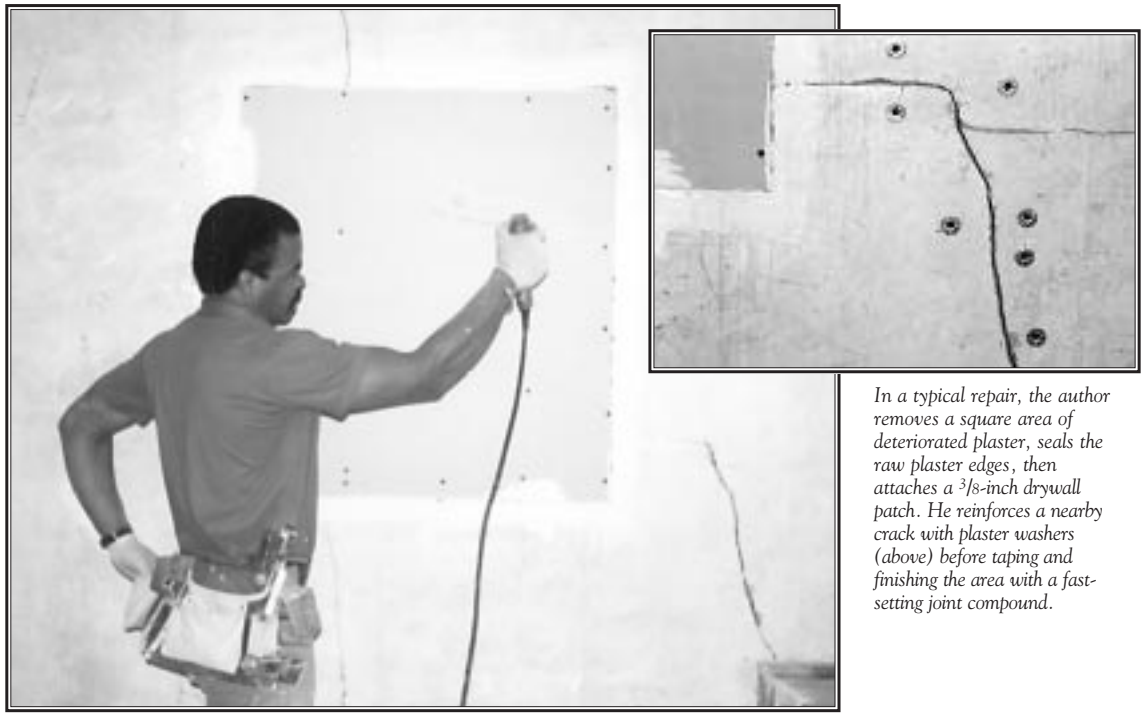
Repairing
Plaster Walls & Ceilings

by Mel Hines

A repair in a plaster ceiling or wall should be invisible. No one should be able to notice the repair after the final finish of paint, texture, or wallpaper is applied. And this should hold true for 20 or 30 years afterwards. That's the goal.

All too often, however, a splendid renovation is spoiled shortly after completion when hairline cracks return, or a fissure opens up where new work joins the old.

Hairline cracks in old plaster require more than the painter forcing in some spackling paste and sanding until smooth. And joining new drywall to existing plaster requires more than taping with gypsum-based joint compounds.



In a typical repair, the author removes a square area of deteriorated plaster, seals the raw plaster edges, then attaches a 3/8-inch drywall patch. He reinforces a nearby crack with plaster washers (above) before taping and finishing the area with a fast-setting joint compound.

In this article I'll describe the basic techniques I use to repair old plaster and patch in new work. I won't treat ornamental plaster, which is an esoteric art in itself. Also, let's assume the old plaster is over wood lath, rather than rock or gypsum, though much of what I say applies to these as well.

Repairing Hairline Cracks

The first step in repairing hairline cracks is to find out how bad they are. After a visual inspection, push on the plaster with the palm of your hand on one side of the crack, then on the other side. Notice whether one side moves independently of the other. If so, you must stop the movement. The two sides must move together or not at all.

