
Douglas Porter, School of Engineering, University of Vermont, and Angelyn Bass, School of Architecture and Planning, University of New Mexico

Deep within the mesas and canyons of the Pajarito Plateau in northern New Mexico are thousands of earthen-plastered dwellings carved into the rhyolite tuff cliffs. Known as cavates, these troglodytic structures were once part of larger stone masonry villages occupied from the 12th to the 16th centuries by the ancestors of the modern Pueblo people. Despite the constant and often extreme physical alteration of the soft tuff cliffs, some of the cavates are well preserved and retain their archaeological and cultural significance through their form, domestic features, and architectural finishes. Recently, a multidisciplinary team has been characterizing the weathering rind that develops on tuff outcrops in an effort to understand the relationship of that surface to the preservation of the cavates and petroglyphs carved in the canyon walls. This effort builds on recent research in discrete element modeling and evaluation of the structural stability of prehistoric masonry associated with the cavates, a collaboration between the National Park Service, The University of Vermont, Massachusetts Institute of Technology, and Los Alamos National Laboratory.

A number of deterioration processes including erosion and exfoliation of cliff surfaces threaten preservation of the cavates and their associated archaeological features, such as petroglyphs, carved hand-and-toe-hold trails, and plastered cliffs walls. A thin weathering rind on the surface of the tuff seems to protect the glassy ash from erosion and chemical weathering, but very little is known about its formation or the level(s) of protection it provides. Preliminary examination of tuff samples suggests that weathering rind formation begins with the deposition of dissolved solutes and suspended particulates on rock surfaces by surface water flowing over canyon walls, followed by the colonization of the rock surface by surface-stabilizing biofilms.

It is hypothesized that these biofilms improve the mechanical strength of the friable rock surface by interweaving cyanobacterial and microfungal filaments; contribute sticky polysaccharides that bind surface particles together and reduce imbibition; produce rough surface microtopographies that slow water runoff and create a still-air boundary layer that protects from wind erosion; and provide some protection from freezing as the result of the dark color of the resulting patina. It is hoped that better understanding of the weathering rind formation will lead to the development of low-impact interventions for stabilization of rapidly eroding areas.

The research differs in some respects from traditional approaches to the topic. The interaction of biofilms with rock surfaces in archaeological sites, monuments, and historic buildings is usually explored in terms of the biodeteriorative effects. The pedogenetic processes associated with lichens are both chemical and mechanical. Damage associated with these processes was once thought to occur very slowly, but recent research indicates that some rocks and building stones are significantly impacted in a decade or less. In the context of the cavates and associated archaeological features, this paper explores the possibility that lichens and other biofilms may have a deteriorative effect when considered at the micron scale, but their larger impact may be consolidation of the outer few millimeters of the rock surface.

A Dynamic Public Resource—The Conservation of an Early 19th-Century Spanish Colonial Tile Artifact in the Middle of a Revitalized Watershed at the Presidio of San Francisco

Kelly H. Wong, Preservation Project Manager, and Jennifer Carreira, Historic Coordinator, Presidio Trust

El Polin Springs is located in the upper reaches of the Tennessee Hollow Watershed in the Presidio of San Francisco, a National Historic Landmark District. Proposed enhancements of the revitalization project include a creek/habitat restoration, new trails, an education area, and visitor amenities. Prior to the start of construction, an archaeological investigation was conducted since the proposed project was situated in a known archaeological site, El Polin Springs, containing buried remnants of an adobe house foundation. Archaeologists discovered the Spanish Colonial terracotta tile basin adjacent to a current road near the location of the future restoration site.

Close collaboration between Presidio Trust archaeologists and architectural conservators quickly developed to incorporate the feature into the final landscape design. Archaeologists proposed excavating the feature and incorporating it into the design so that it could be interpreted and used as a valuable public resource. The surrounding landscape was a known challenge since the feature was located below existing grade. Conservators began material and salt analysis to determine appropriate material and site conservation approaches. In June 2011, after several meetings with archaeologists and other stakeholders, a plan was devised to excavate the feature, leave it exposed and divert the daylighted stream. Initial testing was conducted, and the proposed conservation treatment plan included cleaning, selective pointing, tile repair, and implementing site drainage. A post-restoration monitoring plan, to be adapted into a long-term plan, was also developed to identify and address any future problems.

