# Two-Coat Plaster

## How one builder avoids the drywall doldrums

by James Servais

I've spent much of my career as a contractor perfecting the flawless drywall finish. But a few years ago I was given the chance to try a rough style of plastering. Since then I've rarely applied the slick, smooth drywall. Now I prefer plaster. Its sensuous contours and the ease with which one can achieve curved and textured surfaces simply made the idea of angular drywalled rooms unappealing to me.

I use a two-coat method—one undercoat and a finish coat. I use neither screeds (lengths of angle iron pulled across wet plaster to level it) nor finish putty coats. The resulting walls are slightly irregular, wavy and textured, and as a consequence they take far less time and skill to apply than traditional plaster. This plastering works well with heavy timber framing and exposed wood ceilings, like those in Tudor or Spanish Colonial Revival homes. Obviously the rougher look won't work with every architectural style, but in the right context it adds a degree of authenticity that is hard to achieve any other way, and its rock-solid feel contributes to a building's sense of mass and permanence.

**The substrate**—About the only wood lath that you're likely to see these days is poking out of debris bins in front of older homes undergoing renovation. Contemporary plaster substrates are either expanded metal lath or rock lath. I use rock lath for my two-coat work. It is similar to gypboard—compressed gypsum that's covered on both sides by paper—but the sheets are smaller. They are ⅜ in. thick, 16 in. wide and 48 in. long, and they come in bundles that are easy to handle. Plaster sticks to this substrate because the multi-ply paper that covers the rock lath is very porous on the outside, causing a capillary action that makes the plaster adhere while it dries. The inner plies are water resistant, which keeps the plaster from drying out too fast.

Rock lath cuts like drywall and goes up fast. It's easy to deal with cutouts for switches, receptacles, light fixtures and beam notches because the pieces are small and maneuverable. Rock lath can be attached with drywall nails; drywall screws or (my favorite) stapled with a pneumatic staple gun (photo above right) loaded with 1-in. wide by 1½-in. long staples. Each 16-in. width of rock lath should have at least three equally spaced fasteners into the framing—I prefer four. Unlike drywall, there's no advantage to neat work—just make it quick and firm.

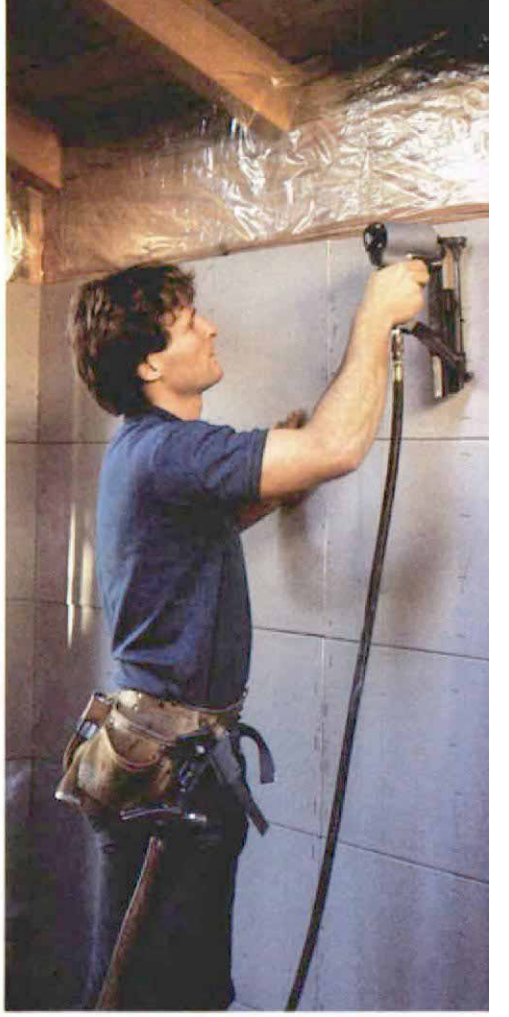
Despite the recent controversy over the use of polyethylene sheet as an air-infiltration barrier, I use it over the insulation but under the rock lath. Once we have set the electric boxes to accommodate a ¾-in. thick wall, we stretch the plastic over the wall, boxes and all. We make a tight-fitting cutout in the rock lath to go around each box, which stretches the plastic pretty tight. The plastic stays there until the wall is plastered and painted. Then it's razored out, leaving electric boxes that aren't clogged with dried lumps of plaster. We also leave a couple of feet of plastic on the floor to help catch errant gobs of plaster.

