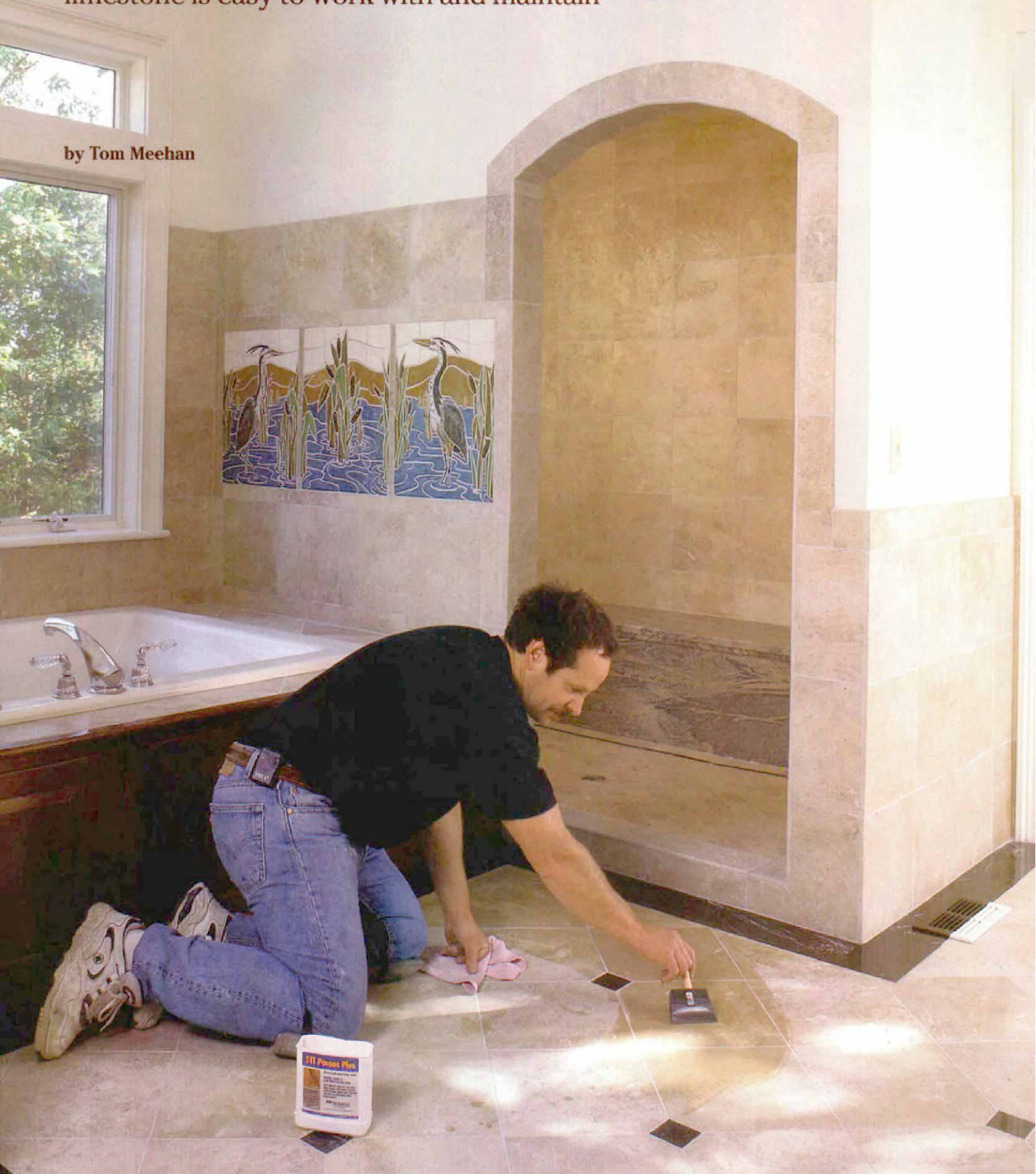


Tiling With Limestone

An earthy alternative to the cold, austere look of marble, limestone is easy to work with and maintain

by Tom Meehan



My wife, Lane, and I own a tile store on Cape Cod, so I've gotten used to seeing tile of many different colors, shapes and materials all in the same room. But I've never met a homeowner who wanted to turn a bathroom into a tile showroom. I did come close recently when I tiled a bathroom that combined striking black marble, gray granite, tumbled marble and a large, colorful hand-painted ceramic mural. The unifying element that made this unlikely combination successful was limestone tile.