A conditions assessment was conducted using a photomontage, and conservators identified several damaged tiles for temporary off-site repair. Tiles were labeled to document orientation and location. Prior to in situ treatments, the feature was allowed to slowly acclimate to newly excavated conditions. The feature was originally laid on a sand bed with a clay-rich soil as the bonding agent. Water was used sparingly for cleaning tile surfaces prior to repairs. Unstable basin walls were selectively pointed with a natural hydraulic lime–based mortar, color matched to existing soil. Cracked tiles were repaired using ceramic pins embedded in Paraloid B-72, and cracks filled with a custom–colored terracotta patching material. Since archaeologists and conservators have the ability to monitor the site and address future problems, the conservation goal was to
limit intervention and use reversible/repairable treatments.

Many challenges were faced during excavation and treatment of the feature during this unusually cold, wet year, and conservators and archaeologists worked closely to collaborate with landscape architects, ecologists, contractors, and project managers. The main goal of early discussions was to create a grading plan for the feature that would adequately address concerns to control ground and storm water. This project illustrates how conservation planning and collaboration with other stakeholders is critical to the success of a treatment. The site opened to the public this fall (2011), and includes an exciting new educational dimension where the public will, for the first time, view the exposed 19th-century tile basin and learn about the site’s Spanish settlement history at the Presidio of San Francisco.

Conservation Works at the Templo Pintado of Pachacamac

Gianella Pacheco Neyra, Museo de Sitio de Pachacamac, Lima

The Templo Pintado is one of the most important buildings inside the Archaeological Sanctuary of Pachacamac, because of its symbolic meaning and because of this temple host at the Pachacamac idol, an Andean deity adored for more than 1,000 years. The Templo Pintado has a special relevance too, because is the only building that has wall paintings with designs. Unfortunately, despite its great importance, since it was discovered in 1938 by Alberto Giesecke, there has not been conservation work, and consequently great quantity of archaeological information has been lost, principally on the designs that could have been represented on the paintings. The Research and Conservation Project of the Templo Pintado, was developed under the direction of the archaeologist Denise Pozzi Escot, and has as its main objective the structure and painting conservation of the building, and recording of the wall paintings, that is why the following activities have been done:

- **Topographical and planimetric mapping of the Templo Pintado**: A complete and detailed map was made, allowed the area to be sectorized in order to get a better record of the damages, localizing them. This map was also useful for designing the roof.

- **Graphic and photographic record of the wall paintings**: We recovered photographic records of the paintings made by a different researcher during the first years of the discovery. It was used to make a new detailed photographic record, and for that a grid was needed with the hole area (85 m long) every single meter.

- **Stratigraphic analysis of the wall paintings**: Every layer of painting was defined into a scheme that define the order of the layers and the relationship to the designs of paints (the Harris Matrix technique).

- **Conservation of wall paintings and mud plaster**: All the layers were rehydrated and reattach, using alcohol and distilled water.

- **Analysis and research of the meteorological and environmental effects over the building**: The museum has a weather station that is used to determine the erosive agents that affect the building conservation and to apply the proper technique.

- **Design and installation of a roof**: The roof made it possible to prevent the eolic erosion and the affectations of light rain.

- **Conservation of the mud plaster**: Clean sand was used to cover them properly.

Gelatin as an Adhesive for the Reattachment of Decorative Earthen Surface Finishes

Emily Aloiz, University of Pennsylvania and Frank G. Matero, Professor of Architecture, Historic Preservation Department, University of Pennsylvania

Gelatin, a natural binder derived from animal protein, has been used as an adhesive long before the introduction of modern materials. Largely replaced by synthetic adhesives, gelatin conservation treatments have attracted new attention in response to the need for identifying more technically and culturally compatible materials for the stabilization of detaching, delaminating and blistering earthen finishes at Mesa Verde National Park (USA). The dry, protected climate of these ancient alcove sites allows reconsideration of the use of gelatin as an adhesive for the reattachment of earthen finishes with the added benefits of retrievability, non-toxicity, versatility in viscosity and rheology, and low cost. Gelatin’s susceptibility to bio-deterioration and brittleness has prompted its substitution with synthetic adhesives, especially for easel and panel painting; however, these properties alone are not necessarily detrimental on earthen materials and can be controlled if understood. In order to advance the reconsideration of gelatin as a viable adhesive for earthen materials, laboratory testing, and field evaluation over a 10-year period will be presented with a focus on critical properties related to its conservation use on earthen finishes.