**Corners and curves**—I learned how to do corners from a mad Rumanian, Dumitru Lo Bont. He told me that in his country you needed a whiskey bottle to make the corners. I bought him a bottle and he put a lot of plaster in the square corner, grasped the bottle by the neck and started to pull it down the corner. About a foot down he declared that the weight was incorrect and stopped to adjust the bottle. He started again and stopped, saying that the weight was not correct. He did this at every corner, until he came to me saying the bottle was now too light and he needed a new one.

Since working with Dumitru, 1 have discovered that you can adjust the radius of corners by putting up a narrow strip of rock lath at 45° across the corner, followed by wider strips of 3.5 diamond mesh (photo facing page, left). The mesh reinforces the plaster at these intersections, reducing the chances that the plaster will crack. The mesh should be attached to the framing on 6-in. centers with screws, staples or drywall nails.

Metal lath is good reinforcement in heavy traffic areas for outside corners that are liable to suffer the occasional bump. It also allows you the freedom to make curved shapes and soft reveals wherever the spirit dictates. For instance, one job I did had a low wall along the upstairs bedroom that was simply a 2x4 stud wall topped with a 2x6. Wrapped with lath and a built-up plaster step, it became a corbeled railing (photos facing page, right). Metal lath will provide you with the latitude to create unusual shapes, but remember that thick buildups over metal lath may require three or four coats of plaster.

To cut the metal lath, I use heavy shears or a skillsaw with a metal-cutting blade. If you decide to use shears, be sure to wear a pair of leather gloves—shear-cut metal lath has sharp, serrated edges that will lacerate skin at the slightest touch.



**Rock lath is the substrate for today's plaster work, and it comes in 16-in. by 48-in. panels that are ⅜ in. thick. Panels are loosely butted together and fastened to the framing with nails, screws or pneumatically driven staples.**

**The plaster**—I've used two kinds of gypsum-based plaster to achieve the two-coat system described here: one kind uses sand as aggregate, and the other uses the lightweight perlite. Both U.S. Gypsum (101 S. Wacker Dr., Chicago, Ill., 60606) and National Gypsum (2001 Rexford Rd., Charlotte, N. C. 28211) make these products. The basic plaster is called either Dual Purpose Hardwall (U.S. Gypsum), or Two-Way Hardwall (National Gypsum). These basic plasters have to be mixed with #2 sand. U.S. Gypsum's Structo-Lite plaster has perlite aggregate, while National Gypsum calls their version Gypsolite. These plasters are premixed and need no further aggregate.

Once applied to the wall and finish-troweled, the two types have very similar textures. The Structo-Lite and Gypsolite weigh a little less than sand plaster, and are consequently a bit less grueling to apply. The sand plaster has greater mass, which is an advantage in passive-solar homes. In our 1,800-sq. ft. house, we placed approximately 22,000 lb. of sand-based plaster at about .36 Btu/lb, heat-storage capacity. If a heat sink is an issue in a house you are building, the

