



Whether it's in the Land of Oz of your own back yard, there's something magical about a brick path - especially if it leads to a sunny, spacious patio. Don't get me wrong; there's nothing magical about how patios get built. They take loads of energy and muscle power. They require careful planning from the first shovelful of dirt thrown to the last paver laid. But you'll get what you work for: a beautiful, usable, outdoor space that will last a lifetime.

Our Patio is "dry-laid", meaning there's no wet concrete used, just precast concrete pavers laid on a bed of sand. Ours is a large ambitious project with curves, paths and steps. We circled trees, looped around landscaping beds and linked together two decks.

Every patio is different - the one you build may be larger, smaller, squarer or rounder. The good news is everything you need to know about building *any* dry-laid patio is right here.

## THE BEST DESIGN FOR YOU AND YOUR YARD

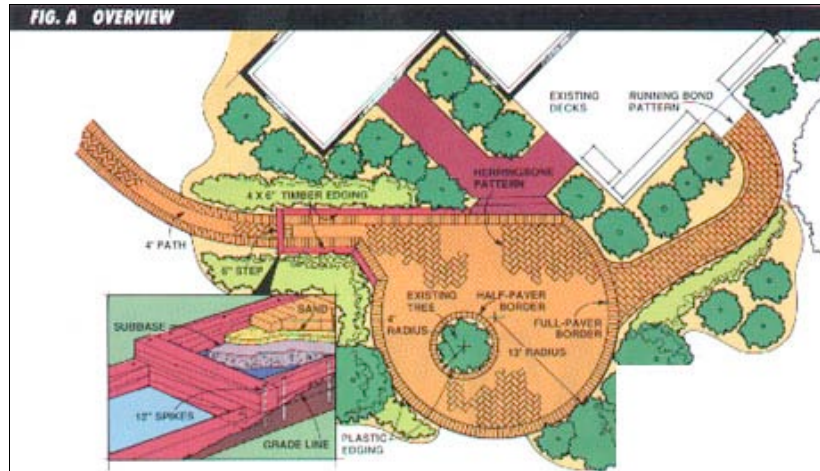
Whether you're a novice or experienced DIYer, you'll find this project doable and satisfying. You'll be limited more by your energy level and free time than by the skills required.

A well-designed patio must take into account the terrain, landscape and the needs and pocketbook of your family. Not all yards are candidates for a patio. In uneven terrain, a raised deck - which can span hill and dale - might be the best option for outdoor space.

We needed to tie in our patio with existing trees, planting beds and decks. We measured everything and made a small scale drawing of our home and existing landscape on paper (Fig. A). We used a straight, 16' 2x4 with a 4' level on it and a tape measure to get a rough idea of how much our yard sloped (we noted that on our drawing). Then we laid tracing paper on top of our scale drawing and doodled a half-dozen patio designs. A consultation with a landscape designer provided us with these helpful tips:

- Patios must have a slight slope (1" for every 4' to 8') for proper drainage. If you don't provide enough slope, rainwater will settle into low spots, eventually softening and washing out the sand and subbase materials beneath. A flat or poorly sloped patio could even direct water into your basement. Too much slope and you'll feel you're on a listing ship. Bear in mind you can build up low spots with an extra-thick layer of subbase.
- Ask yourself how you'll be using your patio. Our expert recommended a minimum of 25 square feet of patio per house occupant. He also added that a patio at least 16' long in one direction is often the most functional. Plan for at least a 6 x 6-foot area out of any traffic path for a dining table and chairs. Do you need space for a grill? A wading pool? Planters? Hopscotch? Sketch these on your tracing paper as you doodle.
- In small areas, use simple pavers and patterns (like the running bond shown in Fig. B). In large areas, you can break up the expanse with a variety of patterns or dividing bands.

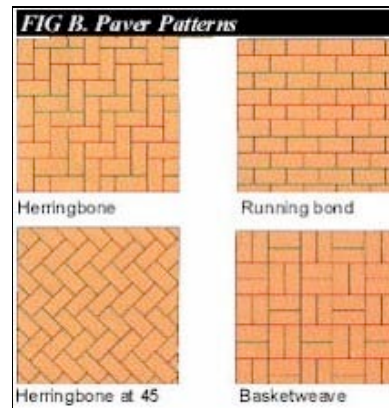
- Curves add interest and grace to the patio - but also loads of cutting and extra work.



## PAVERS: BEAUTIFUL, VERSATILE, MANAGEABLE

One of the beauties of pavers is that together they create a large, durable space, but individually they're lightweight and easy to install. This gives DIYers the permanence of concrete without the special tools, know-how and "hurry-upness" that the concrete requires. Plus, pavers have color, shape, and pizzazz.

