

Outdoor Home Improvement

With spring thaw come thoughts of upgrading the home grounds to a suitable setting for outdoor activities. Here's our annual section of ideas you can adapt to your own house and yard to make this a summer to remember.

Soil-cement paving —almost concrete-tough at a fraction of the cost

By RICHARD DAY

Yes, you can make durable paving—even building blocks—out of dirt. With dirt and a little cement you can install a patio, driveway, or walkway that will last through inclement weather and family traffic. And you can do it without dipping deeply into your coffers. So if you're planning to pave, consider the virtues of soil-cement.

Its basic material, dirt, is certainly abundant and priced right. While concrete contains roughly 25 percent cement and calls for highly select aggregates, soil-cement can be made with as little as eight percent cement and plain earth. A 20-by-25-foot soil-cement patio will cost about \$150, roughly one-fourth the cost of paving with concrete.

Although soil-cement develops only about one-half the strength of concrete, that's sufficient for most foot and automobile traffic. But soil-cement will give you something that concrete and asphalt can't: a pavement that blends in with the surroundings. Soil-cement resembles nothing so much as the dirt it's made from, so your project will have a more natural look.

You probably won't need to drag in a special soil for soil-cement. Most soils below the uppermost layer will work just fine, particularly sandy or gravelly soils, in which the aggregates are already present. In fact, there are few types of soil that won't yield good soil-cement. Soil that contains organic

(vegetable) matter—and you can diagnose this by the presence of a musty smell—won't react well with cement. Dark topsoil and clay require so much cement that they're impractical for soil-cement.

Out of the yard...

There's nothing revolutionary or untested about the stuff. I built a soil-cement basketball pad 11 years ago [PS, Sept. '73], and it's still in good condition. But soil-cement hasn't been confined to backyard projects. In fact, it's found a home in civil-engineering projects in which strength, cost, and durability are primary considerations.

You can drive over soil-cement roads in Edmonton (Alberta, Canada) and in California's northern Modoc County. Soil-cement has been used successfully in dams, airport runways, canal linings, and many other applications for which concrete has usually been the material of choice.

Despite its own success with soil-cement, the Portland Cement Assn. hesitates to recommend it for do-it-yourselfers. Its reluctance stems from the fact that soil-cement requires great attention to detail, particularly because there are no exact numbers to govern the percentage of cement to be used: Every soil must be tested thoroughly to arrive at an optimum percentage of cement.

My experience indicates that there's no reason to be intimidated by the hesitancy of the PCA. If you're willing to be patient, to run the necessary soil tests (see box), and to tend

to all the details of mixing, tamping, and curing, there's every reason that soil-cement should work for you.

The key to success with soil-cement is in determining the right percentage of cement by volume to be mixed with your soil. To find that number, you've got to run some tests. Soils engineers have a battery of standardized tests for soils, but to understand them you have to be well acquainted with terms such as liquid limit, plasticity index, and Poisson's ratio. The PCA has devised a reliable, simple method for testing soils. The "pick-and-click test" allows you to determine the optimum percentage of cement needed for your soil-cement.

The results of a PCA test will also warn you against using soil-cement, even if your soil is a type that should react well. If your optimum cement content is 20 percent, reconsider; you won't be saving much money over using concrete.

Once you've determined the optimum percentage of cement and decided on the necessary depth of soil-cement paving, you can calculate the number of bags of portland cement you'll need for your project. (One bag of portland cement contains exactly one cubic foot of cement.)

Paving for patios, basketball courts, and floors—any area that will support only foot traffic—needs four inches of soil-cement. Driveways and sidewalks that a car will cross need five inches. Garage floors and driveways for light trucks take six inches (heavy-duty

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