How Unsuitable Interventions Can Cause Serious Damages to a Patrimony: A Case Study at São Francisco Convent, in Salvador-Bahia

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Restorative interventions on architectural monuments—without the necessary details and development of studies, involving diverse professionals and technicians without the correct specialization—can bring bad results along the time, being responsible for new problems and damages that can compromise the physical integrity of the building for good. The case study presented refers to interventions in the Convent of
the First Order of São Francisco (Saint Frances), in Salvador, Bahia State, with disastrous consequences for its cloister.

The architectural complex formed by the church and the convent of São Francisco in the historical center of Salvador, was built in the 18th century (1705–1782); it is considered one of the most important architectural ensemble of baroque style in Brazil, and it was listed nationally as a patrimony of mankind, in 1938. Among its integrated valuable goods, highlights the exuberant decoration in the interior of the church, with altarpieces and golden carvings, the ceiling paintings in illusionist perspective and the set of Portuguese figurative tiles of the 18th century. These tiles are distributed along panels and friezes in the cloister, also in other parts of the convent and in the church, being considered the second-biggest set of baroque figurative tiles in the world, both in quantity and quality.

The cloister, developed along a quadrangle, was built in two floors, being formed downstairs by a system of full arches, sustained by columns made by limestone. This gallery is covered by a system of vaults edge, filled, recovered by ceramics tiles. The roof of the ensemble is a four waters type with wood structure covered by ceramics tiles and channel type, supported in one side on the structural walls of the convent and the church and in the other side by a limestone colonnade, forming a balcony. Each side is composed by eight columns of circular shaft, in a total of 32 columns. The set is completed by four pillars, with shaft of composed geometry in the apex corresponding to the cardinal points.

The architectural ensemble has undergone several interventions throughout the 20th century and in 1990s, suffered a great work when the roof was replaced. In the partial diagnosis of the damages in the cloister, a serious problem was observed as a result of that intervention, because the rafters that cover the cells and corridor of the cloister are not continuous to the balcony. They discharge over a groundsel up to the wall while the rafters of the balcony rely directly in the balcony without a sustainable structure. This fact caused a horizontally thrust, from inside to outside, resulting in a plumb and rotation of various columns, as well as the east pillar. Some columns of the cloister showed visible stressed material with significant damages and losses, as well as fissures at different angles besides detachments of material in their stems and basis. The biggest fissures and losses were in the pillars whose vertical section coincided with the cleavage plane of rock. The old interventions, the recurrence of cracks along the mortar or cements and the original stone, just in the joints of the floor and in the pillars basis are apparent. In upper floor, an opening marked in the joint near the body guard of the balcony is visible, resulting from rotation problems in the northeast facade. The plaid tiles of the convent had longitudinal bulging in the correspondent area of their internal walls, notably in the southeast sector of the cloister, causing infiltration of rainwater in the head of these walls.

Another inadequate intervention was the removal of the rails to collect rainwater fixed in the eaves of roofs of the convent, mainly in the balcony of the cloister, resulting in serious problems of degradation and loss of material in the whole ensemble. Serious damages and losses are occurring in the panels and friezes of the tiles in the cloister, because of the continuing action of rainwater, by materials ascendancy by capillarity and salt efflorescence. The association of southeast and east winds, predominant in town, aggravates the apparent damages in the southwest and northwest sectors of the cloister. In these areas the floor of the upper balcony shows ripples and sinking in the intermediate sectors. This process is a result of the constant infiltration of rainwater through the floor to the filling material of the hollow concrete slabs and the subsequent oxidation and expansion of the iron structure of these areas.

The actions of the rain without a correct system of drainage that can direct the water through the rainwater system have a great contribution for the problems in the stone structures and for the cloister floor. Some floor slabs, under columns, shows destabilization with partial sinking and deeper cracks on the borders of the stones. In the northeast and southeast sectors the majority is totally blackened by the proliferation of cyan bacteria and other fungi besides the presence of micro flora and undergrowth on the basis, joints and over some pieces.

Some timely interventions were done but since the year of 2007 the cloister is partially restricted, some of the pillars received shoring and arches were closed with bricks to guarantee the stability of the ensemble. However unfortunately nothing more was done to preserve that important monument against the effects of the rain, the time, and the lack of a correct and incisive intervention enabling these elements to destroy progressively the convent.

