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***“TICRAT” International Workshops: 26 Years  
Disseminating Sustainable Traditional Techniques  
for the Conservation of Earthen Architecture***

***Talleres Internacionales “TICRAT”: 26 Años  
Divulgando Técnicas Tradicionales Sostenibles para  
la Conservación de la Arquitectura de Tierra***

***Oficinas Internacionais “TICRAT”: 26 Anos a  
Disseminar Técnicas Tradicionais Sustentáveis para  
a Conservação da Arquitectura de Terra***

**Abstract | Resumen | Resumo**

The building traditions of the Southwest United States and Northern Mexico have been successfully passed on from generation to generation, but have recently been threatened by the development of new, modern materials and technologies, as well as an undervaluing of traditional earthen building materials and a loss of knowledge in the use of these historic techniques. The Taller Internacional de Conservación y Restauración de Arquitectura de Tierra (TICRAT) was created to disseminate these techniques, mainly lime and adobe, and at least slow down the ongoing loss of knowledge. This international workshop gave rise to a collective participatory program promoting practical and theoretical knowledge on the best techniques to be applied both in modest vernacular and larger restoration projects. These workshops soon spread to many rural communities and urban centers in this region.

Las tradiciones constructivas del suroeste de los Estados Unidos y el norte de México han podido ser transmitidas de generación en generación, pero recientemente se han visto amenazadas por el desarrollo de nuevos materiales y tecnologías modernas, así como por la infravaloración de los materiales de la construcción tradicional con tierra y la pérdida de conocimiento en el uso de estas técnicas históricas. El Taller Internacional de Conservación y Restauración de Arquitectura de Tierra (TICRAT) fue creado para difundir estas técnicas, principalmente las de la cal y el adobe y, al menos, frenar la continua pérdida de conocimiento. Este taller internacional generó un programa participativo colectivo para estimular los conocimientos prácticos y teóricos sobre las mejores técnicas a utilizar tanto en proyectos modestos de arquitectura vernácula como en obras de restauración de mayor envergadura. Estos talleres pronto se extendieron a muchas comunidades rurales y centros urbanos de esta región.

As tradições de construção do Sudoeste dos Estados Unidos e do Norte do México foram capazes de transcender-se ao longo das gerações, mas foram recentemente ameaçadas pelo desenvolvimento de materiais e tecnologias novas e modernas, bem como por uma subvalorização dos materiais tradicionais de construção em terra, e pela perda de conhecimento da utilização destas técnicas históricas. A Taller Internacional de Conservación y Restauración de Arquitectura de Tierra (TICRAT) foi criada para divulgar estas técnicas, principalmente a cal e o adobe, e tentar abrandar a contínua perda de conhecimento. Esta oficina internacional gerou um programa colectivo de participação para promover conhecimentos práticos e teóricos das melhores técnicas a serem aplicadas tanto em projectos vernaculares modestos como em projectos de restauração de maior envergadura. Estas oficinas espalharam-se rapidamente por muitas comunidades rurais e centros urbanos desta região.

