APTI CONFERENCE 2016 - SAN ANTONIO
Preserving Heritage with Tomorrow’s Technology
Vernacular Heritage: Honoring the Ordinary
CS 5.2 – Adobe
November 1, 2016 – 1:15-2:45

Session Chair: Nicky DeFreece Emery

Order of Speakers: Abstracts and outlines for each are included below.
- Characterization and Comparative Analysis of Earthen Plasters from the American Southwest
- Historic Preservation, Self-Determination, and the Cultural Resiliency of Traditional Pueblo Villages
- Last Chance Saloon? Attempts to Conserve Cement-mortared Adobe Walls in Marfa, TX

Learning Objectives:
1) Understand the characteristics of traditional and modern earthen materials and construction techniques.
2) Identify techniques used to characterize and analyze earthen materials.
3) Develop an understanding of traditional and new conservation methods for the treatment of earthen materials.
4) Gain an understanding of approaches to preservation when end users or owners wish to interpret traditional building materials in ways that challenge typical preservation philosophy.

CHARACTERIZATION AND COMPARATIVE ANALYSIS OF EARTHEN PLASTERS FROM THE AMERICAN SOUTHWEST
Presenter: Douglas Porter
Co-presenters: Angelyn Bass, Michael Spilde

ABSTRACT:

The Pueblo people of the southwestern United States have traditionally used earthen materials for building and architectural embellishment. Structures over a thousand years old built and decorated with earth are likely to have been constructed using some of the same materials and practices still in use today. This paper focuses on the characterization of ancient earthen plasters/renders at three Puebloan sites associated with the Sinagua, Cedar Mesa, and Hohokam peoples. The sites include a defensive, multi-room alcove structure at Montezuma Castle (AZ); a kiva used for textile production at Bare Ladder Ruin in Natural Bridges National Monument (UT); and a multi-story puddled earth structure, possibly intended for ceremonial use, at Casa Grande National Monument (AZ). Primary periods of occupation were between the 11th and 14th centuries. In addition to presenting the results of plaster characterization at each of the sites, this paper will discuss the analytical techniques used to examine small samples, the range of results that can be obtained, and evaluate the benefits / limitations associated with each.

Earthen plasters and mortars were used extensively in the construction of ancient southwestern masonry architecture, including for leveling and finishing walls; as the closing courses for embedded roof frame elements; for pointing unit masonry in the margins at the tops of walls and around niches and recesses; as chinking between primary vigas pairs used in roof construction; as multi-coat floor surfaces; as a final finish for roofs; as colored washes; and as a ground for incised and painted embellishments. Though these plasters differ in terms of material components and the contexts in which they were used, they share characteristics that provide clues as to how materials were selected, processed, and applied.

Analysis of plasters and mortars typically requires combining petrographic analysis with aggregate characterization following acid digestion of binder constituents in a bulk sample (ASTM C 1324-05). Aggregate characterization includes determination of aggregate type and proportion, particle morphology, size distribution, mineralogy, chemical reactivity, and source. Obtaining bulk samples of ancient building materials is often impossible. Combining microscopy with computer-assisted image analysis allows for a fairly detailed characterization of ancient plasters and mortars based on relatively small samples. In these circumstances, image analysis of photomicrographs can yield important information on volumetric proportions of aggregates, matrix, void space, grain size and pore distribution, and particle morphology.

In these Ancestral Pueblo sites, sample sizes were small to limit impacts on integrity. Analysis made maximum use of optical microscopy, x-ray diffraction, SEM/EDS, and image analysis, and included investigation of multi-coat plaster systems; application methods; clay mineralogy, soluble salts, and other components; physical characteristics affecting performance; deterioration conditions; surface accretions (soot and biological growth), and surface embellishment.

OUTLINE

1) CONTEXT: EARTHEN PLASTERS IN PREHISTORIC SITES OF THE SOUTHWEST
   a) Wall plasters
      i) Dado plasters
      ii) Margin plasters
      iii) Closing courses
   b) Floor plasters
   c) Roof plasters
2) MONTEZUMA CASTLE / AZ (Sinagua)
   a) Building construction, characterizing architectural features, and use
   b) Plaster description
   c) Distinctive plaster features and materials
3) BARE LADDER RUIN / UT (Cedar Mesa)
   a) Building construction, characterizing architectural features, and use
   b) Plaster description
   c) Distinctive plaster features and materials
4) CASA GRANDE / AZ (Hohokam)
   a) Building construction, characterizing architectural features, and use
   b) Plaster description
   c) Distinctive plaster features and materials
5) ANALYTICAL METHODS
   a) XRD and characterization of clay minerals / soluble salts
   b) Characterization of gross features using optical microscopy
   c) SEM: porosity, binder / aggregate fractions, deterioration mechanisms
HISTORIC PRESERVATION, SELF-DETERMINATION, AND THE CULTURAL RESILIENCY OF TRADITIONAL PUEBLO VILLAGES
Presenter: Shawn P. Evans, AIA

ABSTRACT:

