SURE KLEAN®
Summer 1988
ProSoCo News

A capital restoration for a dignified nation

ProSoCo's participation with the Office of the Architect of the Capitol (AOC), General Contractor, Chas. H. Tompkins, and other key players in the most extensive restoration project ever undertaken on the United States Capitol Building, is an accomplishment in which all of us at ProSoCo take great pride.

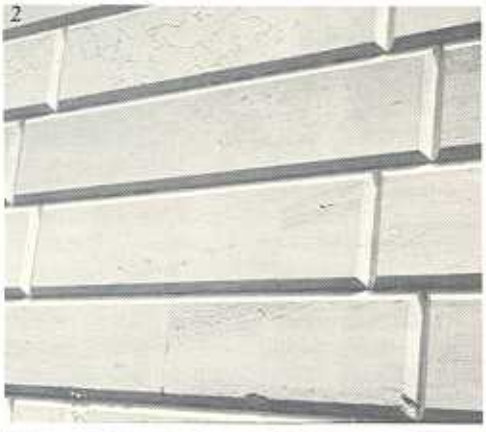
The Capitol's central west facade faces the White House and is most often recognized by our nation's citizens. It is composed of a relatively low-grade building material, Aquia Creek sandstone, which was quarried in Stafford County, Virginia. Preservation of this portion of the building has restored the only remaining **original** exterior walls still visible to passersby.

Under the direction of George White, Architect of the Capitol, plans for restoration of 90,000 square feet of sandstone — excluding the west sides of the newer House and Senate wings — were underway in April 1983. The AOC, with consulting engineers Ammann and Whitney of New York, concluded that paint removal — as a diagnostic tool — would reveal the extent of structural cracks, and assesss repointing and stone replacement needs. Field testing determined which method would effectively remove 35 coats of paint while **preserving the integrity** of the building. The selected paint stripping process included Sure Klean® Heavy Duty Paint Stripper, an alkaline product, and Sure Klean® Limestone Afterwash to remove any residual material.

The contractor used airless spray equipment specially adapted for application of the material. The paint coatings, 1/8" to 1/4" thick, were removed in just two applications of stripper with 24 hour dwell times. Largely obscured corinthian capital detail, limited areas of ornamentation, and mortar joints required additional spot treatments. Various ProSoCo personnel, including local field representative Ken Houck and technical services representatives from Kansas City headquarters and New Jersey and California branch offices, were on the jobsite regularly to provide training and assistance as well as monitoring progress. According to John Bourne, vice president of Northeast Operations for ProSoCo, "We found some areas of stonework that were literally being held in place by the layers of paint coatings."

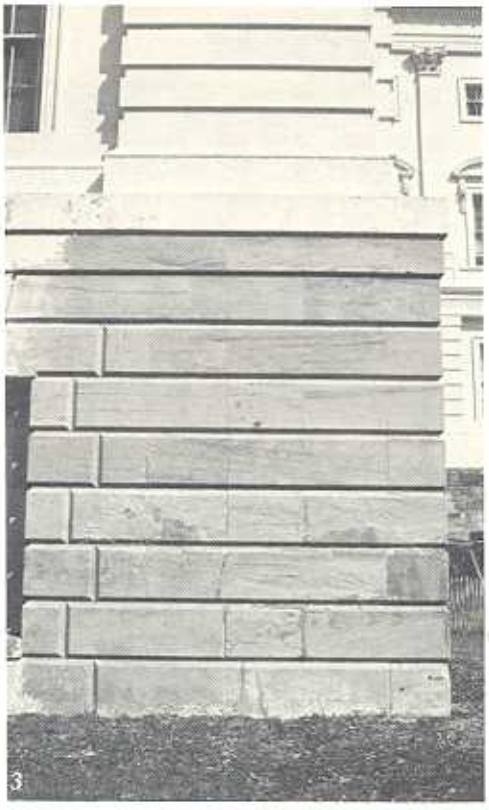
The paint, tightly packed into sculpted relief, was easily removed. "Our products efficiently removed 150 years of old peeling

(See CAPITOL on page 3)



1. Huge wooden trusses braced the weakened colonnade for two decades before the collapse of nearly 100 square feet of original sandstone veneer.

2. The Capitol had been painted roughly every four years for approximately 150 years. The coating layers evolved from linseed oil-based paints through a progressive series of lead-based paints, arriving finally at the most recent acrylic or synthetic resin-type paints.



