AN INTERIOR CONDITIONS ASSESSMENT OF MISSION SAN JOSÉ DE TUMACÁCORI

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INTRODUCTION
The oldest mission site in Arizona, San José de Tumacacori was established by the Jesuit padre Eusebio Kino as part of a 75-mile chain of missions through the Pimería Alta (the area of modern day southern Arizona and northern Sonora, Mexico). In 1908, the mission complex, with exulant Franciscan church, was among the first heritage sites to be designated a National Monument by Theodore Roosevelt under the Antiquities Act.

Soon after its inception, the National Park Service (NPS) assumed stewardship of the mission, assigning as custodian the famed early preservationist Frank "Buck" Phelan, who immediately took intractable action to the historic ruins. Over the subsequent decades under NPS supervision, the mission church at Tumacacori underwent various phases of reconstruction and repair, functioning in essence as a laboratory for testing preservation methods and materials. As a consequence, the church structure embodies in microcosm the evolution of NPS preservation theory and action over the past century.

The history of preservation at Tumacacori must necessarily inform all modern conservation efforts. Assessment and documentation of the condition of the mission church, in response to both natural forces of deterioration and mechanical responses to falling preservation techniques, is thus integral to the adaptive, cyclical maintenance of the adobe structure.

This project was jointly conceived and executed by the NPS and the Drachman Institute at the University of Arizona to aid the Tumacacori National Historical Park in preparing and archiving a record of conditions and treatments in order to evaluate the performance of past treatments, monitor change, and prepare appropriate future treatment plans. Additionally, by connecting technically trained graduate students with the preservation specialists at Tumacacori, the collaboration sought to address the critical lack of training opportunities in Southern Arizona for students to engage in the preparatory documentation integral to adobe treatment and maintenance.

“The history of preservation at Tumacacori offers insights into the development of historic preservation in the southwestern United States. The types of materials used, application techniques, and preservation philosophies all changed over time. These, and the preservation successes and failures, result in the church we see today. By studying the success or failure of different treatments at Tumacacori we gain the perspective of nearly 100 years of experimentation in preservation methods.” Jeremy Moss, "Of Adobe, Lime and Cement"

METHODOLOGY
The project employed four graduate students with backgrounds in archaeology, heritage conservation, engineering and landscape architecture under the direction of the Agreements Technical Representative (ATR), Alex Lim, who serves as the architectural conservator and exhibits specialist at Tumacacori National Historical Park.

In preparation for the interior condition assessment, the investigators established and defined a list of conditions expected to be present at Tumacacori Mission Church (listed above), referencing the ICOMOS Glossary on Stone Deterioration Patterns (ICOMOS 2000), comparable analyses undertaken at the Spruce Tree House site (Lim 2010), and the expertise of ATR, Alex Lim.

Prior to the initiation of this project, laser scanner and photogrammetry documentation conducted by the NPS Southern Arizona Office (SOAR) was completed of the interior of the mission church, resulting in the creation of orthophotographic images of the interior surface (Degner et al. 2014). These photographs were utilized as the base images upon which condition documentation took place. Each photo tile produced by SOAR represented approximately 50 sq. ft. of wall space, subdividing the long nave walls into a seven by four grid of irregularly shaped photo tiles and a one by three grid for the choir loft and sanctuary.

For the field documentation, the SOAR photo tiles were stitched together in Adobe Photoshop to create composite base images of each interior wall of the nave and sanctuary. The conditions assessments were then scanned and keyed into place over the composite base images (pictured above). These data were imported into AutoCAD for digital rendering, and subsequently adjusted in Adobe Illustrator for legibility.

PRODUCTS AND RESULTS
The results of the interior conditions assessment of Mission San José de Tumacacori yielded:

Legend
Interior Walls Condition Maps (pictured right)

These include a set of interactive maps of the interior walls of the church demonstrating the presence of various sets of conditions. The maps consist of black and white orthophotographic background images onto which CAD layers indicating various surface conditions are applied.

Illustrated Conditions Glossary (see attached)

The Illustrated Conditions Glossary describes and defines each condition recorded and provides an image demonstrating the feature as it appears both on the physical walls of the mission church and as it is represented on the final map.

Historic Graffiti Photographic Documentation
All historic graffiti was documented with photographs keyed to the digital maps for easy reference. An Excel database was formulated to record all legible information ascertained from the historic present in the nave and sanctuary.

CONCLUSIONS
While in general the interior condition of the mission church is highly stable, with few observable threats either from age and weathering, the effects of previous incompatability or falling preservation techniques represent the most pervasive concern in the continuing conservation of Mission San José de Tumacacori.

Between the 1940s and 1970s, stabilization attempts using synthetic spray-on preservatives were applied to the plaster. Small nails and bolts were inserted at areas of failure in an attempt to keep the plaster pinned to the substrate. The walls of Tumacacori give an unavoidable account of these methods, which impacted the historic integrity and continue to cause damage to the plaster. In this assessment, plaster detachment in areas was noted, resulting in subsurface voids, evidenced by a hollow sound when tapped and areas of significant bulging and cracking.

About 70% of the interior adobe bricks are original, however stabilization and restoration was performed where moisture wicking up into the walls through capillary action had resulted in severe salt scaling. The bricks used for these repairs were stabilized adobe and are discernible from the original fabric by their lighter color and longer, more regular form. Along the joints where the stabilized adobe repairs meet the original fabric, the historic adobe exhibited a distinct discoloration along with stone disintegration (characterized by the softness of the brick and extent to which the material crumbled when lightly touched). This discoloration and disintegration (pictured left) are seemingly indicative of a previous or current moisture issue where the historic and modernized fabrics meet. Consequently these areas require important areas of consideration in the continued maintenance and conservation of the mission church, potentially opposing ongoing areas of incompatible repair.

While current preservation strategies at Tumacacori focus on the use of traditional building methods and materials, the identification and understanding of previous preservation theories and techniques is an integral part of the conservation plan. The interior conditions assessment represents a partial preservation history and schematic for future monitoring and intervention.

References Cited