Interior Finishes in Integrative Architecture at Spruce Tree House, Mesa Verde National Park

Rebekah Krieger

This research gains a fuller understanding of how Ancestral Puebloans utilized architectural surface finishes in different architectural typologies through characterization and analysis of finish schemes at Spruce Tree House, the third-largest settlement out of hundreds at Mesa Verde National Park. This study asserts that complex finish schemes at Mesa Verde are found within rooms of a public, social, or ceremonial function. This significance can be quantified by the rarity and complexity of the scheme as well as by the physical characteristics and spatial attributes of individual rooms.

The scope of the project crosses disciplinary boundaries by utilizing data collected by archaeologists and compiling research on Native American symbolism and religious traditions. Quantitative data on the occurrence of finishes and embellishments is assessed through tabulation and mapped on plans of Spruce Tree House. Existing research on iconography found throughout the Four Corners region is contrasted with the patterns and symbols utilized throughout Spruce Tree House.

The study focuses on one room in particular, Room 115(2), notable for its complex decorative scheme in a second floor location. Kivas, circular underground ceremonial spaces, have traditionally contained the most elaborate finishes at any given
settlement. The presence of complex schemes in rectangular second floor rooms is unusual at Mesa Verde, and only a few such spaces are found at the park’s largest settlements.

In situ field investigation and analysis of collected samples form the basis for finish investigation in Room 115(2). Thick section analysis is used to determine the appearance and layer structure of representative samples collected from Room 115(2). Scanning electron microscopy combined with backscatter imaging, elemental dispersive spectra and elemental mapping is utilized to identify the presence and location of elemental constituents of representative samples. Room 115(2) is found to have a complex scheme with embellishments nearly identical to the adjacent Room 116(2), a space missing about 60% of its original walls but with legible embellishments due to a lack of the extensive sooting that is present in Room 115(2).

The construction history of Room 115(2) previously established by archaeologists is augmented and challenged by findings from the analyzed cross sections. The interpretation of finish samples suggests that Room 115(2) contained at least four schemes during its occupation. These schemes changed according to the function of the room and the attendant construction changes such as new wall, door, and window locations.

The metrics presented on the presence of finishes throughout Spruce Tree House suggest that second-story room with complex finish schemes play an important role in Spruce Tree House architecture. These rooms are found in pairs and represent a group of special rooms that were part of a larger program of integrative architecture.

Interior Murals, The Conservator’s Perspective: Access and Experience of the Conservator within the Architectural Space

Gillian Randell, Paintings Conservator, New York Fine Art Conservation, Inc.

Murals play a unique role within the architectural space that they inhabit, this presentation reflects on the impact of paintings in site-specific spaces. Concentrating on American 19th- and 20th-century murals, several different schools and movements are discussed including The City Beautiful Movement and Work Progress Administration (WPA); within the context of different venues such as sacred spaces, theaters, courtrooms, and other public spaces.

The conservator’s privileged access to the murals offers an interesting perspective; not only can we experience the murals tangibly and at close range, we have a special entrée to their history and personality from research, testing, and analysis of the materials.

The Museum of Contemporary Art, Oaxaca: the Conservation of a Historic 18th-Century Building

Víctor Pérez Cruz, Francisco Covarrubias Salazar, Rafael Torres Vállez and Véa De La Cruz Báltazar, Cuerpo Académico de Restauración y Tecnología. Facultad de Arquitectura “5 de mayo” de la Universidad “Benito Juárez” de Oaxaca, Mexico

When building projects involving historic structures are undertaken, the functional requirements of the building coupled with conservation concerns sometimes results in decisions that greatly modify the original architecture. The Museum of Contemporary Art (MACO) is housed in a state-owned, two-story, 18th-century building located in downtown Oaxaca, Mexico. Similar to many of the important civil and religious buildings in the city, it is made of green stone, adobe, wood, and bricks.

Throughout its life, the building has suffered damage, mainly due to earthquakes. During the 1970s some changes to the building were made with the goal of conserving the historic structure while adapting it for use as an art museum. Overall the building’s architectural integrity was respected; however, the structure was fortified with lightweight, pre-cast concrete slab (Siporex). In 2009, it was discovered that much of the wood was infested by beetles. Because of this newly detected damage, and also because of the expanding needs of the museum, a second building project was undertaken. Due to the new activities programmed for the museum, one of the goals of this project was to create floors capable of supporting 450 kg/m2. An expressed request of the artists who manage the museum in commodatum was to replace the traditional brick parapet with glass panels. Both modifications are being made, and, as we write, the building project is being completed. The traditional wood beams and bricks are now only decorative. Pre-cast concrete (Novalosa) has been used to fortify the structure of the building, and the brick of the parapet has been replaced by free-standing glass.