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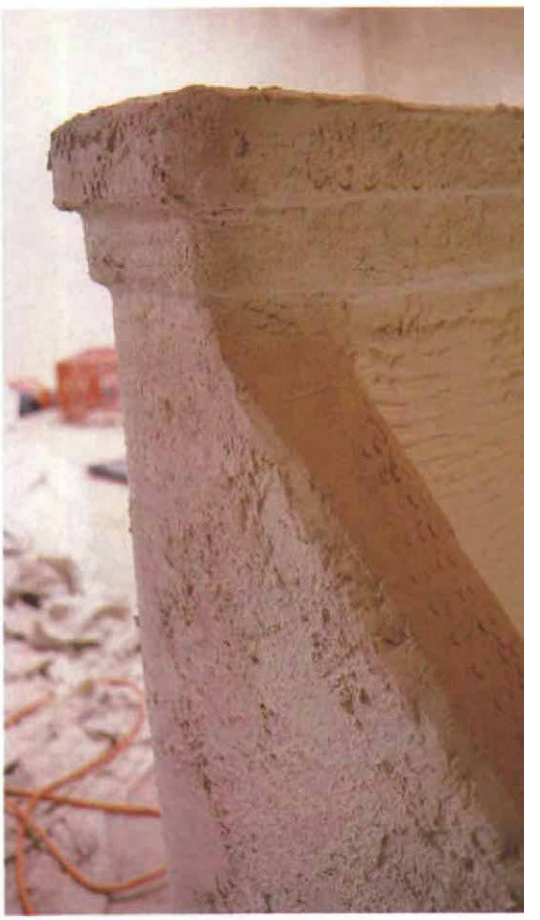
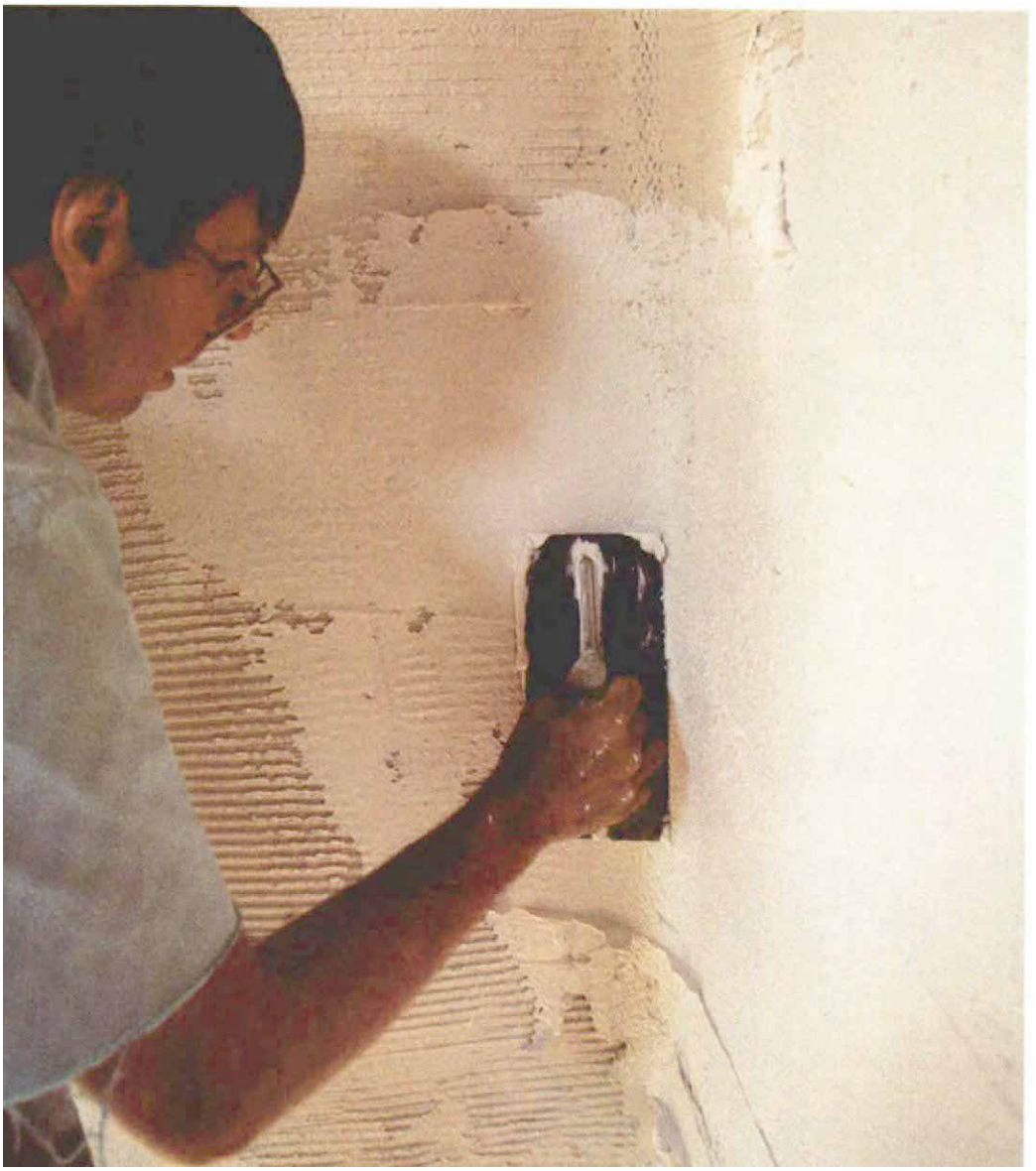
Radiused inside corners can be built up by nailing a narrow strip of rock lath into the corner, followed by a strip of metal lath. Here the author spreads the first coat of plaster across the wall to a depth of about ¼ in. In the upper right-hand corner of the photo, a halved terra-cotta flower pot has been wired to the wall. It conceals a porcelain light fixture. The pot will eventually be plastered to appear as though it's part of the wall.

