase earth (photo below).

STEP 4 COMPACT THE SUBBASE

Tools: plate compactor, hand tamper, landscape fabric

Compact the subbase to consolidate any relocated or new fill. Compacting evens the density of the subbase to reduce the chance of settling after the walkway is completed. A plate compactor is the best tool for the job (photo top right). The large footprint maintains the plane of the grade and can compact from 4 in. to 12 in. of loose fill, depending on the size of the model. Most rental shops stock small and medium models capable of compacting soil up to about 6 in. deep; they rent for $60 to $75 per day. Keep an eye on the depth when grading and filling the subbase; once you get to 6 in. of loose fill, compact the layer and add more.

Compactors are hard to navigate in tight spaces and against steps, foundations, or other vertical surfaces. For close-in packing, use a hand tamper, a flat cast-iron plate 6 in. to 8 in. square with a vertical handle. In a pinch, a block of 2x6 or 2x8 screwed to the end of a 2x3 or 2x4 "handle" will suffice. Slam the hand tamper down on the subbase several times at each spot as you move along edges and inside corners (inset photo).

Water can aid the compacting process. Water sprayed on the subbase before or during compacting helps the earth to compact more tightly and keeps dust at bay. I like to saturate the area a couple times the day before compacting. The water helps to consolidate soil particles and spaces with each saturation as the water percolates through. Most of the water drains through, and the damp subbase compacts tighter and faster with mechanical tamping than it would if it were dry.

Recheck the subbase level to the string after compacting. Regrade to eliminate high spots and fill in low spots, then compact again. Finally, check side to side with a level.

After compacting and touching up this subbase grade, I place a layer of heavy-duty geotextile (landscape) fabric to isolate the subbase from the stone-dust base layer (photo right). Fabric isn't necessary when you have a well-drained gravel subbase, but when you're not sure about the quality of the layer, the fabric helps to stabilize the prep work. The fabric layer also isolates a processed-stone subbase from the stone-dust layer. On this project, I used the fabric to block locust and beech trees that sprout off "parent" roots that network the area.

STEP 5 LAY SETTING BASE

Tools: concrete drag or garden rake, shovel, wheelbarrow, level, string, compactor, hand tamper

Set stakes and a stringline at a height above the subbase equal to the planned thickness of the setting base of stone dust plus a couple of inches for clearance and compaction. Spread out a layer of coarse stone dust, and eyeball the measurement to the stringline. I dump wheelbarrow loads to get a rough match of the depth I'm looking for, then quickly rake out the piles evenly (photos right).

Run the compactor over the stone dust, and reset the stringline to the thickness of the pavers. Use them as gauge blocks for a final grading.

Carve and fill the stone-dust surface using the level. Check the side-to-side grade for level during the process (photo below right).

If you disturb ½ in. or less of the compacted stone dust, there's no need to compact again. If you need to cut and fill greater than ½ in., run the compactor over the surface, and recheck the finish grade to the stringline. Spend some extra time at this step to ensure that the setting base is close to perfect both in compaction and in grade level.

TIP FROM A PRO Stone dust, not sand

Stone dust is the secret to a great paver job and works much better than sand as a setting base. Its mix of coarse, medium, and fine particles packs together for a solid yet water-permeable layer. Even after mechanical compacting, stone dust can be carved for a flawlessly flat surface to set pavers on. Processed sand tends to have a uniform particle size, so it doesn't pack well, making it harder to place pavers in a uniform plane. You need a minimum 1-in. layer of stone dust over the subbase. On this project, I needed to build up the walk elevation slightly. Instead of separate small loads of gravel and stone dust, I ordered about 4 in. worth of stone dust.

STEP 6 SET FULL PAVERS

Tools: gloves, string, level

Orient the stringline to match one of the joint lines in the paver pattern running the length of the walk as a guide for placing pavers. Elevate it about ½ in. higher than the paver thickness so that it doesn't get held up or misaligned by the pavers (photo left).