Sort the tiles before you mix the mortar—

As an experienced tile installer, I had the dream job of integrating all these different types of tile with limestone in a single room. Limestone, which can be fairly soft and porous, is usually a breeze to work and has subtle, earthy tones that form a perfect complement to almost any type or color of material (sidebar below).

Because the color of limestone can vary from tile to tile and from box to box, I begin by opening boxes and checking the tiles for differences in shade or slight veining that might make one tile stand out from the rest. The differences are usually subtle, but a misplaced tile in a different shade can stick out.

As I went through the boxes of limestone tiles for this bathroom, I culled some tiles that had slightly different shades or that had chipped corners. I also came across some tiles with nice crystalline veins that I set aside to give large open areas such as the floor or the shower walls a monolithic look. Out of the 550 sq. ft. of limestone tile that I installed in this bathroom, only about 20 or 30 tiles were irregular in color or badly chipped. These tiles were set aside for cuts, and tiles with off colors were relegated to an inconspicuous closet floor.

To add interest to the layout, we decided to run the tiles diagonally

on the horizontal areas (tub deck and main floor). The diagonal pattern contrasted the square layout of the wainscoting and the shower walls. For the floor, I figured that a 6-in. border (in black marble) would allow me to use more full tiles and fewer small pieces in the field.

To enhance the diagonal layout, I positioned 3-in. black-marble inserts at the intersection of every fourth tile. A pattern of inserts done this way is called a clipped-corner pattern because the corners of the intersecting tiles are cut off to accommodate the insert. I centered the floor pattern in the area that would be seen first, in front of the raised-panel tub-enclosure face.

Another layout concern was the long exposed wall that holds the main door to the bathroom. To catch another full diagonal tile, I increased the border along that wall to about 6½ in. My objective was to give the appearance that the room was built to the size and dimension of the limestone tile.

The layout of the walls was relatively simple. Because the floor tiles ran diagonally, the walls and floor did not have to line up. I made it a

point to avoid small cuts whenever possible and to put the fuller-cut tiles in obvious places such as inside corners. The mural was centered on the wall above the tub to give the feeling of looking out a big limestone and ceramic window at Cape Cod's scenic landscape.

A wet saw is indispensable—

Working with limestone is similar to working with polished marble. However, marble is much less forgiving and is usually set in a perfect plane with no grout joint. In most cases, however, limestone can look better with a fine grout joint. On this job, I left a ½-in. joint between the tiles.

Because limestone is part of a geological formation (sedimentary rock), it should be cut only with a wet saw equipped with a

Cutting limestone

A wet saw is the best tool for cutting limestone, but installation is similar to regular tile.



Wet-saw jig from a tile scrap. A discarded tile cut at a 45° angle and clamped to the wet saw's sliding table streamlines cutting tiles for a diagonal layout.



Buttered back for better adhesion. Because of limestone's porous nature, the back of every die receives a thin layer of mortar, a process known as buttering, which ensures sound attachment for each tile.



No special mortar for limestone. After the backs are buttered, the limestone tiles are set in the same latex-modified mortar used for many other types of tile. The lighter color was chosen because darker mortars can darken the limestone permanently.

Limestone's origins: fossils, coral and seashells

Look at limestone under a microscope, and you'll see coral, seashells and the skeletons of sea creatures that accumulated over eons in the sediment on the ocean floor. Millions of years ago, the surface of the earth was changing dramatically. Mountains were thrust up out of the oceans, and the sediment on the ocean floor turned into limestone. Some of that limestone encountered tremendous geological heat and pressure, crystallizing and transforming it into marble.

Like marble, limestone occurs in a wide variety of textures and colors from grays, greens and reds to almost pure white. Far and away the most common color of limestone tile is a sandy beige like the tile used here. Even so, a single tile can have specific areas of contrasting color, and often you can see the full outline of a seashell or fossil in limestone's richly textured surface.—T. M.



