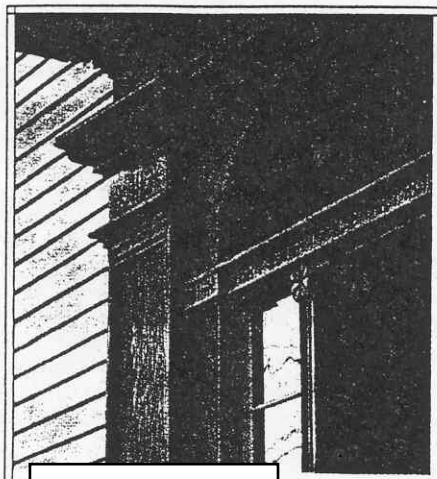


THE MAIN ENTRANCE IS OFTEN THE SHOWPIECE OF AN OLD HOUSE. EVEN when the rest of a building lacked decorative details, early carpenters would invest extra effort at the front doorway. The owners of this c. 1800 late Federal-style house had such a door surround and knew it made a significant contribution to the architecture of their home. They wanted to preserve this character as well as improve the condition of the woodwork so it would be easier to maintain in the future.

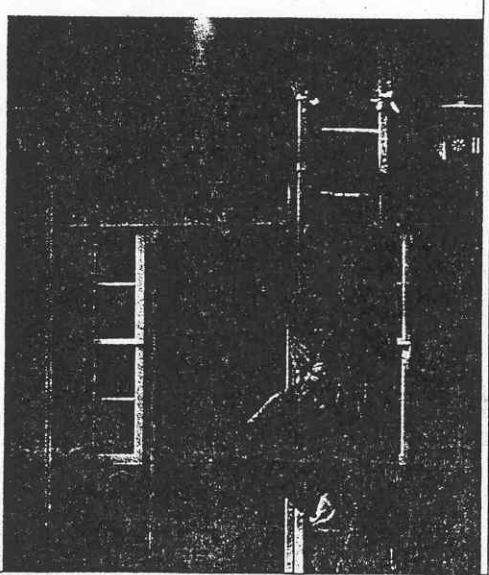
It was clear this woodwork needed help. The heavy buildup of old weathered paint was very rough, and chipped off in places. At the surround bottom entire wood parts — notably the door sill and pilaster bases — were deteriorated and literally falling off. Sometime early in its history the entrance had gone without any paint maintenance for several decades. This weathered the surface of the once-flat boards in a deeply grooved, "corrugated" pattern highlighting the grain. Many grooves had developed into yawning checks or cracks, and a few went completely through the boards.

NEW LIFE FOR AN EARLY DOORWAY

Restoring a Federal Door Surround

The overall design of this rectangular surround is typical of the period in lower New Hampshire, but the mouldings and the unusual "sunburst" carvings around the louvered fan make it special. In restoring this doorway we took care to conserve these details by using a variety of wood repair, painting, and caulking methods that can be applied to many old-house exterior carpentry projects. Futhermore, we carried these methods a few steps beyond average needs in order to achieve a high level of weather resistance.

Unique carvings and surprising colors (above) added to the classic Adam-style elliptical fan and sidelights (right).



OLD-HOUSE JOURNAL

— *by John Leeke* —

RESTORATION PLAN

TO DETERMINE HOW EXTENSIVE THE DAMAGE REALLY was, we examined further. First, we carefully chipped and scraped away the paint at several spots to assess the moulding profiles and the condition of the wood.

High on the surround, where they were protected by the wide overhang of the cap, we found a few mouldings unweathered enough to provide the original profiles of mouldings used at other locations. Still, the lower panel mouldings on the door, the pilaster bases, and other original parts were completely missing. The existing bases were a 20th century replacement, as indicated by the wire nails and planing machine marks on the backs of boards and mouldings. A recent residing of the house front had obliterated any paint shadows or nail holes that might be clues about the original bases.

Even with careful preparation and additional coats the deteriorated paint surface would not provide an effective weather barrier for more than one or two years. Since the owners were hoping to reduce the maintenance needs of the woodwork, as well as improve its condition, we chose to completely remove the old paint in order to repair the woodwork and start anew with an effective three-coat paint system. The aged, weathered wood surface was now a part of the building so we decided to leave a lot of the texture showing. Preparation could then concentrate on stabilizing the weathered areas in order to make them more weather resistant.