3. Tests for paint removal methods were limited to include terpene-based paint remover, methylene chloride-based paint remover and/or alkaline-based paint remover followed by a water rinse. Test panels of Heavy Duty Paint Stripper, an alkaline product, were applied on an inconspicuous lower-court-yard-level wall.

U.S. CAPITOL: ARCHITECTURE AND CONSTRUCTION

1791 Major Pierre Charles L'Enfant appointed to oversee design of the new federal city on the Potomac. Dr. William Thornton wins competition for Capitol design idea.

1793 Capitol cornerstone is laid by George Washington on September 18.

1800 Congress convened on November 22 for its first joint session in the newly completed north wing of the Capitol. The first wing, originally the Senate wing, housed a 32-member Senate, 106-member House, the Supreme Court, the Circuit Court and the Library of Congress.

1814 Capitol burned by the British on the fateful day of August 24. Congress moved into a temporary "Brick Capitol" constructed on the site of the current Supreme Court building.

1818 Initial coat of paint applied to the Capitol to hide stains and scars from the fire.

1818 Cornerstone laid for the Capitol's central section on August 24.

1819 Fire restoration completed. House and Senate reoccupied chambers.

1851 Cornerstone for new House and Senate wings laid by President Millard Fillmore during 4th of July festivities.

1855 Decision was made to replace the central wooden Bulfinch dome with a much larger cast iron dome designed by Thomas U. Walter. Walter borrowed design elements from two prominent domed structures of the old world — St. Peter's in Rome and St. Paul's in London.

1863 New Capitol dome crowned with the statue of the Goddess of Freedom.

1958 Construction began to replace the deteriorated sandstone of the east front of the Capitol. Built of marble, the new front duplicated the old one, but extened the structure by 32 feet. This addition was actually a fulfillment of Thomas U. Walter's original plans of 1874. Since designing the House and Senate wing additions in 1850, he had urged for the sake of proportion that the east front be extended, and had created plans for this purpose.

1983 Nearly 100 square feet of sandstone veneer slabs, each about eight inches thick, fell from the West front of the Capitol, crashing down on the courtyard. This particular veneer came from a section built in 1802-1807 — the original House wing of the building. The collapse occurred on April 27, two days after a House Appropriations Committee had approved $70.5 million to buttress the deteriorating walls.

Capitol *(Continued from page 1)*

paint, dirt and grime without harming the original sandstone surface," said Gerald Boyer, president, ProSoCo, Inc. Paint removal was completed by February 1984. Once the bare stone was exposed, consulting engineers and AOC officials were able to determine the true level of disrepair. Research, testing and investigation by the National Bureau of Standards, AOC and Ammann and Whitney were extensive, and essential for laying the groundwork to determine procedures and methods to continue preservation treatments.

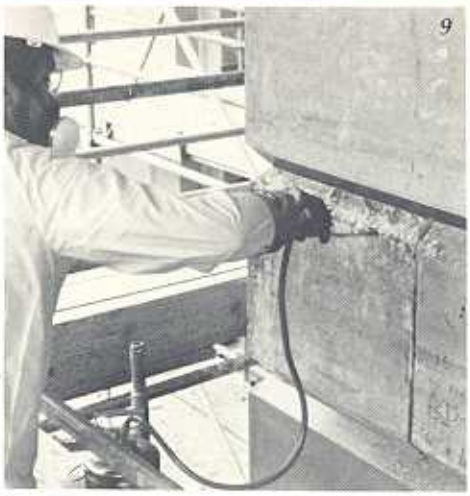
Washington weather had caused nearly irreparable damage to the stone. Though the paint coatings were initially applied to preserve the sandstone, they were also partly responsible for the deterioration. Paint buildup entraps moisture in the stone surface making it more susceptible to deterioration from freeze/thaw cycles and formation of soluble salts. Consolidation of the original stone was a must.

During inspections of the facade, the exposed sandstone was classified in two categories: 1) Sandstone that had deteriorated to the point where replacement was required and 2) Structurally sound stone, which could be saved and preserved by application of a suitable consolidation treatment.

Early inspections recommended the replacement of up to 40% of the original stone. Due to Aquia Creek sandstone's proven limitations and the architect's intent to repaint the facade, Indiana Limestone was selected as the replacement material. The remaining 60% of the facade could be preserved through proper treatment and maintenance.