There's no doubt about the the durability of concrete pavers. They're often used in streets and industrial parking lots where heavy machinery cracks ordinary concrete slabs. Pavers - small and independent - withstand abuse by flexing, rather than cracking, under pressure. They're ideal for regions that go through freeze/thaw cycles, too; the individual pavers absorb heaving and movement without cracking. And it's a lot easier to repair small areas in a dry-laid patio than with a slab.



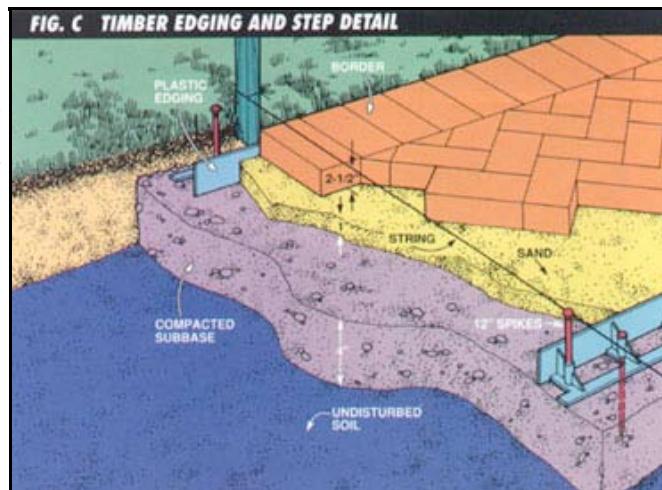
Pavers can be used for driveways, sidewalks, patios, garden paths, even porch floors. As long as the underlying gravel and sand base is properly prepared, pavers can be used almost anywhere. In areas where vehicles will travel, the subbase (Fig. C) must be increased to at least 10".

The simple rectangular pavers we used can be laid in a variety of patterns (Fig. B). Other paver shapes are available: squares, zigzags, keyholes, even some that look like fancy floor tile. Shop around at home improvement and landscaping centers and check the Buyers Guide for more information.

## PAVERS, MATERIALS, AND TOOLS

We paid a little over \$2.00 per sq. foot for our 4 x 8-inch pavers. We purchased them from a landscape center, where they supplied us with brochures from the paver manufacturer which gave us lots of installation tips.

When ordering pavers, estimate the square footage of your patio, then add 5 percent. If you have a lot of curves, borders or half pavers - like our patio - order 10 percent extra. This allows for damaged pavers and provides extra ones for future repairs. The *Snap Edge* plastic edging cost \$2.25 per foot and the 8" - 10" spikes cost \$0.40 each.



We used "class 5" crushed limestone for building the subbase. Class 5, a grade of material commonly



used for road beds, is widely available. It consists of 3/4-inch rock and smaller particles, which nest together firmly when compacted. When ordering, tell the quarry or trucking company you'll be using the material for a patio subbase. If they don't have class 5 limestone they should be able to offer crushed gravel or another suitable substitute. The class 5 we used cost us around \$100 (7 cubic yards at \$7.50 per yard plus a \$50.00 delivery charge). One cubic yard of class 5, when placed 4 inches deep, will cover 81 square feet. If you need to build up an area, order more.

Coarse sand for leveling and bedding the pavers ran \$15.00 a cubic yard, plus delivery. One yard of sand will provide a 1-inch base for about 300 square feet of patio. Order a little extra for sweeping into the cracks when you finish (our patio consumed about four 5-gallon buckets of sand for this). For tools, you'll use everyday hammers, levels and tape measures as well as big, oddball tools like a flat-plate vibrator and a masonry saw that you'll need to rent (up to \$50.00 each per day). With proper planning, you shouldn't need to rent either tool for more than two whole days. All the material and rental charges for our project came to \$1,900. That's a lot! But when you consider pros charge between \$6 and \$10 per square foot when they supply and install pavers, you're saving 1/2 to 2/3 the cost by doing it yourself.



1. **OUTLINE** the patio perimeter using a garden hose for curved areas and long 2x4s for straight sections.

### PLANNING AND LAYOUT

The first thing you should think about is where the last paver you lay will end up. Will your yard accommodate the slope and size of your patio? Will a square patio end in nice, full pavers, or skinny little slivers?

With your graph paper plan in hand lay down a garden hose (1) and 2x4s to form an outline of your patio. Use your level and a straight 2x4 to double-check the lay of the land for a proper slope. Then spray-paint a line 8 inches outside the outline of your patio to act as a line for excavating. Strip away the sod at this point (2), so grass doesn't get in the way of the guide strings you'll soon be setting up.

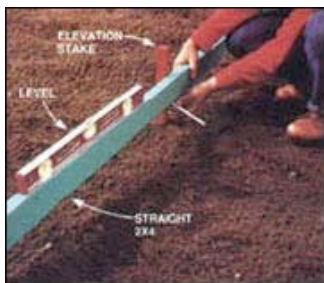


2. **REMOVE SOD** in an area extending 8 inches beyond the boundaries of the patio. Spray paint indicates the excavation line.