## Introduction

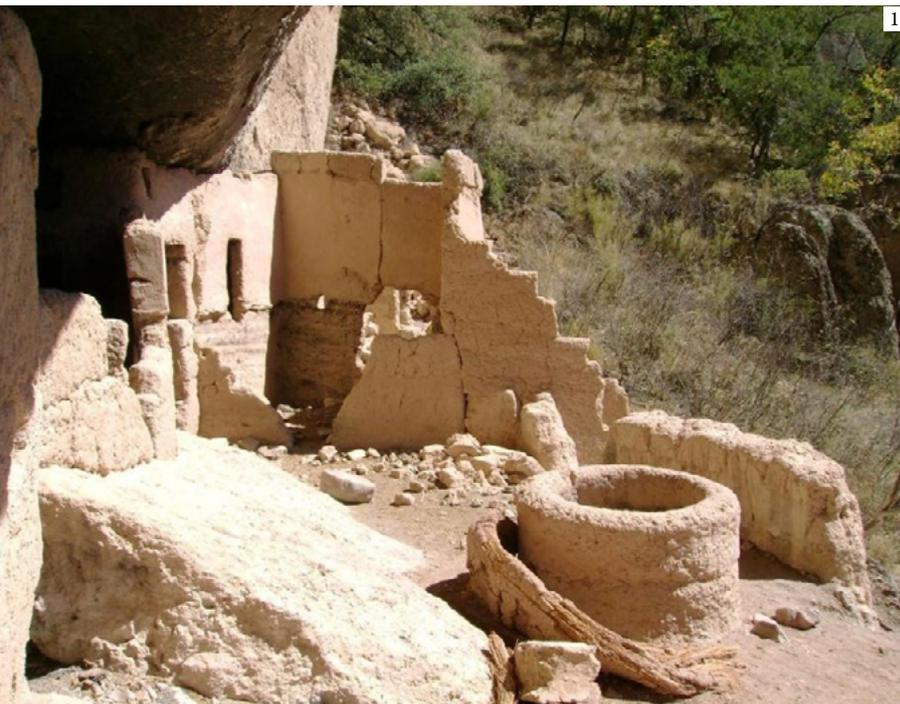
Earthen Architecture is a shared cultural resource and tradition in the Southwest United States and Northern Mexico. Archeological sites and indigenous living communities serve as testament to the early molding of earth, which was tailored for centuries to the needs and functions of the people who inhabited this area. Its durability shows that it is extraordinarily adaptable in this harsh arid region. The tradition has been successfully passed on from generation to generation, but has recently been threatened by the development of new, modern materials and technologies, as well as an undervaluing of traditional earthen building materials, and a loss of knowledge in the use of these historic techniques.

The Southwest United States and Northern Mexico share many cultural ties. Among these are the present-day indigenous cultures that extend throughout the territory and their use of “puddled earth”. This material was used to build most of their housing and ceremonial centers. The present indigenous peoples continue to build using local earth and stone. The early Europeans, along with their Tlaxcala Indian allies, introduced the Central Mexico Pre-Hispanic mud brick and its building technology to this region. This would allow more time for the indigenous people to grow their local crops while their adobes were set to dry. This simple yet innovative method of construction was of tremendous benefit to the local population. The local use of “puddled earth” was soon abandoned and the use of adobe soon became the common denominator along the Camino Real de Tierra Adentro, leading from Mexico City to Santa Fe, New Mexico.

The historical knowledge of earthen methodologies was lost on both sides of the border, with different causes and effects. In the United States, a rapid transformation, the introduction of new materials such as Portland Cement and steel, and the extensive construction of sawmills throughout the Southwest, were some of the major causes of this transition. In Mexico the changes had a similar effect, but these newer materials were adopted more gradually, in some cases introduced by the Americans through the northern Mexican border. However, these changes and these materials are now highly relevant to the safeguarding of these traditional building technologies and historic structures in both areas.

1: Las Rancherías Cliff Dwellings in the State of Chihuahua, depicting the traditional earth construction. Site visit by TICRAT members (Francisco Uviña-Contreras, 2007)

2: Making adobes during a workshop at Quinta Carolina, Chihuahua (Luis Fernando Guerrero Baca, 2010)



## The TICRAT workshops

In the mid-1990's, through a Mexican initiative from the Instituto Nacional de Antropología e Historia (INAH), the Seminario Internacional de Conservación y Restauración de Arquitectura de Tierra (SICRAT) was created to disseminate these techniques and at least slow down the ongoing loss of knowledge. A series of seminars followed, where the U.S. National Park Service (NPS), non-profit organizations, institutions of higher learning, and local and state agencies became supporters and collaborators. The SICRAT soon developed into an interdisciplinary workshop, the *Taller Internacional de Conservación y Restauración de Arquitectura de Tierra* (TICRAT). This international workshop gave rise to a collective participatory program to promote practical and theoretical knowledge on the best techniques to be applied both in modest vernacular and larger restoration projects. It was developed with the idea that it is better to teach and learn alongside local masons and members of the community in order to transfer these traditional building technologies, rather than discussing these issues with professionals who in some cases understood and worked with these materials more in theory than in practice.

These workshops soon spread to many rural communities and urban centers in the Southwest United States and Northern Mexico. States such as New Mexico, Arizona and Texas, in the US, and Chihuahua, Sonora, Baja California Norte, Coahuila, Zacatecas, Durango, Aguascalientes and Morelos, in Mexico, have hosted one or more of these workshops. This essay will present a brief history and the objectives of the TICRAT, and its many successful workshops in the US and Mexico. It will focus on recent projects, community participation, traditional technologies, innovative design, and restoration practices with the use of adobe and lime.