The National Bureau of Standards (NBS), began a battery of tests to establish appropriate consolidation/protection measures for both replacement and original stonework. Two-and-one-half years of exhaustive field and laboratory testing conducted according to American Society for Testing & Materials standard test methods, assessed compressive strength, water vapor transmission, salt crystallization, etc., on nearly a half dozen products by various manufacturers.

ProSoCo's Conservare® H Stone Strengthener and Breathable Masonry Coating (BMC) were approved for use by the AOC based on overall NBS testing results. The stone strengthener replaces natural binding materials lost to weathering and acid rain with silicon dioxide. The compound includes a special silane material to provide water repellent protection. "The Capitol Architect recognized the need for both treatment and a consolidation/protection system to control water ingress in the future," explained David Boyer, vice president, technical services, ProSoCo. "The combination of H Stone Strengthener and BMC provides consolidation,



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9. Specially adapted airless spray applicators were used by the contractor to apply H Stone Strengthener. The equipment provided a controlled, low pressure spray of the material.

10. BMC protects masonry surfaces from accelerated deterioration related to the presence of water. The microporous film maintains as much as 95% moisture vapor transmission.

protection and a colored architectural appearance without interrupting the stone's natural vapor transmission."

Application of the stone strengthener was initiated in February 1987. The material requires a surface temperature between 40°F and 85°F. Because wintery nighttime weather dipped below the freezing mark, surface and ambient air temperatures were constantly monitored. The tubular scaffolding was enclosed with polyethylene sheets. Radiant heaters ran overnight to raise the surface temperature and ensure that all moisture was dried out of the stone completely. Surface thermometers were monitored each morning to verify that the temperature of the stone had risen to within the required range. Heaters were then disconnected, the polyethylene was removed and work began.

Subcontractor, Brisk Waterproofing, a division of Western Waterproofing, applied the H Stone Strengthener in **"cycles"** to sections 72 feet across by seven feet tall. Again, specially adapted airless spray equipment was utilized. Each precisely executed cycle consisted of a series of three consecutive saturating coats, applied bottom to top at 10 to 15 minute intervals. Five cycles of the consolidation treatment were applied to the sandstone and three cycles to the replacement limestone at 45 minute intervals. "I thought the job went pretty much according to plan," said Mike Nagle of Brisk. "It was a great joint effort between the contractor and manufacturer." Because the walls were being heated prior to application, penetration was much better than expected; one-and-one-half to four inches on the sandstone and one to one-and-one-half inches on the limestone. "The depth of penetration is one of the main considerations for an effective consolidation," commented John Bourne.

"The consolidation treatment worked so well that the amount of stonework scheduled for replacement was reduced," Bourne estimated, "from approximately 40 percent to about 25 percent."

As Brisk crews applied the stone strengthener, masons worked to repair and replace sections of badly deteriorated stone. More than 1,000 holes, two inches in diameter, were drilled and grouted to brace the walls. Stainless steel rods between 2 feet and 38 feet long were inserted to reintorce the building vaults. In other areas new limestone slabs were lifted into place with cranes to replace deteriorated sandstone which could not be repaired.

Following treatment with Conservare® H, the next step was to apply Conservare® Breathable Masonry Coating. A water-based coating, BMC is chemically compatible with the stone consolidation treatment and completes the protection **"system"** selected for the project. BMC maintains 95% of the natural moisture vapor transmission of the stone. "Moisture is inherent to natural stone and masonry substrates," explained Mike Boyer, vice president, marketing, for ProSoCo. "Exceptional vapor permeability of the coating also reduces the potential for peeling, blistering and other common coating failures. This is important not only for the integrity of the coating, but also the stability of the underlying stone. If excessive moisture is allowed to accumulate behind the coating, deterioration of the stone and mortar accelerates."

ProSoCo personnel assisted in training the applicators to spray apply and then backroll the coating, eliminating sags and runs and ensuring penetration. Brush application was necessary in detailed ornamentation areas around column capitals and along porticos. The coating was applied by low pressure airless spray at five to eight mils wet.