### EXCAVATING THE SITE AND BUILDING THE BASE

This part of the project is the key to a successful (and long-lasting) patio.

Use the bottom of a door or a set of stairs abutting the patio area as the starting point for establishing the final height and slope of your patio. Your entire slab should slope away from the house at a rate of 1 inch every 4 to 8 feet. This slope may be one long decline or a slight dome-shape so water runs off in more than one direction. Place one end of a long 2x4 at the bottom of the stairway or an inch below the door threshold, then level across to stakes driven at the perimeter of the patio and make a mark (3). Make another mark the appropriate distance down the stake to indicate the slope. In our case, after making a level mark on our stake with a level and 12-foot 2x4, we made another mark 2 inches down to indicate a slope of 2 inches for that 12 feet. (1 inch for every 6 feet)



3. **USE A LEVEL**, a 2x4 and stakes to determine the slope of 1 inch per 4 to 8 feet away from the house is ideal. Run stakes and a grid of string to mark the top of finished patio, then excavate 7-1/2 inches below string.

Make a gridwork of stakes and guide strings to indicate the finished height and slope of your patio, then excavate 7-1/2 inches below these lines. This will provide room for a 4-inch subbase, the 10-inch sand base, and the 2-1/2 inch pavers themselves (4 inches + 1 inch + 2 1/2 inches = 7 1/2 inches). See Fig C. If the area is hilly, you will need to go back and forth between excavating, leveling and setting strings to get things right.

Soil conditions vary greatly across the country. If after digging 7-1/2 inches below your strings, you still find pockets of loose dirt or black soil, remove it or it will eventually settle, creating a wavy patio.

Next, bring in the subbase material. Bring the area up to a height 3-1/2 inches below your strings (4). It should be at least 4-inches deep in all places. The subbase should extend 8 inches beyond the actual edge of the patio to provide room for the edging. It's possible you'll need to build up an area to accommodate your patio. In such cases, remove the sod and loose soil, then build up the area with your subbase material. Building a 10 to 12-inch



4. SPREAD CLASS 5 subbase to a depth of 4 inches over entire patio area and 8 inches beyond. Measure down from guide strings to establish uniform height of subbase.



5. TAMP THE SUBBASE using a flat-plate vibrator (rented at \$40 a day). Work in a circular motion and compact the area twice.

subbase is common; even 20 inches would not be unusual. Compact the class 5 using a flat-plate vibrator (also known as a compactor) as shown in pic. 5. Go over the entire area twice.

## SPREADING SAND

Sand provides the final base for your pavers. If this surface is uneven, the pavers on top will be, too.

Ideally, the sand should be 1 inch thick, but if it's a tad thicker or thinner in spots, that's okay. What you want is a firm, flat surface for laying pavers. Sand also locks the pavers in place. When you vibrate the pavers in place, they'll bed themselves slightly into the sand.

If your patio is under 10 feet wide, use a screed board with a 2-inch notch on the ends to ride along the *Snap Edge* to level the sand. On larger expanses, level long lengths of iron pipe in the sand 2 inches below your guide strings, then run your screed along the top of the pipes. (When you're done with the pipe, remove it, then fill the groove it leaves with sand). In many cases you'll use a combination - a notched screed board riding along the *Snap Edge* on one end, with the other end of the screed running along iron pipe (pic. 8). Whichever screeding method you use, roughly dump and level the sand over the compacted subbase, then fill in low spaces and rake away excess sand as you drag your 2x4. Shuffle the screed lightly from side to side as you work. You're not compacting the sand, just creating a firm, solid bed. Screed only as much sand as you can cover with pavers in one day. Screeded sand left any longer is guaranteed to be ruffled by wind, rain, kids, or a stray cat thinking he's found the world's biggest litter box.

## THE ESSENTIAL EDGING

Edging is an absolute must for maintaining the integrity of your patio. Without solid edging, your sand base and pavers will separate and drift apart as rain, frost, and foot traffic pound away.

*Snap Edge* plastic edging, left uncut, remains straight and rigid, but when it's cut, it can be bent to form curves. Secure the *Snap Edge* into the compacted subbase with 8" - 10" spikes (pic. 6).

We used landscape timbers for combination edging/steps in a sloped area of the yard (pic. 7). Crisscross corners and use double timbers on the front of steps (even though the lower one will be buried). This lower timber prevents the subbase and sand from washing out. The tops of the timbers should be at the same height as the surface of the finished patio.



6. INSTALL THE *SNAP EDGE* on the tamped subbase using 8" - 10" spikes. Cut the webbing on the edging's back side to make it flex for curves



7. INSTALL LANDSCAPE TIMBERS for edging in areas where you need to change levels or step down. Be certain to overlap corners.