There are concerns among the local conservation community that these changes to the building will further compromise its structural stability. One specific concern is that the original adobe walls will not be able to support the new concrete slabs. This issue is further complicated by the risk of seismic activity, which is common in Oaxaca. Additionally, removing the traditional parapet not only leaves the columns unconnected and less stable but also eliminates a characteristic feature of 17th- to 19th-century Oaxacan architecture.
**Nature’s First Green is Gold: a Collaborative Analysis of a Lost Frank Lloyd Wright Wisteria Mosaic**

*Dr. Corina E. Rogge, Assistant Professor, Patrick Ravines, Director and Associate professor, and Jonathan Thornton, Professor of Objects Conservation, Art Conservation Department, Buffalo State College; and Peter Bush*

Frank Lloyd Wright (1867–1959), one of America’s premier architects, designed and built the Darwin Martin House Complex, an exemplar of prairie style architecture, in Buffalo, New York (1903–1905). The focal point of the main house was a glass mosaic depicting wisteria vines that surrounded the central fireplace. The mosaic was likely a collaborative effort: designed by Blanche Ostertag, an illustrator, and made by the Giannini & Hilgart Studio, a Chicago art glass firm. Unfortunately, during the years the Martin House sat vacant the wisteria mosaic was destroyed and the tesserae dispersed; only a few were recovered from the fire grate. Luckily, the extant samples represent the five types of mosaic glass used by Giannini: (1) clear backing glass upon which the decorative mosaic was pre-assembled and which was then itself adhered to the wall, (2) gilded field tiles of amber glass, (3) gilded blossoms of amber glass, (4) brown branches, and (5) green leaves with a crackled gold pattern. This crackled gold surface was created by an unknown method that Giannini attempted to patent in 1904. As part of a renovation campaign undertaken by the Martin House Restoration Corporation, the art glass mosaic will be recreated. To help this restoration effort, a collaborative team of scientists and conservators from Buffalo State College and the University at Buffalo volunteered their time, instrumentation, and expertise to analyze the tesserae and mortar to determine the means of mosaic manufacture, gain insight into the glass composition and determine how the crackled gold pattern of the leaves was created. These results have helped guide efforts to duplicate the crackled gold surface and will be used by the glass artists who will recapture, as Robert Frost would say, this “hardest hue to hold.”

**New Uses of NDE Techniques Including Surface Penetrating Radar (SPR) and Infrared Thermography (IRT) for the Investigation of Earthen Structures**

*Charles Branasby-Zachary and Avigail A Charnov, GB Geotechniques USA Inc.*

Obtaining accurate information for historically important buildings is a critical step prior to developing the remedial/restoration strategy. Buildings constructed of earth are a major part of the built environment. Preservation of earthen structures and a better understanding of how they should be maintained or repaired is critical.

Adobe construction is typically load-bearing, with unfired mud bricks with limited structural strength, and very thick walls. This can be misleading, especially when the adobe material is hidden behind stucco or interior plastered finishes and can be deteriorated both at the outer extremities and within the heart of the wall. Another factor for consideration is hidden openings, which may have been covered by new coats of plaster or stucco or may remain open within the wall, reducing its overall structural capacity.

Traditionally, assessing adobe buildings has been traumatic, necessitating probes into the fabric to provide a structural assessment. This damages the historic fabric, disrupts the building occupants, and provides information only where exposure has been made.

Case studies of innovative and combined uses of non-destructive evaluation (NDE) techniques have provided a wealth of knowledge of adobe structures with minimum disruption. Information capture includes construction arrangement, hidden openings, framing, embedded timbers, voiding/delamination extent within the adobe walls, retained moisture, voiding behind surface plaster, and moisture routes through the site and walls.

The data allows a focused repair strategy to be developed, determines future maintenance requirement, documents and records the current structure and provides a better understanding of the building’s history.