Preparing the joint. Before you actually reinforce the crack, take a fixed-blade drywall knife and cut into the fracture. (A retractable-blade knife will usually collapse under the pressure required to cut into plaster.) For the first cut, the side of the knife should be at a 90-degree angle to the surface. After that, pull the knife at 45-degree angles on both sides to cut a V-shaped groove about 1/4 to 5/8 inch deep in stable plaster. Cut deeper if the plaster is weak. Wire brush the groove to get the loose sand grit from the base coat and finish with a dry paint brush to get the fine particles out.

Reinforcing the sides of the crack. Next, take a 1/2-inch carbide-tipped masonry drill bit, and make indentations along each side of the crack. It takes a little practice to just touch the wall with a spinning bit and make a dent that just barely penetrates to the base coat (about 3/16 inch deep). Next, drive a 2-inch Type-W (wood) drywall screw into each hole, countersinking the head in the indent. The screws can be finished over even if they're flush with the face of the plaster.

When installing the screws, some will miss the wood lath, or split it and not hold fast. Just move up or down a little and drill another dent for a new screw. There is only 3/8 inch between lath strips. I drive the screws with the same screw gun used to secure drywall. However, I do not let the gun drive the screw all the way until it seats. Instead, I drive it to about 1/8 or 1/4 inch from flush, then torque the screws in by hand. If you drive the screws all the way in, the vibration is so intense it ruptures and weakens the brittle, fragile plaster around the screw.

Plaster washers. If the plaster is soft, I eliminate the indenting step and use plaster washers, available from Charles Street Supply Co. (54 Charles St., Boston, MA 02114; 617/367-9046). They are made of spring steel, and have perforations that will hold compound. Again, I don't seat the 2-inch screw and plaster washer, but finish by hand until the saucer-shaped washer is flat. It is ideal to go into framing members, but a stud or joist is not always conveniently located behind a fissure.

Sealing the crack. One way a repair can fail is if the new patch does not bond with the old. This happens because the old plaster is so dry that it depletes the new compound of water before it has a chance to set and bond, causing it to crack where they meet. This may happen immediately or over time.

Hairline cracks in old plaster require more than the painter forcing in some spackle. For a long-lasting repair, prepare the joint and reinforce the old wall.

Old-school plasterers will sprinkle a plaster edge with water just before troweling on a new base coat of perlited-gypsum plaster or the finish coat. But a more reliable approach is to seal all the raw edges and crevices with a white-pigmented sealer. I use Kilz by Masterchem Industries Inc. (P.O. Box 368, Barnhart, MO 63012; 800/325-3552), which is shellac-based and has a high pigment content to block stains. I take a 4-inch brush, and paint it into the V-groove or along a raw plaster edge. This sealer seeps under the edge of the finish coat, and helps to lock it back to the base coat. It also seeps under the ruptured paint edges, and helps to lock them back to the finish coat. The sealer will almost invariably pick up some grit, which dries on the face of the plaster. This makes the prefill or tape coat difficult, so a few passes with 80-grit sandpaper are in order.

First coat for wide cracks. I prefill any gouged out areas that are deeper and wider than 1/4 inch with a fast-setting polyindurate compound. I use Durabond, made by United States Gypsum Corp. (101 S. Wacker Dr., Chicago, IL 60606; 312/606-4000). It comes in various mixes that set up after different working times (20, 45, and 90 minutes). With a 4-inch finishing knife, I force the compound to fill the crevice completely, wiping away as much excess as possible.

As most plasterers know, this first coat of compound not only conceals the joint, but also reinforces it, and to this end, the fast-setting compounds are ideal. They dry very hard, and the shrinkage is minimal because they set up by hydration, a chemical reaction, rather than by evaporation. Using these compounds, I can paint the wall the day after my final coat, whereas with traditional plaster I'd have to wait at least a week before painting a patch. Another reason I like these fast-setting compounds is that they are manufactured under strict, consistent factory specifications, making them virtually goof-proof. In this work, it's always desirable to reduce the human error and misjudgment that comes with working with the various compounds of plaster.