Stone consolidation and BMC applications were completed in September 1987. Finally, Conservare® Pigeon Control

(See CAPITOL on page 6)

VIZCAYA MUSEUM AND GARDENS

Miami, Florida

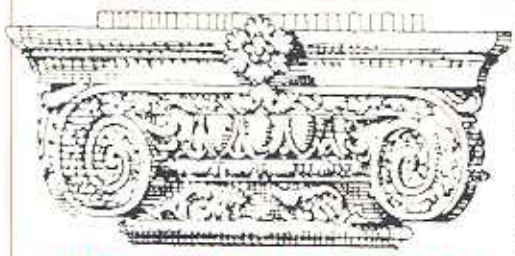
Project: *Exterior fountain conservation*
Architect: *Paul Chalfin, Diego Suarez*
Contractor: *Washington University Technology Associates St. Louis, Missouri*
Products: *Conservare® H40 Water Repellent*

The impressive Italian Renaissance villa — Vizcaya — was designed in 1910 by Paul Chalfin. Intended as a winter home for the late James Deering, International Harvester, Vizcaya sits on the Biscayne Bay surrounded by acres of formal gardens and parterres. Suarez landscaped the estate, borrowing designs from beautiful Italian villas. Fountains and pools dot the grounds. Classical statuary, some of which were imported from Europe, oversee walkways and vistas.

Masonry Stabilization Services Corp. (MSSC), a ProSoCo affiliate assisted Washington University Technology Associates (WUTA) Conservation and Engineering Group last year to preserve these masonry fountains.

A field investigation conducted by Fran Gale, MSSC and Phoebe Weil, WUTA disclosed various types of building materials including oolitic and Cuban limestone, Italian Travertine, coral, concrete and various marbles. Stone evaluation conducted by MSSC's Stone Testing Laboratory helped WUTA determine which chemical treatment was the most suitable. After general cleaning, conservation procedures involving Conservare® H40 were carried out on many coral limestone fountains. For critical application of this sort where the masonry is submersed or exposed to continuous flowing water, Conservare® H40 reduces the amount of water absorption and improves the integrity of the stone.

Centuries old and among those treated with stone strengthener is the Bassano di Sutri. This Baroque fountain was purchased for Vizcaya from a town near Rome bearing the same name.



TECHNIQUES

Many contractors have had great success using ProSoCo's Heavy Duty Paint Stripper and 509 Paint Stripper to remove paint, crayon and other types of graffiti from masonry surfaces. Indelible inks and pigments utilized in felt tipped markers and some aerosol spray paints, however, are another story.

Effective removal of graffiti from porous masonry surfaces has become more complicated as the number of artistic "tools" available to vandals has increased. Conventional paints, lipstick, and crayons form films that remain, for the most part, on the surface and can be removed with the right combination of strippers and equipment. Indelible inks and dyes found in "permanent" markers, and finely ground pigments found in some aerosol paints, however, penetrate the surface making them the most difficult stains to remove.

Colored inks, dyes and pigments used in marking pen and aerosol paints are typically carried in highly mobile, quick-drying solvents. Applied to porous masonry surfaces, the colors penetrate deeply. Vandals armed with markers and spray cans leave their mark not only on the surface, but deep in the heart of the masonry.

ProSoCo's 940 Paint Stripper is a fast acting, solvent based stripper formulated for the removal of paint and graffiti staining. Use of 940 on numerous graffiti removal projects has proven it to be effective for removing difficult graffiti stains.

After appropriate testing to determine compatibility, follow these application procedures:

The 940 Paint Stripper system was used to remove ink stains from the polished granite of the Vietnam Veterans Memorial in Kansas City, Missouri. The poultice mixture shown here proved extremely effective in removing deep set ink stains that defaced the memorial.

Procedures — Removal of surface graffiti:

1. Apply a heavy coating of 940 Paint Stripper to all affected areas.
2. Allow the stripper to remain on the surface for approximately 10 minutes.
3. Using a stiff fibered, masonry washing brush, gently agitate treated surfaces.
4. Thoroughly flush treated surfaces with high pressure (400-1200 psi) fresh water.
5. Allow treated surfaces to dry.

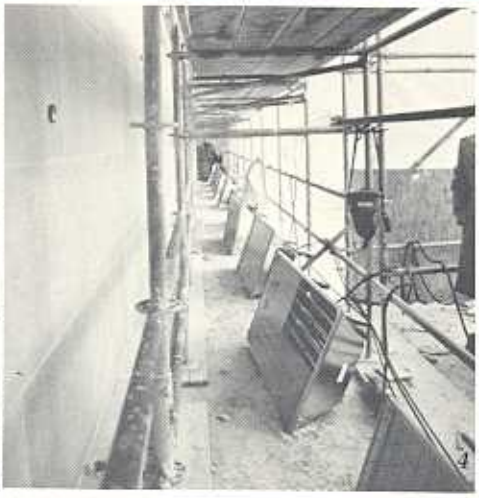
Some stains require multiple applications and/or increased dwell times for complete removal. Removal of pigment shadow embedded in the masonry pores may require use of 940 Paint Stripper as a poultice to draw out deep set stains.