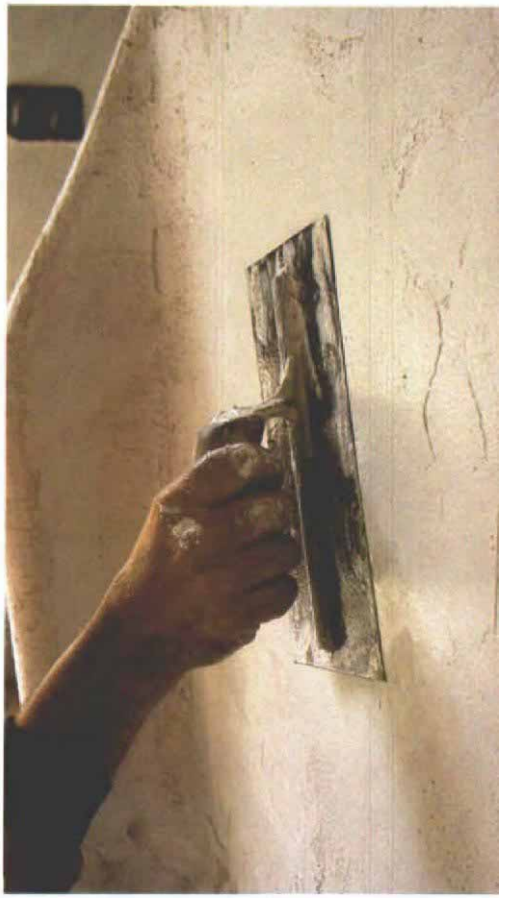


Metal lath can be used to reinforce outside corners and to anchor plaster to wood armatures. At top, the lath wraps around a low wall and over its 2x6 cap. From the other side (above), the wall begins to take on its finished shape after the first coat of plaster has been applied.

Mixing plaster *Is a* messy business, and adjacent structures or plants have to be protected with plastic sheeting. Once the plaster reaches the consistency of cake frosting, as shown above, it should be mixed for another fifteen minutes before it's applied to the wall.

