



## The development of a conservation and rehabilitation plan (CRP) for the earthen Kasbah of Taourirt in southern Morocco

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### Abstract

The pre-Saharan valleys of southern Morocco are home to thousands of earthen *kasbahs*, or fortified earthen settlements, which are unfortunately being lost at an alarming rate. In 2011 the Getty Conservation Institute (GCI) collaborated with the *Centre de Conservation et de Réhabilitation du Patrimoine Architectural des Zones Atlasiques et Subatlasiques* (CERKAS) to develop a Conservation and Rehabilitation Plan (CRP) for one of the region's most significant earthen sites, Kasbah Taourirt in Ouarzazate. A registered national monument dating from the 16<sup>th</sup> century, Kasbah Taourirt was once a residence of the Glaoua Caid, who ruled the region in the 19<sup>th</sup> and early 20<sup>th</sup> centuries. Its richly decorated architecture and wall paintings represent Berber culture and include building types of high architectural, social and historical significance. The main objective of the project was to develop a methodology for preserving Kasbah Taourirt that addresses economic, social, cultural and technical challenges holistically and can serve as a model for similar sites in the region. The CRP sought to establish an appropriate conservation process that respects the original fabric, preserves local building traditions and promotes earthen architecture, develops appropriate participatory processes and builds local capacity. The project has been implemented in three phases: Phase one included the documentation of the entire earthen complex. Phase two encompassed the development of the conservation and rehabilitation plan, a process completed collaboratively with the community and Ouarzazate Municipality which considers the re-use of the whole ensemble and each of its sectors, its future management and maintenance, and protection of the original natural setting. This work has also involved emergency stabilization of vulnerable buildings and testing for the conservation of wall paintings. Phase three is the publication of the plan and dissemination of information about the site to local authorities, scholars, and the community. All phases have included training and capacity building on aspects related to the conservation of earthen sites including 1) documentation, 2) rehabilitation planning; and 3) analysis of earthen materials and conservation of wall paintings. This paper describes the components of the project, presents a critical view of the different activities involved in producing the CRP, and suggests a model for best practice in dealing with similar sites in the region.

*Key words:* earthen architecture, rehabilitation, traditional building techniques, conservation planning



**Figure 1** –Kasbah Taourirt, view of the northern façade of the Caid Residence. Photo: Scott Warren, 2014.



remedial measures were carried out in the Stara such as debris removal, cleaning and repairs to drainage and roofing. During this first phase of the project, CERKAS and the GCI worked with Sebastien Moriset of CRAterre to develop remedial measures, shoring and drainage improvements.

In order to develop accurate architectural drawings, a new survey of the kasbah was begun in 2012. Working with Carleton University's Immersive Media Studio, the GCI and CERKAS carried out a comprehensive survey of the kasbah and its various sectors (Fig. 2). The survey team employed Total Station and photogrammetry to develop a complete set of drawings including plans, sections and elevations of the kasbah as well as rectified photographic images of principal facades.

In addition to documentation and stabilization, archival and oral history research was carried out. As the largest kasbah in the region, Taourirt has been a favorite subject of artists and photographers and there is a large collection of archival materials including historic photographs and aerial views dating from as early as the mid-19<sup>th</sup> century. In concert with the documentation work, this archival material was gathered and organized chronologically in a database. Oral history was also an important source of information about the historical use of spaces within the kasbah, and several interviews were conducted with a 99-year-old former servant of the Caid. This research allowed the team to understand changes to the site over time, including additions, demolitions and loss of fabric, and to develop 3D models showing this evolution.

### **3. Conservation and rehabilitation planning for Taourirt**

The second phase of the project is the development of a conservation and rehabilitation plan to guide future restoration activities and use of the site. With its location in the middle of an active historic city, conserving the kasbah demands a multidisciplinary approach that addresses economic, social, and cultural issues as well as technical challenges. An important component of this phase has been to facilitate discussions between CERKAS, the municipality of Ouarzazate, community groups, governmental organizations, and NGOs about issues and opportunities presented by the site with the objective of arriving at a common vision for Kasbah Taourirt's future use. Activities carried out as part of the conservation and rehabilitation planning include:

- Community stakeholder meetings to discuss priorities for preservation and use of the Kasbah.
- Identifying the values of the site, drafting a statement of significance, and mapping relative levels of significance and character-defining features in order to guide the rehabilitation proposal and insure appropriate uses of significant historic spaces.
- Carrying out a condition assessment of the Kasbah.
- Developing overarching policies to guide the rehabilitation which respect international standards and take into account the condition, significance and values of the site.
- Defining physical intervention strategies, including practical conservation approaches and programming for future use of the structures and public areas.
- Developing operational guidelines for maintenance of the site.
- Presenting the conservation and rehabilitation proposal, including the policies and operational guidelines for the kasbah's future use and maintenance to the community.

To date the project has carried out workshops on the assessment of significance and values, as well as drafting the statement of significance. In collaboration with members of the community and local municipality, the project team identified aesthetic, scientific, social and historical values for Kasbah Taourirt. These values were then mapped on plans of the site. This work has assisted in identifying the most significant spaces of the kasbah in order to preserve them during future rehabilitation work.