**Preservation of Outdoor Public Murals: Research and Public Outreach**

*Amanda Norbutus, Biggs-Davis Fellow, Art Conservation Department, University of Delaware*

Public murals are one of the most visible forms of art in the United States, but their extreme visibility is the cause of their greatest vulnerability. Public murals have become part of the cultural history of the United States, documenting changes in the social and political ethos, and providing outreach and recognition to underrepresented youths and cultures. Initially, most murals were painted in urban neighborhoods with inexpensive materials; the muralists made up their techniques as they went along. Even today, there is little formal training or published consensus regarding the ideal preparation of the supporting surface, drying times between coats of paint, or what coatings may help prevent or mitigate damage. Throughout this century, muralists have incorporated modern materials, adapted traditional techniques, and applied them to outdoor murals. This has resulted in many poorly-crafted murals that fade or flake years before their importance as the defining image for a community diminished.

Both the materials and the meaning of public, community-driven art from each era should be preserved. Rescue Public Murals (RPM), a branch of the Heritage Preservation/National Institute for Conservation, was established in 2006 with an interdisciplinary advisory board to address these problems and to become a source of information for muralists, mural programs, conservators, and art historians. RPM has established programs to save dying murals either in situ or in memoriam. RPM’s photodocumentation of all existing murals is an important tool for the preservation of the image and the meaning of public murals, especially as the actual works are disappearing. In order to save public murals physically, muralists need to paint with...
Research and Practical Solutions. Two Examples of Intervention: The Restoration of Teatro Colon Mosaics and National Congress Encaustic Tiles

Alicia Fernandez Boan, Conservacion Edificia, Buenos Aires, Argentina

The proposed restoration of the Colon Theater mosaics began with a historical consideration: The necessity to distinguish various types of mosaics is not new, we often make the difference between artisanal and industrial mosaics, that is to say small pieces of glass or marble hand cut and held in a fresh bed of mortar (as medieval ones), and 19th century’s industrial ones. Indeed these modern mosaics are a mixture of industrial processes and hand finish. The first part of the process is a high temperature ceramic bar or tablet three inches in length; in location the floor is hand finished, the bars are cut in small irregular pieces using a “tagliolo” and are mounted one-by-one on a fresh mortar copying various designs, very much like a giant jigsaw (puzzle). That is to say that the industrial process ends at the factory that provides the ceramic bars.

We began with the research of the industrial process, in order to replicate the missing or irrecoverable parts. This determined that the material was close to Limoges porcelain. Several proofs demonstrated that the material was porcellanic gres, very close to porcelain but baked at less temperature. The ranges varied in between 1120 and 1230 degrees centigrade depending on the different colors to get. To provide the best results and after different proofs we imported porcelain paste from Stoke on Trent, UK. It was this artisanal imprint the first date of complexity to fill missing parts, we had to adjust forms, subtle ranges in joints width, rhythms of the shapes, being no design the same of the other. The final results are very good not only for recovering handcrafts, but for the local production of this material in Argentina for the first time.

The project of the National Congress encaustic tiles restoration began with the research of the original production technique. During the construction of the Palace of Congress there were no local production of ceramic tiles, being the main suppliers the British firms Minton Ltd (1868–1818), successor to Herbert Milton & Co., Craves Dunnil & Co, etc, and can also mention Sand & Co. Feignies France, or the German Villerroy & Boch Mettlach.

The method of using clay powder coverage was incorporated by William Boulton from 1863, along with other technical improvements, such as the use of perforated copper plates with the design chosen, adjustments to the guide pins, and so on. These technical developments allowed more varied designs and faster drying. Finally, the twentieth century developed the mechanization of production.

Several tests and analysis were made in order to determine original materials, like x-ray diffraction and SEM, Scanning Electron Microprobe.

Proposal for the manufacture of replacement materials: It is a restoration principle for replacement parts to admit a slight difference with the original material, but not a decline in quality. Due to costs, production times and technical problems we changed the original artisanal encaustics graffito for the modern printing techniques. The minimum thickness of the surface decorated ceramics currently used is related to the increased hardness and abrasion resistance of new materials and techniques available. Thus, the sample obtained with porcelain base and screen printing with ceramic enamels achieves a superficial abrasion on the scale 4 PEI (Porcelain & Enamel Institute, USA-4 on a scale of 1 to 5 strength). The porcelain base reduces the absorption to zero. Both parameters are optimal, comparable to those of the original tiles in resistance to traffic and durability of the decorated surface.