After mixing, the plaster is transferred to a work stand and a load is scooped onto a plasterer's hawk.





When the first coat begins to set up, it is worked with a notched trowel (left) to create shallow grooves, which provide a mechanical lock for the second coat of plaster.

The second coat is finished with a steel trowel (above) that is cleaned frequently in a fresh bucket of water. Here the random texture of bumps, craters and swirls is beginning to show.

extra mass that comes along with a plastered interior may help reduce the need for other heat-storage systems.

**Mixing**—The best mixer for a residential job is a paddle-type plaster or stucco mixer. But to use this tool efficiently you have to have a lot of walls that need plaster and a crew ready to move a lot of mud. On small jobs I use an ordinary cement mixer (photo facing page, top left) and a hoe. The problem with the latter is that you can get lumps in the mix that can show in the finished wall, so you need to keep a close watch on the stuff as it mixes, breaking up any lumps you find with the hoe.

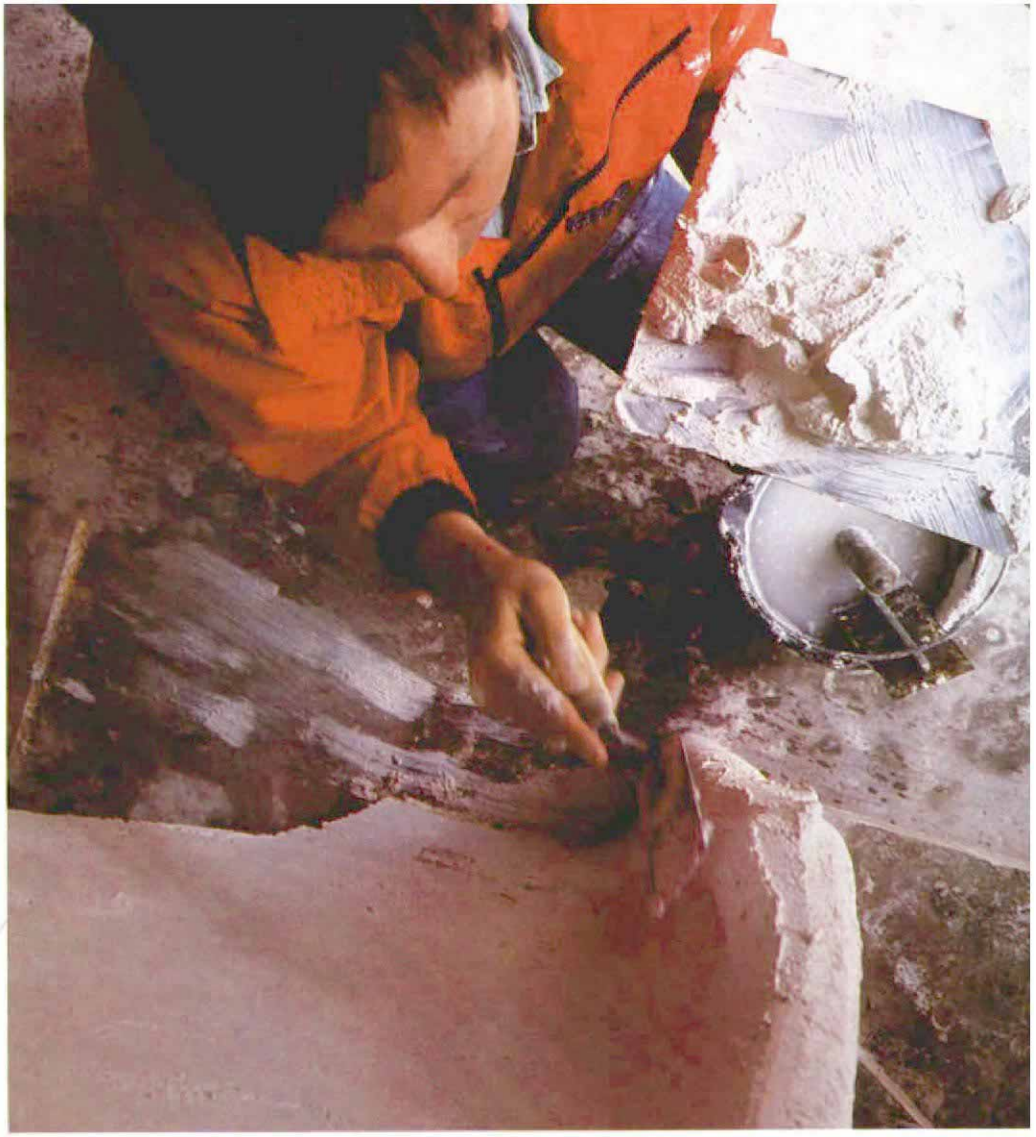
Mixing plaster is a messy job, so I protect the immediate area around the mixer with plastic sheeting. I dig a shallow basin outside the house, line it with plastic, and then place the mixer in the center. This helps to contain the inevitable spills that occur as the plaster is mixed and transported.

