

Conservation and Rehabilitation Plan for Tighermt (Kasbah) Taourirt, Southern Morocco

Research Report

Ouarzazate and Los Angeles
2016



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Centre de Conservation et de
Réhabilitation du Patrimoine
Architectural Atlasique et
Subatlasique



The Getty Conservation Institute

Conservation and Rehabilitation Plan for Tighermt (Kasbah) Taourirt

CENTRE DE CONSERVATION ET DE RÉHABILITATION DU PATRIMOINE ARCHITECTURAL
ATLASIQUE ET SUBATLASIQUE (CERKAS)
OUARZAZATE

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Centre de Conservation et de Réhabilitation du Patrimoine Architectural Atlasique et Subatlasique (CERKAS) is a public institution under the Ministry of Culture created by decree on January 3, 1990. CERKAS' primary objective is to rehabilitate and enhance in cooperation with other national institutions the architectural heritage of the atlas and presaharan valleys for social and cultural benefits. CERKAS also develops rehabilitation plans for Moroccan architectural heritage through the development of technical, social and ethnological studies of traditional architecture and disseminates these studies in the form of publications.

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Foreword (GCI)

It is a great pleasure to present this report on the Conservation and Rehabilitation Plan for Kasbah Taourirt in Ouarzazate, Morocco. This volume is the result of a five-year collaboration between the Getty Conservation Institute (GCI) and the Moroccan Centre de Conservation et de Réhabilitation du Patrimoine Architectural Atlasique et Subatlasique (CERKAS).

The GCI has a long-standing commitment to the conservation of earthen architecture, from its collaboration in the 1990s with ICCROM and CRAterre on the Terra Project and PAT training courses, to the recent work on developing seismic retrofitting techniques for historic earthen buildings in Peru. Similarly, CERKAS has been working for more than twenty-five years to record, protect, and conserve the vast heritage of historic buildings in southern Morocco and has been a key partner in the design and implementation of this plan.

The project to conserve and rehabilitate Kasbah Taourirt was developed to address continuing threats facing earthen architecture in Morocco, including abandonment, development pressures, and poor management. The main objective was to develop a methodology for preserving the kasbah that can serve as a model for the thousands of similar earthen sites in the region. The project sought to establish an appropriate conservation methodology and process that respects the original fabric, preserves local building traditions, promotes earthen architecture as a viable construction system, develops participatory processes, and builds local capacity.

The report presents the results of research, analysis, and field activities carried out between March 2011 and May 2016. It includes chapters on documentation, history, and evolution of the buildings; condition assessment of the historic fabric and wall paintings; and analysis of the site's values and significant features. A set of conservation and rehabilitation policies developed to guide the project is also outlined. Finally, the report describes conservation work carried out in the kasbah and makes recommendations for future maintenance and management. An extensive bibliography on the conservation of earthen architecture in Morocco is provided, as well as a set of appendices with all of the documentation produced during the project.

We are grateful to the project managers, Claudia Cancino of the GCI and Mohamed Boussalh of CERKAS, and their staffs, and to Mario Santana and the students of Carleton University for their collaboration. We hope that this publication will serve not only to disseminate the project broadly but also as a resource for researchers and practitioners working in the region and for those interested in practical and theoretical methodologies for the conservation and rehabilitation of earthen architecture.

Timothy P. Whalen
Director
The Getty Conservation Institute

Foreword (CERKAS)

The densely populated pre-Saharan valleys of Morocco constitute a melting pot of ancient civilizations. Places of historical knowledge, culture, and social organization, earthen architectural sites are spaces of memory imbued with the day-to-day lives of their inhabitants. They are made up of fortified villages (*ighem/igherman* in Amazigh; *ksar/ksour* in Arabic), the residential and defensive mansions built by the feudal chieftains (*tigherm/tighermatines*, *kasbahs*), collective granaries (*gadir/igoudar*), *zaouïas*, watchtowers, shrines, and other elements.

The fortified villages are clusters of houses and other public and private buildings (public squares, mosques, gates, houses, etc.) that take the form of compact and closed spatial structures surrounded by walls for security and socioeconomic reasons. The feudal chieftains' mansions, or *kasbahs*, are single-family residences built in strategic locations for defensive purposes. They offer evidence of the fragmentation of the vernacular political structures and of the emergence of the power of the *caïds* (tribal chieftains) in the nineteenth century. These buildings may be isolated or grouped together and have regular shapes with corner towers. The various architectural components perfectly reflect the harmonious relationship between the people, the economy, and the environment.

These architectural forms have been dramatically affected by widespread changes in Moroccan society. The ongoing transformation of the traditional community and family has set off a rural exodus, resulting in a change in housing styles and a gradual abandonment of the traditional architecture. A shortage of resources, the dilapidated condition of the dwellings, and the desire for modern buildings—a sign of prestige and advancement—further aggravate the situation. This is why pre-Saharan valleys are currently prey to problems that are completely altering their landscapes.

But despite their disintegration, they are communities in search of new modes of integration in light of today's socioeconomic changes. Inventorying, studying, restoring, and rehabilitating these memories is possible using various scientific techniques and methods.

The scientific contribution this project makes to research will be critical to developing an effective restoration and rehabilitation approach useful for institutions seeking to implement policies to develop their architectural heritage.

We hope that through the publication of this work, the institutions, decision makers, researchers, heritage specialists, and, above all, the inhabitants of the pre-Saharan valleys will be able to admire and further appreciate this highly significant ancient architecture.

Abdellah Alaoui
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Executive Summary

Home to a rich tradition of earthen construction, the pre-Saharan region of southern Morocco, which includes the Draá, Dadès, Ounila, and Ziz Valleys, is an important center of Amazigh culture and earthen architecture that contains approximately 300 kasbahs and 4,000 ksour (ksar in the singular). A ksar is a fortified earthen village, while a kasbah is a fortified home built for a ruling family. However, through obsolescence and abandonment, these sites are increasingly threatened and many are in danger of being lost. This is due partly to changes in the economic and social structures that originally supported them.

The ksar of Taourirt is an emblematic earthen settlement and oasis dating from the seventeenth century that is strategically located at the intersection of several trans-Saharan trade routes and is now incorporated within the modern city of Ouarzazate. Located at its core is the fortified Kasbah Taourirt (fig. 1). Registered as a National Monument in 1954, Kasbah Taourirt was originally one of the residences of the Glaoui, a powerful family of tribal rulers who controlled the region during the late nineteenth and early twentieth centuries. It is a nationally recognized symbol of the Amazigh culture and is composed of various earthen building typologies of high architectural, social, and historical significance.

In 2011, the GCI joined forces with Centre de Conservation et de Réhabilitation du Patrimoine Architectural Atlasique et Subatlasique (CERKAS) to develop a Conservation and Rehabilitation Plan (CRP) for Kasbah Taourirt, which intends to establish an appropriate conservation process that respects the original fabric, preserves traditional earthen building techniques, promotes earthen architecture, and develops a participatory process for planning conservation that can become a model for similar sites in the region.

The CRP was implemented in three phases: Phase 1 included documentation of the site, historical research, and emergency stabilization; Phase 2 was the development of the different components of the plan hereby presented and the implementation of conservation works on the site; and Phase 3 is the dissemination of information about the kasbah and its conservation to local authorities, scholars, and the community.

All phases of the CRP include workshops and hands-on training for CERKAS staff in aspects related to the conservation of earthen sites, including documentation, rehabilitation planning, wall paintings conservation, analysis of earthen materials, and practical conservation approaches.



FIGURE 1
North view of Kasbah Taourirt.
Photo: Susan Macdonald, 2011.

The Kasbah and Its Evolution

Kasbah Taourirt is located in the city of Ouarzazate at an elevation of 1,160 meters in the middle of a plateau south of the High Atlas Mountains. The kasbah encompasses nearly 12,000 square meters spread over a low ridge and is composed of vari-



FIGURE 2
Kasbah Taourirt, ca. 1950.
Photo: CERKAS archives, 1950.

ous interlinked structures, including the Caïd Residence, the Médiathèque and offices of CERKAS, and the Stara, a large area with several residences enclosed by defensive walls. Structures and defensive walls of the kasbah were generally built in rammed earth, with mud bricks used for the construction of towers and cornices where decorative patterns enrich the facades.

Oral history states that portions of Kasbah Taourirt were constructed beginning in the seventeenth century, though little fabric from that period remains. The majority of the kasbah dates from the late nineteenth century, when it became the residence of Si Hammadi el Glaoui, the representative in Taourirt of the Glaoui family, who ruled all of Morocco from their stronghold residence at Telouet in the High Atlas Mountains. In this period, Si Hammadi expanded the kasbah from an agglomeration of smaller buildings into a large defensive complex encircled by walls and complete with stables, servants quarters, workshops, a market, wells and hammams, and residences for his numerous wives and children (fig. 2). The Caïd's private residence, located in the northeast corner of the site, was richly decorated with painted wooden ceilings and carved plasterwork on the interior, while wrought iron windows and Amazigh designs adorned the exterior.

Kasbah Taourirt was occupied by the Glaoui family until the end of the French Protectorate. In 1956, control of the property passed to the Moroccan state, and in the early 1960s, the state returned ownership to the Glaoui. In 1972, the kasbah was sold by the Glaoui heirs to the Municipality of Ouarzazate; it fell into ruin and was abandoned until the late 1980s. In 1987, CERKAS was established and, with support from the United Nations Development Program and UNESCO, began to restore parts of the building for use as a public library, offices, and spaces for public events. Part of the Caïd's private residence was also restored and opened to the public. Despite this work, large areas of the kasbah suffered deterioration in the years that followed.

Emergency Stabilization, Documentation, and Historical Research

The first phase of the CRP began in 2011 and addressed the need for documentation and emergency stabilization of the site. An initial condition assessment identified several areas at risk of immediate collapse. Based on the assessment, critical walls were supported with shoring. Other remedial measures were carried out, such as debris removal and cleaning and repairs to drainage and roofing. During initial activities of this phase of the project, CERKAS and the GCI worked with consultant Sebastien Moriset of CRAterre to develop emergency conservation measures.

In order to obtain proper architectural drawings, a new survey of the kasbah began in 2012. Working with Carleton University's Immersive Media Studio (CIMS) as project consultant, the GCI and CERKAS carried out a comprehensive survey of the kasbah and its various sectors (fig. 3).

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 for centuries, and there is a great deal of archival materials, including historical photographs and aerial views dating from as early as the 1920s. 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 former servant of the Caïd who had lived in the kasbah from the 1920s until 1956, when the Caïd and his family left the complex.



FIGURE 3
CIMS and CERKAS team members
documenting the Stara area.
Photo: Claudia Cancino, 2012.

**FIGURE 4**

Model showing different construction phases by color: gray, 17th century; red brown, 18th century; yellow, 1894; light brown, ca. 1860; dark brown, ca. 1870; green, ca. 1886; bright green, 20th century.

Drawing: Elena Macchioni, 2013.

Comparison of historical photographs, oral history, and analysis of the building fabric allowed the team to track alterations to the site over time, including additions, demolitions, and loss of fabric, and to develop 3D models illustrating various phases of construction from the seventeenth to the twentieth century (fig. 4).

Conservation and Rehabilitation Planning

The second phase of the project was the development of the different components of the plan to guide future restoration activities and use of the site and the implementation of conservation works. With its location in the middle of an active historic city, conserving the kasbah demanded a multidisciplinary approach that addresses economic, social, and cultural issues as well as technical challenges. An important part of this phase was facilitating discussions between CERKAS, the Municipality of Ouarzazate, community groups, governmental organizations, and non-governmental organizations about issues and opportunities presented by the site with the objective of arriving at a common vision for the kasbah's future use and operation.

Activities carried out as part of the conservation and rehabilitation planning included the following:

- Community stakeholder meetings to discuss priorities for preservation of the kasbah
- Identifying the values of the site, drafting a Statement of Significance, and mapping relative levels of significance and character-defining features
- Carrying out a condition assessment of the kasbah, focusing on identifying critical conditions and those that can be addressed in the longer term
- Developing overarching policies to guide the rehabilitation that respect international standards and take into account the 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 future maintenance of the site

The project carried out workshops on the assessment of significance and values, as well as on drafting the Statement of Significance. In collaboration with CERKAS and the municipality, the project team identified and mapped aesthetic, economic, social, and historical values for Kasbah Taourirt (fig. 5). This work has assisted in identifying the most significant spaces and features of the kasbah as well as architectural patterns in order to preserve and highlight them during the rehabilitation work. The team also worked on issues related to programming for future use of the spaces.

**FIGURE 5**

Map of significance for the Stara area: green, architectural/aesthetic value; blue, historical value; orange, social value; red, no value.

Drawing: Elena Macchioni, 2013.

Conservation of Painted Surfaces at the Caïd Residence

Another important component of the project was the documentation and conservation of decorated surfaces at the site. Located in the protected center of the Caïd Residence, decorated rooms were used by the wives and children of the Caïd and feature arches, sculpted plasterwork, and colorful wall paintings with geometric designs.

Wall painting conservators, working with CIMS and CERKAS staffs, have carefully documented the decorated surfaces, assessed current conditions, researched the paintings history and iconographic significance, and carried out stabilization measures (fig. 6). As part of this work, a glossary of conditions was developed to guide the assessment.

**FIGURE 6**

Project team member carrying out condition assessment and documentation of the site's wall paintings. Photo: Scott Warren, 2014.

**FIGURE 7**

Project team member carrying out grouting of detached wall paintings of the site. Photo: Lorinda Wong, 2015.

After the condition assessment of the wall paintings was finished, the team worked on designing and implementing structural interventions that preserved the decorative surfaces intact. In preparation, emergency stabilization measures were undertaken on the painted decoration, including grouting and edging repairs of delaminated plaster layers (fig. 7).

Repair and Maintenance Work

While planning for the reuse of the kasbah was ongoing, structures in the Stara area and Caïd Residence were stabilized and restored using traditional earthen construction and conservation techniques. Many of these structures had been heavily altered by squatters who occupied the site from the 1970s through the 1990s.

The work in the Stara area, guided by the architectural survey and studies that distinguished recent construction and alterations from historic fabric, has reversed inappropriate alterations and reestablished the traditional layout and form of the buildings, which were largely hidden under modern accretions. The restoration work addressed priority conditions such as replacing damaged roofs and repairing structural cracks and collapsed or damaged walls (fig. 8). Roofing repairs use traditional materials, including poplar wood beams and reed to form decorative patterns known as *tataoui*. Local materials brought from the Ouarzazate area are being used in the rehabilitation, and skilled craftsmen, known as *ma'alem* in local dialect, are training laborers in traditional building crafts and techniques that ensures the continuation of this knowledge.

Conclusions and Next Steps

There is an extraordinary repository of earthen architecture in southern Morocco that represents Amazigh culture and values. As well, there is the need to survey, document, and better define significance of such sites in order to guide their conservation. The CRP for Kasbah Taourirt intends to be a model that leads to the development of other conservation plans for similar sites in the pre-Saharan region of Morocco.

One challenge to implementing planned conservation work and maintenance of these magnificent structures is insufficient resources, both human and financial. It is important that CERKAS remain in the kasbah and that adequate resources are provided to address the many thousands of sites.

On the level of planning and management, the kasbah needs to be considered a unified whole, with future uses that conform to the values and significance of the place. Existing entities such as CERKAS, the Médiathèque, and the visited area should be integrated into a larger vision for the site that takes into account not only tourist visitation but also protection of the cultural landscape surrounding the site including the palm grove, as well as the development and improvement of the ksar community.

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 and Morocco's earthen heritage.

**FIGURE 8**

East view of Stara West during construction works. Photo: Elena Macchioni, 2014.

CHAPTER 1

The Project of Kasbah Taourirt

The world's earthen architectural heritage is rich and complex. A ubiquitous form of construction, it appears in ancient archaeological sites as well as in modern buildings, in large complexes and historic centers, in individual structures, and in the form of decorated surfaces. Because of earthen architecture's great variety, several disciplines are associated with its conservation.

In recent decades, the field of earthen architecture conservation has grown tremendously. This is reflected in the development of a series of international conferences devoted to the preservation of earthen architecture, the first of which was held in 1972 in Iran.

With each conference, the number of participants has increased along with their geographic and professional diversity. Academics, scientists, architects, and conservation practitioners, united by their interest in earthen architecture, now convene every few years to discuss chemistry, soil science, seismology, hydrology, structural engineering, archaeology, sociology, sustainability, and more, as these pertain to earthen architectural heritage.

In recent years, the international discussion regarding the challenges facing the conservation of earthen sites has centered on the importance of adapting historic urban settlements made of earth to modern living conditions. This is a problem that earthen historic sites face while trying to adapt to change in Latin America, the Middle East, northern Africa, and other regions of the world where large earthen ensembles of historical importance are being abandoned over time.

The earthen ksour and kasbahs region of southern Morocco expands along three different pre-Saharan valleys (Draá, Dadès, Ounila, and Ziz) and contains approximately 300 kasbahs and 4,000 ksour. These magnificent earthen sites have been recognized as culturally significant for their aesthetic, social, and cultural values, and as physical evidence of the historical development of the sub-Saharan region.



FIGURE 1.1
The Skoura palmery with kasbahs,
Dadès Valley.
Photo: Claudia Cancino, 2008.



FIGURE 1.2
Ksar Aït Boujane, Todgha Valley.
Photo: Elena Macchioni, 2013.

1.1 Background of the Project

For nearly two decades, the Getty Conservation Institute (GCI) has been a recognized leader in developing methodologies and setting standards for the conservation of earthen architectural heritage worldwide.

From 1997 to 2006, the GCI was one of the partners in Project Terra, a collaborative agreement between the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM), the International Center for Earthen Architecture at the École Nationale Supérieure d'Architecture de Grenoble (CRAterre-ENSAG), and the GCI to promote the conservation of earthen architecture worldwide. Based on the project activities and research, Project Terra identified the need to address the conservation challenges facing earthen sites in northern Africa.

Although the Project Terra partnership ended in 2006, its long-term initiatives and goals have continued under the programs of the partner institutions. The Earthen Architecture Initiative (EAI) at the GCI was created to continue and expand the work begun during Project Terra.

Similar to Project Terra, the EAI seeks to advance earthen architecture conservation through model projects that improve the way conservation interventions are carried out, research that addresses unanswered questions in earthen conservation, capacity building, and dissemination of information for appropriate conservation interventions on historic earthen buildings, settlements, and archaeological sites with earthen constructions.

In 2003, CRAterre-ENSAG and the Centre de Conservation et de Réhabilitation du Patrimoine Architectural Atlasique et Subatlasique (CERKAS) started a fruitful collaboration for the conservation of the earthen heritage of southern Morocco. This collaboration led to the production of several studies: *Aït Ben Haddou Management Plan* (2007), *Conservation Manual for the Pre-Saharan Valleys of Morocco* (2005), *Building Codes for Traditional Materials* (2005–7), and *Ksar of Aït Ben Haddou: Hopes and Perils* (2008).



FIGURE 1.3
Ksar Aït Ben Haddou, declared a
World Heritage Site in 1984.
Photo: Claudia Cancino, 2006.

From April 2005 to January 2008, the GCI, CERKAS, and CRAterre participated in a series of workshops organized by the École Nationale d'Architecture, the Ministère des Travaux Publics, the Ministère de l'Habitat de l'Urbanisme et de la Politique de la Ville, and the École Hassania des Travaux Publics to oversee the production and development of a chapter on traditional construction techniques (including earth) as part of the Moroccan Building Code. The intention of this chapter was to legally and technically support the continuation of building with traditional materials around the country. In the pre-Saharan region in particular, the code addresses the use of earth as a contemporary building material for new construction. However, despite its efficacy to legalize earthen techniques, the code does not address methods for preserving and rehabilitating historic earthen sites.

In 2010, the GCI, CERKAS, and CRAterre held a series of meetings and discussions in order to identify a model project to design a methodology for the conservation of earthen historic sites and demonstrate appropriate interventions for the continuous use of these sites.

1.1.1 The Conservation Challenge

There are a vast number of significant earthen urban settlements and sites (300 kasbahs within approximately 4,000 ksour) in the pre-Saharan region of Morocco threatened by obsolescence and abandonment and resulting in gradual deterioration leading ultimately to their collapse. This progressive urban decay is due to changes in the economic and social structure that originally supported them, an issue common across many other regions with an earthen building tradition.

These settlements and sites have been recognized as culturally significant for their aesthetic, social, and cultural values and as physical evidence of the historical development of the pre-Saharan region. They are mostly located within the Draá, Dadès, Ounila, and Ziz Valleys, which are also protected at the national level as heritage areas. However, the disconnection between the protection of these settlements, their planning systems, and subsequent uncontrolled development of cities around them generates significant conservation challenges that the current system is unable to address, threatening the existence and preservation of the sites.

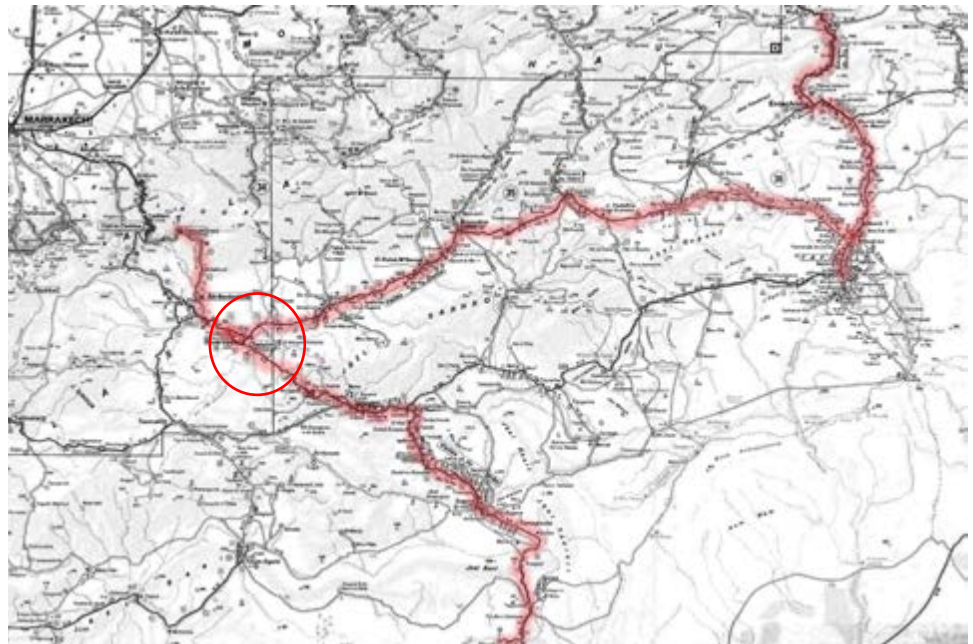


FIGURE 1.4

Map of the pre-Saharan region of Morocco with the valleys of Draá, Dadès, and Ounila highlighted. The city of Ouarzazate is circled in red. Image: Michelin Morocco map 742 National, 2002.

The catalyst for the process of deterioration and decay of these sites is the decline of the agrarian economy, resulting in migration of inhabitants to larger regional settlements and/or cities either within or outside Morocco in search of better living and financial conditions. Mass migration from the region has left lower-income inhabitants behind and led to the decline of the ksour as viable urban settlements.

Within these villages, the lack of basic infrastructure such as running water, sewage systems, and adequate drainage jeopardizes the viability and therefore the conservation of these sites. Earth is a material now associated with poverty and substandard living conditions.

Progressive abandonment has led to a downward spiral of decay, lack of maintenance in public areas due to the breakdown of the communal system, collapse of abandoned buildings, and loss of know-how for building maintenance and earthen construction techniques. Replacement of traditional with “modern” construction techniques exacerbates the problem.

Conserving these settlements and sites demands a multidisciplinary approach addressing economic, social, cultural, and technical problems holistically. However, the main problem is the gradual loss of technical knowledge to design proper interventions and carry on regular maintenance to preserve and rehabilitate these sites while preserving their historic fabric.



FIGURES 1.5 AND 1.6

Above: Collapse of a house within the ksar of Taourirt.

Photo: Susan Macdonald, 2011.

Right: View of abandoned kasbahs within the ksar, immediately adjacent to Kasbah Taourirt.

Photo: Françoise Descamps, 2010.



1.1.2 The Reconnaissance Trip

In March 2010, team members from the GCI, CRAterre-ENSAG, and CERKAS traveled across the Draá, Dadès, Ounila, and Ziz Valleys to define common threats and problems for the conservation of earthen settlements in the region and identify potential sites and project activities to mitigate them. During that trip, Kasbah Taourirt was identified as the site for development of a model methodology for conservation and rehabilitation that could be later applied to similar sites in the region.

1.2 The Building and Its Setting

The ksar of Taourirt, an entire earthen village and oasis dating from the seventeenth century, is an emblematic ensemble strategically located at the intersection of major trans-Saharan trade routes and now embedded within the modern city of Ouarzazate, Morocco.

At the city's core is the fortified Kasbah Taourirt. This earthen site, registered as a National Monument in 1954, was originally one of the residences of the Glaoua Caïd, a powerful family that ruled the region during the late nineteenth and early

twentieth centuries. The site features richly decorated architecture and wall paintings symbolizing the Amazigh, or Berber, culture and includes different building types of high architectural, social, and historical significance. The word “Amazigh” refers to the decedents of the pre-Arab inhabitants of north Africa, known to the world as Berbers, and is today the preferred term for this cultural group.



FIGURE 1.7

View of the north facade of Kasbah Taourirt, restored in the 1990s.
Photo: Scott Warren, 2014.

1.2.1 The Rationale behind Selecting Kasbah Taourirt

Kasbah Taourirt is an ideal model site for the following reasons:

1. It is the largest kasbah in the region with an active ksar, and includes a number of other significant buildings.
2. It is a National Monument.
3. It is representative of several common issues among many earthen sites of pre-Saharan Morocco:
 - It contains several abandoned buildings in need of conservation and appropriate adaptive reuse. The owner of the kasbah is the municipality of Ouarzazate, which has a political interest in restoring an area of the site called Stara, where illegal occupants were recently evicted. The project of the Stara area could be a catalyst to design and implement a methodology that can address the rehabilitation of the entire site.



FIGURE 1.8

View of interior of the Stara area of Kasbah Taourirt, occupied by squatters until 2010.
Photo: Benjamin Marcus, 2013.

- It offers an opportunity to define and regulate the interface between the site, its surrounding earthen village, and the city of Ouarzazate and to control the development threats impacting its significance.
- Taourirt is a highly visible site. It is located at the conjunction of three main valleys that contain many similar sites facing similar problems.
- Taourirt is located within the growing city of Ouarzazate and suffers from impacts from the tourist industry and urban development.
- There is a great potential to develop a positive and constructive partnership at the local, regional, and national levels. CERKAS offices are located within the kasbah, and the organization has authority in the region and is well supported by the local government.
- The governor of Ouarzazate is particularly interested in the rehabilitation of the site and recognizes the need for action in the immediate term, which makes the project timely.



FIGURE 1.9

Aerial view of Kasbah Taourirt (in red) within the city of Ouarzazate. Photo: ANCF, 2009.

1.3 General Purpose and Structure of the Plan

The Conservation and Rehabilitation Plan (CRP) for Kasbah Taourirt aims to develop a methodology for the conservation and rehabilitation of this traditional earthen ensemble that can be used as a model for similar earthen sites. The CRP's objective is to establish a conservation process that respects the original building fabric, preserves technical know-how, demonstrates appropriate reuse of such sites, develops a participatory process, and builds local capacity in these areas.

Designed in collaboration with CERKAS, the CRP will be implemented in three phases. Phase 1 includes the development of a methodology for the documentation and emergency stabilization of the entire earthen complex. Phase 2 will develop a conservation and rehabilitation plan for the kasbah, considering the whole ensemble and each of its sectors, its connection with the adjacent historic community (the ksar), the original natural setting, and the urban context. Phase 3 will develop a strategy for the dissemination of information about the site to local authorities, scholars, and the community.

All phases will include training workshops for CERKAS staff on aspects related to the conservation of earthen sites including 1) documentation, 2) rehabilitation

planning, and 3) analysis of earthen materials and practical conservation approaches. There will be final presentations at the end of each phase, ideally accompanied by a public exhibition and presentation for concerned stakeholders.



FIGURE 1.10

Members of the Taourirt project team in 2014.

Photo: Scott Warren, 2014.

CHAPTER 2

Site Recording

Heritage recording and documentation pertain to the methods of how significant data are collected, interpreted, presented, and archived in order to understand the configuration, evolution, condition, and context of heritage sites and objects. Physical recording and documentation involve scientific data collection over time and serve as a basis for decision making regarding diagnosis, intervention, and monitoring of a site. As an integral part of the conservation process, it covers all types of materials and sites, including those built of earth.

Heritage recording is the first step to understanding a site from its architectural configuration to its building materials. However, it is important not only to carry out a documentation survey but also to secure the use of the collected information for managing the site. This basically means ensuring that the organization managing the records collected has the proper human and financial resources to do so.

