From John Leeke's Historic Home Works http://www.historichomeworks.com

Question:

I have been told a paint job on my house built in 1900 will only last about 5 years. Yikes! Is this true? Some experts and non-experts are telling me to use a solid body stain over the existing paint. There is a lot of flaking paint. The idea is that the remaining paint will flake regardless of whether I paint or stain, but by using stain, I will eventually reduce the amount of scraping required. If I do stain, what about that pesky edge where the paint flaked? Will wood putty smooth that edge under the stain? It seems like that is about the same about of work as scraping, but then I won't have to scrape again. Marty W. in Maine

Recently many of my clients have been "up in arms" because their last paint job looked shabby after only four to six years. Working together we have figured out why this happened and what to do about it. First a few basics about paint.

How Paint Works

"Oil-based" paints are made of three kinds of materials:
Solvent - a thin watery liquid that evaporates with exposure to the air, like paint thinner.
Binder - a thick syrupy liquid that solidifies with exposure to the air.
Pigments - colored minerals ground to a fine powder that can block the sun's rays.

The solvent, binder and pigment are mixed to form liquid paint. When a coating of paint is spread out on the surface the solvent evaporates and the binder glues the pigment particles together and bonds them to the surface. Depending on the materials and formulations used a coating can have different functions and characteristics: Primer, soaks deeply into the surface forming a tight bond. Inter-coat, builds thickness and adds strength. Top Coat, protects from the weather. These coatings work together forming a coating system, The result is a thin film that protects the wood surface from sun and moisture. The film is somewhat flexible so it will move along with swelling and shrinking of the wood which occurs due the inevitable changes in moisture content of the wood. The film also decorates the surface with color changing its appearance.

Traditional "Oil Paint"

For the past three centuries "oil paint" was usually made with linseed oil binder and lead oxide pigment. This paint usually deteriorated by weathering away at the surface of the film, and sometimes by cracking due to shrinkage of the binder in the film as it ages. Maintenance of this coating system was simple: when the film was mostly weathered away the loose pigment was brushed off the surface and a new coating applied. This paint penetrates very well so the porous surface was consolidated and cracks in the old paint film were effectively filled, sealed and "healed". This had to be done every 20 to 40 years! Sometimes only weathered parts of the building were repainted such as towers, lower walls, and

porches. The result was little buildup of paint coatings on the surface. Traditional oil paints kept a building looking clean because any dirt weathered away with the surface and the lead pigment prevented growth of mildew and algae.

Post War Construction Boom

After the 1940's the paint industry changed the binders and pigments in their paint. They continued to call this "oil-based" paint even though it acted very differently from traditional oil paints. The new "improved" paints had alkyd binders which were more flexible and very resistant to weathering. It was the perfect paint for the bare wood surfaces on all the new houses being build, but not so good for older buildings.

Here's why: The new paint was more resistant to weathering. As new coatings were added to the house, the paint film began to build up, forming a thicker coating system. The new paint did not penetrate cracks well, leaving these faults buried in the paint film system. The new outer layers of the paint film were stronger than the inner layers of the old formula oil paint. As it ages it shrinks a little more than old oil paints underneath. This creates stress in the film that leads to cracking, curing and peeling.

Then lead pigment was eliminated from the new paint allowing mildew and algae to grow on the surface. Increased auto traffic exhaust with sticky hydrocarbon dust began to soil buildings more than in the past. Result: dirty looking buildings, leading to more frequent and complete repainting instead of the traditional practice of painting only where the paint was weathered away.

IMPORTANT POINT #1: Recoating began taking place about every 15 years, and EXCESSIVE paint buildup resulted, which is a new condition that never existed before. This new thicker paint film system is not flexible so it cracks. Moisture penetrates the cracks soaking the wood beneath. As the moisture tries to escape it cannot get through the paint and it pushes the paint right off the wood. Increased shrinking of the outer layers of the paint film force the film to curl away from the wood and the film brakes down where it is weakest – right next to the wood. Result: paint peeling down to bare wood.

Modern Times

The more coats added to this thick paint system, the faster it peels. Through the 1960's and 70's it lasted 10 to 15 years between adding another coat and a shabby appearance due to peeling. In the 80's it lasted 5 to 10 years. In the 90's it looks shabby in just 4 to 6 years. Now you know where you're at with your peeling paint, and now I'll tell you why you are there.

IMPORTANT POINT #2: The fundamental cause of the problem: paint materials changed, but the maintenance method did not. Full recoating of the entire building continued, more and more frequently. This was great for the paint industry selling and applying more and more product. Clearly, it was not the best treatment for older buildings. Exterior stains have been used in the past with some success, but even stains create paint buildup, especially the so called "solid stains" which may act more like paint

than stain. We have developed two approaches for the solution to the problem. Frequently both are used on different parts of the same building.

Spot Paint Maintenance Program

This treatment "goes with the flow" in that the paint is allowed to peel off, mostly at its own rate. Full coating is not done since this would further shorten the cycle of coating and peeling. Appearance will be "variable" but is not usually considered "shabby". Every three to five years the paint surfaces are cleaned, loose paint is knocked off and the bare wood in these spots is primed and painted. There is no attempt to feather the thick edge of heavy paint buildup since it will do little to extend the life of the work. Relatively weak "oil-based" primers and paints are used. Matching the color and sheen of the surrounding paint is important. This is a relatively low cost treatment, but it must be repeated for a s long as there is heavy paint buildup that is peeling off. Lead containing waste material must be handled according to regulations. The continuing cost of this treatment over the long term might be higher than complete removal.

Complete Paint Removal and Recoating

All paint is removed down to bare wood. The surface is prepared and oiled if needed, primed, and painted with two top coats. Oil-based primer is used and top coats are acrylic latex or higher performance acrylic elastomeric. This is a very high cost treatment, but is only done once. Since it removes the basic cause of the problem (excessive paint buildup) the cost of continuing maintenance is much lower than the spot paint maintenance approach.