The first workshops established a structure and methodology for the subsequent events. Mornings were set aside for lectures, while the afternoons were mainly for hands-on work or the practical side of the community project or projects. The aim of the lectures was to disseminate the value of local traditional technologies throughout the region. Extensive knowledge was shared and absorbed while working in the vast number of communities on both sides of the border. Almost all presentations expanded on local building traditions and histories. They also included the transfer of restoration and conservation standards and norms to be followed while safeguarding their architectural or archeological cultural resources.

1: Reconstruction of an adobe wall in the community of Alamos, Sonora, Mexico, during a TICRAT (Luis Fernando Guerrero Baca, 2015)

2: Mud plastering and applying an earth roof on an adobe storage structure at the Coronado State Monument, New Mexico during the TICRAT (Luis Fernando Guerrero Baca, 2006)



The theory and treatment of earthen architecture sites, the identification of pathologies in earthen structures, their study and repairs, and the use of lime technologies are among the most important topics discussed during these workshops. Many sites and structures were selected for demonstrating the traditional technologies that have existed over the years, leaving an amazing trail of knowledge in many communities on both sides of the border.

These workshops require extensive planning and work done well in advance to prepare the space or building before the event, as well as to locate accommodation and usually a large space to meet for the morning lectures. In addition to financial resources, it requires a lot of time to promote a real collaboration with community members and local government. Once the site has been selected, a series of groups or modules are created in order to deal with each issue on the building or structure. The issues covered depend on the workshop, but the main topics are: basal repairs, adobe stitching (*injertos*), wall reconstruction and stabilization, the art of making adobes, soil composition and characteristics for adobes and mud plasters, lime technologies and their application, lime washes and lime pigments. A variety of earthen and lime technologies are applied on the buildings to demonstrate to community members, participants, and students the appropriate ways of repairing and maintaining these structures. The applied technologies include the construction and/or repairs of earth roofs, the application of compression roof layers made of lime, and traditional waterproofing techniques.

These waterproofing techniques are also based on traditional knowledge. The first step of this process, after placing a layer of earth several centimeters thick, is to apply a rough coat of lime. This layer is completed by applying a final polished coat of lime plaster. This is then followed by applying lye soap melted in water and, once the first coat of lye soap has dried, a coat of crushed alum boiled in water. Eight or more alternating coats of lye soap and hot alum are applied one after the other in this way.

The topics included in the workshop lectures and demonstrations include: value, theory, sustainability, contemporary use of the material, intergenerational transmission of information or dissemination, stabilization and recovery of lost knowledge, the applicability of these technologies, and the appreciation of these historic sites. The two countries share a rich history and knowledge, but cases are often handled differently because they do not have the same policies on historic preservation or understanding of the materials. Economics and social structures play

1: Community members and students from the Universities in the State of Chihuahua learning on the application of lime plasters on an adobe wall in the city of Hidalgo del Parral, Chihuahua (Luis Fernando Guerrero, 2011)

2: Student participant applying the final finished coat of lime plaster over the rough coat. Once dry, the lye soap and alum hot coats are applied. This was during a TICRAT in the State of Chihuahua (Luis Fernando Guerrero Baca, 2007)



an important role in how we promote and safeguard our historic cultural resources. In the United States, for example, adobe is highly valued and seen as a material for the well-to-do, and viewed in a less disparaging way; while in Mexico, unfortunately, it is considered a “poor” building material, which is often an obstacle to maintaining this building technology.

The SICRATs and TICRATs have now organized more than 40 seminars and workshops, which have been constantly evolving; this has allowed professionals and academics to construct a distinct pattern and methodology in the most recent ones. Some variations also exist, albeit minor ones, according to the chosen site and structure, and its needs and existing distances.

The workshops have produced important results over the years. The first and perhaps the most significant result lies in the very concept of conserving and restoring earthen structures, which is especially relevant to those who take care of these sites or monuments. The way these earthen structures are cared for has been enriched in the process, especially the knowledge of earth as a building material. These workshops have also greatly emphasized how valuable these building traditions are, and have communicated this message to the younger generations above all. It is very important to include children and youngsters in architecture and related disciplines, as they will be the preservationists and designers of our future urban and rural centers. It is also extremely important that knowledge be transmitted from generation to generation, and this continuity must be promoted by the institutions of higher learning.