2.1 CERKAS Documentation Resources

CERKAS has worked with several international partners over the past twenty-five years. The collaboration has focused mainly on documenting the sites, starting in the Draá Valley and moving on to other sites (fig. 2.1). Their documentation method has consisted of drawing the roof plans, borders, open spaces, and some interiors of kasbahs and ksour on translucent paper using aerial photographs from 2004.



FIGURE 2.1
Poster illustrating the development
of an inventory for the Draá Valley
by CERKAS.
Image: CERKAS, 2001.

**FIGURE 2.2**

Sample of conservation reports developed by CERKAS as part of international collaborations.

Photo: Claudia Cancino, 2011.

**FIGURE 2.3**

Team members assessing the existing documentation of Kasbah Taourirt at CERKAS headquarters.

Photo: Claudia Cancino, 2011.

These drawings were checked by hand measure and in some cases with a theodolite at each of the sites in the Draá Valley. Some of the drawings were later digitized using MicroStation (MS), a computer-aided design (CAD) software. Layers were added to each drawing to include data about site uses and general state of conservation (good, in need of intervention, and in ruins).

Though this information is probably unique, the files and hard copies are not catalogued and/or organized in a systematic way. There are several reports but no central location for hard copies and/or digital files (fig. 2.2). Furthermore, the data acquired with the aerial photographs, historic research, and on-site visual observation have not been analyzed despite being organized into an Excel database linked to the drawings using geographic information system (GIS) software (Modular version).

Nevertheless, CERKAS personnel have been exposed to different documentation methods that will help the documentation of Kasbah Taourirt (fig. 2.3). This first section of the CRP intends to provide an overview of 1) the existing documentation for Kasbah Taourirt, 2) the existing documentation for the ksar of Taourirt, 3) CERKAS current software and hardware, and 4) documentation projects developed by CERKAS or in collaboration with other international organizations.

2.1.1 Kasbah Taourirt

Regarding the kasbah, the following documents are part of CERKAS archives and could be of use as a base for documenting the site:

1. Architectural drawings of Kasbah Taourirt: The existing architectural drawings are limited to a roof plan, site border, open spaces, and some interiors based on an aerial photograph of 2004 (fig. 2.4). These architectural plans were made in MS. Despite the fact that the plans can be transferred and opened in other software, they are not accurate regarding dimensions and configurations of space, which is quite normal when using an aerial photograph (usually distorted) to create a base map. Thus, an accurate and detailed survey needed to be developed using the base map created in MS but correcting any errors.

**FIGURE 2.4**

Architectural plan in MicroStation developed by CERKAS from an aerial photo.

Drawing: CERKAS, 2004.



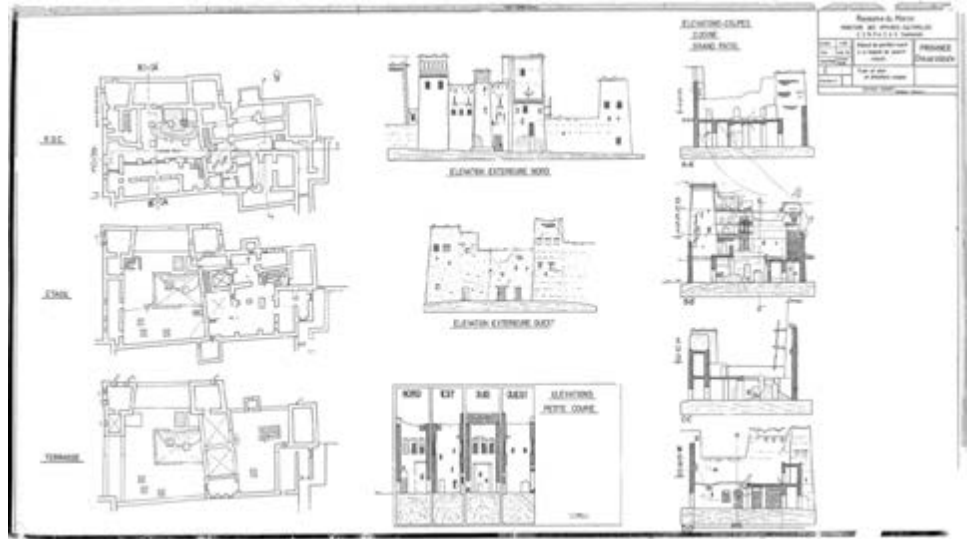
FIGURES 2.5 AND 2.6

Above: CERKAS personnel showing handmade architectural survey of the site developed in 1993.

Photo: Elena Macchioni, 2013.

Right: Scan of architectural floor plans, cross sections, and elevations of the Stara section of Kasbah Taourirt.

Drawing: CERKAS, 1994.



2. Detailed architectural drawing of the Stara: In 1993, a detailed architectural survey of the Stara section of Taourirt was carried out (figs. 2.5 and 2.6). However, these drawings (plans, elevations, and sections) were drawn by hand (1:200 for the plans and 1:100 for sections and elevations) and never digitized. Plans indicating electricity, water, and sewage systems were also developed. These were the base maps that were used to quickly define the areas to be cleaned and to better define the original fabric and sections where urgent stabilization is needed. This process is described in section 2.4.
3. Survey forms: In 1990, a survey form to collect data was developed for the inventory of sites in the Draá Valley and then used at other sites, including Taourirt. The form (developed in Excel) records data such as region, province, district, peripheral elements, peripheral dimensions, number of entrances, main building uses, and number of streets, passages and corridors, as well as water and power and as socioeconomical information. As part of the project, this table of information has been used as the base to develop a more focused survey form that CERKAS could use for on-site recording. The new form is designed to be plugged into a table that CERKAS uses. Emphasis has been made on recording data important for making decisions regarding the management and conservation of the sites. This new form is described in section 2.3.2 and a sample is included in appendix A.
4. Information system: The Excel database compiled with the original CERKAS survey forms is linked to the MS drawings using a modular version of GIS. The new forms developed during the project also aim to match the system already developed in the event that inventories of other valleys are developed.
5. Historical images: As detailed in appendix D, the project collected a good series of images of Taourirt and its surroundings over time (fig. 2.7). The photos were further investigated, properly dated, and organized in a way that can provide information regarding the development and evolution of the site.

FIGURE 2.7

Aerial photograph of the kasbah and ksar of Taourirt, 1960–70.
Photo: CERKAS archives.



2.1.2 Ksar Taourirt

1. Architectural drawings of Ksar Taourirt: CERKAS has a hard copy of the cadastral map of the city of Ouarzazate (scale 1:2000) that includes the ksar of Taourirt. During development of the CRP, a digital copy was acquired through the Agence Urbaine of Ouarzazate. The cadastral map was developed under the aegis of the Ministry of the Interior and was used to properly geo-reference the architectural drawings developed as part of the CRP explained in this chapter.



FIGURE 2.8
Theodolite used by CERKAS.
Photo: Claudia Cancino, 2011.

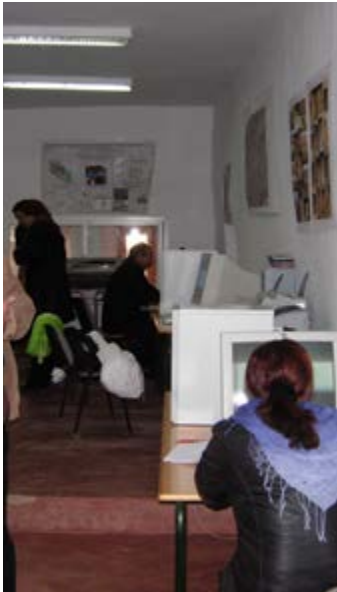


FIGURE 2.9
One of the spaces at CERKAS offices.
Photo: Claudia Cancino, 2006.

2. Survey forms: There is no survey developed and carried out for the ksar.
3. Information system: There is no GIS for the ksar.
4. Images: The description made for the kasbah regarding images also applies to the ksar.

2.1.3 Current Software and Hardware

1. Software: The following list describes the information technology system (ITS) at CERKAS:
 - Operating system: Most of the computers at CERKAS have Windows XP, Windows 7, and Windows NT.
 - Programs: All users (up to eight) have Microsoft Office (Word, Excel, Access, Power Point, and Publisher) and Adobe Illustrator 9.
 - Vector (linear) drawings are developed using MS and only one technician knows how to use AutoCAD. MS seems to be used at least by two CERKAS personnel and ArchiCAD, a 3D design software, at least by one.
 - Raster images are mostly saved as JPEGs or TIFFs. PDFs are also used and CERKAS has Adobe Acrobat.
 - Modular GIS Environment is the software used for GIS. Mostly it is used with vector images and raster images as background. There has not been any analysis of the data collected (i.e., how many of the sites noted as in good state of conservation are also occupied?).
2. Hardware: The following list describes the ITS equipment used at CERKAS:
 - Desktops: There are around seven desktops at CERKAS. Their RAM and memory capacity are unknown but expected to handle big files. CERKAS's director has a laptop.
 - Printers: There are at least two color printers connected to the system and only one plotter. The plotter is an HP DesignJet 500 but is currently not connected to the system.
 - CERKAS has a Theodolite that has been used for the development of the Draá Valley inventory project. However, it is an old model and can't be used for a proper survey of the site (fig. 2.8).
 - CERKAS also has Internet LAN connection for all the computers and Wi-Fi that works only on the last floor of the building at the CERKAS director's office. There is, however, plenty of office space where other computers, laptops, and printers can be connected (fig. 2.9).

2.1.4 List of CERKAS International Projects

The following are projects developed by CERKAS in collaboration with international organizations, organized chronologically:

- École Polytechnique Fédérale de Lausanne, Laboratoire de photogrammétrie. Architectural urban studies of earthen sites at the Draá Valley, 2000–2005. Approximately 300 sites recorded with aerial photographs and data collection. The projects started with Hans Hostettler and ended with Otto Hans.

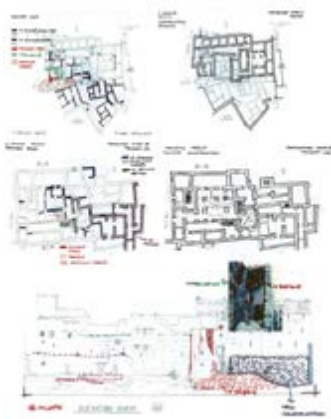
- Japan International Cooperation Agency (JICA). Project dossier for Taourirt, 2004–6. The project included a first phase to collect information about Taourirt (architectural plans, construction details and photographs) and a second phase that included the two-year internship of a Japanese architect who developed hand-drawn floor plans and elevations of most of the sites in the valley of Aït ou Guemez in the province of Azilal.
- Col·legi d'Aparelladors de Barcelona (Xavier Casanovas, currently director of RehabiMed). Recording, documentation, and restoration of Ksar Tamnougalt, Agdz, 1997. This project included the development of a series of workshops with the Universitat Politècnica de Catalunya and a final report.
- Col·legi d'Aparelladors de Barcelona and Universitat Politècnica de Catalunya. Inventory and project proposal for the earthen sites of the Todgha Valley (Dadès to Erfoud), 1998. This project included workshops, the development of a survey form, the documentation of the sites, and the development of a draft proposal.
- Ministry of Culture, Direction Générale de l'Aménagement du Territoire (Division du Patrimoine). Recording and documentation of Aït Arbi, 2004. This project also included the development of survey forms and a final report.

2.2 Proposal for Site Recording

Based on the CERKAS documentation resources assessment, the following was proposed to design and implement a methodology to document earthen sites in Morocco, using Kasbah Taourirt and its context as a case study. The methodology includes the already collected information and existing capacity at CERKAS (personal, financial, and equipment) to carry out the work. The final objective is to apply the same system to other sites along the valleys.

2.2.1 Activities and Deliverables

1. A preliminary approach for the evaluation of areas in need of cleaning, demolition of non-original construction, and emergency stabilization using the base map of the Stara was developed in 1993 (fig. 2.10). The objective of this activity was to graphically identify—with the support of photographic evidence—the non-original structures (earth and/or concrete) as well as the areas with total/partial collapse, with presence of debris, in need of emergency stabilization (figs. 2.11 and 2.12).



FIGURES 2.10, 2.11, AND 2.12

Above: Graphic recording for cleaning and emergency stabilization of the Stara area of Kasbah Taourirt.

Drawings: Claudia Cancino, 2011. Right and far right: Team members record areas to be cleaned and stabilized while identifying original structures.

Photos: Sebastien Moriset, 2011 and Claudia Cancino (far right), 2012.



2. Site survey with forms used by CERKAS during the site management decision-making process. Taking into consideration the existing forms used by CERKAS, new forms for recording, assessing conditions, and emergency stabilization were developed for sites and sector/building inspections.
3. Metric survey of Kasbah Taourirt to produce “as-found” CAD drawings (annotated floor plans, Cross sections, and elevations). The techniques used were a combination of image-based survey methods such as photogrammetry and architectural survey such as total station.
4. An untextured 3D model of the kasbah was created over which aerial photography or satellite images were draped.
5. CERKAS personnel were trained to produce the deliverables specified above.
6. A final report summarized the methods used for producing the deliverables, including methods of new data capture, use of preexisting data, and data processing and integration.

2.2.2 Resources Needed

Based on the CERKAS documentation resources assessment, the project concluded that CERKAS personnel needed to be trained and equipped with proper software (such as AutoCAD). This will potentially involve the addition of memory capacity for their computers or buying new ones as well as other equipment to carry out the work.

It was also proposed that an assessment visit with a documentation specialist should be necessary in order to better define the documentation technique, methodology, and timeline to perform the deliverables described above. This was later performed by Carleton Immersive Media Studio (CIMS) from Carleton University, Ottawa, Canada (fig. 2.13).



FIGURE 2.13

First meeting of the CIMS team with CERKAS and GCI staff to design the steps to develop the site survey.

Photo: Claudia Cancino, 2012.

2.3 Site Survey

The following methodology was proposed to assess the site values, vulnerability, and conditions in order to define and prioritize interventions for earthen sites in Morocco, using Kasbah Taourirt as a case study.

The methodology considered site information already collected by CERKAS (architectural drawings, reports, and/or inventories), current CERKAS capacity (personnel, financial resources, and equipment), and the inclusion of new technologies to acquire further needed information to carry out the work.

2.3.1 Methodology

The ultimate objective of the site survey process was to become a tool for CERKAS in making decisions about general policies as well as specific actions for interventions (long and immediate term) for the site of Taourirt. General policies were based on the site level of significance and vulnerability. Specific interventions will be under the umbrella of the general policies and will be based on the site's architectural values and current conditions. This scheme was used to better define the information to be collected (fig. 2.14).

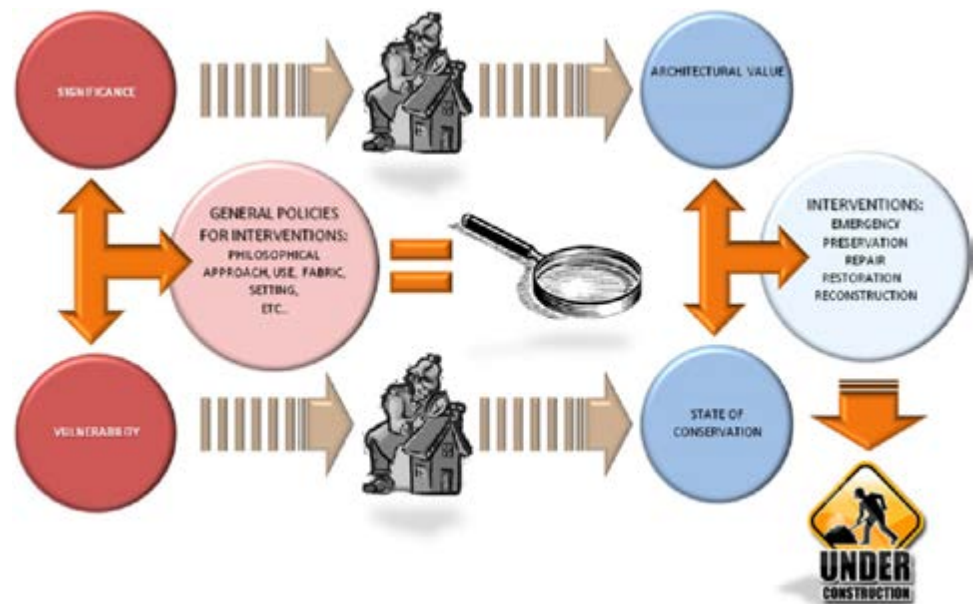


FIGURE 2.14

General site documentation methodology scheme.

Diagram: Claudia Cancino, 2011.

2.3.2 Survey Forms

This first phase included the collection of data through a “general survey form” and the definition of general policies to be applied on site. A second phase included the selection of specific interventions based on a detailed recording and better understanding of the site's state of conservation with a sector/building survey form. Both phases included the design and trial of the survey forms on site (fig. 2.15). The final versions of both forms are included in this report as appendix A.

General survey form

The project developed a general survey form to decide on general intervention policies for the site of Taourirt that could also be used for similar sites in the region. Project members agreed on using the following terminology:

- **Significance:** Site significance will be based on the building's physical attributes, current states of uses, authenticity of materials, and relationship with the setting. The site will be defined as extremely significant, considerably significant, some significance, or insignificant.
- **Vulnerability:** Site vulnerability will be defined based on the general condition of the site (good, deteriorated [recoverable], partially in ruins, in total ruin) in relationship to existing threats (abandonment, inadequate use, potential floods, exposed, unprotected, etc.). Levels of vulnerability will be defined as high risk, low risk, or no risk.

- General policies for interventions: General policies are defined based on the site's vulnerability and significance and should include the following:
 - Policies that control development by guiding changes to the fabric, and the use of place and its setting, which are feasible and compatible with the retention or reinforcement of significance
 - Policies that guide the renewal of the materials or retard their deterioration through preservation, repair (restoration and reconstruction), and consolidation or emergency interventions (protection, removal of intrusive materials, demolition, and stabilization)



FIGURE 2.15

Reviewing survey forms on site with CERKAS team members.

Photo: Sebastien Moriset, 2011.

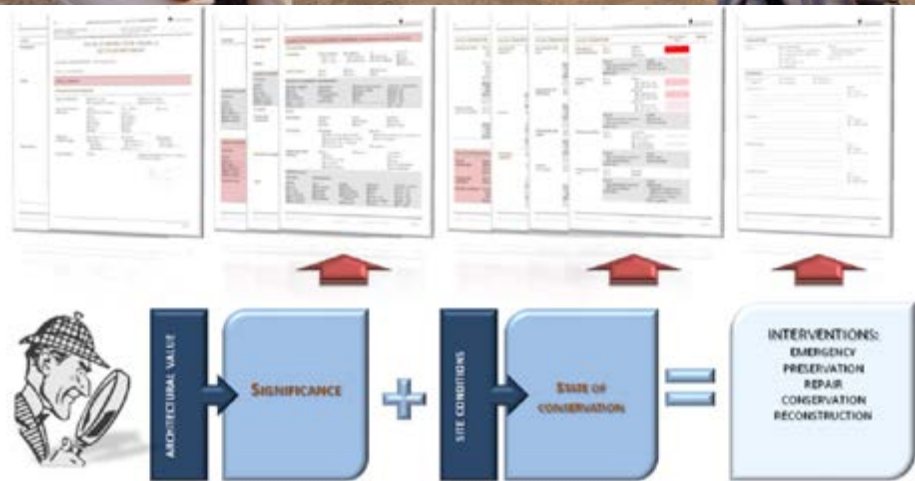


FIGURE 2.16

Scheme outlining how the sector/building survey form defines type of intervention based on site significance and state of conservation.

Diagram: Claudia Cancino, 2011.

Sector/building survey form

Subsequent to the definition of the general intervention policies, sites could be assessed using a more detailed sector/building survey form to generate specific actions resulting from the policies described above (fig. 2.16). For that, project members agreed on the following:

- Levels of architectural value of the site based on authenticity of materials and features
- State of conservation of the site based on the presence of conditions identified as threats to the preservation of the fabric
- Specific immediate and long-term actions based on what needs to be done in a highly or not significant section of a site where specific deterioration patterns are active

2.4 Architectural Schemes

As described earlier in this chapter, a conservation and rehabilitation plan should start with proper heritage records, including “as found” drawings that are geo-referenced. However, in order to be ready for the preliminary cleaning and removal of incompatible additions, scheduled for the beginning of calendar year 2012, the project team decided to use drawings already produced by CERKAS and compose a preliminary scaled scheme of the site to 1) define the original structure, 2) define the sections to be removed and cleaned, and 3) define the areas in need of preventive stabilization and/or further research and investigation.

In order to do that, the following process was implemented:

1. The digital architectural drawing of the site originally developed in MS was transferred to AutoCAD (fig. 2.17a, b). The drawing was incomplete based on the fact that it was drafted over an aerial photograph and thus was basically a roof plan.
2. Three sets of handmade architectural drawings (scale 1:100) were scanned, placed, and scaled as raster images into the AutoCAD drawings (fig. 2.17c, d).
3. The drawings were then redrafted to complete the site.
4. On-site verification was performed by team members and CERKAS personnel to identify the original structure from the additions.
5. That information was then transferred to the AutoCAD drawings, and prints of the first and second floors of the entire site could be produced, identifying sectors, original layouts, entrances, and areas in need of stabilization (figs. 2.18–2.20).
6. The result of this part of the work is a series of architectural schemes that are part of the preliminary cleaning and removal shown as appendix B.

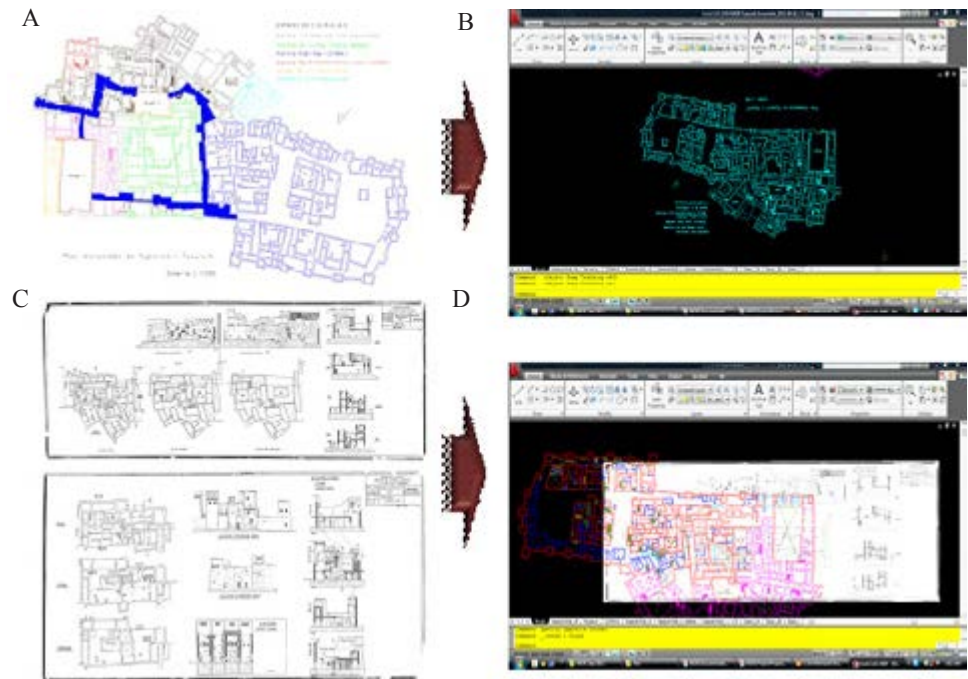


FIGURE 2.17

MS drawings and handmade architectural drawings were transferred into AutoCAD in order to create the architectural schemes.

Images: Claudia Cancino, 2012.

FIGURE 2.18

Architectural scheme of the site, first floor.

Drawing: Claudia Cancino, 2012.

**FIGURE 2.19**

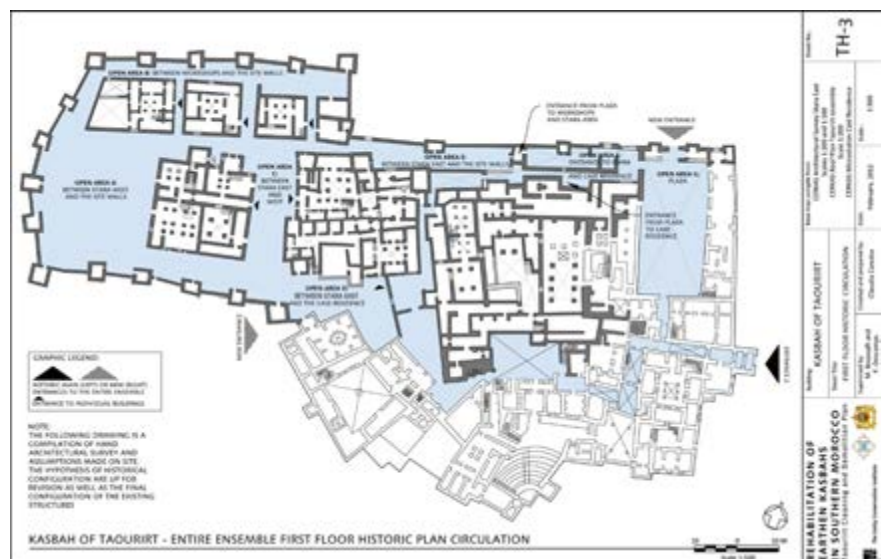
Historical architectural scheme of the site, first floor.

Drawing: Claudia Cancino, 2012.

**FIGURE 2.20**

Historical architectural scheme of the site, indicating original circulation patterns and sector buildings.

Drawing: Claudia Cancino, 2012.



2.5 Architectural Survey

2.5.1 Methodology

During the project campaign of May 2013, CIMS faculty, consultants, and students were organized into three surveying teams and one training team (fig. 2.21):

- Support, Network Adjustment, and Photogrammetry Team (Christian Ouimet, Bjorn Van Genechten)
- Production Team 1 (John Gregg, Zeynep Ekim)
- Production Team 2 (Kenneth Percy, Sarah Ward)
- Training Team (Mario Santana, Laure Chandelier, Bjorn Van Genechten)



FIGURE 2.21

CIMS and GCI team members discussing recording areas of the Stara.

Photo: Mario Santana, 2012.

The support team, prior to the start of the documentation of the Stara portion of Kasbah Taourirt, established a survey network to allow both production teams to measure heritage records in a common coordinate system (fig. 2.22). Once this system was established in the first days of the campaign, the two teams started their work by dividing the kasbah into two areas of survey to ensure that there would be no duplication.

At the end of the campaign, survey markers were established at four strategic locations to help ensure that any future survey work could be tied to the captured information from the 2012 recording campaign. Although these are in a local coordinate system established by the 2012 documentation team, these points will allow the matching/transformation of any future work to the existing measured drawings.



FIGURE 2.22

CIMS survey markers (BMs in blue) and topographic exterior points.

Drawing: CIMS, 2012.

The documentation of the kasbah was primarily achieved using two methodologies. The first was done using a direct survey technique. This involved surveying the exterior and interior spaces with a total station, which was connected to a tablet PC, thus allowing the data to be directly transferred to CAD on site. Any obstructions were hand measured and input directly into CAD (figs. 2.23 and 2.24).



FIGURES 2.23 AND 2.24

CIMS team members recording points using the total station.
Photos: Claudia Cancino, 2012.



Additionally, a second documentation technique was used to record the interior and exterior spaces. This technique involved a “multi-image photogrammetry” or “structure from motion” (McCarthy, 2014) approach, which is a product of recent developments in computer vision. This approach allows us to obtain 3D scenes from 2D images using highly automated workflows with Agisoft Photoscan. This was carried out by capturing a sequence of overlapping and convergent images taken from a scene (or subject) at the relative same distance (fig. 2.25). Recent algorithms allow matching features between pairs of photographs in sequences, which, along with the information contained in the images (adequate camera motion, overlap and structure scene), uses the camera parameters to calibrate and join the images.

CIMS then created a depth map with each photo pixel contained in the image, producing a 3D dense point cloud and/or surface model of these spaces. These point clouds were then used to extract information needed for the production of measured drawings, such as plan sections, cross sections, and elevations (figs. 2.26–2.29).

Kasbah Taourirt was an excellent subject to retrieve accurate metric results with this application. Given that the historic earthen surfaces are extremely irregular, the software was capable of exceeding the number of matches to correlate photographs more efficiently. Another advantage of this technique is that the captured information could later support the production of other deliverables, such as sections and plans at different data/planes, rectified ceiling plans, and orthographic photo elevations.