Pick a starting spot for the paver pattern. I like to arrange the layout so that cut pieces at a change in the walkway direction are equally sized on each side of the bend. Once I pick the starting spot, I run full-size pavers between direction change points (photos right).

The time spent grading the base surface perfectly pays dividends when setting the pavers. Just match the pavers to the line and go. Most pavers have small ribs on the sides to register proper spacing. If the pavers you work with don't or if you want wider spaces, use a uniform gauge like 16d nails, thin strips of wood, or tile spacers. Chances are there will be slight high and low spots in the base grade, so keep an eye out for pavers that are a little higher or lower than those around them. You may have to scratch out some extra stone dust or add a handful to get the paver surface even.

I stage piles of pavers along the length of the walk so that I can focus on setting without getting up, but you may like the break afforded by resupplying periodically.

STEP 7 CUT JOINTS AND EDGE PIECES TO FIT

Tools: brick chisel, circular saw outfitted with diamond blade

I like to set all the full pavers, then cut the ones at joints and along edges as needed. It's more efficient to focus attention on setting and cutting operations separately. Once most of the pavers are set, it's fast and easy to mark cuts precisely by measuring off the ones in place.

There are several cutting options, from a dedicated brick saw to a chisel. The more control you have over the cut, the crisper the cut will be. Because most people don't own and rental shops don't often stock brick saws, you'll have to use an alternative. A gas-powered cutoff saw makes quick work of paver-cutting, but it can be intimidating and cost about $75 a day to rent. Unless you're cutting tons of pavers, an ordinary circular saw outfitted with a dry-cut diamond blade ($25 to $50) works fine. Cutting pavers is noisy, dusty work that can send bits of concrete flying like shrapnel. Be sure to wear a respirator, safety glasses, and hearing protection (photo left).

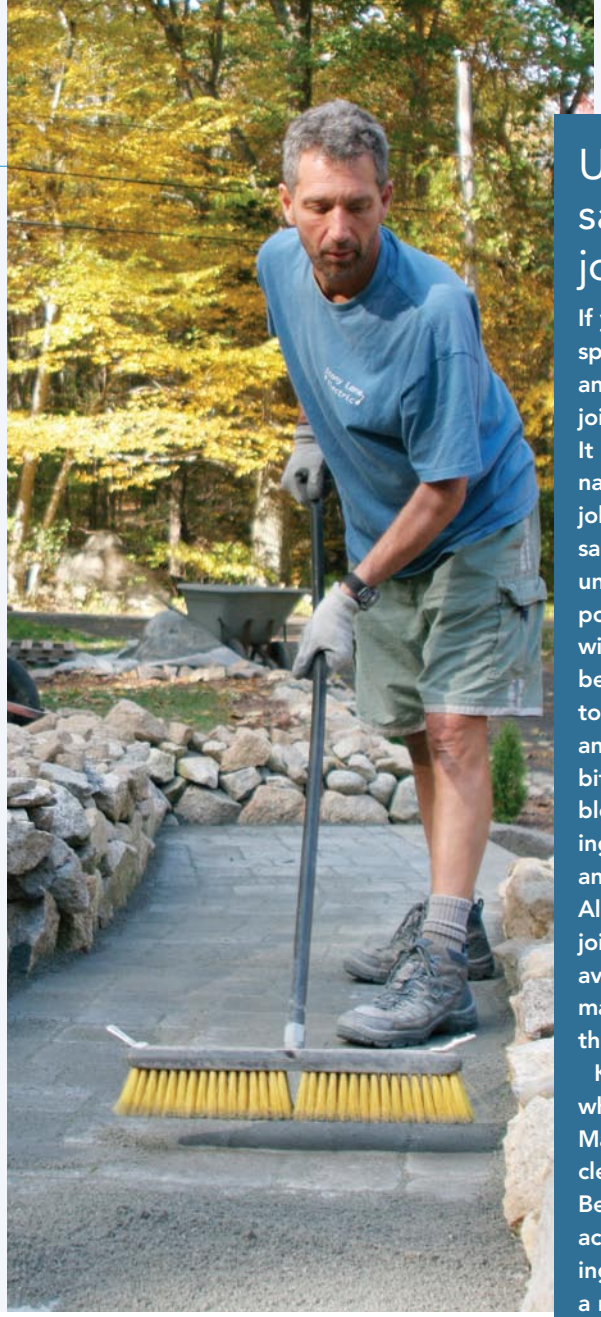
Photos this page (bottom left, inset, bottom right) and facing page: Debra Silber.

