Installing Manufactured-Stone Veneer

Made from cast concrete, so-called phony stone is good looking, affordable and easy to work with, but best of all, gravity is not required

BY VLADIMIR POPOVAC

Take a closer look. From here, it's tough to tell that the stone on the foundation of this house is actually lightweight concrete cast and colored to look like the real thing.

Years ago, I was driving down the road and happened to glance over at a construction site. Two masons perched on scaffolding *25* ft. in the air were setting stone on the outside of a chimney. They had completed about one jagged foot of stone all around the top of the chimney, working down instead of up.

I couldn't believe my eyes. Ordinarily, I'd stop to find out what was going on. But I was too stunned to react, and I just kept driving. Later, I discovered their secret: They were installing manufactured stone.

Manufactured stone looks like the real thing

Most people have trouble discerning manufactured stone from natural stone, even up close. Even experienced masons can have difficulty distinguishing the two. Phony stone, as some masons disparagingly call it, looks like the genuine article in both shape and color (photo left).

So what's not to like about the stuff? First, lightweight manufactured stone lacks the heft of natural stone. And to the experienced hand and eye, it doesn't have the same solid feel or depth of color as rock that has formed over millions of years. It's also applied more like tilework than stonework.

Natural stone has color throughout each piece, but manufactured stone's beauty is skin deep. The color is just on the outer surface, which makes cleanup a bit more problematic, something I'll get to later.

But manufactured stone does have advantages (sidebar p. 97), the biggest of which is that it can be installed from the top down, seemingly in defiance of gravity. Most manufacturers' instructions state that it can be installed in either direction, but working in the reverse of standard masonry logic makes cleanup easier because you are not dropping mortar all over the completed work.

A saw keeps fingers away from sharp edges. Metal lath for the substrate can be cut with shears, but cutting with a diamond-blade saw is quicker and safer.

Smearing the mud. Piled on a sheet of plywood, mortar is pushed up onto the wall, where it is spread in a thin layer over the metal lath.

Compared with natural stone, manufactured stone cuts more easily and more predictably. Made from cast concrete, manufactured stone has an even consistency in each piece, making it easy to shape and fit.

Manufactured stone's biggest advantage is cost. The clients on this project wanted natural river stone for both an inside hearth and for the veneer on the foundation and chimney outside. When the price came in more than they wanted to spend, they decided to use manufactured stone outside, which cut the cost in half. The money they saved let them use the real McCoy inside where the stone would be seen much more closely. Manufactured stone comes in a variety of shapes and colors, so it was no problem duplicating the river-washed look of the Canadian stone they had chosen.

Before the stone goes on

Manufactured stone has to be applied over a cementitious surface. If it is going over existing masonry, such as concrete or block, the surface has to be clean and solid. No wall ties, anchors or lath is needed. And because of its light weight, no support—such as angle irons or a veneer shelf cast in the foundation—is required.

If the subsurface isn't cementitious, such as drywall, plywood or rigid insulation board, you must make it so. The goal is not to build structural support but to create a solid surface that won't move or flex.

Most of the crawlspace walls of this house were wood-framed with plywood sheathing. In situations such as this one, my partner, Marshall Dunn, and I begin by tacking up a moisture barrier. Kraft paper or 15-lb. felt paper can be used. This barrier keeps the subsurface from sucking moisture out of the mortar, causing it to cure too rapidly.

Next, we nail expanded metal lath flat over the entire surface with galvanized roofing

A textured finish provides better grip. A notched trowel creates a furrowed surface that is better for bonding the manufactured stone to the wall.

nails driven into the framing. These nails are the only mechanical anchors holding the manufactured stone to the wall, so don't skimp on them.

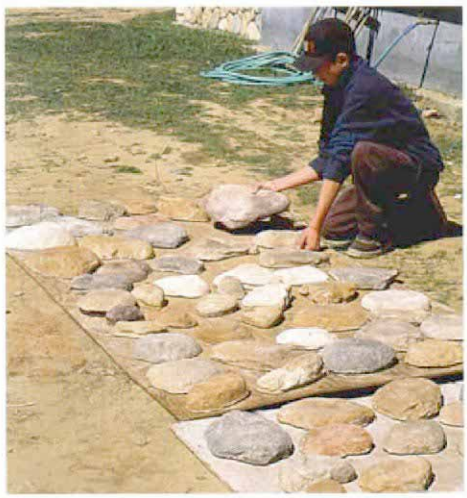
Metal lath can be cut with shears, but cut edges are sharp and can slice your hands if you don't wear gloves. Instead, we use a small circular saw with a diamond blade to make fast cuts while keeping fingers away from the sharp edges (top photo, p. 93).