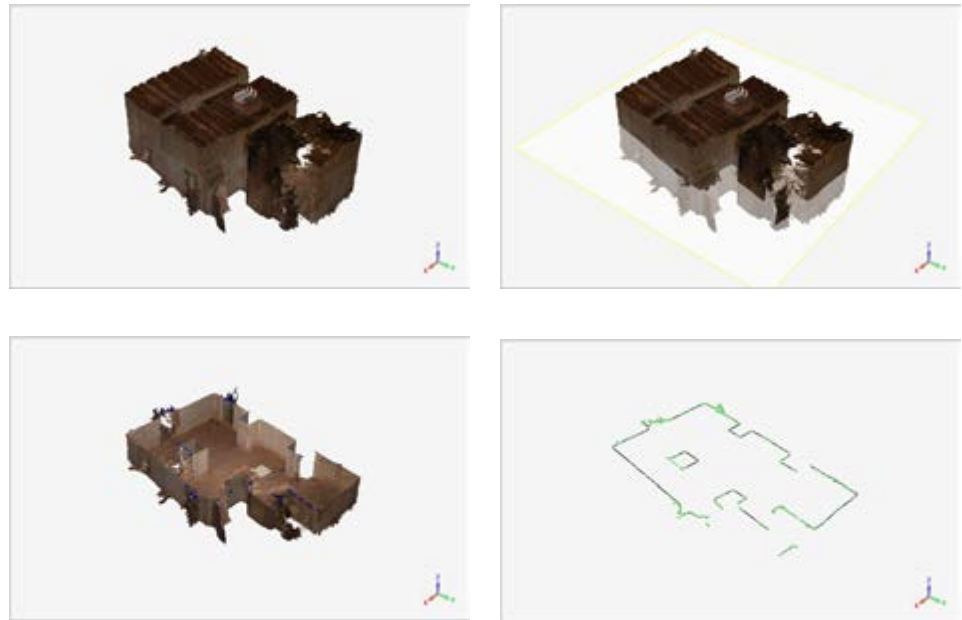
Every effort was made to capture all of the required spaces. However, due to the large size of the site, some sections of the site were not measured. An estimate of 95 percent of the required surface of the targeted areas of the kasbah were recorded in five project campaigns. Unfortunately, at the time of the surveys a small section of the kasbah was still occupied; therefore the areas could not be photographed or measured.



FIGURE 2.25

CERKAS team member taking photographic images on site to be used to obtain 3D scenes.
Photo: Mario Santana, 2012.

Arrangements were made several times to document this portion of the site, but the team was able to enter this area only during the last project campaign. For the production of the CRP, comprehensive accuracy and details of the surveying equipment were provided.



FIGURES 2.26–2.29

Scheme showing how a photogrammetric model can be used to re-create floor plans.

Schemes: CIMS, 2012.

2.5.2 Geo-referencing the Local System

As explained, a local system of coordinates was produced, given the necessity of geo-referencing the measurements and linking the system to the national grid. The support team visited the premises of the “Moroccan Topographic Institute” in Ouarzazate, from which a plan of the exterior boundaries of the kasbah was provided with a list of coordinates in local Moroccan Lambert coordinates.

To link the architectural survey with the provided ground plan of the kasbah, four coordinates were selected in both the local system and Moroccan Lambert system. Originally a GPS unit equipped with European real-time EGNOS correction was selected to link the local coordinate system with the national grid; however, given the better accuracy of points provided by the “Moroccan Topographic Institute,” this device was mainly used for training CERKAS staff (fig. 2.30).



FIGURE 2.30

CERKAS team members using a GPS to link the local coordinate system with the national grid.

Photo: Mario Santana, 2012.

2.5.3 Referential Photography

During fieldwork, additional referential photography was taken in selected areas. These photographs were used for the preparation of cross-section detailing in order to have additional information of the areas surveyed.

Two approaches were used. The first involved taking additional spherical panoramic images and simple point-and-shoot photographs. A photo key plan AutoCAD layer (GCI2012 Photokey plan) indicating the location and orientation of the photographs has been included in the drawings at Level 1 and Level 2 (appendix C) for reference.

The second approach, used in later missions, involves the use of a GoPro camera to collect video clips of all spaces. These two photographic recording approaches created a reference for the condition of the monument and allowed the team to improve and cross reference the measured drawings produced.

2.5.4 Orthographic Photography

Due to the complex geometry and highly decorated wall surfaces in a collection of rooms at the Caïd Residence, digital photogrammetry was used as an accurate documentation technique. Photogrammetry was chosen to produce high-resolution orthographic photo elevations, scaled and laid out to allow condition assessment of the wall paintings to be accurately recorded in situ (fig. 2.31).



FIGURE 2.31

Scheme showing the process used to create panoramic photos.
Photos: CIMS, 2012.

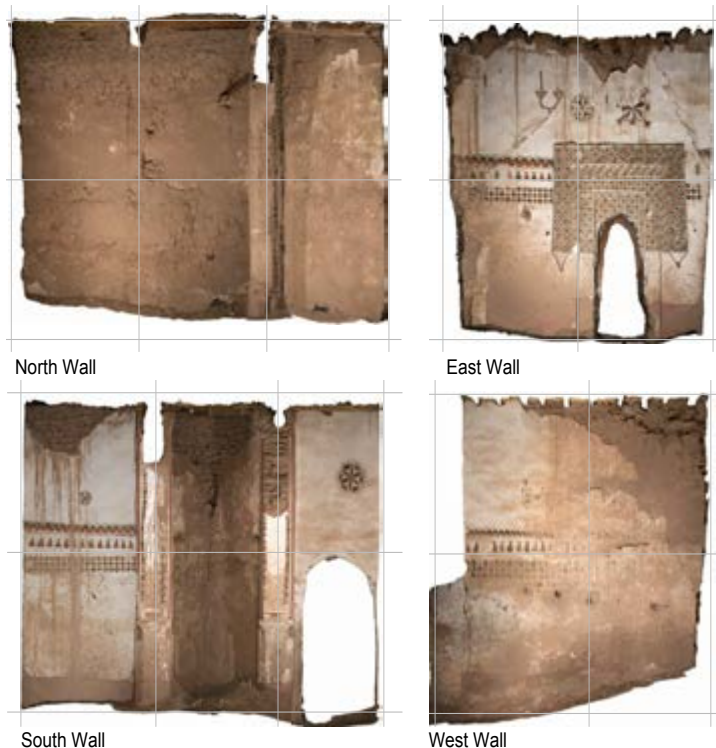
Photographs were captured using a hand-held digital camera mounted on a tripod, a low-cost lighting kit consisting of four speedlights/flashes equipped with diffusers, and wireless transmitters mounted on light stands or placed on the floor (fig. 2.32). Even lighting was required for consistent and evenly exposed photographs.

A sequence of overlapping images was captured, making sure all the required surfaces are recorded in at least two images. The photographs were batch processed for white balance using one adjustment as only the speedlight/flashes were used as a light source (fig. 2.33).



FIGURES 2.32 AND 2.33

Top: GCI team member taking photographs of the wall paintings.
Photo: Scott Warren, 2014.
Right: Orthographic photography of the northwest interior wall paintings of the Caïd Residence.
Photo: CIMS, 2014.





FIGURES 2.34

GCI team member using the total station at the Caïd Residence to collect control points.
Photo: Scott Warren, 2014.

As explained previously, a user-friendly structure from motion software package called Agisoft PhotoScan was chosen to process and develop a photogrammetric dense point cloud from the surface captured with those images.

In order to orient and scale the resulting point clouds, a total station was used to collect control points with 3D coordinates (x,y,z) that link these models to the overall kasbah survey, allowing surface and volume measurement as well as the correct geospatial orientation of the model (fig. 2.34).

This registration of the model also facilitates breaking the model down into zones wall by wall. Because all the separate zones are registered in the same coordinate system, they can be loaded, viewed, edited, and exported separately or collectively. Models were exported in OBJ format, allowing the open-source software Meshlab to create orthographic photo elevations. These images were then scaled and arranged in AutoCAD, printed, and used for the condition assessment of the wall paintings (fig. 2.35).

Once the condition of the wall paintings had been recorded and digitized in AutoCAD, these images could then be used to re-render the photogrammetric model with the output of the condition assessment, creating a 3D model including the condition assessment of the wall paintings (fig. 2.36).

The rendering of the new photogrammetric model (OBJ format) with the condition assessment was created using Adobe Photoshop. Other uses of the photogrammetric model include animating the model; for example, the creation of a fly-through of the space or the lighting of surfaces with artificial light, highlighting texture and detail.

The approach developed by CIMS in collaboration with the GCI and CERKAS proved effective, as it allowed the team to produce measured orthographic images in the field and transmit them to the GCI team for further condition mapping. Many photogrammetric applications allow the production of such records only after intensive processing time.



FIGURE 2.35

GCI staff performing condition assessment of the wall paintings using orthographic photography.
Photo: Scott Warren, 2014.

**FIGURE 2.36**

Rendering of the 3D photogrammetric model (OBJ format) with the condition assessment created using Adobe Photoshop.

Photo: Samuel Whitaker, 2014.

2.5.5 Spherical Panoramic Photography

Numerous semi- and full spherical panoramic photographs were prepared from specified locations throughout the site and additional areas (ksar, Caïd Residence, etc). A Google KMZ file has been assembled with the locations of the panoramic images and is included in the delivered digital data. Furthermore, an AutoCAD layer at Level 1 (GCI2012 – 360 Panoramas) has been included in the delivered drawings (appendix C).

These images were prepared by stitching eight overlapping images for a complete coverage of 360 degrees of the captured scene (six horizontal and two bottom and top views). The images were taken using a Nikon D300 DSLR camera (12.3 megapixel DX format CMOS sensor) and later with a Nikon D800 DSLR camera (24.6 megapixel DX format CMOS sensor), both equipped with a Nikkor fisheye lens of 10.5 mm that covers a field of view of around 180° diagonal. To prevent major effect of parallax, a Nodal Ninja 3 panoramic adapter was used.

The images were stitched using PtGui, a highly sophisticated software that detects common points in overlapping images and creates immersive views of the areas photographed. Although the resulting images are not measurable, they are useful for “as found” documentation and for recording conditions (fig. 2.37).

2.5.6 Equipment Used

Total stations:

- Leica Geosystems Total Station TS11, with a distance accuracy of 2 mm and angular 2 ppm (fig. 2.38)
- Leica Geosystems Total Station TS06, with a distance accuracy of 1.5 mm and angular 2 ppm
- Leica Geosystems TCR405 Power, with a distance accuracy of 2 to 4 mm and angular 2 ppm
- Leica Geosystems TCR304 (provided by the GCI to CERKAS), with a distance accuracy of 2 to 4 mm and angular 2 ppm

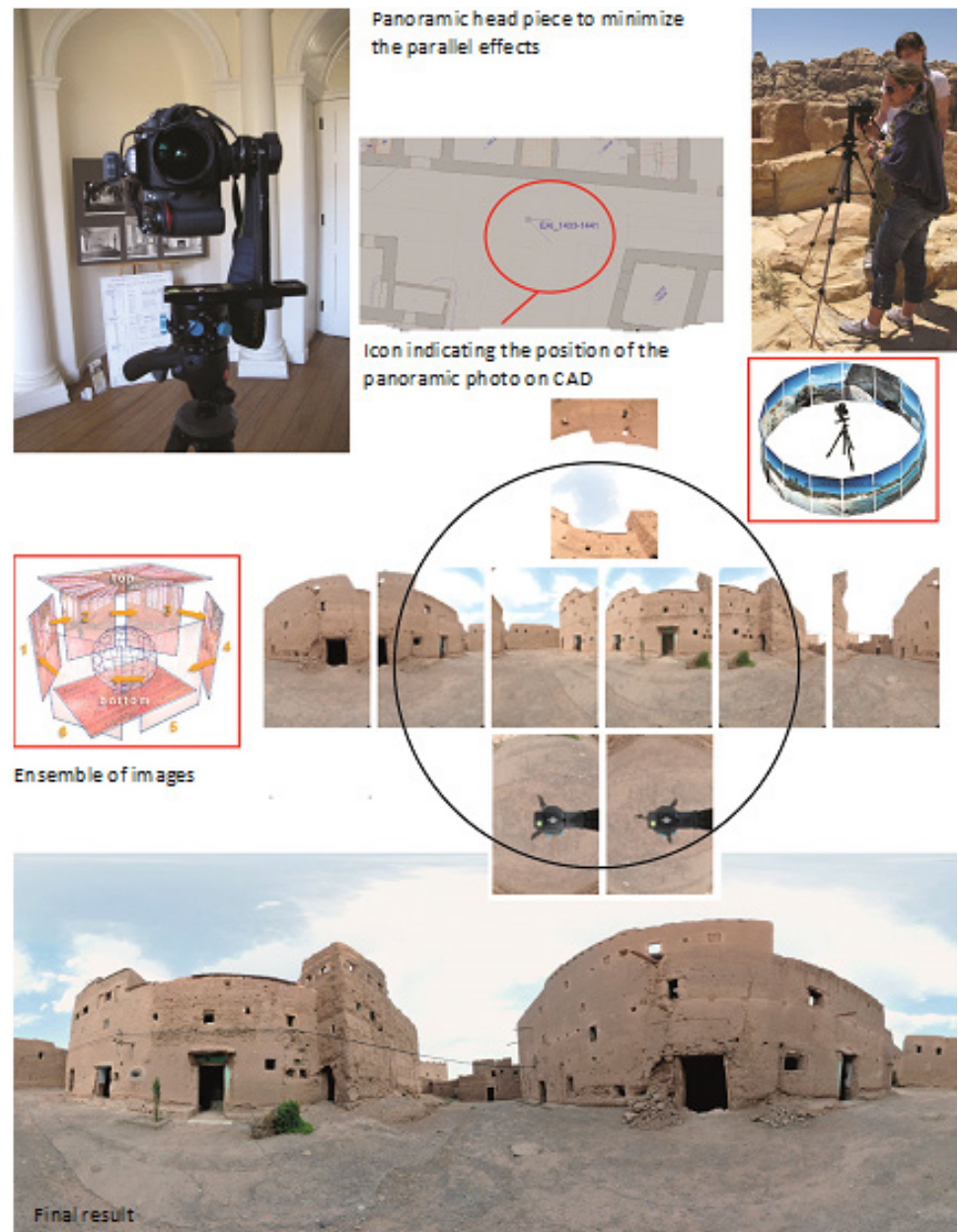


FIGURE 2.37
Scheme showing the process used to create panoramic imaging.
Photos and drawings: CIMS, 2012.

Digital photography and photogrammetry:

- Canon 5D Mark II, 21.1 megapixels, used for photogrammetry
- Nikon D300, 12.3 megapixels, used for panoramic photography
- Nikon D800, 36 megapixels, used for both photogrammetry and panoramic photography
- Nikon D5100, 16.2 megapixels, used for photogrammetry
- Nikkor 10 mm fisheye lens, used for panoramic photography
- Sigma 10–20 mm wide lens, used for photogrammetry
- Nodal Ninja 3 panoramic adapter

Computer:

- 3x Tablet PC Motion Computing LE1600

Software:

- AutoCAD (various versions)
- Agisoft PhotoScan for Photogrammetry
- Theolite LT for total station surveying
- PtGui for panoramic photography
- Adobe Photoshop CS5 for enhancing panoramic photography

**FIGURE 2.38**

Total station equipment used for the development of the architectural survey.

Photo: Claudia Cancino, 2012.

2.6 Training and Capacity Building

The course was designed to be delivered in lectures and fieldwork demonstrations (figs. 2.39–2.41). Each lecture provided an overview of metric information needs and recording techniques for the assigned areas within the kasbah. The priority was to develop appropriate skills within the CERKAS team through training activities. Furthermore, the CERKAS team was directed to measure a section of the kasbah as an assignment to be delivered by the beginning of September 2012, sending a preliminary “recording strategy” and schedule by the end of June 2012.

For the completion of the records and supporting lectures, practicum, and fieldwork, manuals, tutorials, and essential readings were produced and made available, including the recent publication produced by the GCI titled *Recording, Documentation, and Information Systems for the Conservation of Heritage Places*.

The schedule consisted of sixteen days averaging eight hours of daily training on surveying techniques for recording historic buildings. The sessions were coordinated by a documentation expert, and three specialized experts contributed to supplementary sessions. The final objective of the course was to provide an approach for the effective use of recording, interpretation (processing), and dissemination in the conservation of built heritage.

Besides the preliminary training session conducted in May 2012, CIMS delivered further training in the field to CERKAS staff while completing the architectural survey of the kasbah in May 2013 and April 2014.

The teaching strategy involved an innovative hands-on approach, which empowered participants and instructors to:

- develop an understanding of the role of information in conservation, addressing national and international standards;
- review the potential limitations of recording and documentation techniques, including simple and advanced tools, and the financial constraints;
- develop a practical approach to the use of these tools and documentation techniques in order to capture information from cultural heritage resources;
- include the use of information systems in heritage resources management; and
- design a strategy for presenting information to stakeholders and decision makers.



FIGURES 2.39–2.41

Above: CERKAS team member making use of the total station.
Photo: Claudia Cancino, 2012.
Upper right: Mario Santana (CIMS) teaching orthographic photography in class to CERKAS team.
Lower right: Christian Ouimet (CIMS) teaching orthographic photography on site to CERKAS team.
Photos: Claudia Cancino, 2012.



2.6.1 Topics

1. Recording tools – an understanding with an emphasis on low cost:
 - Introduction to Global Navigation Satellite Systems (GNSS) and geo-tagging, features, and other relevant issues related to the protection and management of the site
 - Digital photography (including panoramic)
 - Scaled-rectified photography using a leveled camera, control points, Photoshop, and CAD
 - Reflectorless Electronic Distance Measurement (REDM) total station
 - Digital photogrammetry

2. Baseline records for condition assessment:
 - Using scaled-rectified photography, photogrammetry, and CAD overlay
 - Observation, assessment, and notation of conditions on wall elevations
3. Report preparation and presentation.
4. Introduction to other advanced recording techniques (mastery is not expected):
 - Terrestrial laser scanning
 - Automatic 3D image-based recording
 - Satellite imagery and sources



FIGURE 2.42

Mario Santana, CIMS instructor, teaching the use of total station to the CERKAS team.

Photo: Scott Warren, 2014.

2.6.2 Training Deliverables

In addition to the theory presentation and material provided by the École Nationale des Sciences Géographiques (ENSG) and given the need of training for the CERKAS team on the Leica TCR307 belonging to the GCI, different manuals were prepared in French. The didactic package delivered included the following items:

1. Recording workflows – hands-on training sessions:
 - a. Introduction to guiding principles in heritage recording
 - b. Hardware and software manuals:
 - Total station
 - Orthographic photography
 - Defining an orthogonal projection inside the survey of architectural elevations; use of the Unit Coordinate System (UCS) and CAD
 - User's manual: Total station Leica TCR307. Program: Free station
 - User's manual: Total station Leica TCR307. Program: Surveying and setting out
 - Downloading data from TCR307 to the laptop
 - Presentation and advanced photogrammetry tutorial on Agisoft
 - PhotoScan developed by Bjorn Van Genechten
 - c. Manuals and presentations on photogrammetry developed by the ENSG, France.
2. Readings
3. Illustrated examples

**FIGURE 2.43**

CAD drawing printouts delivered by CERKAS personnel in 2013.
Photo: Tim Michiels, 2013.

These deliverables were provided on hard copy and on a USB flash memory card along with relevant software, references, total station formats, and training material completing the fieldwork exercises compiled during the course.

2.7 Survey Results

2.7.1 Processing Work

Originally, six weeks were planned for the production of the final deliverables for the Stara area and an additional six weeks after the second documentation campaign in May 2013 to produce the Caïd Residence drawings. The production team consisted of two students supported and supervised by Christian Ouimet (fig. 2.43). Additional survey activities were carried on by a smaller CIMS team in April 2014.

The deliverables will consist of CAD drawings of the following:

- Floor plans
- Roof plan
- Cross sections of entire recorded portion of the site (A, B, C, and D)
- Cross sections of sector interiors (G, H, I, J, and L)
- Interior elevations
- Exterior elevations

The above-mentioned deliverables have been presented in 1:50 and 1:200 scales, using a titleblock and layer-naming conventions provided by the GCI.

A written report was produced, which provides a summary of all of the deliverables, along with the panorama photography. The report also provided background information on the project, including the methodology used, description of the techniques, and software used.

2.7.2 Deliverables

All CAD measured drawings of the survey of the site residence areas are provided in appendix C.

**FIGURE 2.44**

Mario Santana (CIMS) teaching the use of the total station with manuals created for the course.
Photo: Claudia Cancino, 2013.

CHAPTER 3

Architectural and Historical Context

Reconstructing the history of Kasbah Taourirt relies on many sources of information, including oral history, written records, photographs, and travelers' accounts. While the history of southern Morocco is well documented, writings about the kasbah itself are rare and mainly come from travel diaries.

During the nineteenth century, European expeditions ventured to discover and document the geography of this area of Morocco. Charles de Foucauld (1858–1916), a French explorer who traveled extensively and clandestinely in the region disguised as a Jewish rabbi, was one of the first to venture into the Draá Valley. His journey is renowned for having twice crossed a dangerous region inhabited by hostile tribes. In *Reconnaissance au Maroc 1883–1884*, he recounts his journey and provides extensive information about the geography and social organization of the region. He also mentions the Caïd of Taourirt of Ouarzazate, Si Hammadi el Glaoui, but gives little information about the place itself (Foucauld and Bondy, 1939).

Throughout the late nineteenth and early twentieth centuries, and under the protection of the Glaoui—a powerful family controlling the South Atlas region who later allied with the French—several military, geographic, and medical expeditions were undertaken. These expeditions contributed to a better understanding of this vast region and its inhabitants. Some information on Taourirt and its surroundings can be gleaned from the accounts and photographs of these journeys (fig. 3.1).

In the early twentieth century, a French military base was established in Ouarzazate that has provided us with valuable aerial photographs. Additionally, visitors such as Jacques Majorelle (1886–1962) have left remarkably detailed watercolors and sketches.



FIGURE 3.1

Historical photograph showing the Caïd Residence and the external defensive walls of the kasbah, ca. 1930.

Photo: Éditions d'art Felix, from the archives of J. Gandini.

FIGURE 3.2

First aerial view of the kasbah and ksar of Taourirt, ca. 1930.
Photo: Armando Lafite archives, Archives J. Gandini.

**FIGURE 3.3**

Views of south facade of the kasbah in the 1920s (top) and in 2011 (bottom). The morphological changes over the years help to establish the chronology of the kasbah.

Photos: Fondation Banque Populaire pour l'éducation et la culture, Royaume du Maroc (top); Sebastien Moriset (bottom).

**FIGURE 3.4**

Views of north facade of the kasbah in the 1930s–40s (top) and in 2011 (bottom).

Photos: Archives J. Gandini (top); Sebastien Moriset (bottom).



An important part of the information compiled in this chapter was collected from Jacques Gandini's webpage, which focuses on the history of Ouarzazate and the surrounding region. It collects and presents many written sources, images, and travelers' accounts (www.ouarzazate-1928-1956.fr).

For detailed information about the construction and historical uses of the Kasbah, oral history is also a critical tool. Important information about the kasbah's history was recorded through interviews with elderly residents, caretakers, and others who have lived in or near the kasbah. This information is summarized in section 3.4.

Archival photographs and images—including aerial (military), travelers' postcards, and artworks—also contribute a great deal of information regarding changes to the physical fabric of the building over time. While photography was carried out in Morocco as early as the mid-nineteenth century, archival images of Kasbah Taourirt largely date from the twentieth century. Changes in the building fabric over time are particularly evident thanks to aerial photography, which began in the mid-1920s with the land reconnaissance by the French military. The first dated aerial image of the kasbah was produced around 1930, and many surveys were carried out subsequently (fig. 3.2).

Due to the fact that photographs were rarely accurately dated, the GCI has created a database of photographs that includes information regarding the subject, author, approximate date, source, and copyright (appendix D). Photographs have been dated through comparison between written documentation and features shown in the images. Comparisons between historical and modern views (figs. 3.3, 3.4, and 3.6), taken from the same vantage points, help to clarify transformations over time.

In addition to aerial photography, an on-site room-by-room survey was conducted by GCI and CERKAS staff to identify walls and features added after 1956, when control of the property passed to the Moroccan state after its designation as National Heritage in 1954. The survey mapped all added walls by identifying modern materials as well as later earthen construction (fig. 3.5). The majority of these alterations and additions occurred during the Stara's later period of occupation by squatters, from the mid-1980s until 2010.

FIGURE 3.5

Right: First-floor plan of the kasbah, indicating changes (in blue) before and after 1956.

Drawing: Elena Macchioni, 2014.

**FIGURE 3.6**

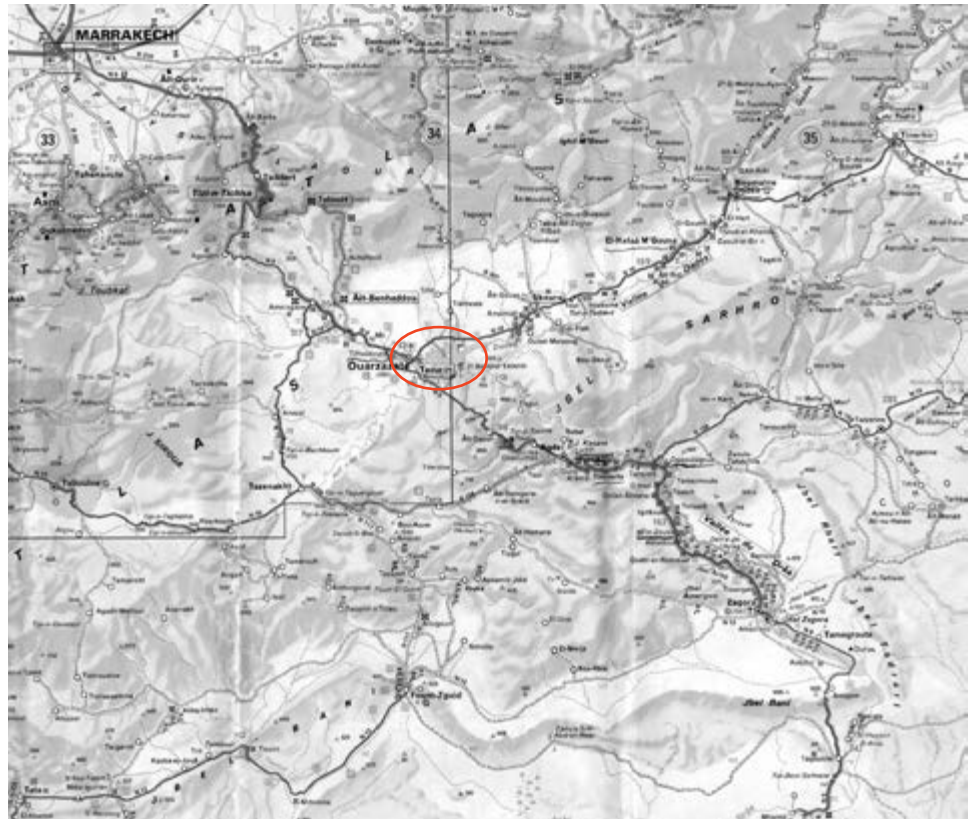
Views of former entrance to the kasbah in 1950 (top) and in 2011 (bottom).

Photos: Archives J. Gandini (top); Sebastien Moriset (bottom).



3.1 History of the Site

Kasbah Taourirt is located in the city of Ouarzazate—30° 55' 0" N, 6° 55' 0" W—at an elevation of 1,160 meters (3,810 feet), in the middle of a barren plateau south of the High Atlas Mountains, at the confluence of the Draá and the Dadès Valleys (fig. 3.7).

**FIGURE 3.7**

Map showing the location of the city of Ouarzazate in relation to Marrakech, the High Atlas Mountains, and the Dadès and Draá Valleys. Location of Kasbah Taourirt is circled in red.

The palm grove after which the city was named is irrigated by the *oued* (a valley, ravine, or channel that is dry except in the rainy season) Idermi. In the past, the oasis was the main intersection of several trade routes leading to Marrakech. The city is today considered the departure point for adventure tourism in the Sahara Desert, hence its name “Door to the Desert.”

The history of the site of Taourirt and its surrounding region is closely linked to the history of the Glaoui family. Their influence rose in the nineteenth century and lasted until the independence of Morocco from the French Protectorate in 1956 (Maxwell, 1966). It started when Sultan Moulay Abderrahman ben Hicham appointed Mohamed Ibibt el Mezouari as Caïd of the Glaoui, Imeghran, and Aït Ouazouguet tribes. He gained power not only through traditional tribal warfare but, more importantly, through his control over the main trade routes connecting the Draá, Tafilalet, and Moroccan Sudan to Marrakech. In 1860, Si Mohamed became the representative of the sultan in the region. In 1893, his son and heir, Si Madani el Glaoui, gained the favors of the Sultan of Fez when returning from a *harka* (military expedition) in Tafilalet (Tharaud and Tharaud, 1920). To thank his host, the sultan offered the Caïd a cannon, which helped him to boost his influence and control over a larger territory in the region and further enhance the family’s power.