Because the prefill is forced in, it will often swell and leave a slight ridge. Just take a drywall knife after it sets but before it dries, and scrape this area flush with the plaster surface. Then the area is ready for a finish coat of mud.

Treating narrow cracks. If the gouged crevices are less than 1/4-inch deep or wide, I just tape as I would a normal drywall joint, using the fast-setting compound with paper tape.

Sometimes the whole wall will be covered with a number of "map cracks," which calls for skim coating the entire surface. In this case, I paint the entire surface with white pigmented sealer, giving the wall a uniform color and making it easy to see even the smallest fissures. Often these do not require gouging out, but I do apply a mesh fiberglass tape, such as the one made by Metallized Products (2544 Terminal Dr. S., St. Petersburg, FL 33712). This self-adhesive tape sticks best to a sealed surface.

Ceilings are different. One note about "map cracks" and fissures in ceilings: Gravity wreaks a lot more havoc on ceilings than on walls. Also, as heat rises in old buildings, it is trapped by the ceiling, making the plaster dry and brittle. Even if all the visible cracks are treated well, it is possible that others will open.

For this reason, I suggest sheathing over old plaster ceilings with 1/2-inch drywall. This also gives the fire protection of a double ceiling. And done properly, cracks in the ceiling won't be a concern for years.

Repairing minor water damage. *Water from a roof leak caused the top coat of plaster to separate from the base coat (above, left). To repair the area, the author scrapes away the loose top coat, leaving the base coat intact (above). Note the dark area in the inside corner; this is rust on the metal lath. The author then seals the area with a white-pigmented sealer and finishes with two coats of fast-setting joint compound (left).*

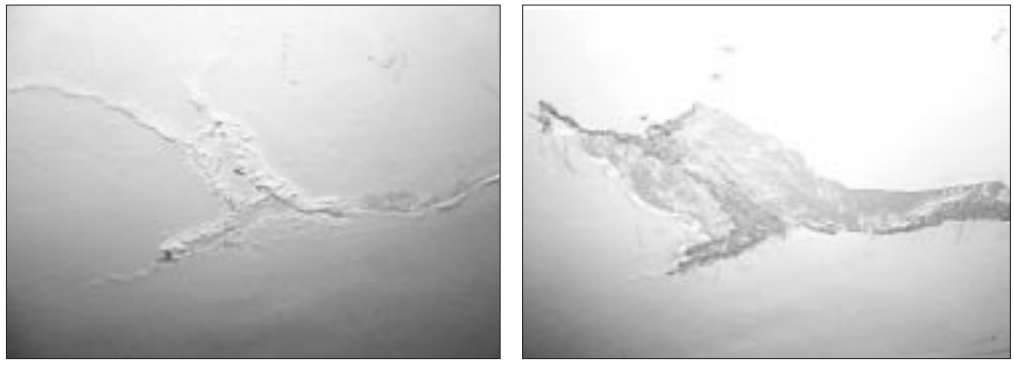
Repairing Water Damage

One plaster problem I am often called on to repair is water damage.

Minor water damage. Often, the water damage is not too severe, but shows a clear stain. I tap on the water-stained area with a screwdriver handle. If it sounds as stable as the unstained surrounding areas, then the finish coat bond has not been severely weakened. However, there is a good chance that the paint bond is weak, so the paint should be scraped off, sanded with 80-grit paper, coated with the sealer, and skim coated as needed.

Sometimes, I can tell from the sound (a dull thud) that the bond between the finish coat and base coat has been weakened. In this case, I take the sharp edge of a drywall hammer and lightly tap the area. Some of the finish will begin to fall off, after which I use an old wood chisel, and pry off the loose surface coat until I get to an area where the finish coat adheres tightly. After wire brushing away loose grains, I seal this area. I want the sealer to seep in to where the base coat and finish coat meet, because when it dries, it helps to lock the coats together. Then I apply one or two new finish coats, as needed.