A mud layer finishes the substrate

Next, we spread a thin layer of mortar over the paper and lath. We use a standard mix, 3 parts plaster sand (finer than concrete sand), 1 part portland cement and 1 part clay. Lime may be substituted for clay, but either provides the bonding power that makes the mix stick to the wall.

We usually spread the mortar with a brick trowel (center photo, p. 93). The trick is to get the mortar on the wall quickly and to keep it flat. Often, we heap a pile of mud on a piece of plywood next to the wall and push the mud directly onto the wall. While the mortar is still slightly wet, we furrow the surface with a toothed trowel to maximize the mortar's grip (bottom photo, p. 93).

We let the prepared surface set at least overnight, and after that point, the prepped wall is treated the same as any other cementitious surface. The next day, before we start installing the stone, we soak the wall with either a sponge or a hose. A drywall, especially on a hot day, can rapidly suck the moisture out of the wet mortar, weakening the bond between the stone and the wall.



Pick a stone, any stone. Manufactured stone is laid out on plywood to keep it clean while the masons choose pieces to fit spots on the wall.

Two shapes: flats and corners

We begin installation by laying out a large number of stones close to where we'll be working. If we're outside, we set them on tarps or sheets of plywood (photo left). Having many stones laid out beforehand makes finding the right stone for a particular spot much easier.

Manufactured stone has to be kept clean and dry before it is installed. Mortar doesn't bond well to dirty or wet stone, and stains in manufactured stone are usually permanent. So at the end of each day, any unused stone is returned to its crate and covered.

Manufactured stone comes in two basic shapes: flats and corners. The flats have a front surface that resembles a stone in outline, convolutions and color. But they are only 1 in. to 3 in. thick, and their backs are flat. Corners have their backsides molded into a right angle. Because corners are harder to shape and give you fewer options, we usually begin with the corners, letting them define the border of the field.

Cutting and fitting the stone

The first piece we set is a top cornerstone (photo bottom left). We use the same mortar mix to set the stones as we used for the subsurface. Once the top piece is scribed, cut, buttered and tapped into place, we move to the next piece down.

The two arms or wings on each cornerstone vary in length, in width and in thickness. So as I move down the corner, I alternate the orientation of the wings whenever I can to produce a more natural look (photo bottom right). I also alternate color whenever possible.

With corners or flats, we start with a stone that looks like a close fit with its neighbors, then shape it as necessary. We determine where to chip by holding the new rock in place. We sometimes mark the cut with a pencil (photo left, facing page), but usually the eye remembers where and how much to

Start in a corner. Corners are harder to shape and fit, so the first stone to go on is a top corner piece (photo left). Color and shape are alternated for a more natural look as the corner pieces are installed (photo right).

Isn't this guy working backward? Installing manufactured stone from the top down keeps excess mortar off completed work. Here, a piece is scribed for a fit.

cut. And if the first shaping isn't perfect, you just keep shaping until you're satisfied.