The living cultures of the Pueblo tribes of the American southwest maintain the oldest traditions of architecture in the United States. Many of the villages have been in their current locations since time immemorial, with several known to have been occupied for more than 1,000 years. The homes have undergone countless cycles of growth, contraction, and alteration. Maintenance of their earthen and walls and roofs was woven into the tribal traditions, and the homes were understood to be of the living earth. When a structure outlived its usefulness, it returned to the earth and was built anew. Over the last half-century two distinct changes in place and material have had a significant impact on the use and condition of the traditional adobe homes - the provision of HUD housing and the application of Portland cement, which have resulted in increasing deterioration and abandonment. Advances in self-determination policy have recently enabled the Pueblos to develop plans to renew their historic villages according to their own heritage values. Some Pueblos are renowned for resistance to change, while other view preservation with great skepticism. What most tribes seek is revitalization, not "preservation" as defined by the federal government. Most seek to extend the palpability of the past, but many are just as, if not more, interested in meeting the needs of modern life in these ancient places. This paper summarizes the results of a two-year study of the physical conditions and place-based revitalization approaches of the Pueblos, as well as the completion of a decade-long preservation planning and rehabilitation project at Ohkay Owingeh. Seen through the lenses of "traditional cultural place" and values-based preservation approaches, these various (and conflicting) responses to the dilemmas of preserving a vernacular tradition of impermanent materials have much to teach the outside world.

OUTLINE:

1) Introduction
   a) Traditional Cultural Place
   b) 21 Pueblo tribes in NM, AZ, and TX
2) The Problem
   a) Mounting need for investment
   b) Causes of deterioration – Portland cement and HUD policies
   c) HUD funding triggers Section 106 review
3) Challenges of Indigenous Views and Preservation Standards
   a) Secretary of Interior’s Standards
   b) Period of Significance
   c) Intangible Preservation
   d) Authenticity
   e) Challenge of “outstanding universal value”
4) Case Study: Owe’neh Bupingeh Preservation Project at Ohkay Owingeh, NM
   a) Overview of conditions in 2006
   b) Intergenerational involvement – youth mapping, elder oral histories
   c) Self-Determined Treatment Approach
   d) Programmatic Agreement with “Traditional Cultural Place” as foundation
   e) Results
5) Broader Pueblo Context
6) Beyond the “Reservation”
LAST CHANCE SALOON? ATTEMPTS TO CONSERVE CEMENT-MORTARED ADOBE WALLS IN MARFA, TX

Presenter: John Fidler
Co-presenter: Anne Oliver

ABSTRACT:

The late minimalist artist, Donald Judd (1928-1994), established his Texas home, artwork studios and exhibition spaces in former military buildings and a railroad warehouse in Marfa in the 1980s. There, he built high boundary walls around some of his properties using salvaged and new adobe blocks. But the adobe blocks were erected with cement-based mortar and they have now differentially weathered to a point where structural stability could soon be jeopardized. Ironically, however, the adobe’s preferential decay next to the cement joints has created an aesthetic not dissimilar to Judd’s famous and very valuable artwork. Therefore, on behalf of the Judd Foundation, the authors were tasked by engineers, Simpson Gumpertz and Heger Inc., to devise remedial treatments based upon pioneering preservation and restoration techniques. Various technologies were deployed ranging from the latest elastomeric consolidants to acrylic latex and other amended adobe plasters, the latter based on experience gleaned from the 1985 adobe treatment trials at Fort Selden, NM (executed by the Getty Conservation Institute in association with the Museum of New Mexico). The authors will describe the decay processes involved and will explain the various treatment trials that were deployed in association with master adobero, Pat Taylor. Many months of monitoring have now ensued and the authors can report on the most promising treatments for what is seen by most authorities in the field as a most intractable problem: surely the "Last Chance Saloon" for Judd’s adobe walls.

OUTLINE:

1) GENERAL INTRODUCTION
   a) Who, what, why, when and how of the project will be described
   b) CEU Learning Objectives
2) BACKGROUND AND HISTORY
   a) Location of Marfa, Texas and its historical development and decline
   b) Brief introduction to the internationally renowned artist, Donald Judd, his patrons and art forms, including adaptive reuse of existing buildings in and around Marfa, TX.
   c) Description of Judd’s adobe walls at La Mansana de Chinati (known as the Block) and other sites in and around Marfa, including general outline of the materials and structural deterioration and risks.
3) OPENING STANCE, PROJECT OBJECTIVES AND CONSERVATION STRATEGY
   a) Recognizing bad practice: incompatible materials
   b) Client’s desires and preservation philosophy
   c) Plan of Work
4) CONDITION ASSESSMENT
   a) Cave-like decay mapping by others
   b) Materials analysis
   c) Survey techniques for deterioration mapping and timescales; rates of deterioration (including accelerated deterioration of an unprotected mockup wall).
5) REVIEW OF ADOBE TREATMENT OPTIONS
   a) Review of Southwest adobe stabilization test sites (a) Fort Selden, NM and (b) Fort Davis, TX.
6) CONSERVATION WORK
   a) Winter Garden test wall
   b) Rationalization and Consolidation
c) Patch Repair Trials & Mockup wall  
    d) Emergency buttressing and contingency plans for wall supports  

7) MONITORING TREATMENTS  
8) INTERIM CONCLUSIONS AND FUTURE PLANS