To mix a batch, put a few gallons of clean water into the mixer, turn it on, and then add your plaster mix until the mass looks like cake frosting. If you are using sand aggregate, your mix should be three parts sand to one part plaster. Let it mix five minutes, then pull out a handful and squeeze it. Water should come easily to the surface of the plaster, but the mixture shouldn't be soupy. Adjust water or plaster until you've got the right blend, and run the mixer about fifteen more minutes. It will take a few tries before you get it right—usually people mix it too dry at first. Once the plaster is blended, you have about an hour to work it.

**On the wall**—I pour the blended plaster into a 5-gal. bucket and carry it to my work stand, either a folding mortar stand or a pair of sawhorses with a plywood top. Then I pour the contents of the bucket onto the center of the table and scoop a load onto my hawk (a 1-ft. sq. piece of steel attached to a wooden handle) with a trowel (photo facing page, top right). I use either a 3x12 or 4x12 steel trowel with a wooden handle. I insist on wood-handled trowels—they feel good in my hand and they take a lot of abuse. These tools are readily available, but if you can't find them locally, you might try Marshalltown Trowel Co. (Box 738, Marshalltown, Iowa 50158) or Goldblatt (511 Osage, Kansas City, Kan. 66110).

If you're new to plastering, start work in a closet or room that won't be scrutinized too closely. Lean the hawk waist-high against the wall, and use the trowel to push about one quarter of the plaster onto the wall. Push the plaster upward in a large arc, move the hawk right or left and repeat the process until the hawk is empty. Once you've got the hawkful of plaster on the wall, go back and evenly spread the plaster until it is about ¼ in. thick. Don't try to make it perfect. When you have an even coat on one wall, keep an eye on it as it dries.

At the correct time—one to six hours, depending on the mix, temperature and humidity—go back and make horizontal scratches over the wall using a V-notched trowel. This makes a mechanical key for the next coat. Don't go too deep. You shouldn't see any rock lath in the scratches. After a day or two this layer of plaster, called the scratch coat, will turn an even light grey color, and it will be crazed with little cracks. It is now ready for the second coat.