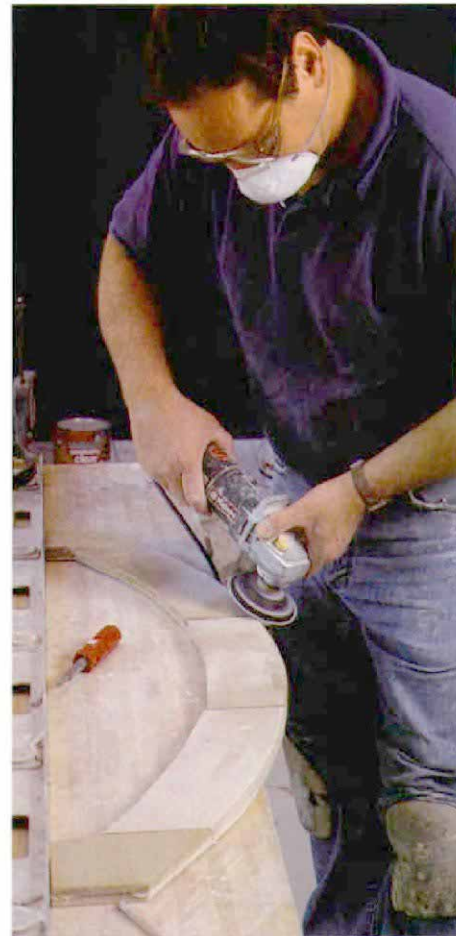
Arched door trim starts with a plywood template. After scribing the arch of the shower entry onto a piece of plywood and adding the top edge of the tile trim, that shape is transferred to the limestone.

Shaping limestone

Limestone can be worked almost like wood, taking shapes and finished edges with ease. But unlike highly polished marble, a light sanding is all limestone needs before it is ready to be installed.



Cut tiles are glued temporarily to the template. After the tiles are cut, the author glues them to the template. Having the tiles aligned the way they will be installed makes it easier to keep the edge shape consistent.



A grinder roughs out the bullnose. An abrasive pad on an electric grinder fairs the curve of the arch and rounds over the tiles. A quick pass with 80-grit and then 120-grit sandpaper gets the tile ready for installation.

diamond-edge blade (top photo, p. 99). I pre-cut as many pieces as possible, especially when the tile is being installed in a diagonal pattern.

As with most tiles, limestone seems to bond best either to a good cement backerboard or to a cement-and-sand based mud job in wet areas such as the shower and tub. Limestone also bonds well to drywall in areas where water isn't a concern. I did a mud job on the shower floor and used backerboard for the shower walls and for the tub deck running up the walls a foot or so. For the rest of the wall work, I installed the limestone over the mildew-resistant drywall on the walls after priming the drywall with a skim coat of thinset the day before installing the tiles.

One often-overlooked characteristic of limestone is its translucence. Regular gray thinset has a tendency to darken the light-colored limestone, so I always install the tile with white latex-modified thinset. For this job I used Laticrete International (203-393-0010) #253, a polymer-modified thinset mortar that mixes with water.

I spread the mortar for these limestone tiles with a 3/8-in. notched spreading trowel. Before installing each tile, I buttered the back with a

thin layer of thinset (center photo, p. 99). This step may be slightly overkill, but it is cheap insurance for achieving a 100% bond when the tile is set in place (bottom photo, p. 99).

Limestone can be shaped with a grinder and sandpaper—When I'm installing an outside corner with ceramic tile, I have to order special tiles to achieve the bullnose edge. With stone tiles such as marble and limestone, edges can be carved or ground right into the edge of regular tiles. With polished marble, that edge has to be polished with a series of abrasive disks that get progressively finer. However, with limestone, once the bullnose edge is roughed out, I just go over it with 80-grit sandpaper to fine-tune the shape and then 120-grit sandpaper to smooth the finish. If I go any finer with the sandpaper, I have to be careful not to make the edge more polished than the tile itself.

One challenge in tile work made easy with limestone is forming tiles for an arched opening like the one I did over the shower entry in the bathroom in this article. The first step was scribing the arched opening onto plywood for a

template. Then I set a compass at 4 in. and paralleled my scribe line to form the arch. After cutting out the arch template, I traced the shape onto three pieces of limestone (photo left).

It was easy to follow the outside radius of the arch with the wet saw, but the inside radius was challenging. I sawed over to the inside-radius line and removed the bulk of the waste. I then used my grinder to cut to the line.

The top of the radius still had to be bullnosed. The best way to put an even edge on a series of tiles is to join them together in the same order as they will be installed. For a square edge such as an outside corner of a wall, I just line up the tiles against a straightedge on the worktable and mold them as a single entity.

