

## TWO CLEANING PROJECTS:

### General:

It is hard to give a definitive number, however my impression from numerous written sources and observation of various urban markets, is that fully 40 percent of all buildings that are cleaned are done for the purpose of improving appearance. An additional 30 percent of the buildings cleaned are done so as part of a larger restoration program. In our case, we have always cleaned buildings as part of an overall exterior restoration.

The most important thing we've learned over the years, is that the business of cleaning buildings is complex and has many variables. Second, that the skill of the operator for whatever system of cleaning selected is as important as the skill of any other craftsmen, manager, conservator or architect on the job. Third, there is no standard answer as to the proper or right way of cleaning.

All the buildings we work on are historic and most of the buildings are between 75 and 150 years old. We generally try to convince our clients to think from the top down. Simply, impair the water from being able to get in, and provide a way for the building to dry out. Second, protect the building fabric within the design guidelines that the original architect or builder intended. It is important that the cleaning process acts to enhance the performance of the building and does not accelerate deterioration.

Cleaning is the first step. For it is the decisions about the type and level of cleaning which will give you the surface and appearance of the materials that is the benchmark for the rest of your project. Budget has a lot to do with cleaning. As a way of example I've chosen two different projects, one with a small, finite budget, the other, where the budget was to be established after developing the optimal scope of work.

### Building One:

Project:	Exterior restoration and repairs to envelope, including cleaning of the façade.
Location:	962 Chapel Street, New Haven, CT
Building:	Terra Cotta façade added to original historic structure in 1914
Architect:	Shape and Bready
Owner:	George Zdru
Restoration Consultant:	Leland Torrence Enterprises
Construction Manager:	Leland Torrence Enterprises
Cleaning company:	Delucia Construction
Craftsmen:	The Guild of Fine Craftsmen and Artisans

The owner for this building is an architect who bought the building because he fell in love with the facade and it's wonderful location on the historic New Haven green. Although the facade of the building is only 85 years old, its presence on the green, arguably the oldest designed city in United States, made it imperative in the architect's mind to do a proper job. However, there was exactly, no budget for the facade.

The boxy street signage, and the '70s storefront were removed to reveal an elegant arched opening. The scaffolding was erected, the green roof tiles replaced where missing, and a new copper gutter system was built by Pat Tarantino.

I have seen many cleaning jobs of terra cotta where the glazed coating has been compromised and in some cases completely removed by overzealous cleaning techniques. As we did not have monies to do any laboratory tests or extensive mock ups, we proceeded by doing a small test area of cleaning with mild soap and water, with rinsing. We used the soap due to the fact that most of the blackening was caused from soot and dirt. Regular water by itself had little or no effect. As there are many details on the building it was often necessary to use a mild scrub brush on the columns and at the crown.

When looking at photographs of the building before and after the cleaning there is clearly a difference, however, it was not dramatic enough to the eyes of the owner. As we did not have the luxury to test various cleaning products and did not wish to entertain the use of any chemicals which could be damaging

or environmentally unfriendly, we took the scientific approach of selecting a product suggested by the cleaning contractor. The product was a citrus based medium, complete with rinds. We tried it in a small area and it looked minimally promising, and as it was not that expensive we were given the permission to proceed with the rest of the building. Finally, the building was rinsed with a light power washing of approximately 200 to 300 PSI. We received some good publicity, and the building smelled great for about a week, but looked about the same.

The architect worked with the woodworker William Evans to design and build a complementary Street facade. The marble rectangles at the central part of a building were replaced. The entire building was re-pointed and the broken terra cotta was patched with a polymer based restoration mortar provided and matched by Edison Coatings.

