



After the paint and joint compound have been removed, holes are drilled to access the void between the plaster and the lath (top left). A conditioner is injected into the holes (top right) and then, to attach the plaster to the lath, glue is inserted (bottom left). Large holes are then attended to with a plaster and gypsum mix (bottom right).

plaster to fail. Possible causes of plaster failure range from water damage to structural problems. A patching material should be chosen – whether it be bonding agents, a lime-putty mixture or a combination of lime putty and gypsum – based on how long the repair needs to last.

Bonding agents are a “paint like” material with a limited track record (compared to plaster and plastering techniques – a few decades versus tens of thousands of years). The bonding agent need not fail (adhesive failure) for the system (the collection of layers) to fail (cohesive failure). Each one of the links in the layers has the potential to fail.

For large infill areas, the preferred patching material is a lime-putty mixture – one part lime putty to three parts sand. The sand should be clean, sharp and have a good size distribution. Mix in goat hair in the amount of 4 lbs. per cu.yd. After wetting the lath, apply the plaster in layers no more than  $\frac{5}{16}$  in. thick. Then build the plaster up to the desired thickness one layer at a time. Adding gypsum in amounts of less than 20 percent will increase the immediate “green” (or initial set) strength of the plaster without decreasing the performance of the lime plaster.

For small areas of loss, the recommended compound for patching is a mixture of lime putty and gypsum. The ratio of materials is three parts lime putty to one part gypsum to a half part water (plus a little more). Form the putty into a ring or doughnut and pour the water into it, then sprinkle the gypsum into the water. The gypsum should soak up most of the water.

**•Preparation for plastering:** To prepare a hole for plaster, undercut the perimeter plaster to allow the patching material to nest under the existing secure plaster. Then spray the lath with water or “conditioner” until damp. The water must soak in prior to patching. After applying a thin layer of plaster to the hole, wait 10 minutes before applying a second layer from the same mixture. Next, cut back the patching material, leaving  $\frac{1}{4}$  to  $\frac{1}{8}$  in. for the finish layer. Make sure the plaster is set before applying the final coat.

**•Raking:** The big issue with cracks is whether or not to rake them. To know what to do, it is important to understand the structure of the plaster. In this instance, the important aspect is the

fiber reinforcement in the plaster. If the crack is very large the fiber will be broken, so this area can be treated as a small-area repair. If the fiber is not broken or ripped, do not cause further damage by cutting this very important reinforcement. Once the crack is stabilized, the treatment of the plaster becomes cosmetic. At this point, ready-mix or time-setting joint compound can be used to fill in the cracks and surface divots without any compatibility issues.

**•Resurfacing old plaster:** What will it look like when it’s finished? Due to its ability to move and change shape, old plaster will have bumps and dents, ripples and smooth areas. To a small degree there will be some re-cracking (around one percent if there are no other building-stability issues that need attention). All these items are part and parcel and consistent with old houses; smoothness can only be achieved with a new installation or resurfacing.

With resurfacing, one needs to keep in mind that every layer installed on an interior surface is a link in

a chain. If one link fails then the entire system will fail. Plaster is applied in layers keyed together mechanically, with texture binding each layer to the next. If paint is applied to the surface, the wall is finished. To repair a surface by installing plaster on top of a painted surface represents a step backwards, as paint lacks the texture that plaster needs to bond properly.

That lime plaster has lasted with an extended track record makes it an ideal candidate for repair and maintenance. Sadly, historic plaster is the most at-risk historic fabric in the country today, despite the fact that substitute materials are inferior in both quality and longevity.

For complete historic-plaster repair instructions and specifications, visit [www.preservationplastering.com](http://www.preservationplastering.com). ■

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The inappropriate materials, including a moisture-trapping paint, used on the third-story porch of this Grafton, VT, house lead to peeling and cracking paint and plaster. Here, the paint has been removed to expose the plaster problems.



Brennan salvaged the maximum amount of plaster possible. The completed repair features skimmed and faired surfaces, which are now prepared for decorative painting.