Efflorescence. Sporadic trickles of water leaking into plaster over a long period of time can lead to efflorescence. This is a rough chalking area that looks like whipped cream with a coat of paint on it. Efflorescence occurs when the salts in the plaster are brought to the surface by water. If the surface has effloresced, chances are the bond between the coats has been weakened. So I recommend



Efflorescence *occurs when water leaches the salts in the plaster to the surface, causing the top coat of plaster and paint to soften and become chalky (left). To repair the damage, the author scrapes the loose top coat from the base coat until he reaches solid plaster at the edges, then brushes the area clean with a wire brush (right). He will then seal these edges and apply fast-setting joint compound.*

Repairing major water damage. *A poor flashing job allowed water to seep into the ceiling around a chimney, causing part of the plaster ceiling to come down (left). To patch the area, the author first removes a square of the surrounding plaster. After sealing the raw plaster edges, he marks the position of the lath on the old ceiling. He then lays in a piece of 1/2-inch drywall, screwing it off to the lath and the ceiling joists before taping and finishing with fast-setting joint compound (bottom, left).*

removing the finish coat and repairing as described above.

Major water damage. If the water damage is severe, it is best to remove the old plaster. To do this, I square the area to the nearest framing members just outside the damaged section. Then, I use an awl to search for a space between lath strips. I then take a reciprocating saw blade made for plaster, mounted in a Milwaukee Job Saw, and saw by hand until I hit a ceiling joist or wall stud. I use short, careful strokes and listen and feel for plumbing, wiring, and the framing member. From here I take a framing square and a 4-foot level, and pencil in a square area. The lines of this square don't have to center on the joist or stud. As long as the new drywall patch is screwed into the lath right next to the framing member, it will be well supported.

For the next step, I bring some elbow grease to the job. I take the fixed-blade knife and cut the lines. I like to score all the lines of the square with a fresh blade, after which it is dull but sharp enough for cutting the base coat. The finish coat is generally harder, but thin, and requires several pulls to penetrate. The base coats are not too tough, but you do earn your pay. Even though it's a lot of work, using a knife is worthwhile. Hatchet and cold-chisel blows will rupture the surrounding plaster and leave jagged edges.

After wire brushing and dusting off the remaining lath, I coat the raw edges of plaster with the white-pigmented sealer. I renail any loose lath, and knock away any keys from between the strips.

All the plaster I repair is between 3/8 and 5/8 inch thick. To fill in for this missing plaster, I cut a piece of drywall of the appropriate thickness, and screw it in with 1 7/8-inch Type-W screws into framing members. If you have to screw into lath only, mark the center of the lath on the remaining plaster before you put your patch up. A screw in the center of a piece of lath is less likely to split it.

Plaster thicknesses can vary at some points, so it is better to use a thinner piece of drywall rather than one that matches the thickest section, then shim it at the thick edges to bring it flush with the old plaster surface.

Matching new to old. Whether you are laying in a patch or tying an addition wall into an old plaster finish, always remove the tapered edge of the drywall so that you have a butt edge meeting the plaster edge. This makes a tough finishing task less difficult. In most cases, I use the same screws with plaster washers to tighten the surrounding undamaged plaster, then use the same treatment as I do when repairing cracks: paper tape and fast-setting compound.

For the finish coats, I skim coat with ready-mix joint compound, or one of the lightweight setting- type joint compounds. These lightweight compounds are mixed with water only and are easy to sand, but they are not a substitute for the hard, fast-setting polyindurates as a tape-coat compound. The short setting times allow for tape, bed, and skim in one visit on some jobs, thereby requiring only a light sanding and point-up on the final coat. ■

Mel Hines owns Atlanta Pro-Serve, a ceiling and wall repair service in Atlanta, Ga.