Organized in a family-based caïdal system, they established the Kasbah de Commandement (Command-headquarters Kasbah) at key strategic locations. Si Madani was first appointed minister of war in 1907. In 1909, he was named grand vizier and installed his nephew Si Hammou as Caïd of Telouet and the territory south of the Atlas, and his brothers El Hadj Thami el Glaoui and Si Hammadi as Caïd and Khalifa of Marrakech and Taourirt, respectively. Si Hammadi lived in the kasbah of Taourirt from 1882 to 1937. Paul Chatinières describes the family and the setting of the kasbah:

The Caïd family of the Glaoui is originally from Ouarzazat, the beautiful oasis behind the Draá River. Their ancestor, the “marabout” or holy man, came to settle near the heights of the Great Atlas on the southern side of the Telouet path, which is crossed by the main road from Marrakech to the vast plateaus of the southern atlas; to Tafilalet, and to the “Soudan Marocain.”... Soon, a long green stain was outlined over the purple haze. It is possible to gradually distinguish the approaching villages, tighermt, palm trees, and a large river. I arrived to Ouarzazate, the great oasis of the region, the first to the south of the Great Atlas. It is extended over 15 kilometers length and 3 to 4 kilometers width along the river, between rocky hills to the south and northern steppes to the north...the scattered villages are set like red spots... Taourirt has the appearance of a Kasbah, but the fine towers emerging from the terrace have the characters of a tighermt. Taourirt is the main stronghold of the oasis and the command headquarters. It is a wide and spacious building. (Chatinières, 1919, pp. 25–26)

This description is critical to understanding Taourirt and its landscape: an oasis enclosing several villages. Other documents, such as the collected historic images in appendix D, confirm this description, indicating as well the presence of other kasbahs and villages in the palm grove (fig. 3.8).

However, the landscape today has changed dramatically (fig. 3.9). Only a few elements suggest the natural setting of the past, like the ksar cemetery and historic entrances (fig. 3.10).

**FIGURE 3.8**

Aerial view of Taourirt in its original landscape, ca. 1930.

Photo: Archives J. Gandini.

**FIGURE 3.9**

In the present day, the silhouette of the kasbah is no longer shaped against the Atlas but is prolonged by the expanded growth of the city.

Photo: Sebastien Moriset, 2011.

**FIGURE 3.10**

Reminders of the original setting of Taourirt remain, such as its palm trees, river, and cemetery.

Photo: Sebastien Moriset, 2011.

Upon the arrival of the French, the city began to change and grow rapidly. The French army installed quarters on a hill located west and facing Taourirt. Around 1929, Colonel Bonnard Chardon started to plan the colonial city. In recent years, due to rural emigration and population growth, the city has expanded dramatically to the north and along the access roads. The Amazigh settlements, constituted by the Kasbah de Commandement and the ksar and formerly surrounded by a natural landscape, is now embedded in a large urban environment (with the exception of the south area), turned toward the oued and indirectly protected from the risk of flooding. But the view from the kasbah toward the opposite riverbank, where another kasbah stood, has also been rapidly transformed by the expansion of housing complexes.

In the first guide for Morocco, published in 1938 (*Le Maroc du Nord au Sud; Ouarzazate et sa région*, p. 7), the kasbah and the ksar are described as follows:

The Kasbah is in fact a small town grouped into two winding streets and narrow lanes, around two noble houses in the style of this country.

One is that of the Caïd Si Hammadi, calipha of the Pasha of Marrakech; the other, that of Si Mohamed el Aarabi, his nephew, the eldest son of Si el Madani.

According to the census of March 1936, 154 indigenous households reside there: 1130 Muslims (392 men and 738 women); 124 Jews (62 men and 62 women). Four gates provide access to the interior. Those of the west, south and southeast are closed every day one hour after sunset, while the eastern one is open all night. There is, in addition, a special gate to access the Caïd Residence. Under the terrace of the Kasbah, under the arch of the big conglomerate cliff, settled the families of poor people who live there as troglodytes. This is also the place that potters have chosen to exercise their art. It is possible to visit three open air workshops and two ovens, working on Wednesday each week, the day before the souk. The finished parts—jars, plates, bowls, and lidded pots—are preserved in the fresh depths of two caves. The works of these maalmine are simple terracotta, sometimes adorned with thin black lines, but they are never finished as the pottery from Tamgrout, nor especially the pretty green or ocher painted surfaces that the Tamgrout potters use. A Moorish bath was installed in the gardens, close to the West Gate. (Maroc du Nord au Sud, 1938, p. 7)

Thanks to the establishment of the French military base and the construction of the landing strip, several aerial photographs were taken. These images provide important information on the evolution of the site and help to identify key features that highlight the significance of the site. Figure 3.11 indicates an earlier state of the place, still with no construction along the road going east to Skoura, and clearly reveals an agricultural pattern. Key components in the landscape can be appreciated, such as the threshing yards north of the kasbah (now erased by modern construction), and the traditional crop gardens and fields in the south, with some palm groves visible as well.

Detailed descriptions of the site and its architecture are rare and incomplete. Even so, military and medical officers participating in the Caïd's harka and members of scientific expeditions usually expressed their astonishment when



FIGURE 3.11

Aerial view of the kasbah and the ksar around 1950 within its surrounding landscape.

Photo: Archives J. Gandini.

discovering the architecture of the region and, in particular, Ouarzazate's Caïd Residence, the kasbah of Taourirt.¹

Sometimes these descriptions are not limited to the monumental complex and also refer to the kasbah and the ksar. In general, they do not give a precise description of the place but mainly reflect the impressions of visitors and focus on elements that catch their eye: the color of the walls, decorative motifs on their upper parts, massive and defensive aspects of the buildings, rare openings, or the height of the impressive towers that characterize this architecture. At most, some comment on the complexity of the floor plan or, from a more anthropological point of view, the description of the mixture of population—slaves, servants, and the Caïd's numerous family members—or activities taking place in the complex (a combination of palaces, stalls, kitchens, and animal pens). Also, there are descriptions of spaces and people, encountered while reaching the richly decorated rooms used by the Caïd to receive his honored guests. Occasionally some mention the ongoing construction works at the site and the construction techniques used.



FIGURE 3.12

Southwest view of Taourirt around 1920. Earliest historical photograph.

Photo: Fondation Banque Populaire pour l'éducation et la culture, Royaume du Maroc.

Taourirt is always presented as the most important and magnificent kasbah of the oasis. In order to appreciate the settlement as it was in the early days of the French Protectorate, the view taken from a southwest angle is probably one of the best (fig. 3.12). The impressive construction of two monumental ensembles rising from a large group of buildings, the location, the setting, and the establishment of the settlement in the landscape are witness to the prosperity and strength that reigned during the height of the Glaoui family's power in Taourirt and southern Morocco during the Protectorate period.

3.2 Timeline

The following timeline summarizes the historical events related to the kasbah of Taourirt and the city of Ouarzazate from the sixteenth century to the present day.

Date	Event	Source
16th century	Oral tradition states that the mother of Amed al Mansour, Saadien dynasty sultan, was born in the ksar.	Oral tradition CERKAS
	Draá Valley was known as a trade route to Timbuktu for gold, slaves, leather, and cloth.	Foucauld, C. (1939), p. 151
17th century	"Ville ingrate, une kasbah colossale aux très petites fenêtres trouant de gigantesques parois verticales couleur sang coagulé, a été construite en même temps que Versailles, nous dit-on..." The text suggests the kasbah was built at the same time as Versailles.	Homet, M. (1937)
17th century	Oral tradition claims the ksar to be older than the kasbah and the kasbah to date from the 17th century.	CERKAS interview with Glaoui descendant (1990)
Before 1860	The Caïd, Si Mohamed ou Abdellah, named representative of Sultan Abderrahman ben Hicham (1822-59), lives in the kasbah.	CERKAS study (1990)
1860	Under the reign of Sultan Mohamed IV (1859-73), Mohamed Ibibt el Mezouari is named Caïd of the Glaoui, Imeghran, and Aït Ouauzuguit tribes.	CERKAS study (1990)
1860	At the death of Sultan Si Mohammed ou Abdellah, another ruler (Amghar) by the name of Mohamed ou Hmad ou Abou becomes the amzouar of Taourirt. He was the leader of the Tamnougalt caïds (a tribe of the Mezguita palm grove in the Draá Valley) at the time of Caïd Si El Abbas Ben El Hassan.	CERKAS study (1990)
1874	Mohamed Ibibt el Mezouari overthrows Tamnougalt sovereignty after his victory over Si El Abbas Ben El Hassan.	Gandini, J. Website and confirmed by oral communication from CERKAS
1882	Hammadi, son of Mohamed Ibibt and brother of el Madani el Glaoui, establishes himself in Kasbah Taourirt at the death of the amghar Mohamed ou Hmad ou Abou. He marries the sister of the amghar, Lalla Sfia Hmad, to consolidate their power in the region.	Gandini, J. Website and confirmed by oral communication from CERKAS
1886	Madani el Glaoui succeeds his father, Mohamed Ibibt el Mezouari, and becomes the chief of Telouet and the Caïd of the Glaoui and Faija.	CERKAS Tamnougalt research (1996)
1893	Last <i>harka</i> (military expedition) of Sultan Hassan I to Fès-Tafilalt-Marrakech (June 29 to December 19, 1893) ends after a difficult journey due to snowstorms through the Telouet pass. He is received at Telouet Kasbah by Madani el Glaoui. Supported by the sultan, the Glaoui consolidate their power and become the leaders of the High Atlas region between Marrakech and Ouarzazate, controlling the Mesfioua area as well as the Dadès and Todgha Valleys.	Mohamed Aafif, M. (1980), pp. 153-68
June 7, 1894	Sultan Hassan I dies. Tribes of the region (Aït Ouarzazate, Aït Boudlal, etc.) rebel and lay siege to Kasbah Taourirt for two years. At the age of 14, Abdelaziz succeeds his father, Hassan I. The grand vizier, Ba Ahmad, is regent until 1900.	Gandini, J. Website and confirmed by oral communication from CERKAS
1901	Kasbah Tamdakht is conquered under cannon fire by the troops of the Glaoui, led by Thami el Glaoui. The Caïd of Tamdakht, Amghar Ali, leader of the Aït Wauzuguit confederation, is beheaded.	CERKAS, Tamdakht research (1985)

1904-9	Travels of Henry Gentil. Thami el Hadj Glaoui, Pasha of Marrakech, provides him protection for his reconnaissance trips.	Gentil, H. (1923), p. 4
1908	Sultan Abdelhafid, with the complicity of the Glaoui, deposes his brother Abdelaziz.	Gandini, J. Website and confirmed by oral communication from CERKAS
1909	In 1909, Madani el Glaoui is named grand vizier.	Gandini, J. Website and confirmed by oral communication from CERKAS
1911	Deposition of the Glaoui by Sultan Abdelhafid	Gandini, J. Website and confirmed by oral communication from CERKAS
1911	Glaoui family controls the widest area ever controlled by a family in Morocco. The Protectorate designates Madani el Glaoui as head of the Glaoui and Thami Glaoui as Pasha of Marrakesh.	Chatinières, P. (1919), p. IV
1912	Signature of the Protectorate Treaty in Fez.	Chatinières, P. (1919), p. IV
1916	<i>Harka</i> led by Thami and Caïd Hammou against the Zenaga and Sektana tribes.	Chardon, B. (1936)
1918	Death of Madani el Glaoui. The Pasha Thami becomes leader of the Glaoui family.	Gandini, J. Website and confirmed by oral communication from CERKAS
1919	General Henri de Lamothe participates in the <i>harka</i> of Pasha el Hadj Thami El Glaoui (in the Dadès-Draá Valley). He arrives in Taourirt on January 7 and resides in Taourirt from January 12 to 29. He is accompanied by Captain Bonnard Chardon.	Chardon, B. (1936)
1924	<i>Harka</i> in the Draá Valley led by Caïd Hammou.	Chardon, B. (1936)
1926	Landing-strip construction and first landing of a plane in Ouarzazate.	Website
1927	Official inauguration of the Marrakech-Tichka road. The same year, the road reaches Telouet. In December, the road reaches Ouarzazate.	Gandini, J. Website and confirmed by oral communication from CERKAS
1928	In April, the <i>35ème Goum</i> (military mixed contingent), composed of Moroccans, leaves Telouet and arrives in Ouarzazate. It establishes the garrison on Igherm Ouguellid Hill, creating the Poste des Affaires Indigènes (Indigenous Affairs Post).	Gandini, J. Website and confirmed by oral communication from CERKAS
1929	Installation of French battalion in Ouarzazate. Battalion Colonel Bonnard Chardon; Resident General Lucien Saint.	Gandini, J. Website and confirmed by oral communication from CERKAS
1930	Beginning of the construction of the French neighborhood of Ouarzazate.	Gandini, J. Website and confirmed by oral communication from CERKAS
1931	First reinforced-concrete bridge over oued Zat, on the road to Tichka. The road is extended to Tinghir.	Oral communication from CERKAS
1932	Area changes status to become a territory. Colonel Chardon plans the future urban center of Ouarzazate.	Gandini, J. Website
1933	Official recognition of the urban center of Ouarzazate, named after the palm grove in which Taourirt and the newly developed French quarter were embedded.	Vizier decree of December 13, 1933 and <i>Dahir</i> of May 8, 1934

1937	Opening of the <i>track</i> (dirt road) to Agdz.	Oral communication from CERKAS
1939	Death of Mohamed. Si Boubker, son of Madani Glaoui, becomes the new leader of Taourirt for nine months.	Gandini, J. Website and confirmed by oral communication from CERKAS
1940	Mohamed el Mahadi, son of Hammadi, is leader of Taourirt until the independence of Morocco.	Gandini, J. Website
1950	Sultan Mohamed V is received in Telouet by El Glaoui Pasha.	Gandini, J. Website
1954	Site and kasbah of Taourirt both are listed as recognized national heritage: the kasbah is declared a national historic monument and the ksar, a servitude protected area.	Vizier decree of February 17, 1954 listing B.O. n.2159 of March 12, 1954, p. 379
1956	Independence of Morocco from French Protectorate. The Glaoui allies to the French, opposed to King Mohamed V. All their properties are confiscated to the benefit of the Moroccan government. Thami Glaoui dies on January 13.	General history
1960	The Kasbah de Commandement is returned to the Glaoui family.	Oral communication from CERKAS
1967	A Club Med resort is built across the kasbah.	Oral communication from CERKAS
1968-74	World Food Program for restoration of ksour in the Draá Valley promotes development in 17 oases including Taourirt. The project raises interest for earthen architecture.	Oral communication from CERKAS
1972	Municipality buys the Glaoui family property (Kasbah Taourirt).	Oral communication from CERKAS
1975	Inventory of kasbahs in the Draá Valley is carried out by the Ministry of Culture.	Oral communication from CERKAS
1987-89	Ministry of Culture UNDP, first phase of intervention in the southeast area of the kasbah (ruined), 1988 following Stevens' report.	UNESCO Stevens' report
1989	Creation of CERKAS. Rehabilitation of the southeast part of the kasbah to host the new center. Inauguration of CERKAS.	Oral communication from CERKAS
1991-92	Restoration of the south area of the kasbah.	Oral communication from CERKAS
1994	Construction of the present theater area and exhibition space by CERKAS.	Oral communication from CERKAS
1995	Restoration of part of the Caïd Residence by CERKAS.	Oral communication from CERKAS
2000-2007	Aerial photo survey and inventory of the Draá Valley heritage. Taourirt is included.	Oral communication from CERKAS
2006	Restoration and inauguration of the Médiathèque (Riad of Jamila Tourquia).	Oral communication from CERKAS
2010	Eviction and relocation of squatters and proposal for intervention in the Stara area.	Oral communication from CERKAS
2010	Restoration and rehabilitation of building components in the restored south area, between the amphitheater and the Médiathèque.	

FIGURE 3.13

Aerial photograph showing Kasbah Taourirt (in red) within its immediate context, ca. 1920.

Photo: Agence Nationale de la Conservation Foncière du Cadastre et de la Cartographie, Royaume du Maroc.

**FIGURE 3.14**

Aerial photograph, taken in 2009, showing Kasbah Taourirt (in red) within its immediate context.

Photo: Agence Nationale de la Conservation Foncière du Cadastre et de la Cartographie, Royaume du Maroc.



FIGURES 3.15-3.19

Photos showing urban evolution around Kasbah Taourirt (in red) from 1920 to 2009.

Photo: Agence Nationale de la Conservation Foncière du Cadastre et de la Cartographie, Royaume du Maroc.

1920



1964



1979



1991



2009



3.3 Construction Chronology of the Site

This section describes the evolution of Kasbah Taourirt over time and is based on a combination of on-site investigation and archival and oral history research.

In order to study the physical evolution of the kasbah, a new, more accurate geometrical survey was needed. As explained in chapter 2, CIMS, the GCI, and CERKAS developed a complete set of drawings including plans, sections, and elevations of the kasbah, as well as rectified photographic images of the principal facades (appendix C).

These documents were used to develop schematic 3D models of the site. The models explain visually the chronology of construction over time and highlight different historical phases (fig. 3.20). In the models shown in figures 3.21 to 3.30, the areas in red represent new construction or additions to existing buildings, which are represented in white. Yellow areas represent demolition or deterioration, which occurred mostly in the late twentieth century.

Through the combination of oral and written history with on-site investigation, the models link historical events and changes in power or ownership to alterations in the physical fabric of the site. However, establishing exact construction phases in earthen architecture is a challenge. The nature of earthen construction—in which the same material is used for masonry units, mortars, and plasters, and much of the masonry is rendered (most of the time, the construction details of the walls cannot be seen)—together with the continuous evolution of the complex, makes exact mapping of alterations difficult. Hence, the models highlight major campaigns of construction or alteration, while historical events associated with each phase are explained in the accompanying text.



FIGURES 3.20–3.30
Chronology of construction at
Kasbah Taourirt, showing the dif-
ferent historical phases.
Drawings: Elena Macchioni, 2013.



FIGURE 3.21

17th Century (Phase 1)

The earliest part of the kasbah, the area occupied today by the offices of CERKAS (fig. 3.21), is said to have been built in the seventeenth century. This structure is built on the edge of the palm grove and close to the historical ksar, which fits with traditional patterns of residential construction around the periphery of oases in the region. It was completely reconstructed in the nineteenth century.



FIGURE 3.22

18th-19th Century (Phase 2)

The second oldest part of the kasbah, according to oral tradition, is the Marabout, dedicated to Saint Sidi Boussaid (fig. 3.22, in red). This structure is thought to have been built in the late eighteenth to early nineteenth century. During this period, the Caïd Si Mohamed ou Abdellah, named representative of Sultan Moulay Abderrahman ben Hicham (1822–59), is said to have lived in the kasbah.



FIGURE 3.23

Ca. 1860 (Phase 3)

The core of the Stara East is a traditional kasbah structure, with a central courtyard and four towers, now partially obscured by later additions (fig. 3.23, in red). According to oral history, this kasbah is said to have been occupied and possibly built by the successor to Caïd Si Mohamed ou Abdellah, another *amghar* (tribal leader) by the name of Mohamed ou Hmad ou Abou, who came to power in 1860. He was the leader of the Tamnougalt caïds, though his power is said to have been limited compared to that of his Glaoui successors.



FIGURE 3.24

1870s (Phase 4)

The Stara East expands with the addition of new structures, specifically on the south and east sides (fig. 3.24, in red). One of these new structures will become the house of Mohamed (a son of the Caïd) and his children. This building has the traditional spatial configuration typical in the kasbah and of the region, with a two-story central courtyard surrounded by pillars and residential rooms.



FIGURE 3.25

Ca. 1882 (Phase 5)

Hammadi, son of Mohamed Ibibt el Mezouari and brother of Madani el Glaoui, established himself at the death of Mohamed ou Hmad ou Abou in the structure known as the Caïd Residence, built in the early 1880s. The structure was originally based on a square plan with a central courtyard and a defense system known as *gri igidar* (fig. 3.25, in red). This Amazigh word refers to a construction system of double walls with a 60 to 80 cm space between them. This space was used to prevent entry if one of the walls was breached and to allow for surveillance and attack from anywhere within the walls.

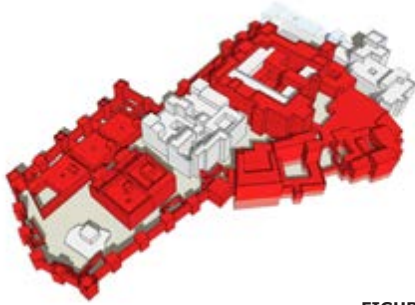


FIGURE 3.26

Ca. 1894 (Phase 6)

In 1894, the Aït Ouarzazate and Aït Boudlal tribes rebelled and besieged Taourirt. According to oral and historical tradition, the kasbah was strengthened and expanded in this period, including the construction of the defensive walls of the Stara and its various buildings, the addition of several structures south of the Caïd Residence, and alterations to the Caïd Residence itself. These alterations included expansion and strengthening from a simple square-plan structure through the addition of outer rooms, thickened walls, and additional towers (fig. 3.26, in red).



FIGURE 3.27

1900s-1930s (Phase 7)

The last major building activity at the kasbah occurred in the early twentieth century and included the construction of portions of the northeastern part of the Caïd Residence, where the most decorated towers can be found (fig. 3.27, in red). In this period, the Cannon Square and its associated structures were also built.



FIGURE 3.28

1930s-1950s

During this period, several additions were made in the Stara area, particularly the construction of second-story rooms above the one-story Atelier buildings (fig. 3.28, in red).



FIGURE 3.29

1950s-1980s

Kasbah Taourirt was occupied by the Glaoui family until the end of the French Protectorate. In 1954, the kasbah was added to the Moroccan National Heritage List, and in 1956 control of the property passed to the Moroccan state. In the early 1960s, the state returned ownership to the Glaoui, and in 1972 the kasbah was sold by the Glaoui heirs to the Municipality of Ouarzazate. With no inhabitants or maintenance in this period, the kasbah rapidly fell into ruin and was largely abandoned until the late 1980s (fig. 3.29, collapses in yellow; alterations in red).



FIGURE 3.30

1980s-2010

This period is marked by a gradual reoccupation of the kasbah. The reuse included the offices of CERKAS (1989–92), the public museum area (1995), and the Médiathèque. Additionally, the Stara was occupied by squatters, which resulted in the demolition of features (fig. 3.30, in yellow) and the addition of new rooms (fig. 3.30, in red), particularly around the surrounding wall. Not visible in the model are the numerous changes made in the building's various interiors, which are more evident in figure 3.5 illustrating construction before and after 1956.

**FIGURE 3.31**

Jacques Majorelle, *Taourirt*, 1928. Watercolor. Kasbah Aït Si Krim is depicted at left and Kasbah Mohamed El Arabi, at right.

3.4 Original Use of Space: Oral History

Given the lack of written documentation, oral history is a primary source of information regarding the use and transformation of the site. This section is a collection of information from different sources to provide an overall picture of the spatial distribution and social life of the kasbah under the command of the Glaoui family until independence in 1956.

At the beginning of the project, Mohamed Boussalh, director of CERKAS, provided the GCI with information and research. This information, composed of drawings, paintings (fig. 3.31), maps, and photographs, was integrated to develop the history of the site and the construction chronology (fig. 3.32). After reviewing and compiling the information, the GCI-CERKAS team met with Da Lmahjoub, a ninety-six-year-old man who grew up and worked in the kasbah at the time of the Glaoui, to confirm some of the changes to the site over time. Da Lmahjoub still remembers the forms and uses of the buildings in the early to mid-twentieth century.

Led by the director of CERKAS, the team interviewed Da Lmahjoub twice. The first interview took place in September 2011 (fig. 3.33) and was mostly related to the use of the ksar and its main entrance. The interview was carried out in the Amazigh language and later translated to English. The second interview took place in April 2014 and focused on the Caïd Residence and the Stara. In this case, Boussalh provided simultaneous translation.

One of the most interesting discoveries occurred when the team asked about the masons and artisans who built the kasbah. Da Lmahjoub explained that they came from different tribes such as Aït Zaouit, Aït Bousksou, Aït Bouyahya, or Imgharen. Some of the buildings took their names from the origin of the builders in charge of their construction (see fig. 3.32).

FIGURE 3.32

Aerial schematic plan of the kasbah and ksar of Taourirt, indicating the names of different areas. Drawing: Elena Macchioni, 2013.

Legend:

1. Imi n'Inraren
2. Threshing yards
3. Assarda
4. Kasbah Aït Si Krim
5. Kasbah of Mohamed El Arabi
6. Imi n'Waloud
7. Imi n'Tizi Square
8. Imi n'Tizi
9. Imi n'Waloud
10. Dou Talaasst
11. Tassendert
12. Imi n'Takmout
13. Mellah
14. Synagogue
15. Imi n'Tamsryt
16. Room for guests
17. Cemeteries



**FIGURE 3.33**

Da Lmahjoub (left), former inhabitant of the kasbah, being interviewed by CERKAS director Mohamed Boussalh.

Photo: Francoise Descamps, 2011.

3.4.1 Ksar

This section includes references to the schematic plan in figure 3.32. An element of the kasbah or ksar is followed by a number in parentheses, corresponding to its location on the schematic.

The ksar originally had four gateways. Each was opened in the morning and locked at night, and each had gatekeepers. Having more than one gate underlines the importance of Taourirt. The gates of the ksar were Imi n’Inraren (1), Imi n’Waloud (6), Imi n’Takmout (12), and Imi n’Tamsryt (15). The prefix *Imi* means “mouth” in Amazigh and is usually followed by the name of the place after the gateway, as the door symbolizes the mouth of a given place.

Imi n’Inraren, meaning “gateway to the threshing yards,” existed until the 1980s and connected the northern threshing yards (2) and the Assarda (3), the square that hosted the souk on Thursdays. Usually, traders from different tribes would arrive at the kasbah on Wednesday night; they spent the night with their goods, mules, and donkeys, in a caravanserai in the kasbah, and went early to the souk the next day. Later on, the weekly market was held outside the kasbah, as happens today. The Assarda was also used to stable the Caïd’s horses and mules. Wood, charcoal, and other goods were sold in this square. Being the entrance from the threshing yards, the Assarda had both economic importance and sacred significance: religious ceremonies related to protection from evil and the blessing of harvests would take place there.

**FIGURE 3.34**

Celebration of the Ahouach in front of the kasbah, at Imi n’Tizi Square. Photo: Archives J. Gandini.

Close to the Assarda were two important buildings: Kasbah Aït Si Krim (4), where the descendants of the Marabout used to live, and the kasbah of Mohamed el Arabi (5), which has a plan similar to that of the central area of the Caïd Residence. Mohamed el Arabi was the son of Caïd el Madani, vizier and minister of war under King Moulay Hafid. His brother, Caïd Hammadi el Glaoui, was chief commander

of the kasbah. Mohamed el Arabi arrived in Taourirt in 1911 after he was exiled by King Moulay Hafid, and brought slaves and treasures from Fes. There is a document mentioning that he stayed in Kasbah Taourirt at this time, indicating that his kasbah was not there at the beginning of the twentieth century and may date from after 1911.

Imi n'Tizi Square (7) (fig. 3.34) was the place where earth for construction was mixed and prepared. At the time of the Caïd, construction was a collective activity. All community members were involved in the construction of a house for a single family. Imi n'Tizi (8), meaning “passage gate,” was inside the ksar leading to the main square, or Imi n'Waloud (9) (figs. 3.35 and 3.36). In this open space, ceremonies in which the entire community was involved, such as weddings and circumcisions, took place. Moreover, it was the major trade center of the ksar, surrounded by shops of mainly Jewish and Muslim tenants. Being near the Mellah, which was the Jewish quarter, many shops were owned by Jewish craftsmen such as goldsmiths, blacksmiths (who made locks, keys, and ploughs), carpenters (who made doors and windows), tanners, saddlers, leather-goods craftsmen (such as shoemakers), weavers, and tradesmen who sold clothing and fabrics. There were also grocery stores selling different products (sugar, tea, flour, eggs, oil) owned by Muslims. Da Lmahjoub remembers some of the names of the craftsmen families: Jewish families (Mochi N'ait Bennani, Aït Draoui, Aït Boubssou, and Aït Berha) and two Muslim families (Ben Ladim and Ben Haroui).



FIGURES 3.35 AND 3.36

Historical photographs of the interior of the ksar, showing two views of the street leading into the Imi n'Waloud.

Photo: Archives J. Gandini.

The main square, connected to the Assarda through the main street of the ksar, was known as Dou Talaasst (10), the name of a tree that provided shade. Another alley, named Tassendert (11), was connected to Dou Talaasst near the Assarda.

Major streets are called *agharas* in Amazigh. Inside the ksar there was a mosque, which was rebuilt and still exists today; and a *timzguït*, or Koranic school, where the sons of the Caïd and other children of the ksar would study.

The third gate of the ksar was Imi n'Takmout (12), or “gateway to the canal,” because it connected with planted fields and palmeries south of Taourirt. In the

area close to the oued were fields where cattle used to graze and where people went to fetch water and fodder for their cattle and horses.

