

## buildingskills

LEARN THE BASICS

BY ANDY ENGEL

### Placing a small concrete slab

**A**lthough the amount of concrete used is small, the forming and finishing techniques for a slab such as a deck-stair landing—or in this case, a propane-tank pad—aren't much different from those used for larger slabs. First and foremost is subgrade preparation. Get that wrong, and the slab will crack. The underlying ground needs to be compacted evenly. In most cases, slabs shouldn't be placed next to new buildings until the backfill around them has settled for several years. After digging out the slab location, compact the soil directly below so that there's no loose dirt.

#### Use a gravel base

One step that's called for but rarely done on small jobs is to place gravel between the slab and the subgrade. The usual explanation is that the gravel provides drainage to prevent soil saturation and the resulting frost heaving. But unless you drain that gravel somewhere with pipes, where's the water going to go?

There are two reasons to use gravel. First, concrete moves because of thermal expansion and contraction. Restricting this movement will crack the concrete. A gravel base allows the slab to move freely. Second, slabs need a flat base to ensure uniform thickness, and gravel is easier to grade than many soils.

#### Choosing concrete

For a slab that's 40 sq. ft. or more (about ½ cu. yd. of concrete for a typical 4-in.-thick slab), it's easiest to order truck-mixed concrete. This 3-ft.-sq. slab was small enough that mixing bagged concrete by hand

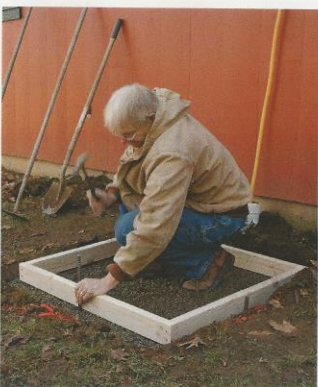
STEP BY STEP



**1 Prepare the subgrade.** Dig 6 in. beyond where you want the slab edges and 8 in. deeper than where you want the top of the slab. Make sure the subgrade pitches away from the building, and tamp down loose soil.



**2 Grade the gravel.** Fill the excavation with 4 in. of gravel. Rake it flat, and use a level to make sure it's pitched about ¼ in. per ft. so that the slab, which will parallel the base, drains water.



**3 Make and set the form.** Most 4-in. slabs are actually the 3½-in. depth of standard 2x4s. Nail the corners together, and place the form on the graded gravel, making sure it doesn't rock. Drive 12-in. lengths of rebar to just below the top of the form to keep it from moving.



**4 Mix the concrete.** Dump two 80-lb. bags of mix in a wheelbarrow for each batch. Add 3 qt. of water per bag, and mix thoroughly with a hoe. Add small amounts of additional water if necessary to bring the concrete to a consistency that's about the same as thick cake batter.

made sense. At 9 sq. ft. and 4 in. thick, the project called for 3 cu. ft. of concrete. An 80-lb. bag of concrete mix makes  $\frac{3}{5}$  cu. ft., so this slab took five bags.

I used a crack-control concrete, which includes reinforcing fibers. The slab was small enough that no steel reinforcement was needed, but that little extra strength from the fibers only cost me \$5. Larger slabs, say 5x5 and up, will benefit from reinforcement with rebar or wire mesh to control cracking.

Concrete needs moisture to cure. After finishing the slab, cover it with plastic and keep it damp for at least a day. A week is better, and 28 days ensures the best cure.

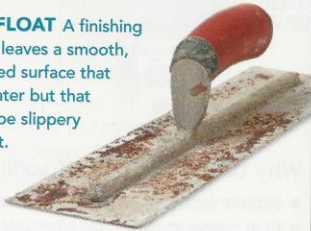
*Andy Engel is a senior editor. Photos by Patrick McCombe, except where noted.*

## Concrete tools

**MAG FLOAT** Used in the initial tooling to bring up a creamy mix that's easy to finish. As a final finishing tool, it leaves a coarse, slip-resistant surface that's good for exterior slabs.



**STEEL FLOAT** A finishing tool that leaves a smooth, compacted surface that repels water but that also can be slippery when wet.



**EDGER** Rounds over the exposed edges of slabs, leaving a surface that's more resistant to chipping than a simple square edge would be.



### STEP BY STEP



**5 Settle the concrete.** After dumping the mixed concrete in the form, jab into it all along the edges with a shovel. This helps to ensure that the mix fills the form without leaving voids.



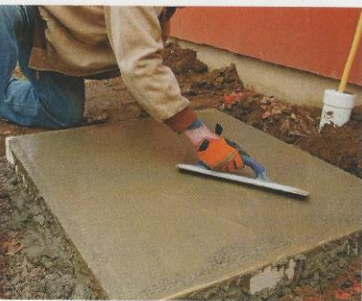
**6 Tap the sides of the form.** Lightly hammer the form all around the slab until you see bubbles rising from the concrete. This step makes for a smoother slab edge that won't collect water, which can freeze and spall the concrete.



**7 Screenshot the slab.** Flatten the concrete using a straight 2x4 that's about 1 ft. longer than the form width. Move the board forward with a back-and-forth sawing motion while keeping it on the form.



**8 Tamp the surface with a rake.** Gently tamp the entire surface of the slab. The rake pushes down the gravel that's part of the concrete mix, and brings up a mixture of cement and sand that's easier to smooth.



**9 Smooth the rake marks with a mag float.** Keep the leading edge of the float up. When the surface water dissipates, float the slab again. This is the final finish for exterior slabs. For a smooth interior slab, work it again with a steel float when the surface begins to lose its wet sheen.



**10 Round the corners.** This leaves smooth, friendly edges that are less likely to chip. Use an edger once after each mag floating; on interior slabs with exposed edges, use it after the steel float. After the slab hardens for a day or more, pry the joints apart and remove the form.