The arch, however, was a more formidable task. I began by gluing the pieces of limestone to the plywood template (photo center). I used a glue called Akemi (Axson North America Inc.; 800-365-8171), a quick-setting two-part polyester used to join stone to stone. In that capacity it forms a tenacious bond, but because I was gluing to plywood, I was able to break the bond and chip off the glue when I was finished shap-



The arch goes up. Once the tiles are shaped and smoothed, they are installed on the wall, leaving the proper spacing for an attractive grout joint.

Waterproofing membrane for a built-in shower niche

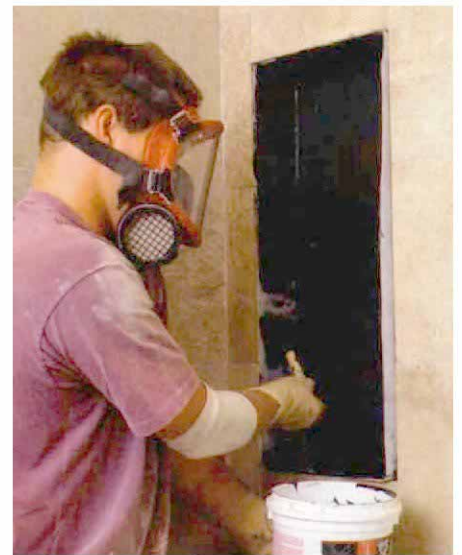
A lot of the showers that we tile these days call for a tiled alcove or niche for shampoo bottles and soap. Most often, we line the framed opening with backerboard and install the tile right on top. However, if I know that there is the possibility of a lot of water pressure hitting the niche directly, I line the backerboard with a waterproof membrane. We decided to go that route with the niches in this shower.

The system we used here is made by Laticrete. After taping and sealing the backerboard corners and seams inside the niche with thinset mortar, my assistant, James Mahony, began the membrane by applying a coat of Laticrete 9235 waterproofing liquid, a black self-curing latex-rubber compound, over the whole interior of the niche. He took care not to get any black on the finished limestone walls of the shower. The compound is pretty noxious, so James wore rubber gloves and a respirator while installing the membrane, especially in the confines of the shower stall.

Next, a nonwoven polyester fabric supplied with the kit was pressed into the wet compound (top photo). James trimmed the excess out of the corners and then applied another coat of the black compound, thoroughly saturating the fabric (center photo). The compound combines with the fabric to create the waterproof membrane. The next day, James came back and installed the limestone in the niche using a latex-modified thinset, also made by Laticrete, as an adhesive (bottom photo). Even with the waterproof membrane, we pitched the bottom of the niche slightly so that water would run out easily.—*T. M.*



Fabric is pressed into the wet liquid. After the inside of the shampoo niche is coated with a latex-rubber liquid, a nonwoven polyester fabric is pressed into the liquid.



A second coat of latex-rubber saturates the fabric. When the fabric has been installed, a top coat of rubber-latex liquid is applied to impregnate the fabric thoroughly.



Tiling the niche. After allowing the membrane to cure overnight, the limestone tile is then set into the same latex-modified thinset used in the rest of the room.

Seal limestone before and after grouting

A coat of sealer before grouting helps to prevent the porous limestone from sucking moisture out of the grout as it cures. The final coat protects the tile from bathroom moisture.



The first coat of sealer. Sealing before the grout is spread keeps the tiles from absorbing the liquid in the grout and keeps the grout from staining the tiles.



The final coat of sealer. When all the tile is installed and grouted, a second coat of sealer is applied over the entire tiled surface. Sealer keeps the limestone from staining.



Protecting limestone from dark grouts. Here, the light-colored limestone has been masked off while black grout is applied to the marble border.

ing. Next, I used an electric grinder to round over the top edge of the arch to form half of a bullnose (photo right, p. 100). After I finished the edge with sandpaper, the tiles were installed with the preshaped edge forming a continuous curve (photo left, p. 101).

Seal twice, grout once—Cleaning and sealing the limestone before grouting is a must. At this stage, limestone should be sealed with a coat of an impregnator sealer to protect it from staining and to act as a grout release before grouting (photo left). Manufacturers suggest testing the sealer on a small area of stone first. A good impregnator should not darken stone but leave stone in its natural state when it dries. I try to seal the edges of the tile as well so that the porous limestone doesn't suck the moisture out of the grout and cause it to cure prematurely.