STEP 8 SAND THE JOINTS

Tools: broom, shovel, hose, and water

Just as grout fills the joints between tiles, sand fills the joints between pavers. You can use washed brick sand, stone dust, or polymeric sand (sidebar right). The sand locks the pavers together and keeps other debris from filling the joints, yet still lets water pass through. I often use leftover stone dust from the setting base to fill the joints. After sweeping off any leaves or debris from the paver surface, spread shovelfuls of sand across the top. Use a stiff-bristle push broom to move the sand around and work it into the joints (photo right).

The sand won't pack in tightly right away. To pack in the sand, you can tamp on the top of the pavers with a 2x4 or water the surface. Water consolidates the sand particles and moves them deeper and deeper into the paver joints. After tamping or watering, push more sand over the surface with the broom. Keep working in with the broom and water or tamping until the joints no longer settle. Clean off the excess sand, and you're done. After a week or two, you may notice the sand settles more. You may need to apply more sand periodically until the joints are filled completely.



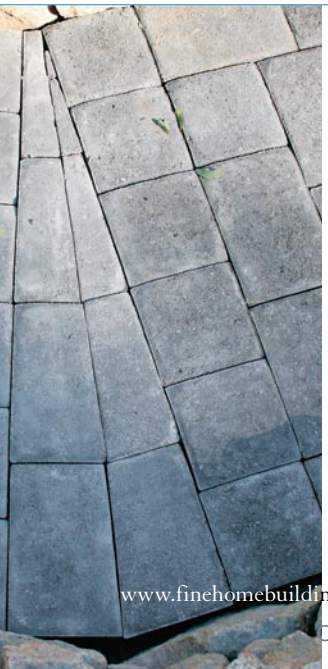
Use polymeric sand for cleaner joints

TIP FROM A PRO

If you don't want weeds sprouting between pavers or ants burrowing through the joints, use polymeric sand. It costs a lot more than ordinary sand, but for a premium job, it's worth it. Polymeric sand is a combination of uniform sand granules and polymer binders that react with water to cure in place between the pavers. It bonds to the sides of the pavers and expands and contracts a bit to keep the joints filled, blocking debris from entering, seeds from germinating, and pests from burrowing. Also, it won't wash out of joints during heavy rains. It's available in several colors for matching or contrasting with the pavers.

Keep in mind a few things when using polymeric sand. Make sure the pavers are clean and dry before starting Because polymeric sand is activated by water, applying it to wet pavers will start a reaction that may leave some stuck stubbornly to the surface. After brooming the sand into the joints, tap the tops of all the pavers to ensure that the sand has filled in all the joints, and resand if necessary. Clean off any excess sand before watering.

When watering, mist the pavers lightly. Never spray water at the surface, or you'll blast the material out of the joints and onto the paver surface. Use polymeric sand only in dry conditions when rain isn't expected for at least four hours. Stay off the walkway for half a day to let the sand mix cure.



I score at least halfway through each paver when making crosscuts and then split the rest of the way through with a brick chisel. On thin cuts or taper cuts that wedge to a point, I cut the full thickness of the paver. This often means cutting from both the face and the back side to reach all the way through. Small corner nips or edge chips can be made with a mason's hammer (photo right).