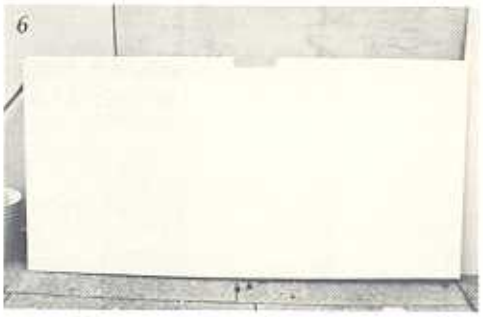
A poultice is a moist paste produced by blending an absorbent dry powder with a liquid. To remove graffiti shadows, Sure Klean® Marble Poultice (dry powder) is blended with 940 Paint Stripper and water to form a poultice paste. This paste is trowel applied over the stained area, covered and left for 3 to 6 hours. Solvents in the 940 Paint Stripper penetrate into the masonry dissolving and mobilizing the graffiti shadows. As the poultice mix dries, the solvents and graffiti shadows are absorbed into the poultice paste for removal.

Procedures — Removal of graffiti shadows:
Mixing instructions:

1. Pour Sure Klean® Marble Poultice into a suitable mixing container.

(See TECHNIQUES on page 6)





4. Application of Conservare® H Stone Strengthener requires a surface temperature between 40°F and 85°F. To offset cold temperatures, the scaffolding setup was enclosed with polyethylene sheets and radiant heaters ran overnight to raise the surface temperature of the stone.

5. Top L: Surface temperatures were monitored throughout the heating process.
Top R: Ambient air and relative humidity thermometers were utilized to record proper environmental conditions.
Bottom L: Safety precautions, including immediately accessible fire extinguishers and eyewash stations, were taken.
Bottom R: Air intakes, windows and doors were temporarily closed off and sealed to prevent intrusion.

6. A series of seventeen custom color samples were evaluated in direct sunlight, shade; morning and afternoon; cloudy and clear days, to match the adjoining marble of the House and Senate wings.

7. Pigeon Control Netting is a physical not a visual barrier. The netting keeps pigeons from roosting on column capitals and porticos without obstructing sightliness or obscuring the natural appearance of entablature ornamentation.

8. Brisk Waterproofing Superintendent, Peter Colone, extracts core samples to verify depth of penetration achieved with the stone consolidation treatment.

IF THESE WALLS COULD TALK . . .

Congress originally resolved to establish two Capitol cities, but George Washington eventually declared the District of Columbia as the only permanent home for the new government. When the issue of a balanced budget reared its ugly head, legislators argued over expending construction funds while the struggling states were in serious debt. Amazingly enough, the disputes were solved when Thomas Jefferson and Alexander Hamilton, always at odds on philosophy, could agree on just one thing: a Capitol must be built.

◇

The Capitol site was found — on horseback, of course! — by George Washington and Major Pierre Charles L'Enfant. They spotted the weed-covered Jenkins Hill on a ride in 1791.

◇

In keeping with the true spirit of capitalism, the Capitol design was determined by a competition. The winner was neither architect nor artist, but a *doctor* named William Thornton.

◇

On August 24, 1814, during the War of 1812, the Capitol was burned by the British. Only a strange and violent thunderstorm that evening saved the Capitol from total destruction. This was taken by many to be a divine sign that the new nation must go on.

◇

In 1817, disagreement over whether the inaugural ceremony for President Monroe should be held in the House or Senate wing of the Capitol led to the establishment of the current *outdoor* inaugural tradition.

◇

In 1858, an argument over the admission of Kansas as a state erupted in a physical brawl in the Capitol. Fortunately, the incident ended when John Potter of Wisconsin grabbed William Barksdale of Mississippi by the hair . . . Barksdale's toupee came off, and Potter paraded around the room with his prize until all were convulsed with laughter.

◇

During the Civil War, a joint Committee on the Conduct of War suspected Mary Lincoln of spying for Confederate relatives.

◇

Three thousand Union soldiers slept in the building at the beginning of the Civil War.