Missing woodwork would be restored by making new parts of wood according to researched designs. All original and replacement parts would be back-primed before installation and caulked in place with modern flexible sealants. Parts prone to severe exposure, such as the pilaster bases, would be back-painted with a topcoat on all surfaces before installation. These measures would assure at least moderate resistance to water and decay even if the joints opened up and nothing was done to reseal them.

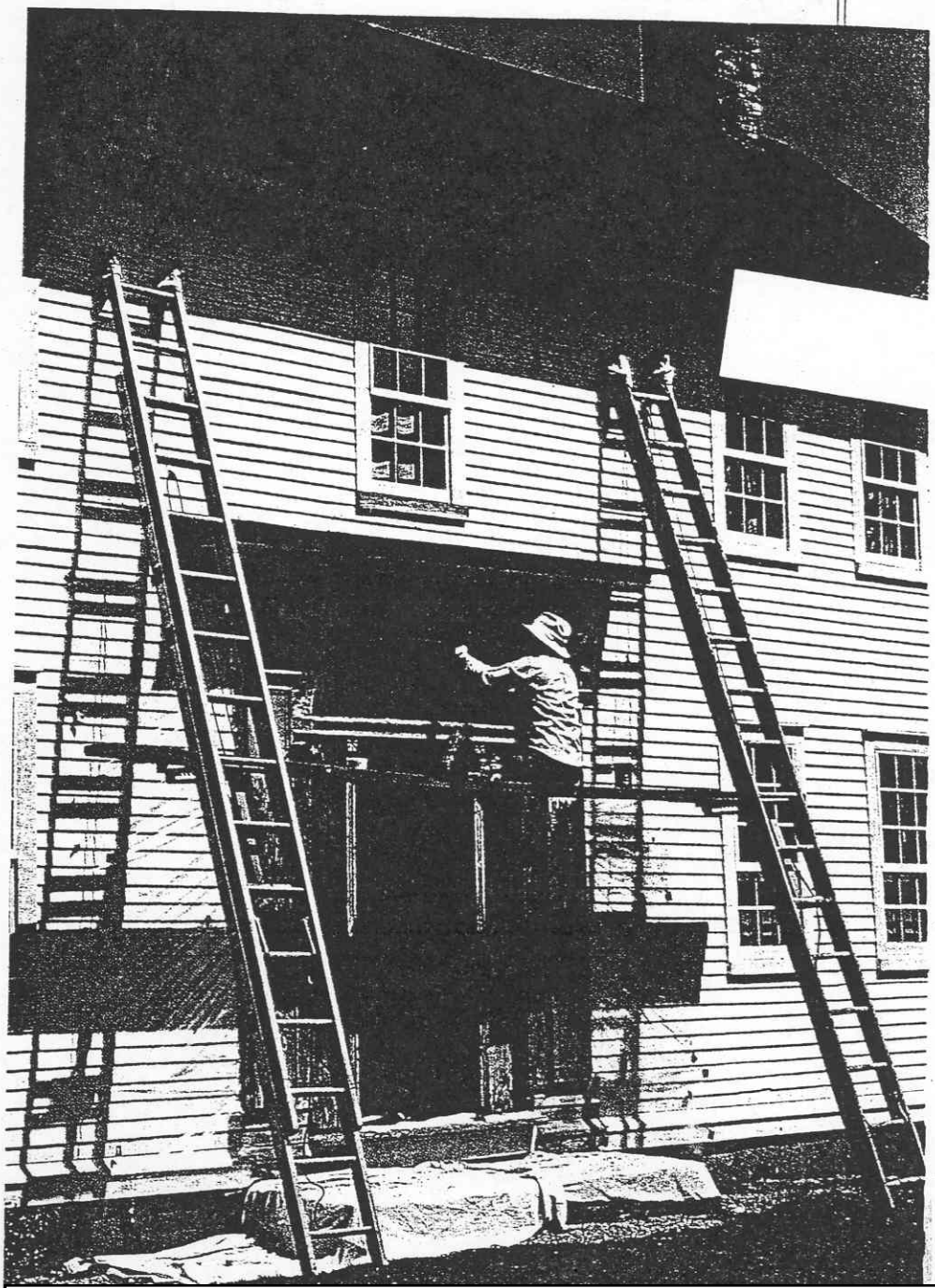
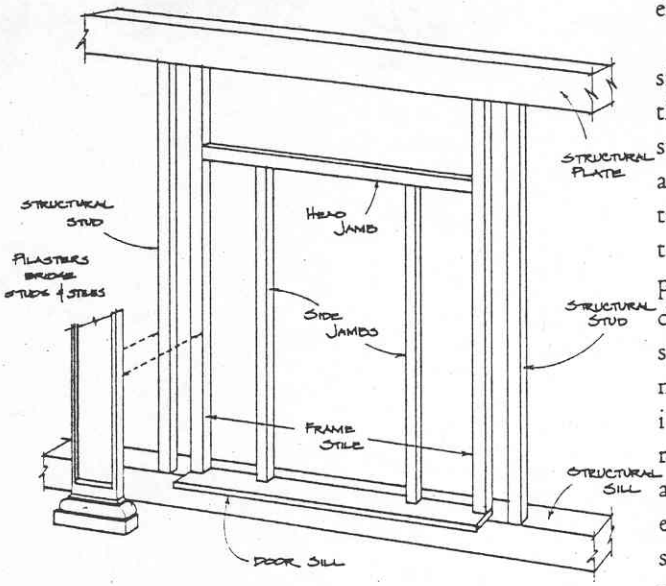