The team has also worked on issues related to programming for future use of the spaces. This has included highlighting character-defining features and adapting designs for modern services such as electrical wiring, lighting and plumbing to fit within historic spaces without loss of important fabric.

#### *3.1 Conservation of painted surfaces in the Caid Residence*

An important consideration within the rehabilitation planning process is the care and conservation of significant areas of decorated surfaces at the site. Located in the protected center of the Caid Residence, the decorated rooms were used by the wives and children of the Caid and feature wall paintings, ornate friezes and sculpted plasterwork around doorways and arches.

Wall painting conservators are working with Carleton University and CERKAS staff to carefully document the decorated surfaces, assess current conditions, and research their history and iconographic significance. As part

of the documentation, high resolution photographs of the decorated surfaces are taken and a photogrammetric model created from the images. Models are then exported to Meshlab, an open source software, to create orthographic photo elevations. These images are then scaled and arranged in AutoCAD, and printed for use as base images for mapping conditions such as cracks, detachment, and loss (Fig. 3, left).<sup>1</sup> 3D models can then be created to allow a virtual flythrough of the captured rooms and are useful for analyzing structural conditions and for showing the correlation between the architecture and areas of fragile decoration (Fig. 3, right). As part of this work, a glossary of conditions was developed to guide the assessment. Non-invasive examination techniques such as ultraviolet and infrared imaging, thermography, and microscopy were also used to study the layers of the paintings and their support.



**Figure 3** – Map of conditions in the Caid Residence (left), and 3D orthographic model of a painted room highlighting structural problems (right). Images: Lori Wong and Samuel Whittaker, 2014.

The assessment has revealed numerous phases of decoration, as well as threats to their survival, including major structural problems in supporting walls, failure of the roof, and large areas of detachment of the painting substrate. In parallel with the detailed assessment of wall paintings, an assessment of structural issues and roofing conditions has been carried out in the Caid Residence.

The next phase of this work included the development and implementation of structural interventions that preserves the decorative surfaces intact. In preparation, emergency stabilization measures were undertaken on the painted decoration including grouting and edging repairs of delaminated plaster layers. Protection measures for the painted decoration were also implemented in one room to protect the paintings during construction work. Following the completion of the structural work on the building, conservation of the painted surfaces will need to be carried out.

#### 4.2 Preserving traditional earthen building techniques

While rehabilitation planning work is ongoing, structures in the Stara and Caid Residence are currently being stabilized and restored using traditional earthen construction and conservation techniques. Many of these structures were occupied by squatters from the 1970s through 1990s and were heavily altered through the demolition of historic walls and features and the construction of new elements in concrete.

The work in the Stara is reversing inappropriate alterations and re-establishing the traditional layout and form of the buildings, which was largely hidden under modern accretions. The restoration work is addressing priority conditions first such as replacing damaged roofs, repairing structural cracks and damaged walls, and eliminating moisture problems and basal erosion (Figure 4, left). This work is guided by the architectural drawings produced by the project as well as surveys carried out which identified new and historic construction.

A workshop has been established on site to facilitate the preparation of earthen materials including plaster, adobe bricks, and rammed earth (Fig 4, right). Roofing materials including wooden beams, reed matting and lime are also processed in the workshop. Local materials brought from the Ouarzazate area are being used in the rehabilitation and skilled craftsmen, known as *Maallem* in local dialect, are training laborers in traditional building crafts and techniques.

<sup>1</sup> (Ouimet, 2014).



Figure 4 – Conservation works in the Stara, including repairing a structural crack (left), and preparation of adobe bricks (right). Photos: Benjamin Marcus, 2014.

### 5. Next steps: opportunities and challenges

During the final field campaigns in fall 2015 and in 2016, the project will continue to plan and implement urgent conservation works in the kasbah including the protection of wall paintings in the Caid Residence and rehabilitation of structures in the Caid Residence. A set of conservation policies for the site as well as programming options for future use of the buildings will also be developed. Once these elements of the CRP are complete, the project team will present these options to the community and work with local authorities to adopt the plan as a guideline for future conservation activities.

The project also aims to make information about Kasbah Taourirt and its conservation available to local authorities, scholars, and the community. To accomplish this, a website has been established that will function as a repository of information such as archival materials, project reports and architectural drawings. In addition, the project team will publish and disseminate the CRP document.

One challenge to the project and its sustainability is insufficient resources, both human and financial. There are few architects trained in conservation and no conservators in Ouarzazate, and little professional expertise outside of CERKAS and its staff. One of the activities of the project has been to reach out to local architecture schools in Marrakech and elsewhere to talk about Morocco's earthen heritage and expose the next generation of Moroccan architects and engineers to the importance of this heritage and its conservation. Similarly, building awareness of heritage concepts and approaches on the local level among municipal and cultural authorities is also critical to the long-term success of the project and to ensuring a viable future for Kasbah Taourirt.

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