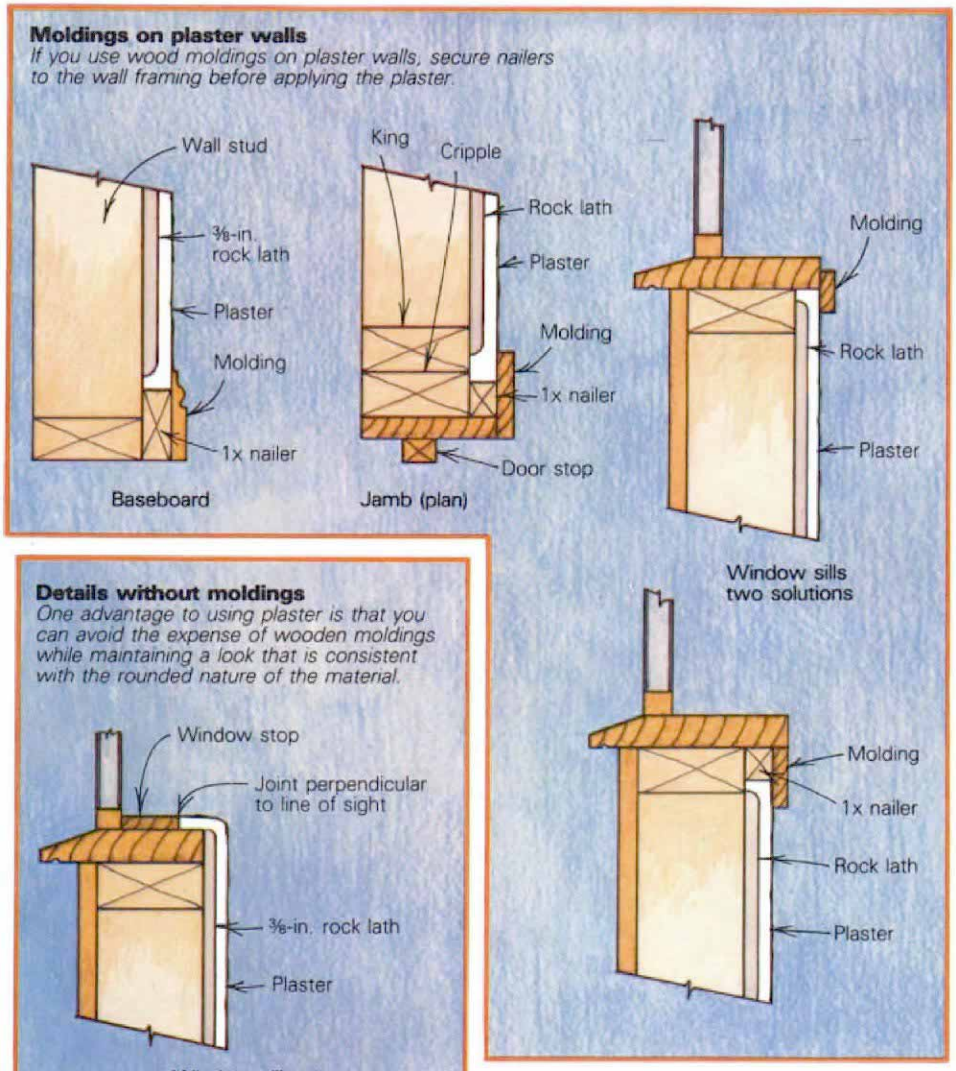


The next coat is the same material applied in the same way, spread thick enough to fill the scratches in the first layer (photo facing page, bottom left). If there's not much humidity in the air, lightly mist the scratch coat with water before applying the second layer of plaster.

Once you've got the second coat in place, wait until it just begins to set. Now get your steel trowel and a bucket of clean water and start smoothing out the finish surface to the desired texture. Dip the trowel in the bucket, then pull it across the plaster at a very slight angle (photo facing page, bottom right). You have to apply a fair amount of pressure to affect the plaster, so lean into it. If you find that you're moving the entire thickness of the second coat, you need to wait longer for the plaster to set. The more passes you make with the trowel and the more pressure you apply, the smoother the finished surface will be—just like working concrete. On curved areas where the radius is too tight for the 4x12 trowel, use a margin trowel (photo above).

I have found that many of my students get frustrated at this part of the job because they want to make the walls look smooth and unblem-

**A margin trowel is useful for working the plaster on rounded corners (top). When creating the plaster roll that acts as a transition from the window stop to the wall plane (above), there's no need to worry about getting wet plaster on the wood if it has been sealed first. Smooth the edge with your finger and wipe the excess plaster off the trim with a damp rag.**




ished—like drywall. Remember that this is two-coat work and it's not your aim to achieve perfectly smooth walls. The uneven texture and imperfections are part of the charm of this method, part of what you're working toward.