Photo by John Leeke, Historic Building Specialist, Copyright 2002 John C. Leeke.

Work began with surveying the condition of the surround woodwork and carefully removing 200 years of failing paint. Carpentry repairs were made at the building site (we considered removing the entire surround to work indoors), retaining as much of the original fabric as possible.

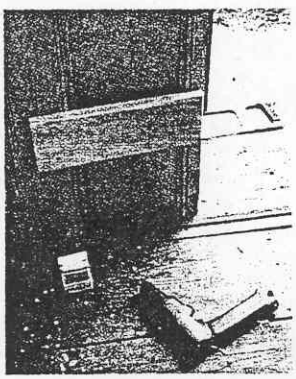
SILL REPLACEMENT

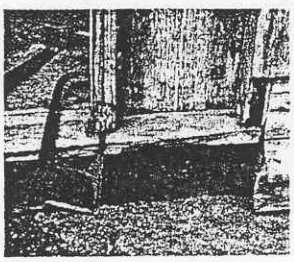
THE DOOR SURROUND is a framework that is independent of the house structure (see drawing). The frame fits into an opening in the larger timber frame of the house. In this surround the pilasters were tied to both the door frame stiles and the structural wall studs. Removing the entire surround to repair the worn sill would have meant taking apart the pilasters, so instead I decided to pull out the old sill while leaving the rest of the frame in place.



In this house the door frame starts with the door sill across the bottom, a pair of side jambs, and the jamb across the top. Two frame stiles running from the door sill to the structural plate hold the head jamb in place. The pilasters bridge the door frame and the wall studs.

The first step in replacing such a sill is bracing both side jambs before removing the door or sill. I used boards 6" to 8" wide and drywall screws for their firm grip and to avoid shock to the woodwork from pounding nails. The jambs could also be braced to the house interior perpendicular to the door. The old sill is removed next. I begin with gentle prying and wiggling to locate nails, then I cut them with a hacksaw. If the old sill is not worth saving it can be cross cut with a circular saw and split out in small pieces with a heavy chisel and mallet.

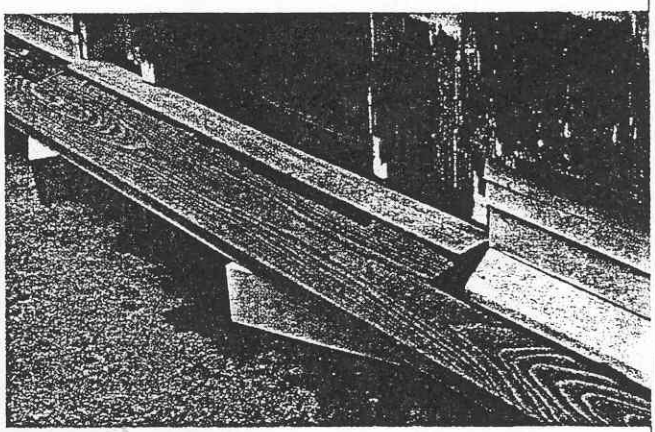




Afterwards I measure and lay out the size and location of the structural sill timber, surround jambs, and other parts on a scaled drawing. White oak makes a long-lasting sill because it is strong and dense and has a cellular structure that blocks water penetration. Red oak or maple are not as water-resistant and may succumb to the fungal decay common in exterior door sills. In my woodworking shop I joined, planed, and ripped the oak plank to size. I also fabricated a threshold of oak and glued both pieces together with epoxy adhesive formulated especially for exterior woodwork.