The Mellah (13) was in the southern part of the ksar. In the interior of this Jewish quarter, the synagogue (14) can be found.

The fourth gate of the ksar was Imi n'Tamsryt (15), or “gate of the reception room,” a building where guests were hosted (16). Outside the ksar were two cemeteries (17), one of which was later known as Aït Sidi Yahia.

3.4.2 The Stara and CERKAS Areas

This section includes references to the schematic plan in figure 3.41. An element of the kasbah or ksar is followed by a number in parentheses, corresponding to its location on the schematic.

In the Kasbah de Commandement, as in other kasbahs, were several gates leading to successive courtyards. These gateways opened onto outer and inner yards, official public yards, and private family courtyards. They are all called *arahbi*, which is the Amazigh name for courtyard.

Access to Kasbah Taourirt was possible through only one gate, named Imi n'Ndaf, or “door of the guardian” (1). Today it is the entrance to CERKAS headquarters (figs. 3.37, 3.38, and 3.39). The gate was protected at the time of the Caïd by two guardians who sat and slept on the *doukkana* (benches) at each side of the door (2).



FIGURE 3.37

Aerial schematic plan of Kasbah Taourirt, indicating the main entrance, Imi n'Ndaf.
Drawing: Elena Macchioni, 2013.



FIGURE 3.38

Imi n'Ndaf today, entrance to CERKAS offices.
Photo: Claudia Cancino, 2009.



FIGURE 3.39

Historical photograph of Imi n'Ndaf, the only gate through which to enter Kasbah Taourirt.
Photo: Archives J. Gandini.

Imi n'Ndaf used to open onto a major artery in the kasbah that went all the way to the Stara. Camels, horses, donkeys, residents, visitors, and plaintiffs in lawsuits who came to the Caïd's courthouse all passed through this gateway. During the caïdal period, there were no obstructions on this major street, but later many walls and gates were added.

Crossing the door, on both sides of the corridor, were two staircases (3) that led to the *mesria*, two rooms on two upper floors. Located on the first floor was the

**FIGURE 3.40**

Aerial view of Kasbah Taourirt, indicating (in red) the area covered by the schematic plan in fig. 3.41.

Photo: CERKAS, 2004.

**FIGURE 3.41**

Schematic plan of east sector of Kasbah Taourirt.

Drawing: Elena Macchioni, 2013.

Legend:

1. Imi n'Ndaf
2. Doukkana
3. Staircases
4. Horse saddle storage
5. Tower
6. Tigmi lajdid
7. El Menzeh N'imi N'indaf
8. Arahbi N'ougli
9. Passage to the Stara area
10. Afla N'oughoulid
11. Tower for guests
12. Gr'swari gate
13. Riad Akdim
14. Tahanout Laaqchour
15. Imi N'ourhabi N'Ougonssou
16. Imi N'Chbik
17. Imi N'ifelouane
18. Imi n'Sidi Hammou
19. Sala n'Sidi Hammou
20. Imi n'ryad
21. Jamila Tourquia's apartment
22. Ahanou Nimskharn
23. Passage between the Caïd Residence and the Stara East

Tamsrigh N'imiraren, or "poet's room"; on the second floor, the *lmanzeh* (referring to fresh air blowing through the windows). On the left side of the gate was a room used for storage of horse saddles (4).

Farther down this corridor, on the street level, were several rooms for gatekeepers, slaves, cooks, and servants. Visitors (*tolba* and *foqaha*) and religious people (prayer leaders or preachers belonging to Gnawa, an ethnic brotherhood of sub-Saharan origin, or to Aissawa, a mystical brotherhood from Meknes whose music and dance brought participants to an ecstatic trance) were hosted here.

The tower that overlooks the passage (5) was a later addition, built for the visit of King Mohamed V in 1950.

On the left was another important commercial and residential architectural unit called Tigmi lajdid (6), with its gateway, Imi N'ourhbi. In this area were several shops and storage rooms on the ground floor and residential rooms upstairs. There was a space called Aslih Nait Tflit, where people from neighboring tribes would spend the night. In this place, meals were served during the evenings of the souk.

From Tigmi lajdid, it was possible to get through a gateway to one of the numerous Caïd's *Menzeh* (apartments). One of these apartments, called El Menzeh N'imi N'indaf (7), was located next to the gateway of the same name. This Menzeh had an official function as the courthouse where the Caïd issued his rulings. Next to the courthouse was a room where the Caïd prayed, especially on the Lailat Al Kadr, or "night of ordainment," the twenty-sixth day of Ramadan, during which the Prophet received his first revelation.

There were many wells in the kasbah and a cistern in the inner courtyard of the Caïd Residence. Imi N'ouanou was the gate to one of the wells and led to a passageway to the prison. Crossing Imi N'ouanou, the gate called Afla N'oughoulid

**FIGURE 3.42**

Arahbi N'ougliid ("King's yard") today, also known as Sultan Square (Sahat el Medfaa, "Cannon Square").

Photo: Claudia Cancino, 2005.

(11) served as a connection between two different areas. Toward the north, a lateral gate led to a large open area called Arahbi N'ougliid (9) (fig. 3.42), "the King's yard," where the Caïd's horses, camels, and mules were kept. This yard, with rooms for servants and workers on one side and animal stables on the other, was used for social events and trade exchanges. Some horses, however, had their individual stalls in another location, with the room for the stable boy next to it, while the saddles were stored in one of the rooms upstairs. Arahbi N'ougliid was renamed Sultan Square after the visit of King Mohamed V. For this occasion, the square was remodeled: one story was added to the buildings on the south and east sides, and the door (originally opened in the 1920s and the present entrance for visitors to the restored part of the kasbah) was changed, creating an arched opening. The square is also known as Sahat el Medfaa, or "Cannon Square," because of the cannon offered by King Moulay El Hassan to Caïd Madani, which is displayed here. From the northwest corner of the square, one gate was the passage to the Stara area (10) during the Caïd's period.

Afla Noughoulid (11) also connected to a yard where there used to be shops (*ahanou* in Amazigh). Over the passage was a tower for guests (12) that later collapsed.

Furthermore, there were several *riads*, or reception courtyards, inside the kasbah. All their doors were named Imi N'riad. The Riad Akdim, or the "old riad" (16), was composed of two rooms and an open patio (now roofed) where distinguished guests, such as the French painter Jacques Majorelle, used to stay. One small room close to the entrance door was used by members of the religious brotherhood Aissawa.

On the right side, after the Gr'swari gate (14), which means "between two pillars," there was a space to store straw, and a well. Tahanout Laaqchour (18 and 19), the alms rooms, were used to store cereal, wheat, and barley for the Laaqchour (Islamic charity system). Storage rooms (*lahri*, *lakhzine*, or *tadouarrit* in Amazigh) were important in the life of the kasbah, as all occupants were sustained by the food prepared in the several kitchens inside the kasbah. Some of the rooms were used to store cereal and legumes, others for storing eggs, oil, butter, flour, and nonperishable food items. There was also a storage room for the oil used to light lamps.

The door called Imi N'ourhabi N'Ougonssou (20) led to the Arahbi Nougansou, or interior courtyard, today the CERKAS courtyard. In this large area, public celebrations such as festivals, folk dances (*Ahouach*), and religious mystical trance dances were held, which continue today (figs. 3.43 and 3.44). Male spectators crowded around the dancers in the courtyard, while women watched from the narrow windows of upper-level apartments. Nowadays, it is possible to see traces of former doors, now closed, on the walls around the courtyard. One of these walled doors is Imi N'ifelouane (22), which led to the southern part of the Caïd Residence.

On the south side, the door called Imi N'Chbik (21) still exists, but the room has another door on the southern wall, opened during the recent restoration work carried out in the area. Other spaces around this courtyard were Tadouarrit, Afla N'Sala, or Imi Nizergane. Imi Nizergane, now totally in ruins, had several storage rooms, a kitchen, and a well on the ground floor. In some of these rooms were wooden chests in which harem women stored fine garments and jewelry (for example, jewels made of gold coins called *Louise* in Moroccan Arabic, after the French *Louise d'or*; this jewelry was a sign of great wealth and social standing). On the upper floor, one richly decorated window is extant today.

**FIGURES 3.43 AND 3.44**

Ahouach held at CERKAS courtyard ca. 1929 (top) and in 2014 (bottom).

Photos: Nantes Archives, 1929 (top); Elena Macchioni, 2014 (bottom).

On the west side of Arahbi Nougansou was a gate named Imi n'Sidi Hammou (23) and a staircase on the north side, both still extant. The staircase leading to the upper floor also still exists. Crossing the door led to three buildings where relatives of the Caïd used to live: Sala n'Sidi Hammou (24), Imi n'ryad (25), and Jamila Tourquia's apartment (26). Although all the Caïd's wives had their own apartments, Lalla Jamila Tourquia's apartment seemed to be the most important. She lived in a multistory building with her children and servants. She had her own hammam, kitchens, a Koranic school for her children, a room for her servants called Ahanou Nimskharn (27), her own *tarehbit* (diminutive of *arahbi*, meaning small yard), which led to a rear service yard with stables for her cows and horses, and a well and orchard. Currently, the building is used as a mediatheque.

Historically, there was a passage between the Caïd Residence and the Stara East (28), now filled with constructions.

The following section includes references to the schematic plan in figure 3.46. An element of the kasbah or ksar is followed by a number in parentheses, corresponding to its location on the schematic.

In the part of the building known as the Stara East was the house of Mohamed, son of the Caïd, and his children (1). After the death of the Caïd in 1937, Mohamed was proclaimed the new Caïd. Inside the Stara East, it is still possible to recognize two hammam (2 and 3), the southern hammam being the older one. Oral history provides information regarding the use of two of the Ateliers: the one in the middle



FIGURE 3.45

Above, an aerial view of Kasbah Taourirt, indicating (in red) the area of the schematic plan (fig. 3.46).

Photo: CERKAS, 2004.



FIGURE 3.46

Schematic plan of the west sector of Kasbah Taourirt. Doors used at the time of the Caïd are marked with red arrows.

Drawing: Elena Macchioni, 2013.

Legend:

1. House of Mohamed, son of the Caïd
2. Hammam
3. Older hammam
4. Amur's house
5. Sidi Mohamed Mubarak's house
6. Sidi Lahsen's house
7. Marabout Sidi Bouzid
8. Well
9. Da Lmahjoub's house

was the house of a man named Amur (4) who was an animal caretaker; the one on the west was the house of Sidi Mohamed Mubarak (5). The northwestern tower of the walls was the house of Sidi Lahsen (6), another son of the Caïd.

The Caïd's family courtyard had many different areas and doors: Imi n'Jalouk, or "the metal door," led to the Caïd's private apartments; Imi N'tmesrit, Imi N'riad, and Imi N'Imenzeh all led to the private apartments of his wives and children.

Although Kasbah Taourirt housed only the second tier of command of the Glaoui family, brothers, nephews, cousins, and other relatives and senior members occasionally stayed there. For example, both Thami el Glaoui and Sidi Hammou (married to Caïd El Madani's daughter) had their own rooms.

The most important places in this courtyard were the private apartments of the Caïd and his harem, particularly the apartment of his favorite wife, Lalla Jamila Tourquia, “the Turkish.” Besides Lalla Jamila, there were eight wives in the harem: Ghnima (probably the first wife), Tahouarit, Anbar, Oum Lkhir, Fatima, Radia, Hasna, and Mbarka Salem.

The private apartments of the Caïd’s children and male relatives were called *mesria*, or *tamesrit* (upstairs room), *borj* (fortified building), or *sala* (large room), depending on their size and height; all had wrought-iron windows (*fouk chbik*). Private living spaces for relatives were Borj n’Sidi Bachir (Sidi Bachir tower), Borj n’Sidi Othmane (Sidi Othmane tower), Sala n’Sidi Bouslam (Sidi Bouslam room), Sala n’Sidi Hammou (Sidi Hammou room), and Tamesrit n’Sidi Mokhtar (Sidi Mokhtar room). Other male relatives mentioned by Da Lmahjoub were Sidi Mohamed, Sidi Abdeslam, Sidi Madani, Sidi Mijd, and Sidi Hadi. Only one daughter is mentioned, Lalla Zahra. Some of the *tamesrit* were reserved for horsemen (*imnayan* in Amazigh).

There is one Marabout inside the kasbah called Sidi Bouzid (7)(fig. 3.47), where Moulay Abdellah Outhar, who, according to tradition, is a descendant of the Prophet, is buried. Inside are seven or eight graves and two more outside. On the northern side of the Marabout was a well, later on a fountain (8). The surrounding open space was used to slaughter animals for both religious ceremonies and food preparation. In this place, an oven could also be found. It is important to mention that there was another Marabout outside the kasbah that had a strong relation to the one inside (some religious ceremonies involved the use of both at the same time).

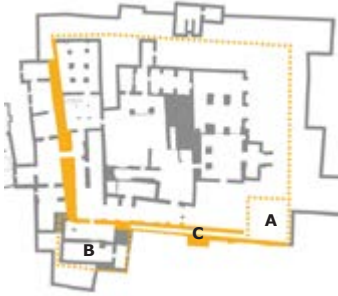
Da Lmahjoub was able to identify his own house, a building on the northeastern side of the Stara walls, which hosted servants and their families (9).



FIGURE 3.47

View of the Marabout inside the kasbah, called Sidi Bouzid, in the open space of the Stara area.

Photo: Tim Michiels, 2013.

**FIGURE 3.48**

Plan of the Caïd Residence, ground floor, with the position of the *gri igidar* and the towers (in yellow). Drawing: Elena Macchioni, 2013.

3.4.3 Caïd Residence

The Caïd Residence was the inner fortress of the kasbah and the most protected area of the complex. To ensure its protection, it was built with *gri igidar* (double walls)(fig. 3.48). The position of these walls, the analysis of the structural connections between vertical elements, and the erosion of some areas (which were possibly exposed to rain) allow identification of the most ancient core of the building. The residence originally presented a square plan with towers at its corners and at the middle point of each external wall.

Towers were traditionally used as the private residences of the Caïd and the members of his family. In the 1950s, the main towers were:

- Borj n'Bouyhia (A, fig. 3.48; figs. 3.49 and 3.50), private residence of the Caïd and highly decorated both outside and inside. It collapsed around 1960.
- Borj of the son of Caïd Si Attman in the 1920s–30s (C, fig. 3.48; fig. 3.51).
- Borj Lalla Ftoum (B, fig. 3.48; fig. 3.52), residence of the daughter of the Caïd and the wife of Mohamed El Arabi. Interiors were decorated with gypsum plasters and blue painting on the upper walls and ceilings.

FIGURES 3.49 AND 3.50

Right: Borj n'Bouyhia.
Photo: Nantes Archives, 1930.
Far right: Borj n'Bouyhia.
Photo: Sebastien Moriset, 2011.

**FIGURES 3.51 AND 3.52**

Above: Borj of the son of the Caïd.
Photo: Mario Santana Quintero, 2014.
Right: Borj Lalla Ftoum.
Photo: Mario Santana Quintero, 2013.



**FIGURE 3.53**

Aerial view of Kasbah Taourirt, indicating (in red) the area covered by the schematic plan in fig. 3.54.

Photo: CERKAS, 2004.

FIGURE 3.54

Schematic plan of the Caïd Residence. Doors used at the time of the Caïd are marked with red arrows.

Drawing: Elena Macchioni, 2013.

Legend:

1. First gate
2. Small courtyard
3. Room with a well
4. Access to the staircase
5. Kitchen
6. Kitchen
7. Main courtyard
8. Room, now collapsed
9. Granary
10. Small hammam
11. Corridor to the second door
12. Residence
13. Main granary
14. Room where carpets were made
15. Original street, later a deposit



The following section includes references to the schematic plan in figure 3.54. An element of the kasbah or ksar is followed by a number in parentheses, corresponding to its location on the schematic.

There were two gates into the Caïd Residence, both leading to the inner courtyard, to which only the family of the Caïd, slaves, and laborers were allowed to enter. The first gate (1), still existing, leads to an open courtyard on the eastern side of the building. The second gate, Imi n'Iflwane, was on the ground floor of the tower called Borj Lalla Ftoum and today opens onto the CERKAS courtyard.

The facade of the Caïd Residence overlooking Cannon Square presents an imposing and richly decorated tower called El Quobi N'Caïd, or "the Caïd's room." *El Quobt* in Amazigh (*El Quobba* in Arabic) is usually an impressive room with painted (Marrakech style) cedar-wood ceilings. Next to it was a prayer room called *tamasourt*. The adjacent buildings along the wall were former private rooms for the Caïd's sons and daughters. Next to these was Borj N'ait Gdif, built prior to King Mohamed V's visit and the place where Pasha Thami el Glaoui stayed.

Entering the inner part of the Caïd Residence from the entrance, one sees a small courtyard (2) surrounded by service spaces. On the south side, a room (3) with a well was used for washing. Above it on the second floor was a room for the storage of meat. On the east side, one door (now walled) gave access to a staircase leading to the upper floor (4). The space on the north side of the courtyard was used as a kitchen (5) and was connected by two doors to the main courtyard and to a second space also used as a kitchen (6).

The main courtyard (7), called *tarhabit*, was used as a service area with animals, grinding mills, and ovens, and had an underground cistern. Originally, it probably was partially covered, with an open courtyard in the center. On the west side, there was a room (8), now collapsed, with a central door. The south side room was used as a granary (9); south of it was a small hammam (10). No remains can be found of a building on the southeast side of the courtyard that appears in aerial photographs. A corridor (11) led to the second door of the Caïd Residence, on the east side of Borj Lalla Ftoum. On the ground floor of the tower was a room where carpets were made (14). The space around a central light well had a residential use (12). The

**FIGURE 3.55**

Panorama of central courtyard of the Caïd Residence with decorated rooms outlined in yellow.

Photo: Claudia Cancino, 2011.

main granary (13) was next to this. Rooms on the west side (15), originally a street before the twentieth century, were later used as a deposit to store grains.

The spaces around the central courtyard were occupied by women: each of the wives and daughters of the Caïd had one room, used as a depository for valuable items. These rooms are known as *maison du tissage*, or “weaving rooms,” but this name does not respond to their function during the Caïd period. In fact, the sewing rooms, called *metiera tisset*, were on the upper floor, close to the Borj of the son of the Caïd.

The interiors of the rooms around the courtyard were decorated (fig. 3.55). A full description of these painted surfaces can be found in chapter 5.

Notes

- 1 Among the descriptions: M. Barrère-Afrre, *Le balcon sur le desert* (Paris: Ed. Bonne Presse, 1950); H. Bordeaux, *Un printemps au Maroc* (Paris: Librairie Plon, 1931); M. De Mazières and J. Goulven, *Les Kasba du Haut Atlas* (Paris: La vie Marocianes illustrée, 1932); P. Dumas, *Le Maroc* (Grenoble: Arthaud éditeur, 1942); D. Henri, *Images du Maroc berbère* (Paris: Librairie Plon, 1947); J. Felze, *Au Maroc inconnu. Dans le Haut-Atlas et le Sud Marocain* (Grenoble: Arthaud éditeur, 1935); M. Didier, *Au Sud de l'Atlas, vers le pays des casbahs* (Casablanca: Ed. Paul Bory, 1950); R. Montage, *Les Berbère et le Makhzen dans le Sud du Maroc. Essai sur la transformation politique des Berbères sédentaires* (Paris: Librairie Félix Alcan, 1930); R. Montage, *Villages et kasbas Berbères. Tableau de la vie socialite des Berbères sédentaires dans le Sud du Maroc* (Paris: Librairie Félix Alcan, 1930); T. Henri, *Kasbas Berbères de l'Atlas et des Oasis* (Paris: Horizon de France, 1938).

CHAPTER 4

Site Assessment

Kasbah Taourirt can be divided into different sectors: the Caïd Residence, CERKAS headquarters and its extended offices, the Médiathèque, the visited area, and the Stara. The Stara itself is composed of Stara East, Stara West, the Ateliers, the Marabout, and the walls (fig. 4.1).

This chapter focuses specifically on the physical state of these buildings, including their construction, evolution over time, and current condition. The architecture of each sector of the kasbah is described in detail, followed by a chronology of construction, or summary of physical changes to the building over time as identified through on-site investigation and archival research. Lastly, for each sector of the kasbah, an assessment of existing conditions is provided.

Because of the size and complexity of many of the structures, a complete architectural description of each space is neither useful nor desired. This documentation of space is better accomplished through the architectural drawings completed as part of this project (appendix C). Similarly, information about changes to the structures before 1930 is difficult to ascertain, as archival information and oral history before that date are rare.

Ongoing conservation work in the Stara has also limited somewhat the condition assessment in this area. Detailed assessment has instead focused on the most critical areas of the kasbah, particularly those within the Caïd Residence.



FIGURE 4.1
Schematic model of Kasbah Taourirt, showing the various structures that compose the kasbah.
Diagram: Elena Macchioni, 2013.



FIGURE 4.2

GCI and CERKAS staff conducting a condition assessment of the Caïd Residence.

Photo: Claudia Cancino, 2014.

4.1 Methodology

A condition assessment of the kasbah, focusing on the Caïd Residence, was carried out in April 2014 by the GCI and CERKAS (fig. 4.2). The goals of the survey were to identify risks to the site as well as to understand overall patterns of deterioration, with the goal of identifying urgent and priority conservation issues. It was also intended as a training exercise for CERKAS staff and was conducted in collaboration with GCI consultant Alaa el-Habashi.

Within the Caïd Residence, the condition survey was carried out in all accessible rooms; however, some rooms remained inaccessible. The visited area, which was restored in 1989, was left out of the survey.

Conditions were recorded by hand in the field on plans and elevations and later transferred to AutoCAD (fig. 4.3). The complete set of drawings for the Caïd Residence and the Stara area can be found in appendix E.

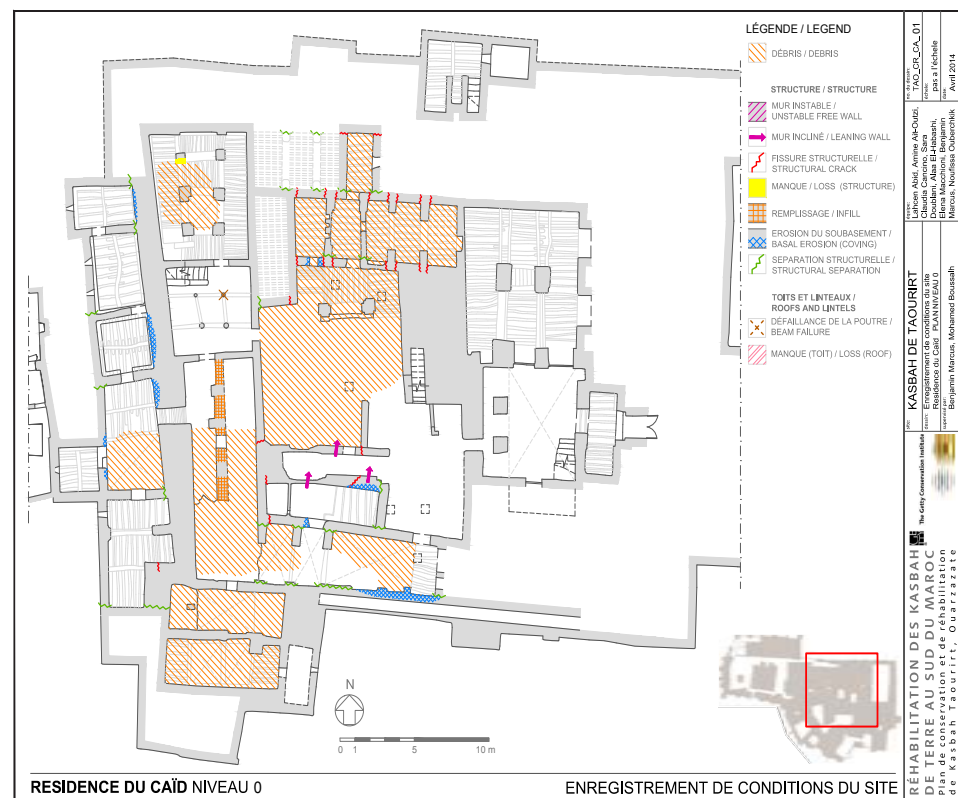


FIGURE 4.3

Condition assessment example, Caïd Residence, ground floor.

Drawing: Elena Macchioni, 2014.

Emphasis was given to the actual decay mechanisms that degrade the materials and the building systems. Excessive moisture in all its forms—rainfall, high and continual relative humidity, standing water, groundwater—is the single most important factor in the performance of an earthen structure, affecting both materials and building systems. Degradation of the materials and the building systems can also be affected by excessive winds, physical abrasion by animals and humans, other forms of human intervention, and ground motion.

The chronology of construction, detailed in this chapter for each sector of the kasbah, is based on a combination of on-site investigation, archival information including historic photographs and documents, and oral history. For a more detailed account of the oral history of Kasbah Taourirt, see section 3.4.

4.2 Conditions Glossary

A glossary of conditions was also developed to guide the condition survey. The glossary and survey focused on three broad categories: structural problems, roofing issues, and conditions of surfaces. A separate survey and glossary was developed for wall paintings in the Caïd Residence (see chapter 5, section 5.3).

Structural Conditions



Structural crack

Crack through a load-bearing wall. Characterized by crack thickness in the order of centimeters. Also applies to diagonal or shear cracks and through-wall cracks of variable thickness.

FIGURE 4.4

Stara East, west facade.

Photo: Benjamin Marcus, 2013.



Basal erosion (coving)

Erosion/loss of material at the base of walls resulting in loss of wall section thickness. Typically due to rising moisture, salts, or use of an impermeable coating such as cement.

FIGURE 4.5

Stara, eastern Atelier.

Photo: Françoise Descamps, 2011.



Leaning wall

Out-of-plane wall. Planar wall movement is generally due to failed connections with other walls or beams, shallow foundations, or basal erosion/saturation from lack of drainage.

FIGURE 4.6

Stara West, northwest corner.

Photo: Susan Macdonald, 2011.



Unstable free wall

Unstable or partially collapsed wall section that lacks wall-floor connection and/or connection with adjacent walls.

FIGURE 4.7

Caïd Residence, interior courtyard wall.

Photo: Elena Macchioni, 2014.



Collapsed wall

Missing wall section showing debris and remains of recently collapsed wall.

FIGURE 4.8

Stara East, southwest corner.

Photo: Sebastien Moriset, 2011.



Loss due to alteration (structure)

Loss of historic fabric due to recent alterations such as the introduction of new doors, windows, and conduits.

FIGURE 4.9

Introduced doorway, Stara East, northwest corner.

Photo: Benjamin Marcus, 2013.

Roofs and Lintels



Beam failure

Failure or collapse of individual roof beams, generally due to localized water pooling combined with an overloaded roof.

FIGURE 4.10

Caïd Residence, rear decorated room ceiling.

Photo: Benjamin Marcus, 2013.



Collapsed roof

Partial or total loss of a roof or roof section including roof surface and supporting structure.

FIGURE 4.11

Collapsed roof at Caïd Residence.
Photo: Benjamin Marcus, 2013.



Deteriorated lintel

Damaged or weakened lintel that typically causes structural deformation of supported masonry, resulting in areas of settling, cracking, or collapse above the doorway.

FIGURE 4.12

Doorway, Stara West.
Photo: Claudia Cancino, 2013.



Failed drainage

Failed or blocked drainage that causes damage to the adjacent fabric. May also be related to roof failure or improper slope of the roof surface.

FIGURE 4.13

Failed drainage at the visited area.
Photo: Sebastien Moriset, 2011.

Surface Finishes



Loss due to alteration (surface)

Loss of historic surface finish due to alterations or additions to the building fabric.

FIGURE 4.14

Loss of surface finish at Caïd Residence.
Photo: Benjamin Marcus, 2013.



Erosion

Heavy weathering that results in complete loss of wall surface, deep pitting, and/or loss of masonry unit integrity.

FIGURE 4.15

Erosion in the Caïd Residence, outer wall of western rooms.
Photo: Benjamin Marcus, 2013.



Surface erosion

Shallow erosion limited to the masonry surface that does not affect the masonry unit or structural integrity of the wall.

FIGURE 4.16

Surface erosion in the Caïd Residence, outer wall of western rooms.
Photo: Benjamin Marcus, 2013.



Detached plaster

Partial planar discontinuities or voids in the masonry/finish interface. Detected by a hollow sound produced when tapping on the surface.

FIGURE 4.17

Detached plaster in the Caïd Residence, outer wall of western rooms.
Photo: Benjamin Marcus, 2013.

4.3 Construction Techniques and Materials

While the various buildings of Kasbah Taourirt were constructed over time in a variety of architectural forms and purposes, they share similar construction techniques and materials common to most historic earthen buildings in the region.

Pisé, or rammed earth, is the main technique used in the construction of load-bearing walls at Kasbah Taourirt. Employed on ground floors and upper floors in taller buildings such as the Stara and Caïd Residence (fig. 4.18), rammed-earth walls at Taourirt are typically 60 to 80 cm in width. Foundations are made from large stones and wall corners are typically reinforced with short lengths of wood.