### Conclusion and future initiatives

In spite of the rich architectural values of the building traditions of northern Mexico and the Southwest United State, most of their inheritors do not appreciate them and traditional methods are still often considered irrelevant in comparison to the monumental architecture in the region. Many of our urban centers have lost their sense of identity, since most of their traditional architecture has been abandoned and allowed to deteriorate. These workshops are therefore of immeasurable importance to many of our students, academics, professionals, and local community members. They not only promote the importance of this type of architecture, but also value the materials with which it is and can still be constructed.

The SICRAT and TICRAT initiatives have been around for over 26 years, and should be celebrated and recorded for future generations. In fact, the 25 years of these seminars and workshops were recently celebrated in Pecos National Historical Park, the town of Pecos and the community of Cañoncito del Apache, near Santa Fe, New Mexico. This successful event brought together participants from several regions in Mexico and the Southwest United States. It was a joint venture

1: One of the modules in the TICRAT held in Tumacacori National Historical Park (Luis Fernando Guerrero Baca, 2016)

2: Participants applying capping during the 2019 Pecos National Historical Park, New Mexico, TICRAT (Luis Fernando Guerrero Baca, 2019)



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with Vanishing Treasures, a National Park Service Program, Pecos National Historical Park, the Instituto Nacional de Antropología e Historia (INAH) of Mexico, Cornerstones Community Partnerships, the University of Arizona, and the University of New Mexico. This event was also the last major workshop, which occurred in 2018.

We are currently engaged in discussions to develop a series of webinar videos to promote these traditional technologies. Discussions with the University of Arizona, the University of New Mexico, the National Park Service and Cornerstones Community Partnerships are ongoing, and the team will continue to plan, and eventually bring in our Mexican partners and colleagues from INAH. This webinar will include site visits to archeological sites and will be used to develop a series of questions on the subject of plaster applications, in both countries. Soil composition, methods of application, amendments, and other considerations will also be included in the program. The goal of these webinars or zoom meetings is to eventually develop a series of test walls in Mexico and the Southwest United States.

In 2022, the TICRAT workshop will be presented prior to the Terra World Congress. The 2022 Terra World Congress is the thirteenth international conference organized by the earthen architecture community under the aegis of ICOMOS since 1972 and will be taking place in Santa Fe, New Mexico. These events will be used to provide training in the preservation of historic architecture to hundreds of specialists in the fields of conservation, anthropology, archaeology, architecture and engineering, scientific research, site management, and sustainable development of earthen architectural heritage. Besides the TICRAT workshop, the plan is to create a large exhibit and presentation during the Congress, as well as a publication. All the sites, participants and regions involved and all the technologies taught during these years will be included in the publication.

### **Biographies | Biografías | Biografias**

#### **Francisco Uviña Contreras**

He received his Master of Architecture and Master's Certificate in Preservation and Regionalism in 2009 from the University of New Mexico, where he graduated with distinction. Francisco worked for Cornerstones Community Partnerships, a non-for-profit organization, from 1994 to 2008, to assist with field assessments, documentation of historic buildings, adaptive re-use design and new design work utilizing traditional building methods as the Architectural/ Technical Manager. Francisco is the co-author and illustrator of Cornerstones' *Adobe Architecture, A Conservation Handbook*. Francisco currently serves as Director of the Historic Preservation and Regionalism Graduate Certificate Program at the School of Architecture and Planning at the University of New Mexico. He is also the coordinator for the "Patrimonio Histórico+Cultural Iberoamericano (PHI)" Network in the United States and a member of the Scientific Committee of the *Journal of Traditional Building, Architecture and Urbanism*.

#### **Luis Fernando Guerrero Baca**

Luis Fernando Guerrero Baca is an Architect and holds a Master of Architectural Restoration and a PhD in Heritage Preservation. He is a Professor and researcher and leads the Research Department of Built Heritage Conservation and Adaptive Reuse in the Universidad Autónoma Metropolitana Xochimilco, in Mexico City. He is the author of *Arquitectura de tierra en México* (UAM-Azcapotzalco, 1994), and the editor of *Patrimonio Construido con Tierra* (2007), *Reutilización del Patrimonio Edificado con Adobe* (2014), *Arquitectura de Tierra en América Latina* (2016) and *Bioconstrucción a detalle* (2019). Luis Fernando is a member of the PROTERRA Iberoamerican Network and of the "Earthen architecture, building cultures and sustainable development" UNESCO Chair.