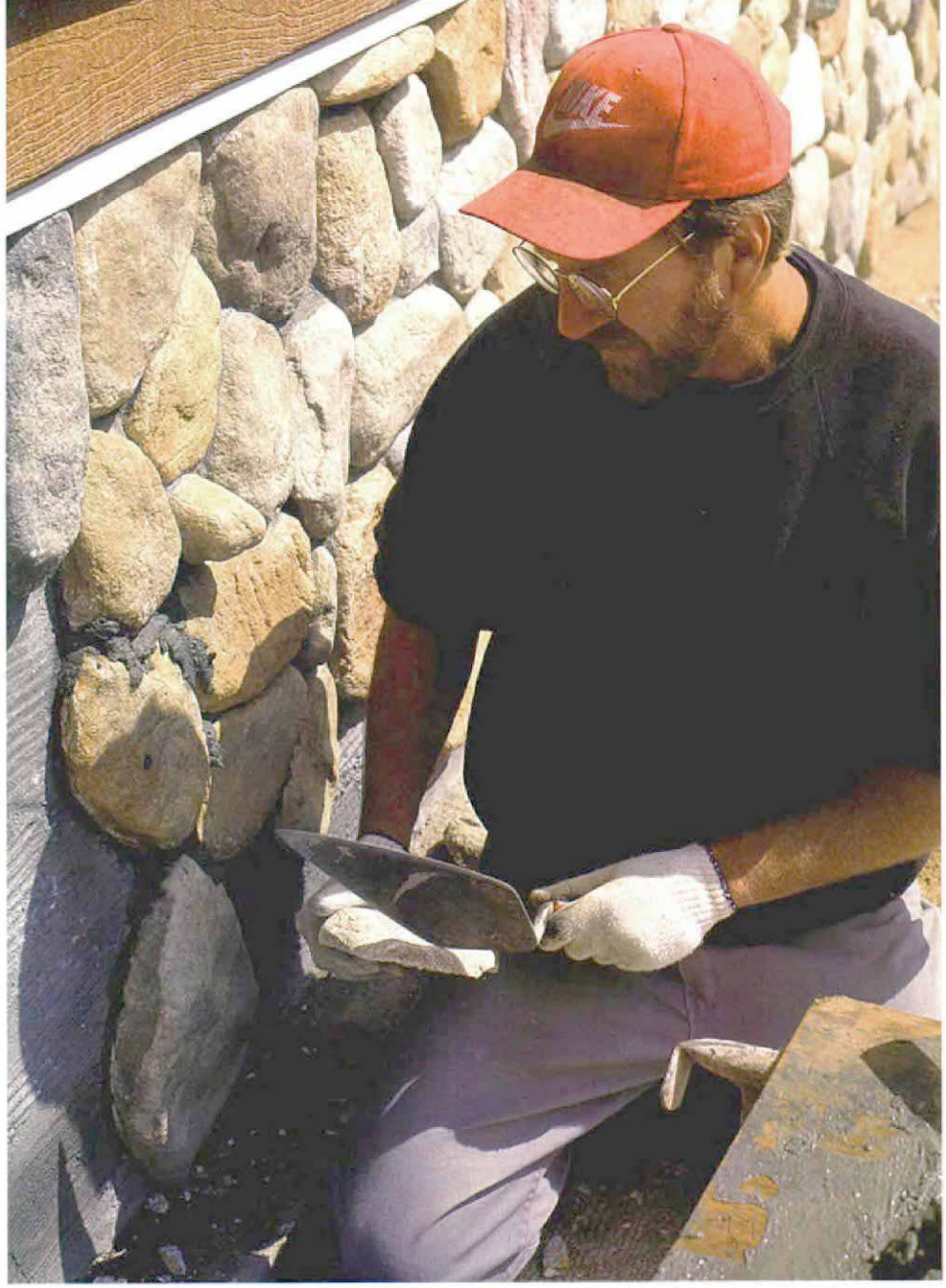
I like to use a masonry hammer to do the chipping, but my partner shapes the stone with the edge of his brick trowel (photo top right). Either way, support the stone while you're striking it; manufactured stone is fragile before it's wedded to the wall. Cradle the stone in one hand against your body, and attack the area to be removed from back to front as if you're whittling. Be patient; remove the unwanted material a little at a time.

Although we prefer to shape the stone by hand, occasionally we need to remove a larger section of stone than is feasible by chipping. In this case, we use a 4-in. handheld grinder equipped with a diamond cutting wheel. It's fast and accurate. You can even soften and slant the cut, which helps to hide it. The only drawback is the dust produced. We always wear masks when using the grinder, but we prefer to shape the stone by hand.

Because manufactured stone has color only on the surface, we try to minimize the visibility of the cuts. Manufacturers suggest that if the stone to be set is above eye level, then you should shape the stone from the top and vice versa. But taking special care while cutting and then using creative mortar techniques can hide most cuts.