Shared Heritage: Conservation of the Rosario’s Built Heritage

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The conservation of cultural heritage has become an issue that goes beyond conservation itself and involves professionals from different disciplines. Furthermore, a sustainable management needs to be based in a conservation process that integrates the community that had value the goods in the first place.
From this perspective, the aim of this paper is to reflect the experience that the Municipal Program of Preservation and Restoration of Architectural and Urban Heritage implemented in Rosario city regarding the protection and conservation of the architectural heritage, mentioned ahead. In Rosario, architectural heritage has a leading role shaping the urban landscape as the urban memory laid on it and has become a main factor in the city's transformation. In this context, different actions have been defined to address conservation in an integrated way:

Public management and conservation through re-use.

The first public actions regarding the conservation of built heritage were supported by the revalue, re-use and enhancement of city’s landmarks and become local government administrative offices.

Urban Code: indirect and direct protection of property.

The indirect protection refers to urban code’s regulations (2008) that define the way the city is built. They try to discourage indiscriminate substitution by the use of urban indicators such as the height control of the new construction in heritage areas. The Historic Protected Areas proposed complement the above regulations by adding direct goods’ protection. The goods’ intervention level is based on the protection levels introduced by the inventory.

Disclosure strategies and citizens’ participation. Disclosure is an instrument that permits the average person to get acquainted with heritage becoming the starting point of the process. The following disclosure strategies of the protection instruments intend to involve the average person in heritage conservation are under construction:

• Urban rides. Cultural routes related to the heritage property that originates the HPA.

• Consensus Heritage Project which permits the active participation of the average person in the appraisal of heritage and in the local inventory construction.

Traditional Decorative Painting Materials

John Canning, President, John Canning Painting and Conservation Studios

Traditional decorative painting materials are still being used today for restoration and reinstatement of historic work, and for the creation of new work. The most basic material is oil paint made from four constituents: pigment, binder, thinner and drier. The purpose of each will be discussed along with examples of traditionally used products, i.e. raw linseed oil, pure gum turpentine, Japan drier, and earth pigments. Distemper paints will be presented in the same fashion referencing traditional binders such as rabbit-skin glue, eggs, and beer.

The seven comprehensive steps to wood graining will be illustrated: priming, ground color, water stain and flobbling, oil base graining, water stain & mottling, varnishing, and waxing, A live wood graining demonstration will be performed.

Traditional gilding materials, tools, and techniques will be presented along with examples of failed systems.

Stenciling and striping materials, tools, and techniques will be illustrated.

Usonian Frank Lloyd Wright: An Evaluation of Coating Products and Surface Treatments for the Exterior Wood of the Pope-Leighey House

Pamela Kirschner, National Preservation Programs Specialist, Preservation Programs Department, National Archives and Records Administration; and Andrew Fearon, Architectural Conservator, Milner and Carr Conservation

Loren Pope requested a house design like the Herbert Jacobs House, often referred to as Frank Lloyd Wright’s first Usonian House. Frank Lloyd Wright responded within two weeks saying “Of course I am ready to give you a house...” and it was constructed in 1941 in Falls Church, Virginia. Five years later the Popes sold it to the Leighneys who lived there until 1964 when it was threatened with the construction of Route 66. Mrs. Leighney asked the National Trust for Historic Preservation to help her save the house signing a contract to allow it to eventually become a public site. The Pope-Leighey House was then moved to the grounds of the Woodlawn Plantation in Alexandria, Virginia.

In 2011, a collaborative study was conducted with funding through a Save America’s Treasures grant to determine an appropriate exterior protective coating for the National Trust for Historic Preservation owned property, the Pope-Leighey House designed by Frank Lloyd Wright in 1939. Wooden Artifacts Conservator, Pamela Kirschner and Architectural Conservator, Andrew Fearon, combined efforts to perform an investigation of documentary sources, analysis of physical evidence, and examination of related Usonian house examples. Written documentation, letters and original photographs were researched in the National Trust Archives and the Frank Lloyd Wright Archives at Taliesin West to assist in understanding the materials used.

Several exterior coating products were evaluated for the reintegration and retention of the original cypress siding. In situ and external test panels were monitored with the intention to yield a program that is minimally invasive while promoting the greatest longevity of original materials. Volatile Organic Compound (VOC) content, retreatability, ease of implementation, and sensitivity to the original intent were included in a series of guiding criteria for selection.

The historic material research and coatings evaluation together provides further understanding of Frank Lloyd Wright’s intent for exterior wood while offering new solutions for the proper care and maintenance of related examples.