Adobe, or mud brick, is generally used for the upper floors of towers and parapets of structures where decorative surfaces and window openings are common (fig. 4.19). Decorative features such as arches, recessed niches, and traditional Amazigh designs are all executed in brick and then covered in earthen plaster. Mud brick is also used for the construction of smaller partition walls, staircases, and columns on the interiors of buildings.

FIGURE 4.18

Rammed-earth walls at the Caïd Residence.

Photo: Elena Macchioni, March 2014.



FIGURE 4.19

Example of the use of mud brick on upper walls at Stara West.

Photo: Elena Macchioni, May 2014.



Kasbah Taourirt was constructed with a variety of roofing types depending on the use and importance of the space. These roofing types include the following:

- **Tataoui:** Spaces used for entertaining guests or for other high-level ceremonial functions were often constructed with tataoui ceilings. Tataoui employs layers of laurel wood and natural colors to create decorative patterns (fig. 4.20).
- **Reed:** In lesser spaces, simple reed matting is used with either poplar wood or palm wood beams (fig. 4.21).
- **False ceilings:** False ceilings employ a double layer of reed matting covered in plaster to create a smooth plaster finish, often in the form of a dome or incised with geometric shapes.
- **Painted wood:** Located primarily in the Caïd Residence, richly painted ceilings employ designs from Marrakech and convey the space's importance (fig. 4.22).

FIGURES 4.20 AND 4.21

Below left: Tataoui ceiling, rear room, Caïd Residence.

Below right: Reed ceiling, Caïd Residence.

Photos: Lorinda Wong, 2014.

Roof surfaces are made of a thick layer of compacted earth. It is then covered with successive layers of lime to form a water-resistant surface. Drainage was achieved through a wooden scupper made of either hollowed palm beams or wooden boards joined together to form a channel.

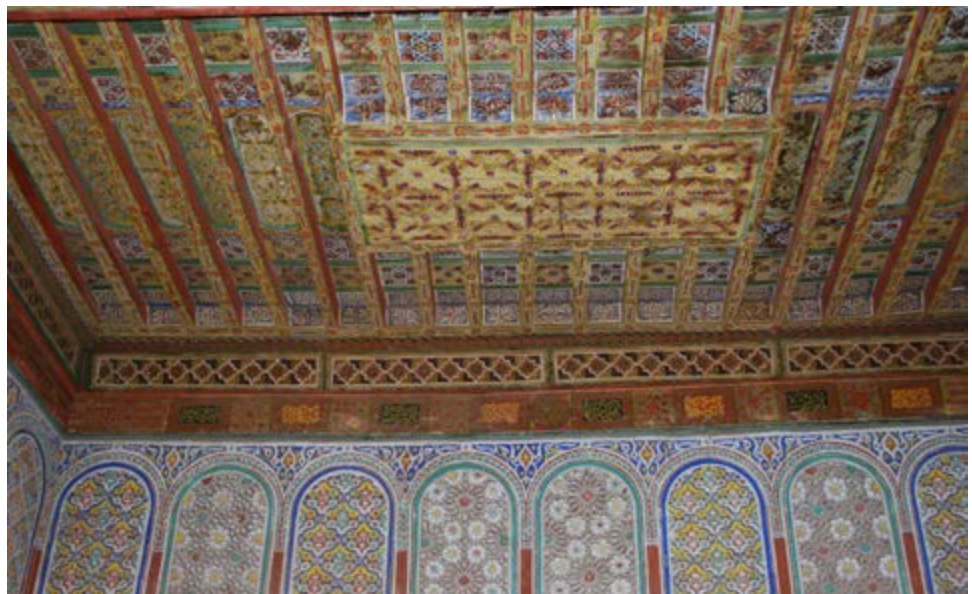


FIGURE 4.22

Painted wood ceiling with carved plaster frieze in the visited area of the Caïd Residence.

Photo: Susan Macdonald, 2010.

Most walls of the kasbah are finished with simple earthen plaster, applied in several layers. This plaster is made of local earth and a small amount of straw.

Gypsum plaster is used in many residential spaces as an interior finish. In particularly important spaces, it is formed into decorative shapes such as recessed arches and column capitals. In the Caïd's private residence, carved plaster panels were applied to the wall and painted in bright colors (fig. 4.23).



FIGURES 4.23 AND 4.24

Left: Tadlakht and gypsum room in the Stara East. Photo: Sebastien Moriset, 2011.

Right: Detail of carved and painted plaster panels in the Caïd Residence.

Photo: Susan Macdonald, 2014.



In some important spaces, particularly those that required water usage such as bathrooms or kitchens, a lime-based interior finish was used called *tadlakht*. Tadlakht is made from lime, sand, and egg white and rubbed with smooth stones and cloth to achieve a shiny, water-resistant finish. Such decorative gypsum and tadlakht work can be found in the Stara East (fig. 4.24).

4.4 Site Assessment by Sector

4.4.1 Caïd Residence

Architectural description

The Caïd Residence is situated in the northeastern area of the kasbah and forms the core of the site, linking the Stara to the west and the courtyard and CERKAS headquarters to the east (fig. 4.25). The Caïd Residence is the largest structure in the kasbah. Containing numerous rooms, it is articulated by a central courtyard and is the most imposing and decorated building in the kasbah. The core of the Caïd Residence is a three to four-story square plan structure, now partially in ruins, constructed around a square courtyard (fig. 4.26). It has very few openings onto the rest of the kasbah, as it was intended to be a secure residence for the Caïd and his immediate family. The northeastern side of the building was the main residence, while other areas were used as more utilitarian spaces. Within the central courtyard on the northern side, a two-story structure known colloquially as the *maison du tissage* (weaving house) features decorated arches and wall paintings (fig. 4.27). Two granaries are located in the northwest corner.



FIGURE 4.25

Aerial view of Kasbah Taourirt, indicating (in red) the Caïd Residence. Photo: CERKAS, 2004.



FIGURE 4.26
Caïd Residence, ground floor.
Drawing: CIMS, 2013.

A “reception” courtyard articulates the Caïd’s residence with the plaza situated north of the kasbah through a door (not original) that today is the tourist entrance. Old photos show this area as an open space with animal pens. Adjacent to the “new” entrance door are other recent constructions used by souvenir vendors.

The core of the building is the most imposing and decorated area of the ensemble on both the outside and the inside.



FIGURE 4.27
North front room at the Caïd Residence.
Photo: Lorinda Wong, 2013.

The northeastern rooms contain painted ceilings, ornate friezes on the upper parts of the walls, and fine carvings around the doorways. The decoration is largely inspired by the Marrakech style and uses its techniques and materials such as painted wood and carved and painted plaster. Adjacent to this area and directly connected to it are the buildings built around the central patio or courtyard, now partially in ruins.

The historic entrance door, today the entrance to CERKAS, is located in the middle of the east facade and opens onto a “street” that, crossing through courtyards and passages, connects the different areas of the kasbah. It also separates the residence (north) from the service area (south). This traditional single access to the kasbah was used by servants, horsemen, and visitors and allowed guards to restrict access.

Restored areas of the Caïd Residence include a section of the visited area in the northeast corner as well as two shops located on the ground floor. These shops encompass a number of rooms and are characterized by high ceilings made of simple materials such as palm beam and reed matting, with plaster walls painted white.

Approximately 60% of the residence remains unrestored, particularly the western and southern portions and the central courtyard, including the aforementioned painted rooms of the maison du tissage. The unrestored spaces are described in further detail in the following sections.

Construction chronology

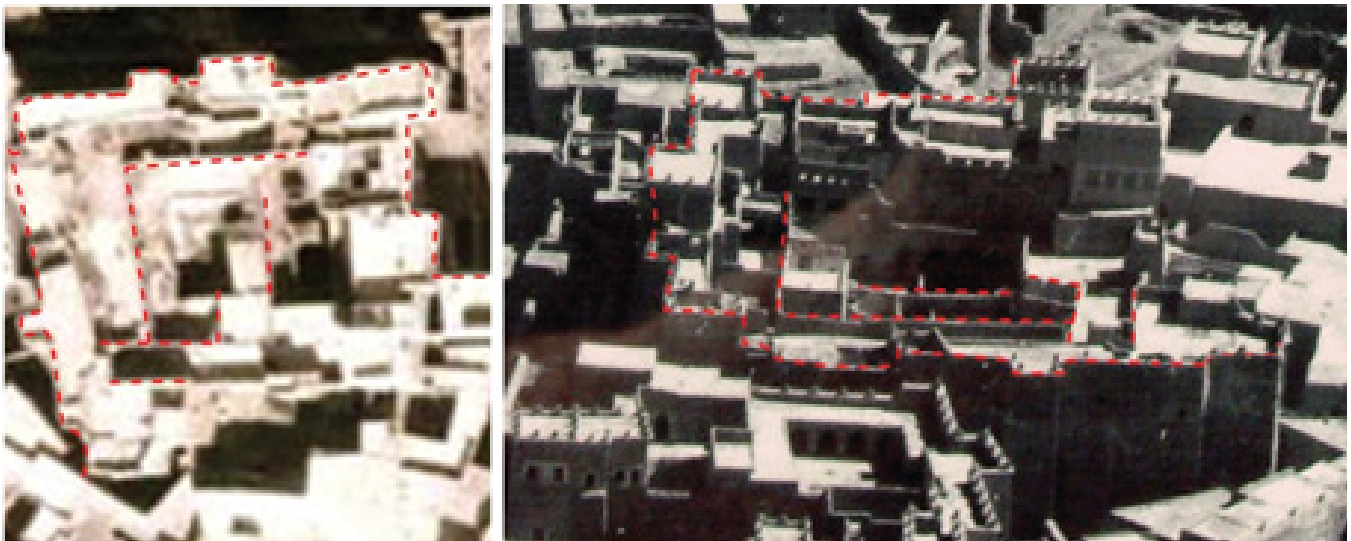
Pre-1930 evolution of the Caïd Residence

While pre-1930 evolution of the Caïd Residence is poorly documented in archival sources, on-site investigation reveals many additions and alterations to the building. The main structure known as the Caïd Residence is thought to have been built in the 1880s, when Caïd Si Hammadi took control of the kasbah. The building was originally based on a square plan with a central courtyard and a system of defense known as *gri igidar*.

This square plan building may have been altered through the addition of rooms both in the interior, within the courtyard of the Caïd Residence, and along its exterior. These additions are most evident on the western side where double-thick walls can be seen between a series of inner and outer rooms, indicating an additional and possibly later phase of construction. For more information on these early changes to the structure, see chapter 3, section 3.4.3. Documented alterations to the Caïd Residence begin, however, after 1930, with the advent of photography.

Changes 1930–70

Comparison of the aerial photograph taken around 1930 (fig. 4.28) and one taken in 1951 (fig. 4.29) shows little detectable change; this corresponds to the ongoing period of habitation by the Caïd family.



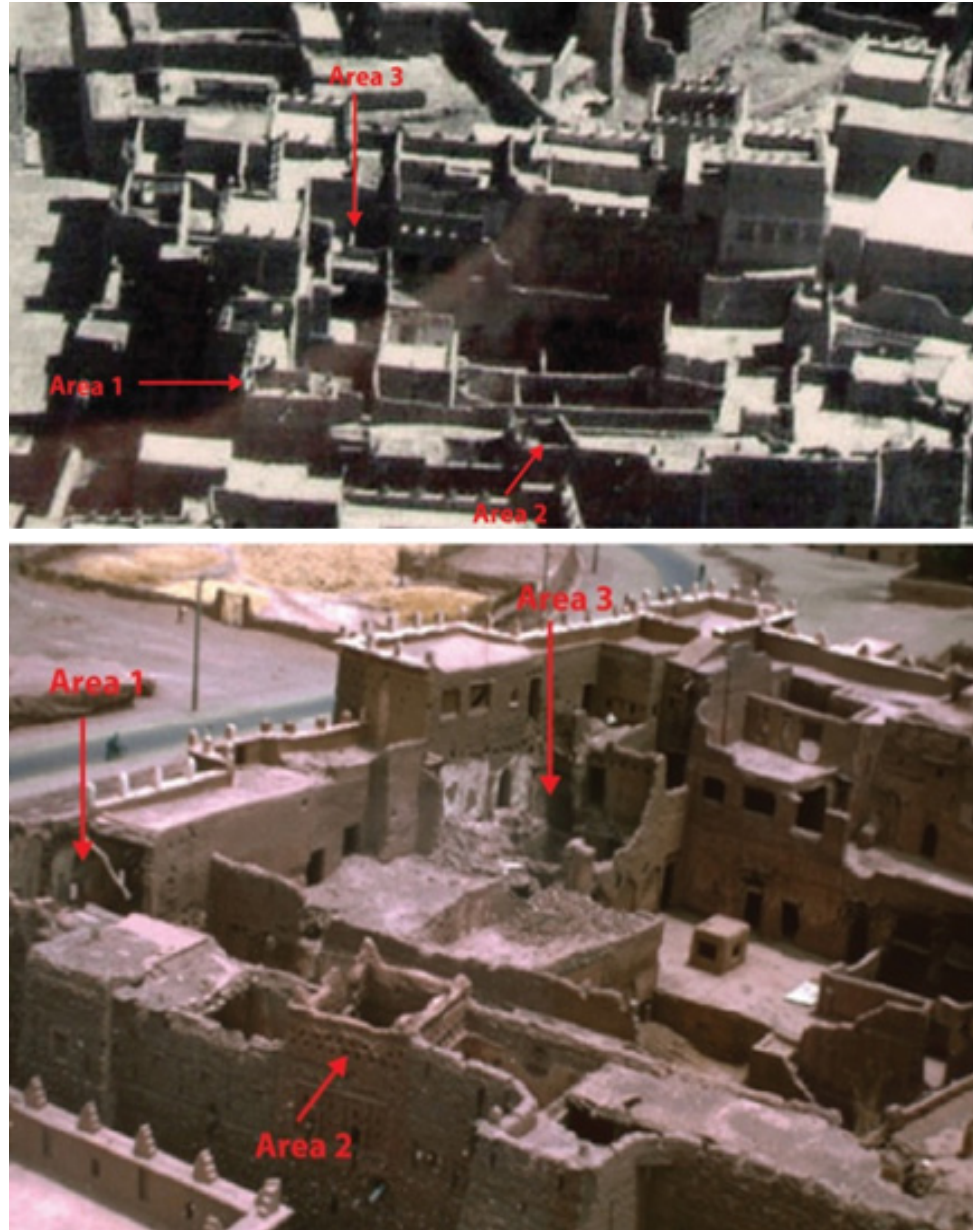
FIGURES 4.28 AND 4.29

Aerial photos taken ca. 1930 (left) and in 1951 (right). Corresponding outlines of the Caïd Residence are highlighted in red. The structure remains largely unchanged. Photos: Archives J. Gandini.

Comparisons of the above photographs and the later photographs of 1951 and the 1970s (figs. 4.30 and 4.31) appear to show widespread collapse and deterioration of the internal spaces after the Caïd left.

In figure 4.31, the roofs of the granaries and rooms farther to the south have collapsed (area 1). The roofs that form the western edge of the residence have also collapsed (area 2). The central courtyard and surrounding buildings have changed significantly, with major collapse around area 3.

The extent of change in this period of neglect can be seen in the aerial photograph estimated to date from 1977 (fig. 4.32). Area 1 appears to show further collapse or change to the roofs; this is the north front room where the most extensive painting is now found, meaning the painting may have been exposed in this period. Area 2 reveals what may be the collapse of the central courtyard and



FIGURES 4.30 AND 4.31

Aerial photos taken in 1951 (top) and ca. 1970 (bottom), indicating areas of significant collapse. Photos: CERKAS collection.

the rooms to the west and south (West 1, southwest room). When compared to figure 4.28, a structure also seems completely gone from the lower right (southeastern) corner of the courtyard.

Photographs estimated to have been taken in the 1970s of the southwest corner (figs. 4.33 and 4.34) show the extent of the collapse and deterioration in this area. West 1 room has collapsed, and the rooms to the south of the central courtyard are in a state of ruin.

The three images (figs. 4.33, 4.34, and 4.35) looking to the west of the building, taken in the 1970s, are the earliest available images of the wall paintings in the Caïd Residence, meaning the painting predates this period of neglect and may be linked to the time of occupation by the Caïd family.

Figure 4.35 shows the collapse of the northern and western section of the central courtyard down to ground level. The roof of the room at the top right has also collapsed, but was later repaired in the 1980s (fig. 4.36).

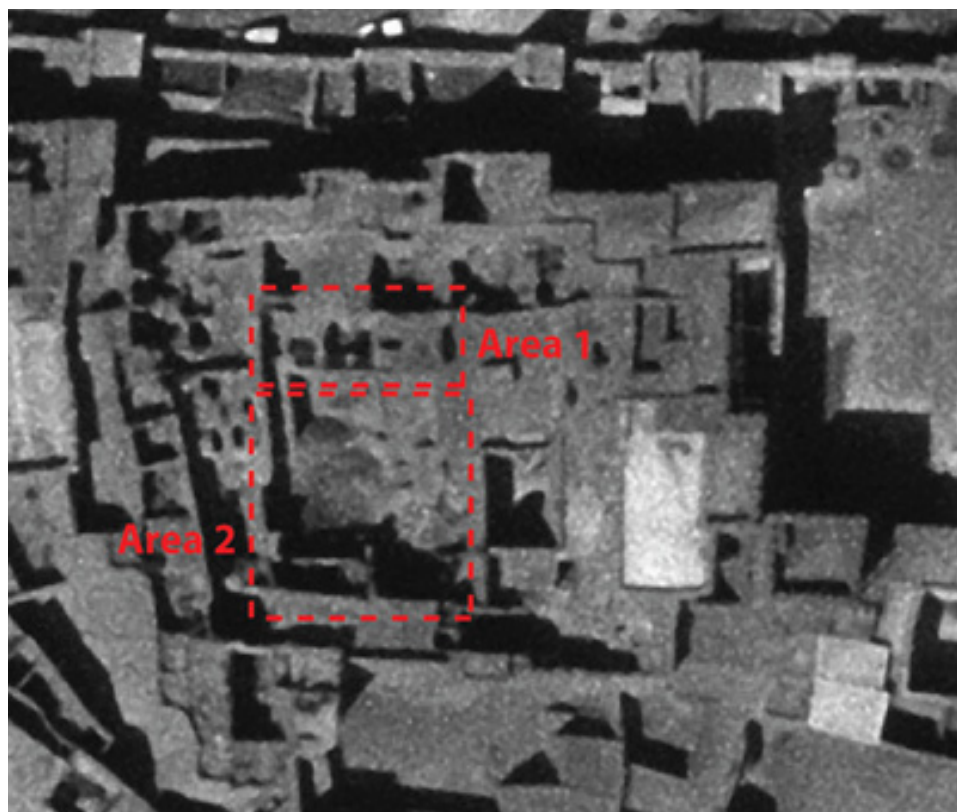


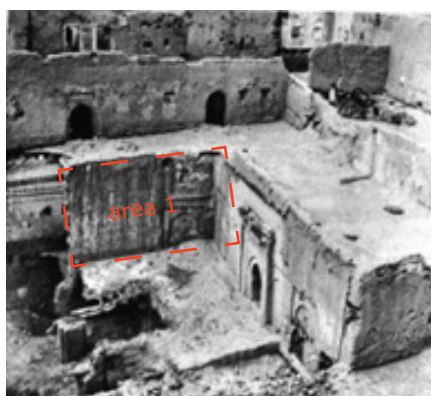
FIGURE 4.32

Aerial photo (c. 1977) of the Caïd Residence, showing areas of change (in red).
Photo: CERKAS collection.



FIGURES 4.33 AND 4.34

The area of collapse to the south and southwest is revealed by photographs taken ca. 1970.
Photos: CERKAS collection.



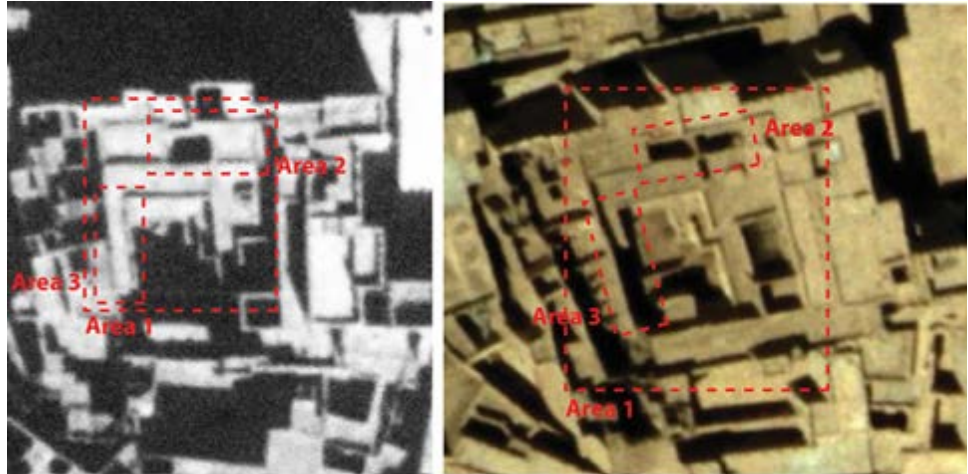
FIGURES 4.35 AND 4.36

Views looking to the northwest, taken ca. 1970 (right) and 2013 (far right). Notice the wall painting to the left of area 1.
Photos: CERKAS collection (right); Elena Macchioni, 2013 (far right).

1970–2014

An aerial photograph taken in the 1980s (fig. 4.37) appears to show that the roofs of area 1 have been restored since 1960–70 (compare to fig. 4.32).

Between the 1980s (fig. 4.37) and 2004 (fig. 4.38), the right roof in area 2 has collapsed and the roof of West 1 room in area 3 may have collapsed again.



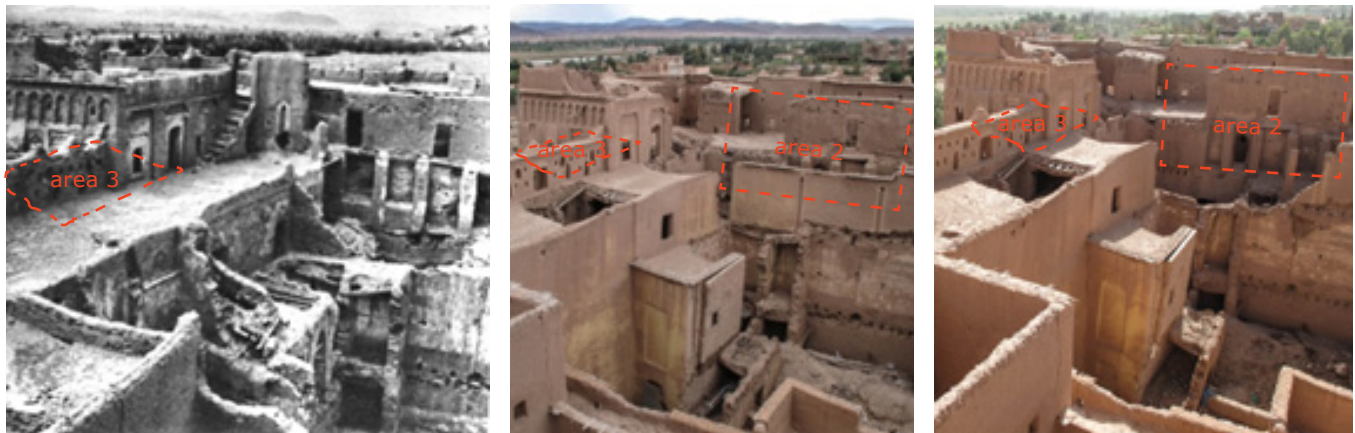
FIGURES 4.37 AND 4.38

Aerial photographs taken ca. 1987 (right) and 2004 (far right) show collapse of some areas and restoration of others.

Photos: CERKAS collection.

There was further collapse to the roof and east wall of West 1 room and the central courtyard in 2013 (fig. 4.36, area 1). A wall to the west added prior to 2010 was also gone by 2012 (figs. 4.40 and 4.41, area 2).

Comparisons between photographs taken around 1970 (fig. 4.39) and the present condition show significant collapse in the southwest tower. A roof has collapsed to the south of the building between 2004 (fig. 4.38, area 3) and 2010 (fig. 4.40, area 3).



FIGURES 4.39, 4.40, AND 4.41

Photographs taken of the southwest corner, ca. 1970 (left), in 2010 (center), and in 2012 (right) show the loss of part of the roof in the south sector and a wall at the west side.

Photos: CERKAS archives, ca. 1970 (left); Claudia Cancino, 2010 (center); Claudia Cancino 2012 (right).

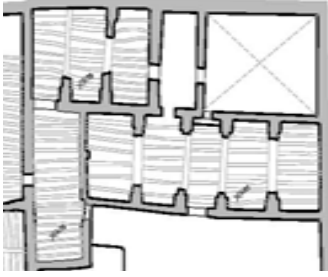


FIGURE 4.42
Schematic plan of the painted rooms at the Caïd Residence.
Drawing: CIMS, 2013.

Conservation issues and assessment

The condition assessment of the Caïd Residence revealed a number of urgent issues, including lack of roofs, disruption of traditional drainage, and structural problems such as leaning and collapsed walls. The conditions are discussed in detail according to the different areas of the residence.

Painted Areas

The painted areas of the central part of the residence comprise four rooms on the upper floor of a two-story structure built primarily in adobe (fig. 4.42). This construction material is distinct from the rammed earth of the residence. The rooms are constructed butting up against the more massive rammed-earth walls, and while there is evidence of wooden ties linking the two structures, there does not appear to be interlocking masonry. This could indicate that the painted rooms were built separately from the primary structure of the Caïd Residence and may have been added later within the previously existing courtyard.

The arches and walls of the painted rooms are in poor condition structurally, with extensive vertical cracks and separation between adjoining walls. The arches are also constructed with mud-bricks and are poorly linked to adjacent walls. This structural weakness and past roof failures have caused the arches to sag, leading to cracking and, in two instances, complete collapse. This is compounded by loss of the roofing over time and damage to the base of walls from rising damp and accumulated debris. This structural movement is most evident in the front painted rooms where the arches have separated from the walls and are cracking down the center as they sag (fig. 4.43).

Based on evidence from historic aerial photographs, the painted rooms have suffered repeated loss, repair, and reconstruction of the roofing. The current roofs are said to be constructed in the 1980s and employ a mixture of recycled beams, palm matting, and plastic bags and other rubbish as an intermediate layer. They are of poor quality and condition, with several holes that allow water to enter the rooms, particularly on the western side, causing extensive damage to the paintings below.



FIGURE 4.43
Detail of sagging arches leading to structural cracks separating the painted arches from the walls.
Photo: Lorinda Wong, 2013.

**FIGURE 4.44**

Debris built up below the painted rooms.

Photo: Claudia Cancino, 2013.

**FIGURES 4.45, 4.46, AND 4.47**

Above: Schematic plan of Caïd Residence with granaries (1) and (2). Diagram: CIMS, 2013.

Below left: Upper floor of the northernmost room (1).

Below right: Upper floor of the southern granary (2).

Photos: Benjamin Marcus, 2013.

The ground level in the northern part of the Caïd Residence is now about 1.5 meters higher than in the past, and debris has trapped moisture and caused basal erosion, which has damaged the walls and affected the structural stability of the wall bases (fig. 4.44).

Several painted rooms were once located along the western side of the courtyard. These have mostly collapsed and currently only one room remains. The painted western walls of these rooms still exist and the paintings are completely exposed to the elements. A large debris pile resulting from the collapse of these rooms contains the fragments of many painted and carved plaster decorative elements.

Granaries

Two rooms west of the painted rooms were also assessed. The northernmost room is a two-story columned space with a central *puit de lumière*, or light well (1) (fig. 4.45). The first floor is a utilitarian space with earthen plaster walls and square columns. A mostly collapsed staircase leads to the second floor. On the second floor, pointed arches with sculpted moldings surround the two-story square light well; the walls are whitewashed, featuring minimal painted decorations in white and red of unknown age (fig. 4.46).

The ceiling of the second floor was once tataoui. The rest of the ceiling is in reed matting and is most likely a later replacement. The northernmost section of the second-floor ceiling and two supporting arches have collapsed and the debris has collected at the bottom of the light well.

The southern room, perhaps the original granary of the Caïd Residence (2) (fig. 4.45), is a two-story structure with thin wooden columns on both levels supporting roofs of hewn logs and reed matting (fig. 4.47). A staircase of mud-bricks and wooden treads leads to the upper floor. The upper floor features low walls of single wythe mud-brick, perhaps dividers for storing different grains or other goods.

On both floors, the wooden columns support carved wooden capitals in traditional Amazigh design. This granary is in excellent condition, with almost no damage except for the deterioration of one of its wooden capitals, which has caused the roof in this area to sag 10 to 15 cm. Several existing holes in the roof allow water into the space and threaten to grow larger if left open.