Before installing this sill I strengthened the ends of the side jambs and frame stiles with epoxy consolidant and paste filler. Also, I fastened pressure-treated blocks to the structural sill to support the outer edge of the door sill. Next I tested the sill's fit in the opening, trimming slightly until it slid easily into place. Then I removed the sill and set it aside to be painted. Deck enamel holds up well to abrasion so we coated the sill bottom and all edges with this paint. (Some deck enamels perform best with no primer so be certain to follow the manufacturer's recommendations.) The interior threshold was varnished to match the unpainted interior.

Finally, I slipped the sill in place and inserted sawn shingle wedges between the structural sill and the threshold. This raised the inside edge slightly, seating the ends of the side jambs and frame stiles against the threshold top. I fastened the outer edge of the sill to two of the sill blocks with countersunk stainless steel screws, filled later with epoxy paste. The side jambs and frame stiles were fastened with screws in pockets carved with a sharp gouge.

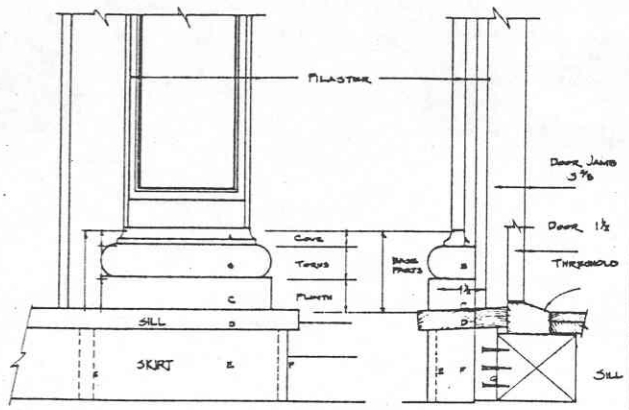


Top left: Bracing the side jambs to hold them in place until the new sill is installed. Bottom left: Cutting nails with a hacksaw frees the old sill. Above: Testing the fit of the new oak sill before final installation. Note the white epoxy treatment on the jamb and stile bottoms.

PILASTER BASES

SINCE WE HAD NO PHYSICAL EVIDENCE OF THE ORIGINAL pilaster base design we wound up researching ideas in early books. The owners had already surveyed the town in hopes of finding original bases that could be a model for our work. While there were similar doorways, they all had replacements so we went to the books.

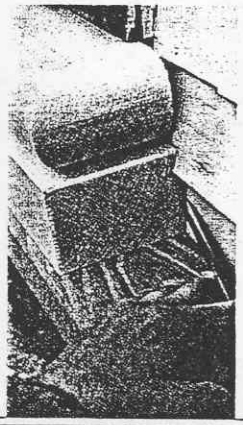
From one source came a page from a builder's style book published about the time the house was built, and I had a later book that showed the classical orders. including some pilaster bases. We used ideas from both books and other door surrounds to arrive at the final design. I sketched out ideas until I had two that seemed appropriate, but I left the final decision up to the homeowner.

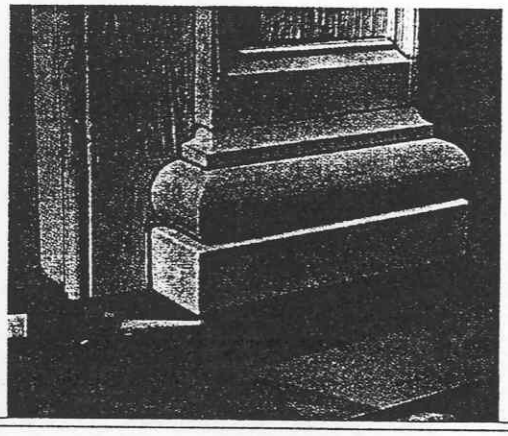


The final design of the pilaster bases draws on several period sources using the classical elements of cove, torus, and plinth.

Back in the shop we fabricated the base parts from thick, solid Eastern white pine. After sizing the blocks on the joiner and table saw we shaped the rounded part on the bandsaw and with a hand plane — less than half an hour's work. Once the parts were done, I trimmed them to fit in place. Next, I scribed the back edges with a compass and trimmed the wood with a sharp chisel to form a 1/4" gap. Then the parts were back-primed and back-painted with one coat.

During final installation each part is sealed in place with polyurethane caulk. The gap made earlier allows the sealant to stretch and shrink with movement of the parts, yet still maintain an effective seal.