8. SPREAD AND LEVEL a 1 inch bed of sand over compacted subbase. Pipes provide a guide for dragging the 2x4 screed board across.





**9. INSTALL THE PAVERS** starting along the longest, straightest edge. Border pavers provide a crisp finished edge, especially along curved portions of patio.

## PAVE AWAY

You should now be standing before an expanse of sand that's flat as a pancake (but slightly sloped). Take down the guide strings you used to determine height and slope and put up new stakes and strings to mark the lines for the pattern of your pavers (pic. 10).

Start along your house or other long, straight edge and lay down the border pavers. (A border isn't essential, but adds a crisp, finished look especially along curves.) Then lay the rest of your pavers in your selected pattern. Just lay the pavers in place - don't bang on them or twist them. Measure over to your string every few rows to make sure you're staying on track. You can leave a slight gap between pavers or tap them tighter together with a rubber mallet.

If you've taken the time to set things up right, laying the pavers goes amazingly fast. Many pavers have little nubs on the sides to serve as spacers. Don't walk or kneel on the edge of the patio until after you've vibrated it; otherwise these pavers can sink unevenly.



**10. CONTINUE LAYING PAVERS** using a layout string to keep them in line as you work. Put a gap between pavers or tap them tighter to stay in line.

We let our pavers run "wild" near the curved edges (pic. 11). Using a paver as a guide, we marked the inner pavers, removed and cut them on a masonry saw, then reinstalled the cut inner piece and the border piece. On tight radius circles, we used half pavers for the border (pic. 12) to avoid large, pie shaped voids between them.

As big and foreign as the masonry cutting saw appears, it's actually safe and easy to use. A constant stream of recirculating water keeps the blade cool and lubricated, and a sliding tray carries the paver past the blade. A cut takes about 10 seconds. Don't forget to wear your hearing and eye protection.

When all your pavers are cut and in place, vibrate the entire patio (pic. 14), starting at the outer edge and working inward in a circular motion. The vibrator will lock the pavers into the sand and help even up the surface. Don't let the vibrator sit in one place too long, or pavers could settle unevenly or crack. Some pros place plywood down and vibrate on top of that to help distribute the weight of the machine.

If a paver sinks deeper than its neighbors, use a pair of screwdrivers to pry it up, sprinkle a little extra sand in the void, then replace the paver.



**11. MARK PAVERS** that run "wild" into the border area. Then remove the paver, cut to size and place back in position along with border paver.



**12. USE HALF PAVER** for bordering tight circles. Smaller pavers cut down on the size of the pre-shaped gaps between each piece.



**13. CUT PAVERS** on masonry saw. Saw has a built-in sliding carriage for moving pavers past the blade. Recirculating water keeps blade cool and lubricated.

## SWEEPING AND UPKEEP

Spread coarse sand across the surface of your patio. After the sand dries, sweep it around the patio (pic. 15) to fill the spaces between the pavers. Make sure the sand is dry - wet sand will bridge, rather than fill the gaps. It may take two sweepings with a push broom a few days apart to completely fill the gaps. The sand helps solidify the pavers, and also fills any spaces where dirt might enter to

provide a mini-planting bed for weeds. We rolled two coats of a water sealer over our completed patio.



**14. TAMP THE PATIO** with a flat-plate vibrator after the pavers are installed. Tamp entire outside edge first, then circle in.



**15. SWEEP COARSE, DRY SAND** between cracks of pavers to lock together and fill voids. Repeat with more dry sand in a few days.



**16. LANDSCAPE** around the complete patio with flowers, shrubs and grass. Grass will root through the open spaces in flexible edging to anchor it in place.

We didn't do this to protect the pavers - they don't need protecting! We did it to enrich the color. Landscape around your patio with grass, sod, or planting beds to give it a finished look. Bring in dirt to even out the space between the new patio and existing yard. Keep dirt at least 1/2 inch below any plastic edging to allow rainwater and runoff to easily drain away from the patio. Set up the lawn chair and take a snooze - you've earned it!

## PATHWAYS



A pathway can be part of a larger project or a project in itself. A walkway made from pavers is an attractive way to link your driveway to your front door, existing deck to a new patio, or back door to garden area.

Here are a few tips:

- Keep the pattern simple; a border running parallel to the path with a simple staggered pattern within is often the most attractive.
- Put a slight tilt in the path for drainage. One-half inch across a 3 foot wide path is adequate
- Take extra care to keep the edgings an equal distance apart; it will make screeding, cutting and paver laying easier.



**SMOOTH AND LEVEL** the sand using a notched screed board riding along the edging for a guide. Include a slight tilt for good drainage.



**INSTALL THE BORDER** marking and cutting other paver at an angle at curved areas.



**LAY THE PAVERS** using a string guideline. Cut and install pieces that build up to the border later.

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