FIGURES 4.48, 4.49, AND 4.50

Above left: Schematic plan of Caïd Residence, showing western rooms/alleys (3), southern rooms (4), and Borj Lalla Ftoum (5). Drawing: CIMS, 2013.

Center: Southern rooms looking east.

Right: Southern rooms looking west.

Photos: Benjamin Marcus, 2013.



Western and southern rooms

A series of rooms along the western side of the residence may have originally served as an alley outside the main residence, according to oral history, and was later covered over and divided (3) (fig. 4.48). Evidence for this can be seen in the remaining exterior drainage channels, now blocked by later roofing, and eroded condition of parts of the wall, indicating that it may have been exposed to the elements at one time.

These rooms vary in height but are generally three stories high and feature walls finished with earthen plaster and basic ceilings of poplar wood and reed matting. All walls are constructed in rammed earth and remain in good condition (4) (figs. 4.48–4.50).

The main deterioration factor in this area is the collapse of one roof section, which has led to the loss of intermediate floors. The rooms are also dark for the most part and bat infestation is found in the northernmost rooms.

The southern rooms encompass two long open corridors constructed in rammed earth with little decoration. Originally three stories in height, the loss of roofs and intermediate floors has created a long open space. At the southwestern corridor of the complex, a large open space filled with debris was once a wide, three-story room supported by four columns. These columns, and the roofs they supported, have collapsed, leaving a 2.5-meter-high pile of debris that obscures almost the entire ground floor.

South of this area lies a four-story tower built in rammed earth known as Borj Lalla Ftoum, or Lalla Ftoum's tower, a former residence of one of the Caïd's wives (5) (fig. 4.48). This tower has a staircase on the west side that provided access to the upper floors. The intermediate floors, now collapsed, were originally supported by mud-brick walls on the first floor, pointed arches on the second floor, and square pilasters on the third floor. The fourth floor contains several small interconnected residential spaces that are richly decorated with gypsum plaster (fig. 4.51).

The roofs of Borj Lalla Ftoum have collapsed, destroying the intermediate floors and creating a large debris pile at the base. The stairway has also filled with debris and partially collapsed. The decorated rooms and their roofs are partially intact but have several holes and areas of water penetration that are rapidly causing the deterioration and collapse of the faux ceiling, as well as the roof above.



FIGURE 4.51

Interior of Borj Lalla Ftoum, showing pointed arches (now filled in), columns, and decorative brickwork.

Photo: Benjamin Marcus, 2013

FIGURE 4.52

Right: Aerial view of Taourirt, identifying areas that were restored in the southeastern section of the kasbah (visited area, Médiathèque, and CERKAS headquarters).
Photo: CERKAS, 2004.



4.4.2 Southeastern Sector (CERKAS Offices and Visited Area)

Architectural description

The southeastern sector of the kasbah is composed of several interconnected structures linked by a common passageway (fig. 4.52). This passage was the primary entrance to the kasbah and now serves as the primary entrance to CERKAS headquarters. The space is divided by arches that support the ceiling (fig. 4.53). To the left, several doorways provide access to a large two-story structure. This structure is oriented around a rectangular central light well framed by six hexagonal columns (fig. 4.54). The ground floor is composed of several rooms, including a kitchen, a bathroom, and the office of the director of CERKAS. On the second floor, a balcony surrounds the light well, and doorways on all four sides of the balcony provide access to various rooms.

For more detailed information on the architectural arrangements and use of space in this part of the kasbah, see chapter 3, section 3.4.

Construction chronology

1930–70

The entrance corridor to the CERKAS office area featured several sets of stairs that accessed second-floor rooms called *mesria*, or formal living spaces. These have been largely walled off and the only second-floor access is from the caretaker's apartment.

In the mid-twentieth century, the open passageway between the museum courtyard and area of the CERKAS offices was covered, and a second story was added to the entire area, including the wing north of the CERKAS door (figs. 4.55 and 4.56). Doors to a shop or residence located to the left of the main CERKAS door were removed.

**FIGURES 4.53 AND 4.54**

Top: Entrance space to the former kasbah, divided by arches.
Photo: Françoise Descamps, 2011.
Bottom: Two-story structure adjacent to the entrance space, oriented around a rectangular central light well.
Photo: Mario Santana, 2013.

FIGURES 4.55 AND 4.56

Views toward east entrance of the CERKAS offices ca. 1950 (right) and in 2011 (far right), showing the second-story addition north of the central tower.
Photos: Archives J. Gandini (right); Sebastien Moriset, 2011 (far right).



FIGURES 4.57 AND 4.58

Views toward the southwestern corner of the museum courtyard, showing additions that included covering over the passageway between the museum courtyard and CERKAS offices (right) as well as construction of the present arched doorway (far right).

Photos: Archives J. Gandini, 1929 (right); Claudia Cancino, 2011 (far right).



As part of the second-story addition between the museum courtyard and CERKAS headquarters, the current arched opening was constructed, replacing an earlier square doorway. The western wall of the museum courtyard was also built higher, and minor changes were made to the configuration of elements, including doors, windows, and earthen buttresses (figs. 4.57 and 4.58).

The main door to the museum area has been altered several times. According to oral tradition, historically there was no door on the north facade; instead, the eastern entrance was the main access point to the entire kasbah (see fig. 4.55). In the mid-twentieth century, the doorway was altered to create the current whitewashed arch with green tiles (fig. 4.59). Before 1930, a plain square opening with wooden lintels existed or was introduced (fig. 4.60). After 1955, additional arched and whitewashed doors were added to create the current shops, two to the right and one to the left of the main door (fig. 4.61).

FIGURE 4.59

View of the northern facade of the complex, the current entrance to the visited area. The whitewashed arch with green tiles is at left.

Photo: Scott Warren, 2014.

**FIGURES 4.60 AND 4.61**

Views of the main entrance in the north facade, showing changes in the main door from a square opening before 1930 (right) to an arch in 1955 (far right).

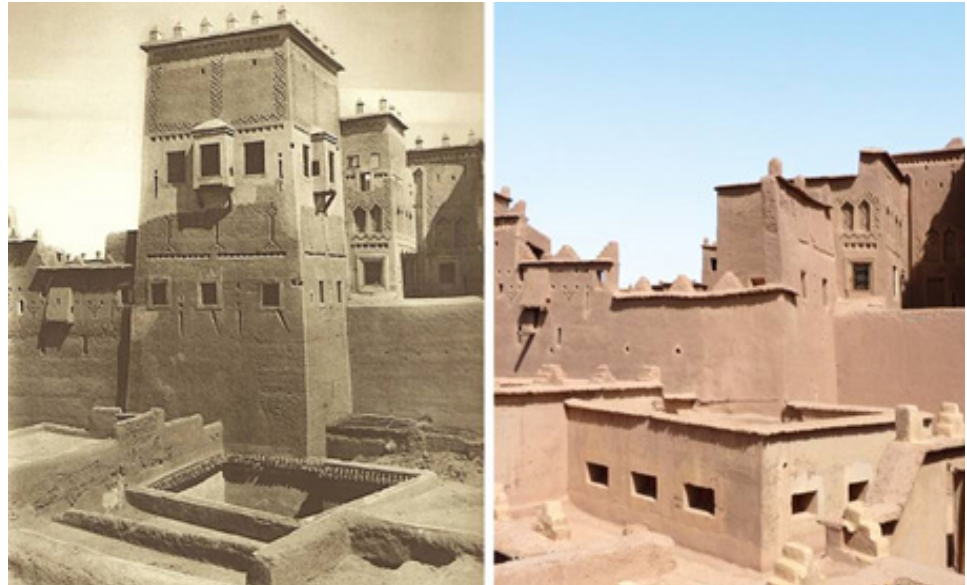
Photos: CERKAS collection, ca. 1930 (right); Archives J. Gandini, 1955 (far right).



FIGURES 4.62 AND 4.63

Views facing north toward the Caïd Residence, showing two towers that were present ca. 1930 (right) but subsequently collapsed (far right).

Photos: Archives J. Gandini, ca. 1930 (right); Sebastien Moriset, 2011 (far right).



1970–2014

Collapses significantly altered the configuration of the museum area, including the partial loss of two towers at the western side of CERKAS headquarters (figs. 4.62 and 4.63). In 1989, the structures south of the Caïd Residence were restored for use by CERKAS. Later, in the mid-1990s, the suite of rooms that forms the eastern side of the Residence was also restored and opened for visitation as an architectural exhibition. While retaining the majority of historic spaces intact, these restorations involved many changes:

- Replastering of interior and exterior walls
- Addition of painted cement floors
- Re-creation/restoration of architectural woodwork and roofs
- Installation of new electrical and plumbing systems
- Closure of several formerly open spaces, including the present meeting room adjacent to CERKAS headquarters
- Installation of new ceramic tile floors

In the same period (mid-1990s), the former residence of the Caïd's favorite wife, Lalla Jamila Tourquia, and adjacent buildings were repurposed as the Médiathèque. Major changes included those listed above as well as several that affected the exterior appearance of the kasbah (figs. 4.64, 4.65, and 4.66):

- Construction of a new arched entrance between the main structure and the remains of defensive walls
- Removal of traditional drainage channels and addition of scuppers, enlarging windows
- Reconfiguration of rooms and spaces to the east of the Médiathèque

Conservation issues and assessment

The southeastern sector of the kasbah was largely restored in the late 1980s and early 1990s. This restoration preserved the historic spaces while replacing the majority of roofs, installing new windows and doors, and adding plumbing and electricity and new finishes such as floor tile and wall plasters. As these spaces were restored rather recently, their condition was not assessed as part of this study, though a longer-term plan should take into account their continued maintenance.

FIGURES 4.64, 4.65, AND 4.66

Views of the southern facade of the kasbah, facing northeast. Photos from ca. 1930 (top), ca. 1980 (middle), and 2013 (bottom) show the evolution of this part of the building, including the addition of a new gateway to the Médiathèque, the alteration of windows and drainage systems, and the reconfiguration of collapsed buildings east of the Médiathèque.

Photos: Archives J. Gandini, ca. 1930 (top); postcard, 1980, CERKAS collection (middle); Susan Macdonald, 2013 (bottom).

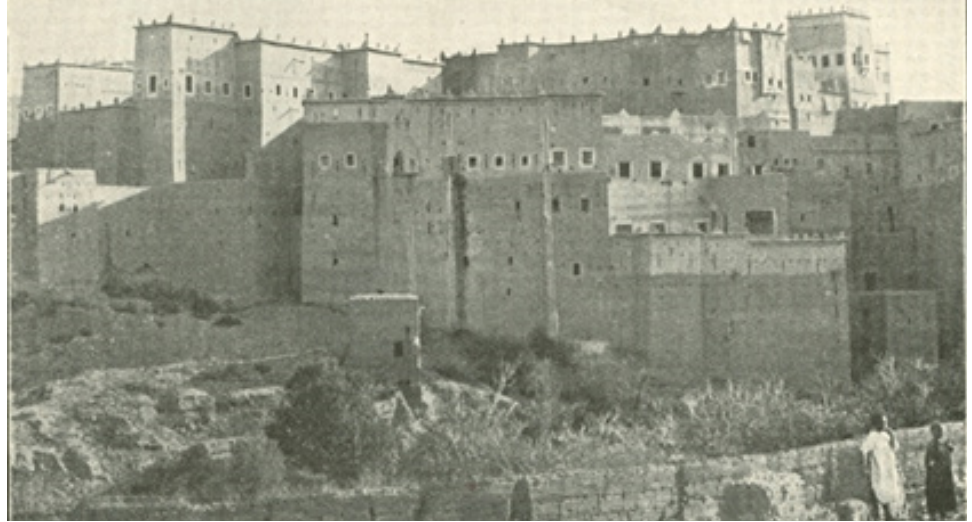


FIGURE 4.67

Aerial view of Taourirt, identifying the Stara East.

Photo: CERKAS, 2004.



4.4.3 Stara East

Architectural description

The Stara East is a square plan structure roughly divided into two separate sectors, the northern and southern halves (fig. 4.67). Based around a traditional square plan seen in many typical kasbahs, the northern sector has four towers, three of which are clearly articulated, while the fourth is extant but enclosed by adjoining structures. Between the towers are long rooms surrounding a central colonnaded courtyard with a square central opening, or light well. The courtyard space features a stone well, a hammam, and a series of square columns that support the overhanging roof. Stairs provide access to the courtyard roof.

East of this structure is an attached series of rooms. As of February 2015, these rooms have not been surveyed by the project team, as they were still occupied by the last remaining family living in the kasbah.

The southern sector of the Stara East contains two open courtyards surrounded by rooms. The western courtyard is a long unroofed space surrounded by small rooms. A passageway at the eastern side of the courtyard leads to a second courtyard space. This two-story space is arranged around a square central light well. On the ground floor, the space is highly decorated with white *tadlakht* walls. Four rooms surround two round columns with decorative capitals (fig. 4.68). The columns support arches and a wooden ceiling. The second floor of this space is also oriented around a square central courtyard.

**FIGURE 4.68**

Second courtyard at Stara East with *tadlakht* walls.

Photo: Scott Warren, 2014.

**FIGURE 4.69**

Plan of the Stara East, showing traditional square plan core and possible additions to the south side of the building.

Drawing: CIMS, 2013.

Construction chronology

In the Stara East, a series of historic additions or alterations to a potentially historic core can be seen that also predate 1930. While it is not confirmed which are the older parts of the building, it appears that the northern half of the Stara East features a traditional square plan with a colonnade and well at the center, while the southern half of the building is separated by an open courtyard and may be a later addition or a separate construction that was adjoined to another structure on the site (fig. 4.69).

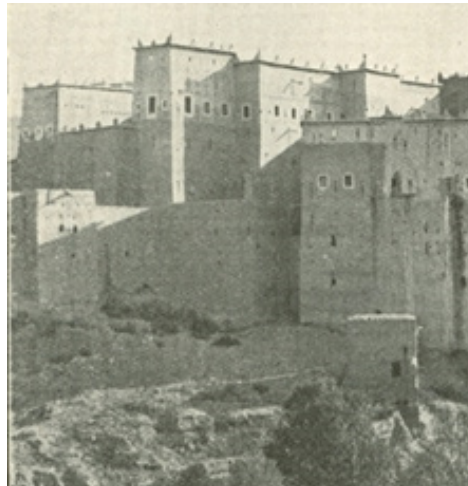
A large area of the southern facade of the Stara East collapsed sometime before the 1980s, completely altering the configuration and plan of this area (figs. 4.70 and 4.71). The remaining southwest tower was in a state of decay, with its roof gone and upper floor partially missing.

During the period of occupation by squatters, the collapsed area of the Stara East was filled in with two stories of mud-brick rooms and the tower reduced by one story. Sometime after 2004, the southwest tower of the Stara East collapsed completely.

FIGURES 4.70 AND 4.71

Details of historic photographs, showing southern area of the Stara East before collapse (1931, right) and after collapse (ca. 1980, far right). This part of the building was subsequently filled in with squatter dwellings and the tower, also pictured, eventually collapsed.

Photos: Archives J. Gandini, ca.1930 (right); postcard, 1980, CERKAS collection (far right).



Another alteration to the Stara East occurred on the roof of the southern half of the building, located above the decorative gypsum room. The second floor was originally a square plan open courtyard with no roof, allowing maximum light into a series of rooms around the courtyard. Sometime between 1951 and the 1970s, an overhanging roof of wood and earth was added, which further enclosed the space, creating a polygonal opening (figs. 4.72 and 4.73).

Other changes to this second-floor courtyard include bricked-up doorways and windows.

FIGURES 4.72 AND 4.73

Details of historic photographs, showing the second-floor courtyard, originally constructed as an open space (1951, right) and subsequently enclosed with an overhanging roof (ca. 1975, far right). Photos: Archives J. Gandini, 1951 (right); CERKAS collection, 1975 (far right).



Conservation issues and assessment

While a complete condition assessment of the Stara East has not been carried out, several areas of deterioration have been noted as “emergency” conditions. The southern sector suffers from severe structural problems at the southwest corner. This is evidenced by full-height vertical cracks and a large area of collapse (fig. 4.74). The west-facing facade of the Stara East is heavily eroded due to prevailing winds and rain (fig. 4.75). The upper floors of the towers, particularly the southwest tower, are without roofing and in critical condition.

On the interior, the Stara East was extensively altered by squatters beginning in the 1980s, and many interior spaces have been reconfigured with the construction of mud-brick partition walls. At the time of this writing, the building is undergoing conservation works by CERKAS to remove these partitions and repair major structural problems.

FIGURES 4.74 AND 4.75

Details of Stara East, showing structural damage (top) and roof loss in decorated spaces (bottom). Photos: Benjamin Marcus, 2013.



FIGURE 4.76

Aerial view of Taourirt, identifying the Stara West.

Photo: CERKAS, 2004.



4.4.4 Stara West

Architectural description

The Stara West is a two-story square plan structure built primarily of rammed earth (fig. 4.76). The plan of the building is divided into two identically designed halves, each oriented around a central light well with four columns. Rectangular rooms surround the light wells on both upper and lower floors (fig. 4.77). Rooms are lit with small windows on the eastern, southern, and western sides, while interior rooms receive no natural light except from the two central light wells. Each half of the building has a set of stairs from the ground floor to the roof. The northern side of the building features large open rooms that may have originally been used as utilitarian spaces. According to oral history, the building is said to have been used as a residence and workshop for the Caïd's cavalry.

The southern, eastern, and western facades of the Stara West are very similar with nonhistoric door openings on the ground-floor level and small square window openings on the second-floor level. The north facade features two square multistory structures that may have historically served a utilitarian purpose and were most likely the original entrance to the building.

Construction chronology

The original date of construction is unknown, but it is clear from the photographic record that the original form of the Stara West has remained largely unchanged since 1930. Major alterations to the exterior of the building include the addition of door openings on all of its facades. The interior was heavily altered over time but retains the majority of its historic form, including walls, columns, and light wells, intact.

Conservation issues and assessment

The Stara West was also heavily subdivided during occupation by squatters. This especially affected the western half of the building, where exterior doors were added, structural columns removed, and numerous small rooms built to create separate living quarters for a number of families. The April 2014 conservation work by CERKAS involved the demolition of these partition walls, reconstruction of all floors and ceilings, and rebuilding of several lost columns.

**FIGURE 4.77**

Ground-floor plan of the Stara West.

Drawing: CIMS, 2013.

FIGURE 4.78

Aerial view of Taourirt, identifying the Ateliers.

Photo: CERKAS, 2004.

**FIGURE 4.79**

Plan of Ateliers, accompanied by a detail of the western Atelier.

Drawings: CIMS, 2013.



4.4.5 Ateliers

Architectural description

Three structures, known as the Ateliers, are located on the northern side of the Stara and are two stories in height except for the western Atelier, which is only one story (fig. 4.78). All three structures have similar plans based on typical kasbah design, with a central light well framed by four columns and rectangular surrounding rooms (fig. 4.79). Narrow alleys separate each structure, and the principal doors to the buildings open onto these alleys, providing access to the building interiors. The first floor of each structure is constructed of rammed earth while the second floors and parapets are made of mud-bricks. Recent conservation work by CERKAS has involved the reconstruction of the second floor on two of the houses, while the southernmost Atelier remains a one-story structure. Staircases in the southeastern corner of each building provide access to the second level.

Construction chronology

While their original construction date has not been established, the Ateliers date from before 1930. The Ateliers were originally built as one-story buildings separated by narrow alleys. Each building features a square plan based around a central light well, supported by four columns (fig. 4.80). The westernmost building has a walled courtyard on its western side that may have been used as a garden or animal pen. According to oral tradition, the Ateliers were used as quarters for slaves and servants during the period of the Caïd. All three buildings have been altered substantially over time, though the western building is well preserved and retains its original plan and height, as well as some historic finishes on the interior.

The middle and eastern Ateliers have been altered heavily through the addition of second-story rooms and the construction of partition walls on the interiors and within the alleys. Between 1930 and 1951, a full second story was added to the middle Atelier and to the southern side of the eastern Atelier, and later to the eastern side (figs. 4.81 and 4.82). After 1956, the buildings deteriorated substantially with the rapid loss of their palm wood roofs. By 1970, the roofs of the additions had partially collapsed and subsequently caused the collapse of parts of the original structure.

**FIGURE 4.80**

Puit de lumière, or light well, in the interior of one of the Ateliers in the Stara.

Photo: Sebastien Moriset, 2011.

FIGURES 4.81 AND 4.82

Details of historical photographs, showing the transformation of the middle and eastern Ateliers from one-story structures (top) to two-story structures through additions (bottom). Note also the small well in the foreground of the bottom photo.

Photos: Archives J. Gandini, 1930 (top) and 1951 (bottom).



In the 1980s and through the period of squatter occupation, significant alterations were made to the interiors of all the Ateliers, such as the addition of mud-brick partition walls, removal of original columns, blocking of the light wells, and the addition of kitchens and bathrooms.

Conservation issues and assessment

At the beginning of the GCI's involvement in the project, the Ateliers were unoccupied but had been extensively subdivided during the occupation by squatters. The upper floors of both the eastern and middle atelier were in extremely poor condition, with walls remaining from the collapse of past rooms. However, the ground-floor spaces were habitable due to their recent occupation (fig. 4.83).

**FIGURE 4.83**

South facade of the Ateliers, showing the state of deterioration of the buildings.

Photo: Claudia Cancino, 2011.

FIGURE 4.84

Aerial view of Taourirt, identifying the location of the Marabout.

Photo: CERKAS, 2004.



4.4.6 Marabout

Architectural description

The Marabout is a one-story square plan structure. It is located on a raised area of ground that is thought to be the original height of the hill on which the kasbah was built (fig. 4.84). The Marabout is constructed in mud brick. The northern elevation is the principal facade and features an arched doorway. The other three facades are identical in configuration and characterized by areas of thin and thick walling, possibly a decorative feature or method of strengthening the wall system (fig. 4.85). On the southwestern side of the mound on which the Marabout is built, a section of masonry wall can be seen that is constructed with small round boulders.

On the interior, the Marabout contains the graves of seven individuals. The raised triangular grave mounds are crowded within the space, without headstones or footstones. There is a simple ceiling of palm beam and reed matting.

Construction chronology

The Marabout appears unchanged in all available documentation. However, the mound on which it is located appears to have been surrounded by a wall at one time, now largely lost. A well was located in the open space of the Stara to the northeast of the Marabout.

Conservation issues and assessment

The interior is in good condition, with the original roof intact. On the exterior, erosion in the form of long channels on the east and south walls was observed, most likely caused by blocked drainage. The roof is also covered in debris, which may account for the interruption of drainage.

FIGURE 4.85

View of the Marabout within the open space of the Stara area.

Photo: Benjamin Marcus, 2013.



FIGURE 4.86

Aerial view of Taourirt, identifying the location of the Stara walls.
Photo: CERKAS, 2004.

**FIGURE 4.87**

Freshly painted decorations on south portion of the Stara walls.
Photo: CERKAS collection, ca. 2000.

**FIGURE 4.88**

Interior view of one of the towers, showing collapse of the upper floor.
Photo: Sebastien Moriset, 2012.

4.4.7 Walls

Architectural description

The Stara walls extend from the northern elevation of the Caïd Residence to the far west end of the Stara and completely enclose the Stara, ending at the Médiathèque building (fig. 4.86). The walls are approximately 200 meters in length and average 5 meters in height. The walls are constructed of rammed earth and feature sixteen square, two-story towers. The majority of the towers' second floors are accessed by mud-brick staircases. An arched opening is located along the southern walls, though this was historically not the entrance to the Stara.

Construction chronology

The current door opening in the southern section of the Stara wall is a late twentieth-century addition.

The majority of the structures abutting the southern and western walls of the Stara were constructed after 1985, during the occupation by squatters from the 1970s until 2010. Significant alterations were carried out on the towers in this period, including the addition of openings and passages and the reconstruction of the roofs.

White (now faint) painted decorations were added to the crenellations on the exterior walls (fig. 4.87), most likely as part of a film shoot or public event that took place around the year 2000.

Conservation issues and assessment

Many towers of the walls were adapted for use as residential spaces during the period of occupation by squatters. This included introducing door and window openings that would not have existed historically and weakened the structural stability of the wall system. Roofs were also replaced or repaired with recycled beams and poor-quality roofing materials, including plastic sheeting, that has not withstood the elements.

Several towers of the walls had structural issues that were repaired during the CERKAS conservation work in 2014–15. These issues included replacing collapsed roof beams and rebuilding a large area of collapse on the upper floor of one of the northern towers (fig. 4.88).

CHAPTER 5

Decorated Surfaces Assessment



FIGURE 5.1

The wall paintings in the northwest room of the Caïd Residence. Photo: Samuel Whittaker, 2014.

The greatest concentration of rooms with decorated surfaces within Kasbah Taourirt is located in the central area of the Caïd Residence (figs. 5.1 and 5.2). This cluster of rooms is situated on the second floor of the building, to the north and west of the main courtyard (*tarhabit*), which was originally used as a service area for animals and also contained grinding mills and ovens (Da Lmahjoub; oral history, see chapter 3). The rooms in this area present a rare example of late nineteenth-century decoration of private living quarters of the family of Caïd Hammadi el Glaoui (1882–1937). Each of the Caïd's daughters is said to have had a separate room in which their valuables were deposited (Da Lmahjoub; oral history). The function of the rooms prior to Da Lmahjoub's testimony is unknown. Although seemingly rudimentary, the decoration is unparalleled in the region for its concentration of painted surfaces within one kasbah that includes a wide variety of Amazigh motifs featuring geometric patterns, knives, guns, and jewelry highly decorated with wall paintings, sculpted plasterwork around doorways and arches, and friezes on the upper parts of walls.

The main entrance to the decorated rooms is centered along a terrace north of the central courtyard and is accessed by stairs that lead from the ground floor. This facade (North-facade) has a central doorway, ornately decorated with sculpted plasterwork with remaining traces of paint. The entrance leads into a sequence of five rooms, four of which are painted and one that has completely collapsed. The painted rooms in this northern section have been named the North-front room, North-rear room, Northwest room, and West 1 room (fig. 5.4).

Running along the western side of the central courtyard is a collapsed room referred to as West 2. It still retains significant wall paintings (on the remaining north and west walls) but collapse of the ceiling, arches, floor, and eastern wall has left it exposed. According to oral history, this room would have been accessed by an entrance to the south that connected to what during the Caïd period was once a



FIGURE 5.2

View of the decorated rooms in the Caïd Residence, looking west. Photo: Samuel Whittaker, 2014.



FIGURES 5.3 AND 5.4

Top: Horizontal band of repeating geometric patterns, typical of the wall painting in the Caïd Residence. Photo: Samuel Whittaker, 2014.

Right: Plan of the second floor, showing the rooms with decoration in the Caïd Residence.

Drawing: CIMS, 2013.



FIGURE 5.7

A painted wooden door from Kasbah Taourirt with Amazigh motifs similar to those of the wall paintings.

Photo: Samuel Whittaker, 2014.



FIGURE 5.8

Geometric patterns represent Amazigh textiles with hooks to hang at the top.

Photo: Samuel Whittaker, 2014.



FIGURES 5.5 AND 5.6

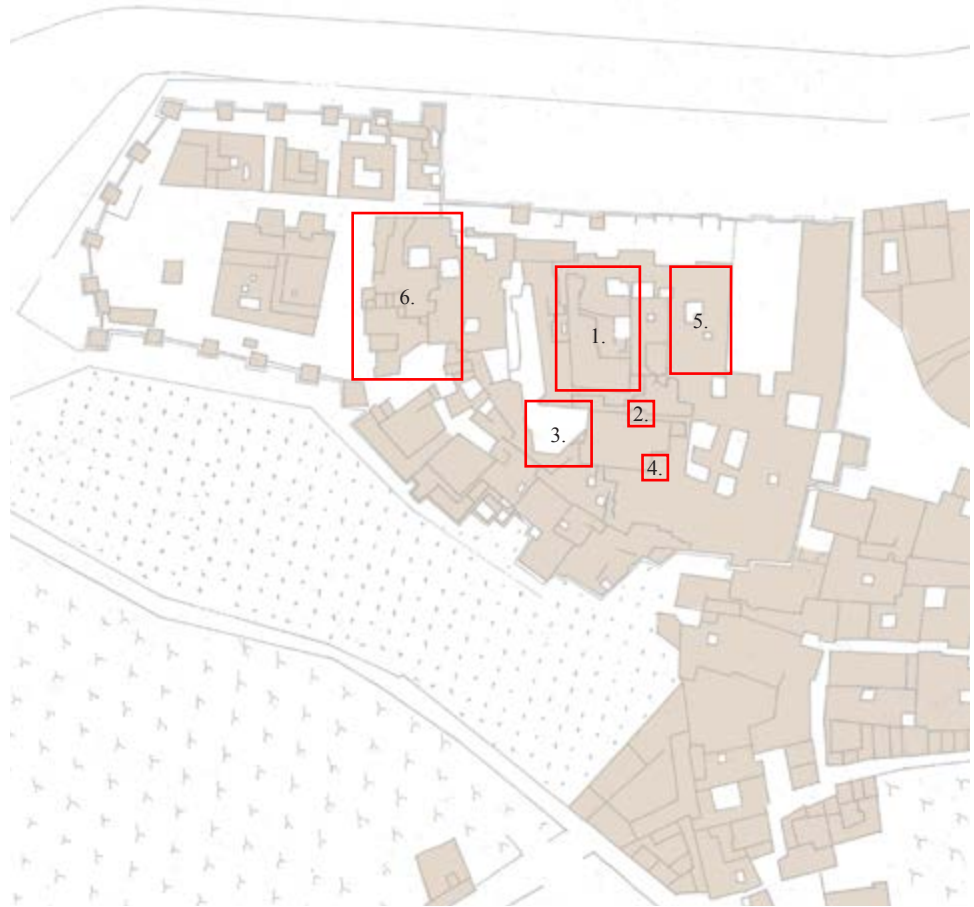
Left: six-leafed circular motif, common in Amazigh painted doors, ceilings, and jewelry. Right: whirling circular motif, also common in Amazigh painted wood and jewelry.