Buttering the backs

When we're satisfied with the fit of a stone, we spread a thin bonding coat of mortar over the back of the stone, pressing the mortar firmly into the stone to ensure good adhesion. Next, we run a small ridge of mud ½ in. high around the edges of the stone (photo bottom left). The extra mud on the edges oozes out to fill the joint when the stone is pushed into place. River rock has



Shaping manufactured stone is a breeze. Cast-concrete manufactured stone has an even consistency, making it easy to shape with either the edge of a trowel or a mason's hammer. An electric grinder can also be used.

Buttering the backs. A thin layer of mortar is spread across the back surface of the stone, and a ridge around the edges helps to fill joints between the stones.

A light tap sets the stone. After a stone has been pressed into place, a light blow with a soft mallet ensures that the stone will stay put while work continues.

Cleanup begins with a small stick. When mortar has just begun to set up, a small softwood stick is used to remove excess. The pointed end rakes the joints between stones to the right shape and depth.

fairly big joints, so if we're installing stone with a tighter pattern, less mud is needed around the edges.

The back of the stone has to be bonded to the wall, but too much mortar can spell trouble. First, the excess mud squishing out of the joint could run onto the face of the stone, adding to your cleaning chores. But even more serious, too much mud adds extra weight, and the stone will fall as soon as you turn your back or while you're tapping the next stone into place. Practice and experience dictate the right amount of mud.

We hold the buttered stone about 1 in. away and 1 in. below its final position, then slide it into the wall and up, wiggling the stone as it slides. This action spreads the mortar uniformly across the back of the stone and into the joints above. While holding the stone in place, we tap it a couple of times with a soft mallet and let go (photo bottom right, p. 95). The stone should now be set.

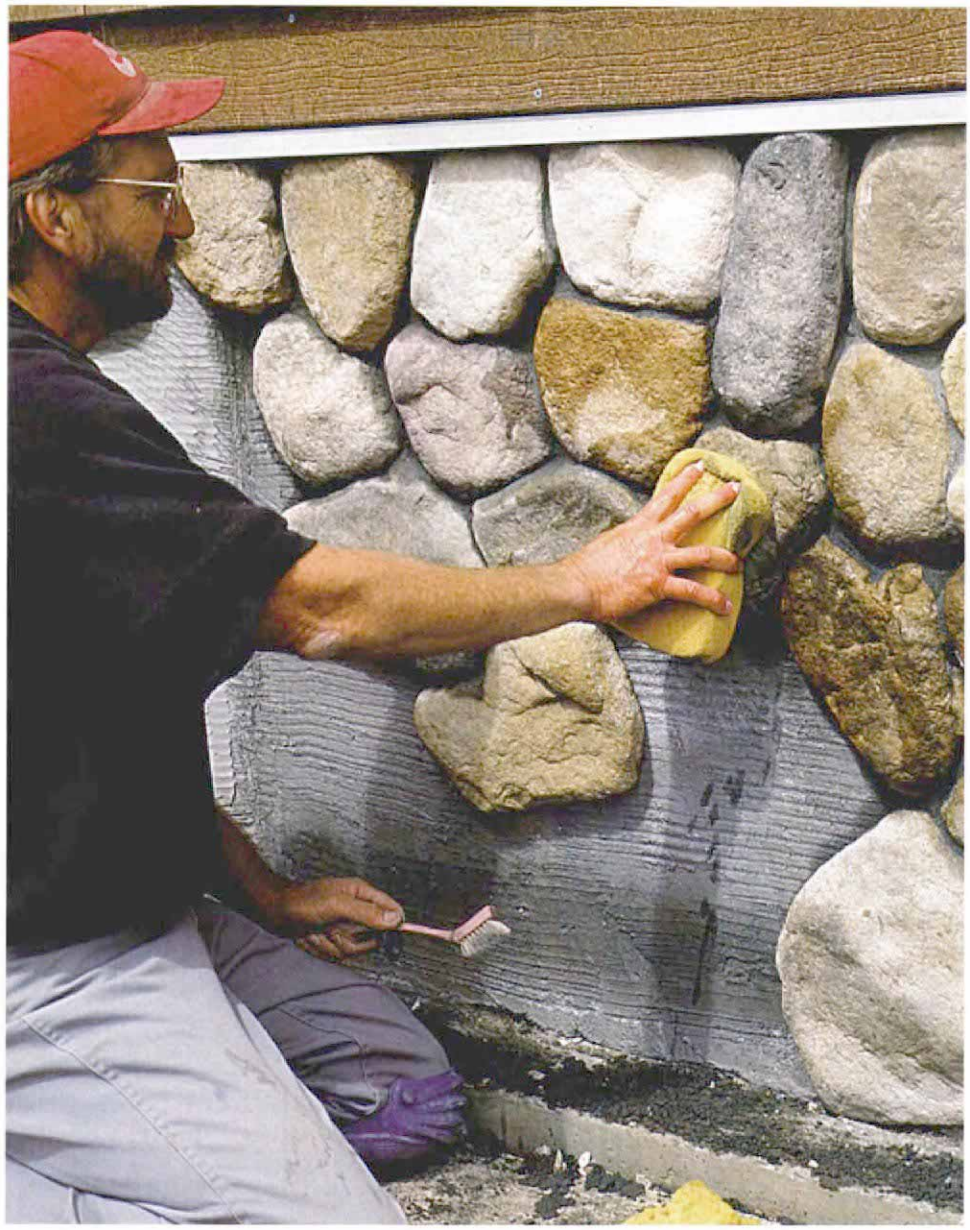
The river rock's large, uneven joints made it necessary to add mortar occasionally to fill in the joints as the installation proceeded. We use partially dry mortar that still adheres well, but won't smear and stain the stone. Grouting mortar can either be put in by hand or squeezed out of a grouting bag.