Top left: Shaping the torus curve by sawing out two 45 degree bevels, then planing these down with smaller bevels. Far left: Scribing the base parts creates a careful fit to the wall contour and a gap for sealant. Left: Flexible sealant fills all joints to exclude water as the wood moves.

SUPPLIERS

ABATRON
141 Center Drive, Dept. OHJ
Gilberts, Il 60136
(321) 426-2200
Epoxy consolidants and paste fillers.

ACCURATE METAL WEATHERSTRIP CO.
725 South Fulton Avenue
Mount Vernon, NY 10550
(914) 668-6042
Weather stripping and related materials.

CONSERVATION SERVICES
8 Lakeside Trail, Dept. OHJ
Kinnelon, NJ 07405
(201) 838-6412
Epoxy consolidants and paste fillers.

EPOXY TECHNOLOGY, INC.
14 Fortune Drive
Billerica, MA 01821
(508) 667-3805
Epoxy adhesives.

GOUGEON BROTHERS,INC.
P.O. Box X-908, Dept. OHJ
Bay City, MI 48707
(517) 684-6881
The West System epoxy adhesives.

TREMONT NAIL COMPANY
8 Elm Street
PO Box 111, Dept. OHJ
Wareham, MA 02571
(508) 295-0038
Galvanized cut brads, other period fasteners.

DOOR REPAIRS

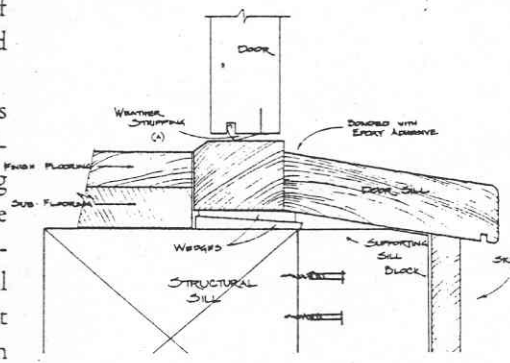
EXTERIOR DOORS ARE SUBJECT TO SEVERE CONDITIONS. Driving rain penetrates the smallest cracks and gaps, and the contrast between a cold, damp outdoors and dry, warm indoors puts the woodwork under tremendous stress. Besides serious weathering and loose mouldings, this door had cracked panels and a weakened stile where a succession of locks and latches had been installed.

Final trimming on the bottom of the door to fit the new sill.

To begin repairs I removed the mouldings, carefully recording their positions on the door with a number system. After removing all paint I cleaned out cracks in the panels with my special scrapers. Then I soaked the cracks with epoxy consolidant to insure a good bond with the epoxy paste filler that followed. Epoxy filler is formulated to match the strength and flexibility of the surrounding wood. This is an important consideration since the wood panels will continue to expand and shrink with their inevitable changes in moisture content. In door or paneling repair it is critical that the epoxy does not bond the edges of the panels to the frame. They must float freely to swell and shrink without splitting.

Door frames and panels frequently deteriorate when water seeps in behind the mouldings. Soaking the end grain of the panels and penetrating frame joints causes panels to split and decay within the joints. To prevent this deterioration I seal these joints with polyurethane caulk. Round foam backer rod (available at building supply houses) forms the sealant into an hourglass shape that is thin and flexible. If the gap were completely filled the panel might split because the sealant would act like a stiff adhesive bonding the panel to the frame. After after all woodwork repairs are complete — but before the mouldings are reinstalled — I prime and paint the door.

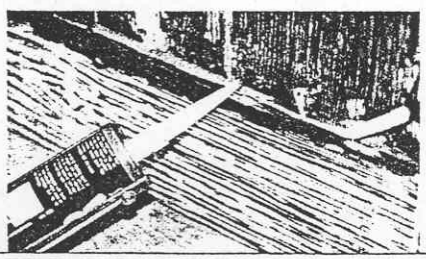
When it came time to reinstall the mouldings I fitted each piece and just tacked it in place. I used galvanized cut brads similar to the original brads, placing them away from the original holes so they would hold better. Then I removed the mouldings, brads and all, and back-primed them. (The nails provide convenient handles during priming.) When the paint was dry I nailed the mouldings back for good, applying sealant as I worked.



The door seals against the new sill with an inconspicuous weatherstrip applied to its bottom.