### **Building Two:**

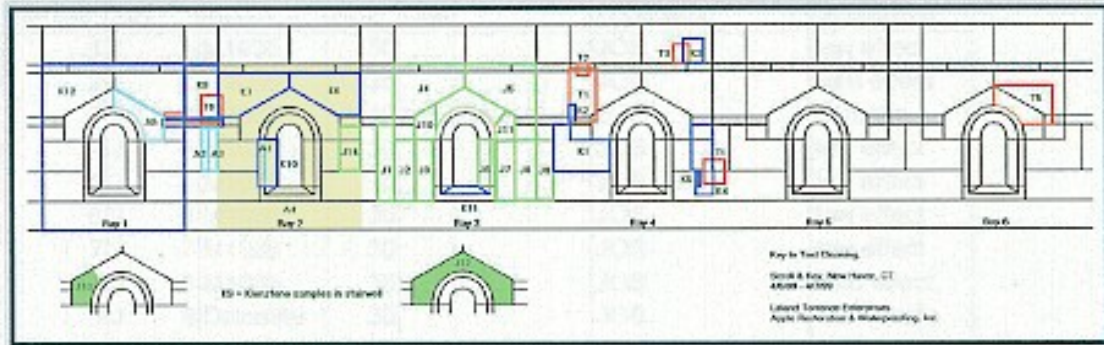
Project: Exterior restoration and repairs to envelope, including cleaning of the façades.  
Location: Scroll and Key, Secret Society, Yale University  
Building: College and Wall Streets, New Haven, CT  
(NY) Built 1868  
Architect: Richard Morris Hunt  
Owner Representative: Leland Torrence Enterprises  
Restoration Consultant: Leland Torrence Enterprises  
Construction Manager: Leland Torrence Enterprises  
GC for Masonry: E&W Construction  
Consultants: Brian Skinner and Jay Agu, Geology and Geophysics, Yale University  
Cleaning Tests: Apple Restoration and Waterproofing  
Craftsmen: The Guild of Fine Craftsmen and Artisans



For this project we had the advantage of having a client that wanted research, testing and was willing to wait for the proper analysis. We started the project as part of an overall survey and analysis of existing conditions both inside and out, and development of a ten-year capital improvement plan with prioritization of the needs and estimated costs for the work. The survey for the exterior restoration was performed six months prior to commencing the restoration. There was also some roof work and various methods of stabilization to allow the building to dry out. The survey included sounding, mapping and photographing of all the exterior masonry. Core samples of both the sandstone and blue stone were taken to determine the extent, type and cause of the deterioration of the surface.

It is important to note that fairly extensive research was performed prior to the mock ups for cleaning. As the building had been covered with ivy for close to a century, there were numerous factors contributing to the deterioration of the stone. In particular, the sandstone with its varying sizes of aggregate, its extreme porosity, and delicate silica binders proves to be a difficult candidate for cleaning. Some 42 cleaning tests were performed on the building at different times. Ken Follett of Apple Restoration and Waterproofing oversaw and mapped the majority of these tests.

## Graphic Key of Mock-Ups



It is a tribute to the preservation and restoration community at large that 20 years ago one would've been hard pressed to find any expertise in the area of cleaning. A good portion of the cleaning at that time involved blasting away with black beauty. Today, we are able to get manufacturers representatives for numerous sophisticated products and systems to do testing free of charge. However, the dilemma is that the existence of various substrates and their condition makes it almost impossible to choose just one system. Nevertheless, the expense of treating an entire building as one might treat a priceless sculpture is rarely economically feasible.



There were four major chemical conditions contributing to the breakdown of the silica binders in the sandstone. However, according to Brian Skinner, Eugene Higgins Professor of Geology and Geophysics at Yale University, they all pale in significance to the accelerated deterioration caused by the pitted surfaces that exponentially increase the water absorption of the stone. The original ashlar surface of the stone allowed for good

repellency of water. A clean quartz surface is naturally hydrophobic. The tests showed that the pervasive film of debris was lodged as deep as three average sand grains from the original surface.

The test results on the honed vs degraded surface were dramatic. A drop of 0.5cc of water was dispersed and absorbed instantly on the existing degraded surface while it remained as a coherent drop for more than five minutes on the honed sample. Therefore the decision was made to re-hone the surface of the stone to match its original performance specifications and provide a clean surface. By this method we could protect the greatest percentage of the

original fabric for the longest period of time and return its appearance to the beauty intended by its well known architect Richard Morris Hunt. . The work was performed by E& W Construction and Gothic Stone Restoration with members of The Guild of Fine Craftsmen and Artisans.

The frieze at the front facade of the building presented another problem, as did the marble capitals. Although some of the detail was worn away completely, other of the detail was in almost perfect shape. We had four options for the carved sandstone: 1) retool the surface, 2) use a mild acid with poultices, 3) micro abrasives, and 4) leave it alone. The primary objective was aesthetic. The black and grey surface no longer matched the clean surface of the rest of the building. It was decided that something should be done to augment the discoloring. Retooling was ruled out as it was felt the stone was not in good enough shape to withstand the vibrations and that many details might break off. The micro abrasives previously tested had been relatively ineffective due to the depth of the organic matter. Hence poultices were used.



Arteco & Design Restoration Corp carried out the work. A poultice made up of EDTA, talc and water was repeatedly applied to the treated surfaces for two twenty four hour cycles. The dried poultice was removed with low pressure water.

Prepared by: Leland Torrence March 22<sup>nd</sup>, 2000