Manufactured stone needs special care for cleanup

Before we get too many stones installed, we stop to clean up, especially if it's a warm, dry day when the mud sets up more quickly. Cleaning manufactured stone takes much more care than cleaning natural stone. With the latter, you can scrub as hard as you'd like, using abrasives, wire brushes and acid

A gentle hand with a soft brush. The color on the surface of manufactured stone can be damaged with abrasives or acid, so excess mortar must be brushed off lightly with a soft brush.

A damp sponge completes cleanup. Any light stains or mortar left after brushing is wiped from the stone with a sponge that is barely damp.



without altering the hard surface and body of stone.

But phony stone won't stand up to the same kind of abuse. Any mortar stains must be cleaned within the first few hours, or they become permanent. Acid and abrasives that can erase the colors from the surface are absolutely verboten. Again, working from the top down and using the right mix should help to keep messiness and cleanup to a minimum.

The ideal time to clean the stone and rake the joints is as soon as the mortar dries but before it hardens. Exactly when this ideal moment arrives depends on a number of factors, including the temperature, the humidity, the location of the sun (or the shade), the wetness of the wall, the stiffness of the mud, etc. But usually, it occurs one to three hours after the stone is set.

Even if you've been a little sloppy in spots, resist the temptation to clean the stone until the mortar has set up. Cleaning the stones when the mortar is still wet can smear the mortar and stain the stone.

The first step in cleanup is raking the joints. When the mortar has dried sufficiently, we find a piece of soft wood, such as a redwood or cedar shim, about 6 in. long and the width of a finger (photo top left, facing page). With this stick, we flick off globs of mud that are perched on the stones and rake out the joints to the desired depth.

As this simple stick is used, it shapes itself into the perfect tool. We guard the sticks we use and hide them in places we're sure to remember for tomorrow or next week. But of course, we never find them again.

The deeper you rake the joints, the smaller they get and the tighter they look. Just be sure not to expose the stone's cut edges.

Once the surface mud is flicked off and the joints are properly raked, we brush the stones with a soft, dry or barely damp brush (photo bottom left, facing page). Brushing takes away all the tiny, lingering particles of mortar. After brushing, stonework should be almost totally clean, and the joints should be smooth and uniform in depth.

The final step is washing, which is actually too strong a term. We wipe the stone lightly with a sponge just damp enough so that water isn't squeezing out (photo right, facing page). Any remaining stains should lift right off. If a stain requires heavy rubbing, you've waited too long, but go ahead and rub. Tomorrow will be too late. □

Vladimir Popovac and his partner, Marshall Dunn, are masons in Sonora, California. Photos by Roe A. Osborn, except where noted.