Since we were careful to keep the side jambs braced in their original positions hanging the door was an easy matter of fitting the bottom edge to the new sill. With the door in place and closed I scribed the lower edge to the new sill with a pair of dividers. I set the dividers to 1/4" — the thickness of the weather strip that would be installed — and then drew the dividers across the door, scribing the line. Next I used handsaws to trim off the excess wood. A power circular saw would mar the paint on the uneven surface or splinter off the edge of the door; hand tools give me more control. I used a fine-toothed crosscut saw (12 tpi) on the stiles and a rip saw along the bottom rail, finishing up with a hand plane.

A weatherstrip along the bottom of the door will keep rain and snow from blowing in and can be applied before the door is hung. For early doors I prefer spring bronze or stainless steel types that mount to the bottom because they are close to invisible.



Top: Cracks are cleaned with specially made tools, then primed with epoxy consolidant. Later, forcing in epoxy paste completely fills the cracks. Bottom: Wide gaps where panels meet the bottom stile were filled with backer rod topped with polyurethane caulk.

PAINT REMOVAL

EARLY SPOT SCRAPING AND CHIPPING PROVED THAT mechanical removal of the thick paint buildup would be difficult due to the rough and uneven wood surfaces, so we tested three different types of chemical removers: methylene chloride, solvent (without methylene chloride), and one of the new water-based di-ester ketone strippers. We started with 6" x 6" patches of each stripper at the bottom of the pilaster. Then, we selected the best performing product and applied two larger patches above with different methods. As it turned out, painting on the methylene chloride stripper and removing it with a stainless steel brush worked better on the rough surface than spraying and scraping. I recommend this rather formal testing procedure because it saves much time, effort, and expense later. Special scrapers made from reground linoleum knives removed paint from deep checks, cracks, and joints.

An alcohol rinse removes the last residue of chemical remover while masking protects the adjacent surface.

Safety is an important part of any restoration project, but is especially critical when using hazardous chemicals. Methylene chloride is a suspected carcinogen so no safety precaution was overkill here, including protective clothing with long sleeves and pants, goggles, maximum fresh air circulation, and changing filter cartridges frequently when respirators were used. In addition to following the manufacturer's instructions, we obtained the Material Safety Data Sheets for the products and used their guidelines.

Shaped scrapers pick away softened paint without damaging the wood carvings.

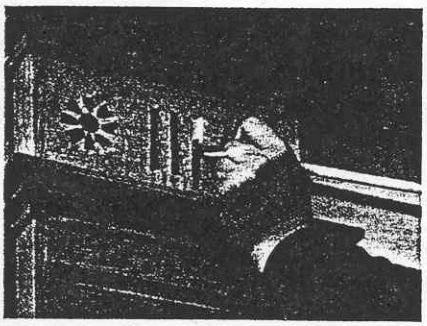
Stripping decorative carvings demands great care. We used wire brushes and shaped scrapers to remove the softened paint. The result was bare wood with only bits of paint left in the deep weather checks. Careful preparation makes wood repairs easier and assures good performance for the new paint coatings.

FINAL FINISHES

PAINT IS THE FIRST LINE OF DEFENSE IN PROTECTING EXTERIOR woodwork from the weather. We used a full three-coat paint system on all parts of the door, with the careful preparation invested at the start of the project making up at least 90 percent of this paint job. Each coat was gone over lightly with 120-grit sandpaper to provide "tooth" for the next coat, and parts that remained on the doorway were coated in place.

Both new parts and parts that were removed and preserved were primed and back-primed before installation. Parts prone to extreme exposure, such as the pilaster bases, were additionally painted and back-painted with their first top coat. This provides extra protection from the weather when the joints between the parts deteriorate.

One of the suprises on this project occurred during initial paint removal when we discovered that the surround originally had a multicolored paint scheme — an unexpected departure from solid green trim. While we didn't do a scientific investigation and documentation of the paint history, we did save a few chips and make notes on where each color was used. For the first layer of new topcoat we tried these colors out just for fun. (If they weren't satisfactory, we could change the scheme in later topcoats.) Since we just wanted to see the overall effect on the entrance we didn't strive for a perfect color match, just the nearest standard colors in the local paint dealer's colors. The comments around town ranged from "Wow! We love your door!" to "When are you going to cover the primer?"



Experimenting with the early polychrome paint scheme produced an effect far different than the familiar green-on-white.

Contributing Editor John Leeke is a consultant and contractor who helps homeowners, contractors, and architects work with early buildings (RR 1, Box 2947, Sanford, ME 04073; 207-324-9597)