◇

The Capitol served as an emergency hospital with 1,500 cots during the Civil War.

◇

The height of all nearby buildings and structures has been restricted to preserve the prominence of the Capitol on the hill.

Sources: *The Voice of the People* published by the U.S. Capitol Historical Society. *We The People — The Story of the U.S. Capitol*, ©1985, U.S. Capitol Historical Society.
Building a National Image: Architectural Drawings for the American Democracy, 1789-1912, ©1985, National Building Museum.
The Mount Vernon Ladies Reference and Research Association.

ProSoCo Notes

Dennis Burk has joined ProSoCo as the new Regional Sales Manager of the North Central region. Dennis brings ten years of sales management experience to ProSoCo and is well versed in moisture protection and water repellent products. As Regional Sales Manager, he will be responsible for all ProSoCo product lines. A native Missourian, Dennis earned a bachelor of science degree from Southwest Missouri State University and is an active CSI member in several midwest chapters. Located in the Kansas City office, Dennis can be reached at 913/281-2700 or 1-800-255-4255.

Tom Yager is ProSoCo's new District Sales Manager for Maryland, Washington, D.C. and Virginia areas. Tom comes to ProSoCo, Inc. from W.R. Grace's Construction Products Division and a 10 year background in sales and distribution of construction products. His distributor and architectural sales experience is enhanced by indepth technical training of ProSoCo products. Born and raised in the D.C. area, Tom earned a bachelor of arts degree from Towson State University. He is currently active in two local CSI chapters and can be reached at 301/321-7597 or through the New Jersey office at 201/754-4410.

ProSoCo is pleased to welcome **Michael R. Vizcarrondo** as District Sales Manager of the Florida region. A native Floridian, Mike is a graduate of Florida State University and brings more than five years of construction product sales experience to ProSoCo. Mike can be reached at his office 813/960-8182 or through the Georgia branch at 404/939-9890.

Congratulations to a pair of dedicated ProSoCo employees. **Scott Buscher,** National Sales Manager and **Jo Coke,** Division Manager, new construction products, have been recognized by their peers. Scott received a Sales & Marketing Executive award from the Kansas City chapter of this national association for distinguished sales achievements. American Concrete Institute (ACI) elected Jo Coke a Fellow for her outstanding service to the concrete industry.

Techniques

(Continued from page 4)

2. Add sufficient quantities of 940 Paint Stripper to wet the dry poultice powder and achieve a stiff paste.
3. Continue mixing and add a small amount of water to bring the paste to a smooth, wet and trowelable consistency.

Application instructions:

1. Using a taping knife or trowel, apply a heavy coating — approx. 1/4" thick — of the poultice to the affected areas.
2. Cover poultice with polyethylene and tape or otherwise seal the edges of the polyethylene film to control evaporation.
3. Allow the poultice to remain on the surface for 3-6 hours.
4. Remove the polyethylene film and allow the poultice to stand until dry.
5. Carefully scrape the dried poultice from the treated surfaces.
6. Wash dried poultice powders and solubilized staining matters from the treated surface with fresh water and a stiff-fibered masonry washing brush.
7. Allow treated surfaces to dry.
8. Repeat as necessary.

CAUTION: 940 Paint Stripper is a highly flammable solvent material. Use and handle accordingly. Avoid contact with pedestrians and refer to product labeling and Material Safety Data Sheet on container.

Capitol

(Continued from page 3)

Netting was tested and installed. Various means of preventing the birds from roosting on column soffits and window pediments had been tried over the years with only limited success. ProSoCo's netting creates a physical barrier that does not cause harm to the stone or the birds. "A means of passive control," commented David Boyer, "Pigeon Control Netting eliminates access to roosting areas." The capitals and porticos on the House of Representatives wing and the central west facade were completely enclosed. On the Senate side, only the column capitals, entablature and coffered soffits were protected.

This extensive restoration project was completed last October. "We're very proud to have been an integral part in the preservation of our nation's Capitol." Gerald Boyer reflected, "A project like this only happens once in a lifetime. All the key players deserve recognition."

"I don't know when the next train leaves for Boston, but I **do** know how to remove rust stains from marble. First, mix some pumice stone into a paste..."

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The news articles included in the *ProSoCo News* represent a factual reporting of methods which some contractors have found effective. They are not intended to be a company endorsement of procedures but merely as possible alternatives in individual situations. Additionally, the use of photographs does not constitute an endorsement of the products.

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