CONCRETE CAST IN STONE

Manufactured stone is a lightweight, nonstructural alternative to natural stone made by several different companies. Although the process may vary slightly from company to company, most manufactured stone is made by pouring lightweight concrete mix into molds made from actual stones.

Pigment placed in the mold before the concrete is poured gives each stone its color, and most companies offer many types of stone in a variety of colors (photos right). The stone featured in this article is River Rock, Lakeshore Blend from Cultured Stone.

Ordering manufactured stone is easy. First, figure the square footage minus openings such as doors or windows. Next, add up the linear feet of the outside corners. Each company supplies figures for how many square feet each linear foot of cornerstone covers for a variety of stone. The square footage of the corners is subtracted from the total for the final figure.

Because of its forgiving nature, there is little waste with manufactured stone, but it doesn't hurt to order a little extra. Our local masonry-supply yard currently sells flats for around $4 per sq. ft. Corners currently run about $6 a lin. ft.

-V.P.

Sources of manufactured stone

Century Stone
mnjinternational.co.kr

Classic Stone; (800) 905-8000

Coronado Stone; (800) 847-8663
coronado.com

Crown Hill Stone; (800) 295-1120
crownhill.com

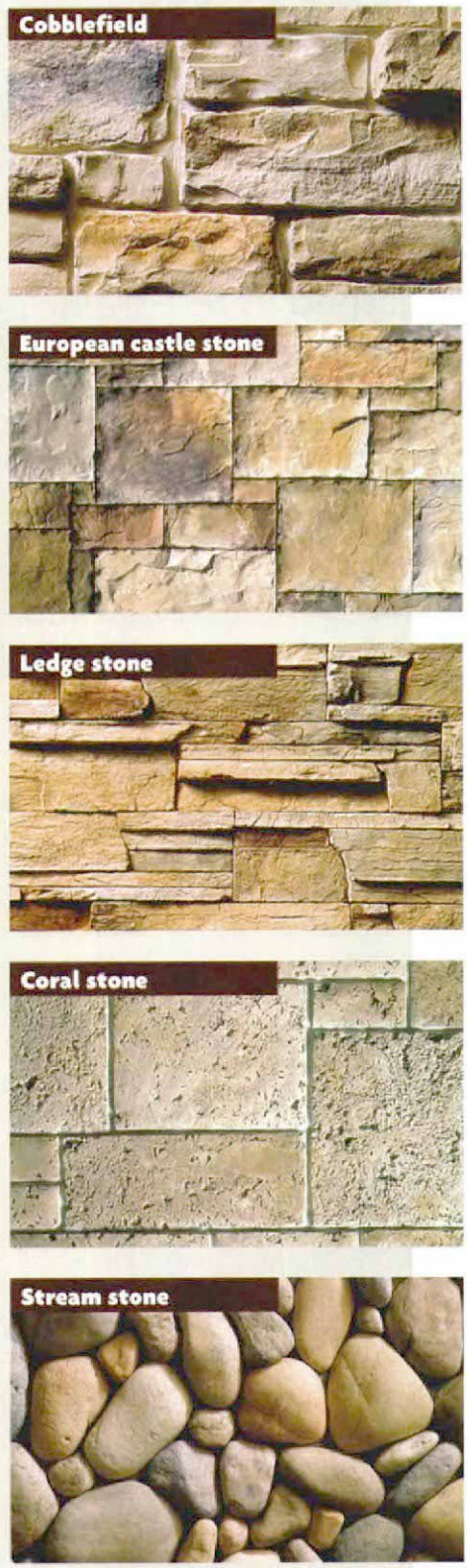
Cultured Stone; (800) 255-1727
culturedstone.com

El Dorado Stone; (800) 925-1491
eldoradostone.com

Hammer Stone; (800) 246-1543
hammerstone.net

J&N Stone Inc.; (800) 321-1372
jnstone.com

Tejas Textured Stone; (972) 578-5616
tejasstone.com



A few of manufactured stone's many faces. Because it is a cast-concrete product, manufactured stone can resemble many different types of stone, each of them in a variety of colors.

Photos this page: Courtesy of Cultured Stone