**Trim details**—A layer of high-quality plaster is hard and brittle, and it's very difficult to penetrate with a nail. Consequently, you either have to provide nailers for moldings or eliminate them altogether. Since the finished layer of plaster ends up fluctuating between ¾ in. and ⅞ in. thick (⅜-in. rock lath plus about ⅜ in. of plaster), I use 1x nailers for baseboards and door and window casings (drawing, above). If a crown mold is called for, I use a nailer similar to the one used for the baseboard. The nailers are secured to the framing, and they work as screeds to control the thickness of the wall where fluctuations might otherwise show up as gaps between wall and trim.

The other option is to eliminate the molding and run the plaster directly into door and window jambs. The problem with this method is slight cracking at the wood/plaster intersection as the wood shrinks. Once the wood has settled into its eventual dimension, the cracks can be patched with Spackle and paint.

i like the way traditional Southwest architecture deals with this problem. There the plaster rolls around the corners into window stops and door jambs (middle drawings, left). This puts the separation line at right angles to your view (you walk or look past them). To do this rolled effect, door jambs and window stops should be sealed before plastering. I use a margin trowel to place the basic roll of plaster (bottom photo, previous page), followed by a pass with my index finger to straighten the edge. If the woodwork is properly sealed, any plaster residue will come away with a wet rag.

In my own house we used no molding. Instead of a baseboard, the flooring meets the wall at a crisp edge. To make a slot for the flooring, I first attached scrap 1x to the floor after the plastic.vapor barrier was in place, but before the rock lath went up (drawing, bottom left). After plastering, the scrap was carefully removed, leaving a slot for the ¾-in. oak flooring.

I ran the walls right up to our wood ceiling. I either protect exposed woodwork with masking tape, or take extra care to keep the plaster off unfinished wood surfaces. In most of the houses that I build, I sandblast the exposed woodwork to bring out the grain. Not surprisingly, this removes any traces of plaster on the wood. You can get the same results with a wire brush.

Imperfections in the finish can be scraped with a Stanley scraper or sanded and spackled. Wait two weeks for a plaster job to dry out, prime it with a good oil-base primer/sealer and then paint it as you would drywall.

Details such as light fixtures, built-in furniture and bookcases are all possible with plaster. The shape is framed and covered with lath or mesh, and then plastered. The same shapes would be very difficult in drywall.

My wife Gillian and I had just about run out of money when we were building our house, and needed some effective but inexpensive light fixtures. Enter the flowerpot sconce. Gillian had some empty hemispherical clay pots lying about. We sawed one in half and secured it with metal lath over a porcelain socket (photo, p. 59). With a couple of layers of plaster over it, the lamp appears to grow out of the wall, and it casts a warm indirect light toward the wood ceiling.

**Plaster's drawbacks**—Now for the bad part. Plastering is hard work. Spreading thick, cementitious goo onto walls and ceilings for hours on end is physically taxing. Arms, back, legs—everything will hurt, until you get used to it. The decline of plastering in the building trades is probably due in part to the fact that it is labor intensive, hence costly, and in part because few people want to work that hard anymore. Don't overestimate your strength on your first job.

The other consideration is cost. Because of limited production, rock lath remains expensive at about $.20 per sq. ft. The plaster comes to about $.40 per sq. ft. Considering the added labor expense, I estimate a plaster job at twice the cost of ½-in. skip-troweled drywall. On the plus side, if you can eliminate moldings, plaster gets closer, and if you have many curved walls or odd details it gets even more competitive. But if you love the beauty and freedom it gives you, plastered walls become a bargain and an attractive alternative to drywall. □



Drawings: Frances Ashforth