I've used two different sealers, Miracle Sealants Porous Plus (800-350-1901) and StoneMasters Gold Seal (800-851-2027). I usually apply the sealer with a foam brush and then wipe down the tile with a clean rag. These sealers give off organic vapors, so if you're not installing the lime-

stone in a well-ventilated area, I recommend wearing a respirator.

I grouted the limestone with a latex-modified floor grout made by TEC (800-323-7401). For these 1/8-in. wide grout joints, I chose a sanded grout. Once the tile had been sealed and dried 24 hours, I grouted in pretty much the same way I do for most other tiles, raking the grout in diagonal strokes across the grout joints to ensure that they get completely filled. When I'm grouting limestone, though, I try not to spread or cover more than 40 sq. ft. to 50 sq. ft. at a time. If any places in the grout joint did not get sealer, the grout could cure too quickly, making it difficult to work and also reducing its strength.

A cleanup before the final sealer—I waited two or three days to let the grout cure completely and then cleaned the tile thoroughly with a neutral-pH cleaner. Your local tile store can steer you toward several different cleaners. I then let the tile dry for a week or more, depending on the humidity, before applying the final coat of sealer (photo center). Some sealer manufacturers recommend that you wait 30 days be-

fore sealing to make sure all the moisture is released from the stone. Unlike other sealers, an impregnator sealer allows the tile to breathe and to release its vapors after the sealer is applied.

The French limestone in this bathroom is highly porous, so I doubled the final coat of sealer on the floor and tripled it on the tub deck and in the shower. When sealing shower walls, I start at the bottom and work my way up to prevent sealer from streaking. I also make sure that I don't leave puddles of sealer on flat surfaces. Pooling sealer can darken and glaze over limestone.

The black grout that I used on the marble border can seriously stain the limestone. So after the limestone is sealed, I mask it off before spreading the black grout (photo right).

Should you discover scratches or marks that won't disappear with regular cleaning, those areas can be hit lightly with 120-grit or 220-grit sandpaper. Once I have sanded a tile to remove a mark, I then reapply a coat of sealer. □

Tom Meehan and his wife, Lane, own Cape Cod Tileworks in Harwich, Massachusetts. Photos by Roe A. Osborn.



A mural in a field of stone

The crown jewel of this bathroom is a hand-painted ceramic-tile mural by Pat Wehrman of the Dodge Lane Potter Group in Sonora, California (209-532-3876). The mural—done in three sections—depicts a salt marsh with cattails and great blue herons, the same view someone is likely to have looking out the large bay window over the tub. Even though the individual pieces in each section were large, the mural went together like one of the jigsaw puzzles my sons love to play with.

I'm always extra careful handling the pieces of a mural. If a piece gets lost or broken, it is nearly impossible to replace it with one that will match the original both in size and in color.

Each section of the mural came with a map to help us reconstruct it accurately (photo above left). First, James Mahony, my assistant, dry-fit all the sections together on a large sheet of plywood, while I put layout lines on the wall. Next, I set the limestone tile on the wall up to where the mural began. Starting at the lower right-hand corner, I worked up and across each section of the mural.

I set the mural tiles in the same white thinset I used for the limestone (photo above right). Because of the irregular shapes and sizes of the mural pieces, I spread the thinset with the same



$\frac{3}{8}$ -in. by $\frac{3}{8}$ -in. notched trowel. As each section was completed, I moved the pieces with my fingertips until the grout joints were perfect. A few strategically placed plastic wedges helped to

keep the pieces from drifting back (bottom photo).

The final installation step was adding the limestone frame around each section. The limestone was sealed, grouted

Assembling a ceramic jigsaw puzzle. With the help of a paper map provided by the artist, the installer lays out the ceramic-tile mural carefully on a sheet of plywood (above left). After it is laid out, the mural is assembled from its lower corner; the installer works up and over until each section is completed (above). When all the sections are set in place and framed with limestone, a final rinse and wipe down removes excess mortar from the hand-painted ceramic surface (left).

and sealed again. Magically, as the limestone around the mural dried, the subtle colors in the stone enhanced and magnified all the hues in the hand-painted glaze of the mural.—*T. M.*