Photos: Samuel Whittaker, 2014.

granary and a hammam. Two granaries, Granary 1 and Granary 2, are situated to the west and are less ornately decorated. These rooms would have been accessed by a staircase from the central courtyard, now lost (Da Lmahjoub; oral history). Farther to the south is another collapsed room, referred to as the Southwest room.

5.1 The Decoration

In all the rooms, apart from the two granaries, a lower red band with triangular motifs along the top runs around the base of the walls. A trace of this band was observed below later paint layers on the North-facade. Above this band, the walls are decorated in a mixture of styles, combining local Amazigh and Marrakech influences. This includes horizontal bands of repeating geometric designs around the walls, both sculpted and unsculpted (fig. 5.3), circular motifs of swirling and leafed Amazigh designs (figs. 5.5 and 5.6), and checkerboard and other geometric patterns related to Amazigh textiles (fig. 5.7). There are also representational images of Amazigh jewelry and weaponry. The North-front room, North-rear room, and West 1 room (now collapsed) are articulated by cusped arches of Marrakech style. Arches, select doorways, and West 1 room are also decorated with painted and sculpted geometric designs in friezes and spandrels, as are the painted wooden doors (fig. 5.8).

**FIGURE 5.9**

Schematic plan of Kasbah Taourirt with areas of surviving decoration indicated in red squares.

Drawing: CIMS, 2013.

5.1.1 Other Examples of Painted Decoration in Kasbah Taourirt

Within the wider context of painted decoration in Kasbah Taourirt are a number of painting phases and styles. These areas, indicated by number in figure 5.9, differ significantly in condition, extent, period, quality, style, and function. Situated just outside of the central courtyard rooms (1) are paintings in Granary 2 with red geometric motifs and borders around architectural features (fig. 5.10). Elsewhere are paintings in Borj Lalla Ftoum (2) and Borj n'Bouyhia (3). These are characterized by the use of blue pigment and depict geometric motifs similar to those in the paintings in the Caïd Residence (fig. 5.11).

In the area now occupied by the CERKAS offices (4), there is an elaborately decorated wooden ceiling (fig. 5.12). These painted ceilings are found in other kasbahs of the region such as at Aït Allah, Tiflit, and Ksar Tamnougalt (Naji, 2008). In the visited area (5) are two rooms with ornately painted wooden ceilings and sculpted plaster friezes in the Marrakech style (fig. 5.13). The paintings in this area are the most sophisticated and ornate within Kasbah Taourirt. There is also a sequence of rooms with paintings similar to Granary 2, simple red geometric motifs and borders painted in red (fig. 5.14).

In the Stara East (6) are paintings dating to the occupation by squatters, simple illustrations in black of airplanes and animals (fig. 5.15). There are also other surviving ex situ wooden fixtures in Kasbah Taourirt such as decorated doors, pillars, and lintels that have Amazigh motifs similar to those of the paintings in the Caïd Residence.



FIGURE 5.10
Simple red geometric painting in the granary.
Photo: Samuel Whittaker, 2014.



FIGURE 5.11
Painted ceiling in Borj Lalla Ftoum, the tower to the southeast of the Caïd Residence.
Photo: Samuel Whittaker, 2014.



FIGURE 5.12
Painted wooden ceiling in CERKAS offices.
Photo: Samuel Whittaker, 2014.



FIGURE 5.13
Ornate, Marrakech-style painted ceiling in the museum with stucco work on the walls.
Photo: Samuel Whittaker, 2014.



FIGURE 5.14
Red geometric designs in a room in the museum.
Photo: Samuel Whittaker, 2014.



FIGURE 5.15
Illustrations of animals and airplanes are found in the Stara East.
Photo: Benjamin Marcus, 2013.

5.1.2 Comparative Sites in Southern Morocco

The paintings in Kasbah Taourirt are a rare example of painted Amazigh decoration in a southern Moroccan kasbah. In the surrounding Dadès and Draá Valleys, there are a few comparative sites that share stylistic similarities (figs. 5.16, 5.17, and 5.18). There are also historical references to a tradition of painting in southern kasbahs. One such source is Henri Terrasse's book *Les arts décoratifs au Maroc*, in which he describes the fortes of the "seigneurs de L'Atlas" as being carved and painted, especially in the most important rooms (Terrasse, 1925). He goes on to describe how the technique of decorating the plaster walls of kasbahs was practiced south of the Atlas in the valleys from Telouet to Dadès, and that it was particularly developed in the Tifnout Valley.

Other sources describe carved and painted plaster from this region as being the result of recent influences and not ancient local traditions, with simple and unrefined painting and decoration reflecting influences from Marrakech (Jaques-Meunié, 1961). It does appear that the painted plasterwork from this region is strongly influenced from Marrakech. According to oral tradition, the paintings in the Caïd Residence were decorated by ma'alem. This corresponds to descriptions by Salima Naji in her book *Art et Architectures berbères du Maroc: Atlas et vallées présahariennes* in which she describes different ma'alem, who decorated buildings in southern Morocco as well as artisans who traveled from Marrakech (Naji, 2008).

**FIGURE 5.16**

Interior paintings in Ksar Tamnougalt.
Photo: Samuel Whittaker, 2014.

**FIGURE 5.17**

Interior paintings in Ksar Tamnougalt.
Photo: Scott Warren, 2014.

**FIGURE 5.19**

Floor plan indicating (in red) the location of the North-facade.
Drawing: CIMS, 2013.

FIGURES 5.20 AND 5.21

Below: West wall of the North-facade, showing door to West 2 room.
Right: North wall with decorative doorway flanked by blind arches.
Photos: Samuel Whittaker, 2014.

**FIGURE 5.18**

Satellite image of the region around Ouarzazate, showing the locations (in red) of comparative wall painting sites. Photo: Google, 2014.

5.1.3 The North-facade

The North-facade and north terrace are accessed by stairs leading up from the first floor of the main courtyard (fig. 5.19). A sculpted decorative doorway along the north wall provides an entrance into the internal spaces of the North-front room (fig. 5.21). The central door is flanked on either side by blind arches. The doorway is formed of mud bricks with a wooden lintel, once painted, above. Above this, running along the apex of the wall, is green tilework typical of the region. The frame of the door is decorated with plasterwork, premolded before being attached. The design is in the Marrakech style, with two variations on the eight-point star arabesque pattern. A door in the western wall leads into West 2 room (fig. 5.20). A previous door south of this has been in-filled and the present door cut through. There are several phases of plastering and painting to the North-facade; traces of blue paint have been found in the decorative plasterwork, suggesting it was once fully painted.



**FIGURE 5.22**

Floor plan indicating (in red) the location of the North-front room. Drawing: CIMS, 2013.

**FIGURES 5.23 AND 5.24**

Painted Amazigh designs of circular motifs, such as whirling patterns and six-leafed rosettes, decorate the arches.

Photos: Samuel Whittaker, 2014.

5.1.4 The North-front Room

The North-front room is approximately 11.5 m long and 3.7 m wide (fig. 5.22). There are doorways to the north and south, and the room is articulated by four lobed arches that span the space from north to south, one of which is collapsed. The east and west walls have decorative brickwork in a dogtooth pattern.

A lower red band with triangular motifs along the top runs around the base of the walls. The arches are decorated in part with sculpted plasterwork, also painted with brickwork used in a dogtooth pattern (fig. 5.25). The plasterwork is in the Marrakech style of repeating geometric patterns based on the star motif. The arches are decorated with Amazigh designs of circular motifs, such as whirling patterns and six-leafed rosettes (figs. 5.23 and 5.24). Repeating geometric patterns that appear to refer to Amazigh textiles are used. The Amazigh designs of circular motifs and textile patterns are repeated on the north, east, south, and west walls. A horizontal band of interlocking curves is also depicted at the top of some sections of the north and south walls. In addition, there are depictions of Amazigh jewelry, weaponry, and keys, as well as floral motifs around the door.

**FIGURE 5.25**

General view of the North-front room. Photo: Samuel Whittaker, 2014.

The ceiling is constructed with palm, red laurel, and cane and dates from the 1980s when the ceilings were replaced. The earthen floor has been covered with concrete. A triangular-shaped bench or shelf, a later addition possibly for storage, is located in the southwest corner.

There are numerous and complicated later patches of plaster repairs, some of which have been reintegrated into the decorative scheme. Two poorly made wooden shelves have been added, and the northern doorway has been completely reframed, plastered, and painted. These later alterations probably date from the use of the building as a film set from the 1980s onward. Of the two main schemes of painting, only a lower painted scheme is visible today through loss to the later scheme that covers it.

**FIGURE 5.26**

Floor plan indicating (in red) the location of the North-rear room.
Drawing: CIMS, 2014.

5.1.5 The North-rear Room

The North-rear room is approximately 4 m long and 2.3 m wide (fig. 5.26). Doorways are found to the east, south, and west. There is no sculpted decoration in this room. A lower band of red around the walls lacks the triangular decoration at the top. Horizontal bands of painted geometric patterns as well as circular motifs and Amazigh weaponry and jewelry decorate the walls (figs. 5.27, 5.28, and 5.29). There is only one scheme of painting present. The ceiling is constructed in the roseau style with a mixture of red laurel, palm, and cane. The floor is earthen.

**FIGURES 5.27, 5.28, AND 5.29**

Amazigh decorations in the North-rear room. Photos: Samuel Whittaker, 2014.

**FIGURE 5.30**

Floor plan indicating (in red) the location of the Northwest room.
Drawing: CIMS, 2014.

5.1.6 The Northwest Room

The Northwest room is approximately 5.5 m long and 4 m wide (fig. 5.30). It is articulated by two arches, one now collapsed, that vault the room from north to south. These arches are constructed and decorated in a similar style to the arches in the North-front room. There are doors to the east and southwest.

The room has an earthen floor with a hole in the middle that connects to the first floor. The ceiling is mainly roseau except for the southeast corner, where some of the earlier, more decorative tataoui ceiling decoration survives. The doorway in the eastern wall is ornately decorated with sculpted plasterwork and paint in a similar style to the North-facade (fig. 5.32). Horizontal bands of repeating geometric pattern span the middle of the walls. Above this level are circular Amazigh motifs and Amazigh weaponry and jewelry (fig. 5.31).

The Northwest room is the most badly deteriorated, with large sections of loss to the paintings. The whole north wall and large parts of the west wall and north side of Arch 2 have lost all of the painted plaster. This is due to historical failure of the roof, causing water infiltration.

**FIGURES 5.31 AND 5.32**

Detail (above) and general view (right) of the east wall of the Northwest room.
Photos: Samuel Whittaker, 2014.



**FIGURE 5.33**

Floor plan indicating (in red) the location of West 1 room.
Drawing: CIMS, 2013.

5.1.7 West 1 Room

West 1 room (fig. 5.33) is now half collapsed: the floor and ceiling have collapsed as well as the eastern and southern walls and two arches. Wall painting remains on the western and northern walls (fig. 5.34). Remains of decorative painted plasterwork exist at the top of the central section of the eastern wall. Horizontal bands of repeating geometric patterns run along these walls at a lower height. The northern wall is highly unstable, having become separated from the northern and southern walls.

**FIGURE 5.34**

The western wall of West 1 room, showing remains of wall painting.
Photo: Samuel Whittaker, 2014.

**FIGURE 5.35**

Floor plan indicating (in red) the location of West 2 room.
Drawing: CIMS, 2013.

5.1.8 West 2 Room

West 2 room is approximately 6 m long and 2 m wide (fig. 5.35). There are doors to the north and east as well as a door to the east that has been filled in. The ceiling is in the roseau style and the floor is earthen. In the west wall is a small niche that today opens to the adjacent room. Horizontal bands of geometric patterns are found on all four walls, roughly halfway up the wall, while on the north and south walls are circular motifs and weaponry (fig. 5.36).

**FIGURE 5.36**

Detailed view of West 2 room.
Photo: Samuel Whittaker, 2014.



FIGURES 5.37 AND 5.38

Both sides of the south wall of the North-front room, showing the joint between the mud brick and rammed earth, creating a clear bulge in the wall.

Photos: Samuel Whittaker, 2014.



FIGURE 5.39

Area of the decorative tataoui ceiling construction in the Northwest room. The construction of this area of the ceiling was prior to paintings as the plaster goes over the beams.

Photo: Lorinda Wong, 2013.

5.2 Original Technique

5.2.1 Structure

The building technique for the walls of the decorated rooms in the Caïd Residence was primarily rammed earth at the base of the walls, with mud bricks at higher levels. The walls were found to have been constructed to a height that ranges from approximately 3.6 m to 4 m and were measured to be 30 to 60 cm thick. The join between the rammed earth and mud bricks is commonly located at a height of 2.5 m. Where they could be measured, the thickness of the walls ranged from 30 to 60 cm on the second floor, while the thickness on the first floor was about 60 cm. In the North-front and North-rear rooms, this can be observed due to the wall bulging at lower levels (fig. 5.37). Elsewhere, such as in the southern wall of West 2 room, the entire second floor is mud brick and only the first-floor walls are rammed earth (fig. 5.38). In all the rooms, the floor is constructed of earth and wood. In the North-front room and immediately outside the North-facade, this floor has been covered with concrete.

The ceilings are mostly non-original and date from the 1980s, when they were replaced after a long period of failure. The height of the present ceiling is unaltered except in the North-rear room, where it has been lowered by approximately 50 cm. This lowering means the top of the paintings are covered. The ceilings are constructed in the simple roseau technique with a mixture of red laurel and palm tree covered with cane. This mixture of wood suggests the beams were reused at the time of the ceiling replacement during the 1980s. Remains of the original, more decorative tataoui ceilings can be found in the Northwest room and the southern end of West 1 (fig. 5.39). Based on overlapping plaster in the Northwest room, this ceiling was constructed prior to the plastering of the walls and indicates that all the rooms would have once been decorated in this more elaborate style.

The arches in the North-front and Northwest rooms are constructed in mud brick, with a supporting beam carrying the load of the ceiling. The supporting beam and construction of the arches can be seen in the collapsed arch in the Northwest room. The columns of the arches in the North-front and Northwest rooms are approximately 60 cm thick. This differs dramatically in West 1 room, where the now collapsed arches were once approximately 20 cm wide.

The painted rooms described above are one of a number of areas with painted decoration both in the Caïd Residence and elsewhere in Kasbah Taourirt. Within the Caïd Residence, the other remains of painted decoration are currently inaccessible due to collapse. The three towers to the south of the residence, Borj n'Bouyhia, Borj Lalla Ftoum, and Borj of the son of the Caïd were once highly decorated, inside and outside (Da Lmahjoub; oral history, chapter 3). Extensive collapse has destroyed much of this, but painted decoration still remains in Borj Lalla Ftoum and Borj of the son of the Caïd.

Elsewhere in Kasbah Taourirt, there are examples of other wall paintings, painted relief work, and painted wooden ceilings and doors. In the museum area are two elaborately painted rooms with decorated walls and wooden ceilings. These paintings are the most sophisticated and ornate of Kasbah Taourirt and show influences from Marrakech and Islamic art. There is also a sequence of rooms with simple geometric motifs and borders painted in red.

In the area now occupied by the CERKAS offices, there is a room with an elaborately decorated ceiling similar to those in the visited area. The remaining painted ceilings and other ex situ wooden fixtures such as doors and pillars are decorated with similar Amazigh motifs to the paintings.

**FIGURE 5.40**

The collapse of this arch reveals the method of construction: mud bricks supported by a wooden beam.

Photo: Samuel Whittaker, 2014.

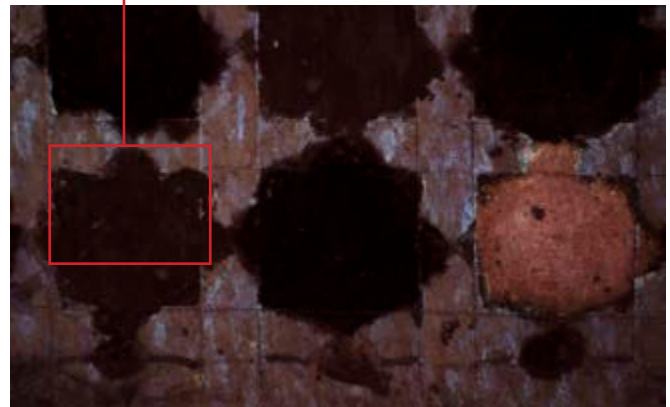
5.2.2 Technical Imaging of the Painted Surfaces

Technical imaging, including visible-reflected (VIS), visible-reflected raking (VIS-R), IR-reflected (IRR), UV-reflected (UVR), and UV-induced visible luminescence (UVL), was used on an area of paintings in the North-rear room (figs. 5.41–5.49). By recording how the materials responded to different forms of radiation, questions about the different periods of painting and paint stratigraphy could be answered.

**FIGURE 5.41**

The red box shows the location of Area 1 on the east wall of the North-rear room.

Photo: CIMS, 2013.

**FIGURES 5.42 AND 5.43**

Left: An area of painted surface targeted for UVL imaging. Right: In the UVL image, a red that luminesces a strong orange/yellow is seen in the lower right. A non-luminescent red is seen in the lower left (outlined in red) and upper center of the image. This appears to be the result of two periods of painting where the luminescent red was applied first and later painted over with the non-luminescent pigment.

Photos: Samuel Whittaker, 2014.

FIGURE 5.44

Two separate red pigments were used to paint the stars. VIS image.

Photo: Samuel Whittaker, 2014.

**FIGURE 5.45**

The luminescent red in this UVL image can be observed underneath the non-luminescent red on the star to the right. Both periods of painting appear to have been hastily and poorly executed.

Photo: Samuel Whittaker, 2014.

**FIGURE 5.46**

The layering of the two reds can be seen when imaged with IRR. The lower red is invisible to IR while the upper red is clearly visible.

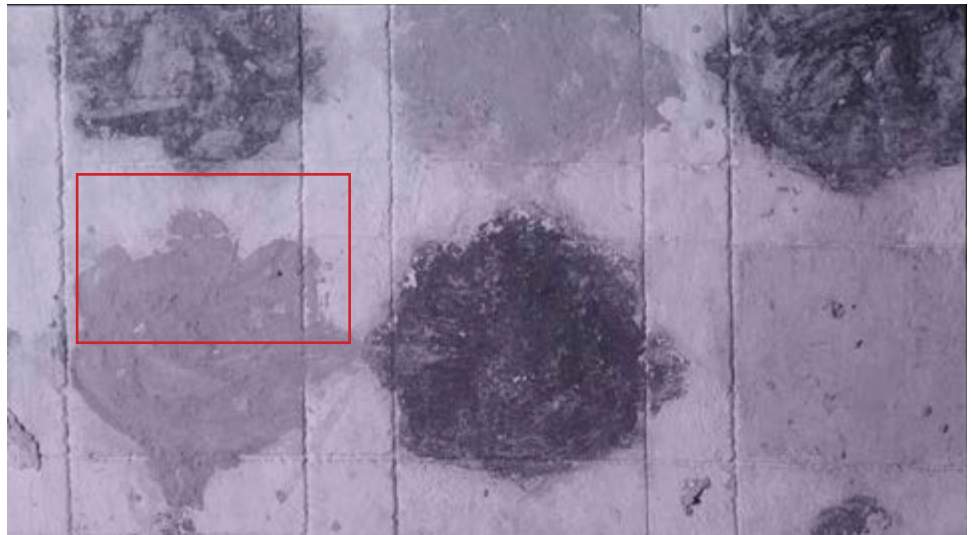
Photo: Samuel Whittaker, 2014.



**FIGURE 5.47**

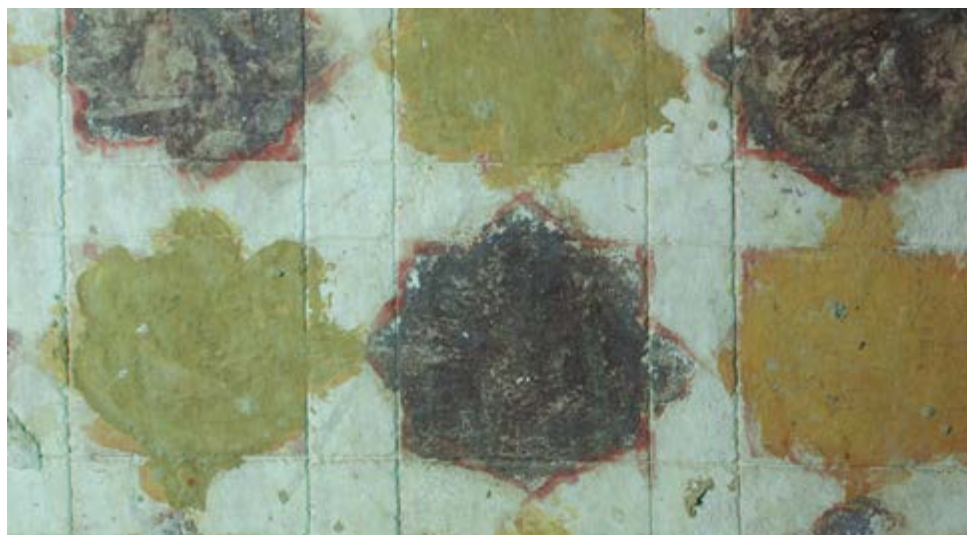
VIS image.

Photo: Samuel Whittaker, 2014.

**FIGURE 5.48**

The difference between the two reds can be seen when imaging the area with IR (X-nite 830 filter) radiation. The luminescent red is almost completely invisible to IR radiation while the non-luminescent red is clearly visible.

Photo: Samuel Whittaker, 2014.

**FIGURE 5.49**

The repeating pattern was first outlined using a blue/green paint for both the red and green shapes. This can be clearly distinguished in the IRR false-color image. This is due to it being invisible to IR radiation, making it appear red.

Photo: Samuel Whittaker, 2014.

5.3 Conditions Glossary

A glossary of conditions was developed to guide the condition survey. The glossary has been divided into categories of conditions, including structural problems, plaster layer, paint layer, surface deposits, previous interventions, and macrobiology.

Structural Conditions



Structural crack

Crack through both the support and plaster layers of the painting. Characterized by crack thickness in the order of centimeters. The crack may also cause cracks in the plaster and paint layers of the surface.

FIGURE 5.50

Structural crack in the North-front room.
Photo: Samuel Whittaker, 2014.



Crack

Crack through any or all of the plaster and paint layers. Characterized by crack thickness in the order of millimeters. Often occurring in relation to structural cracks, delamination, and loss of the plaster layer.

FIGURE 5.51

Crack in the plaster in the North-front room.
Photo: Samuel Whittaker, 2014.

Plaster Layers



Plaster detachment

Lack of adhesion between separate plaster layers or between plaster layer and primary support that creates a void. Often characterized by bulging or displacement of the plaster layer.

FIGURE 5.52

Detached area of painted plaster.
Photo: Samuel Whittaker, 2014.



Loss

Loss of the paint and partial loss of the plaster layers. The loss to the secondary support is either partial loss within one layer or loss of an entire plaster layer, revealing an earlier plaster layer beneath.

FIGURE 5.53

Loss of painted plaster in West 2 room.
Photo: Samuel Whittaker, 2014.



Deep loss

Loss of the entire painting stratigraphy (paint and plaster layers), leaving the mud bricks and rammed earth exposed.

FIGURE 5.54

Deep loss in the Northwest room.
Photo: Samuel Whittaker, 2014.



Loss: complete

Loss of the entire painting stratigraphy and supporting structure due to structural collapse.

FIGURE 5.55

Complete loss of part of arch in the Northwest room.
Photo: Samuel Whittaker, 2014.



Loss revealing lower painted decoration

Loss of an upper plaster layer revealing an earlier painted scheme.

FIGURE 5.56

Loss of upper painted plaster, revealing lower painting scheme.
Photo: Samuel Whittaker, 2014.



Loss: mechanical

Small or localized loss/damage to the paint and/or plaster layers due to intentional or unintentional contact. Often directional scratch marks or small circular areas of loss.

FIGURE 5.57

Scratch mark on the paintings in the North-rear room.
Photo: Samuel Whittaker, 2014.

Previous Interventions



White plaster

Areas of loss in the plaster that have been repaired with a white gypsum or lime plaster. These areas have sometimes been reintegrated with the decorative scheme.

FIGURE 5.58

White plaster repair in the North-front room.
Photo: Samuel Whittaker, 2014.



Damage due to structural alterations and additions

Change to the building structure such as replacement, repair of the ceilings, or alterations to doorways. This has often caused damage and/or loss to the wall paintings.

FIGURE 5.59

Recent doorway between the North-rear and North-front rooms.
Photo: Samuel Whittaker, 2014.



Earthen plaster

Areas of loss in the plaster that have been repaired using an earthen plaster.

FIGURE 5.60

Area of loss filled with an earthen plaster in West 2 room.
Photo: Samuel Whittaker, 2014.



Gray plaster

Areas of loss in the plaster that have been repaired using a coarse gray plaster. This plaster has also been smeared over the surface of the painted decoration in a rough, haphazard manner.

FIGURE 5.61

Gray repair plaster in the North-rear room.
Photo: Samuel Whittaker, 2014.

Surface Deposits



Dust

Widespread deposition of dust, often relating to the uneven topography of the wall painting, that obscures the wall paintings.

FIGURE 5.62

Protruding area of painting above the door in the North-front room, covered with a thick layer of dust.
Photo: Samuel Whittaker, 2014.



Dirt

Thick layer of earth-colored material covering the painting in localized areas. Often occurring in areas of exposed earthen plaster and walls or where collapse has exposed the paintings to the macro environment.

FIGURE 5.63

Paintings in the Northwest room covered with a thick layer of mud.
Photo: Samuel Whittaker, 2014.



Drips

Vertical drips of earthen material originating from the apex of the wall that obscure the wall paintings.

FIGURE 5.64

Earthen plaster drips on the painted plaster.
Photo: Samuel Whittaker, 2014.



Bat excreta (urine)

Gray directional splashes of bat urine that discolor the paint and plaster layers.

FIGURE 5.65

Bat excreta in the North-rear room.
Photo: Samuel Whittaker, 2014.



Bat excreta (guano)

Small round dark pellets of bat excreta adhered to the wall.

FIGURE 5.66

Bat excreta in the North-front room.
Photo: Samuel Whittaker, 2014.

Macrobiology



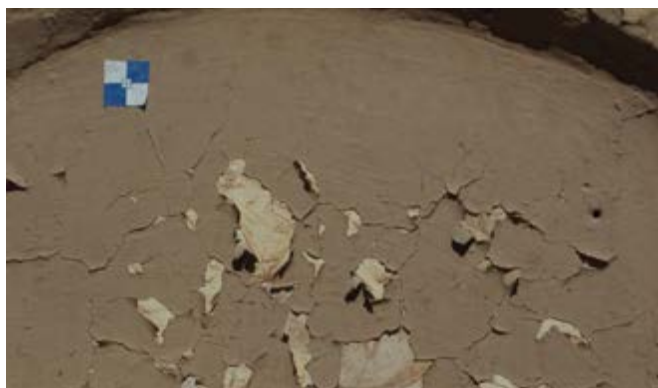
Damage due to bat infestation

Large numbers of bats use the rooms to nest, causing damage and loss to the wall paintings, particularly because so much of the plaster is delaminated and brittle.

FIGURE 5.67

Bats in the North-front room.
Photo: Samuel Whittaker, 2014.

Paint Layers



Flaking

Fracturing and lifting of the paint layers.

FIGURE 5.68

Flaking paint on the North terrace.
Photo: Lorinda Wong, 2013.

CHAPTER 6

Significance and Values

Defining the significance and values of the kasbah is a core exercise of the rehabilitation planning process. These definitions provide a framework for developing conservation policies and guide the development of a rehabilitation plan for the site that can be proposed to the local authorities. The approach is to propose treatments and interventions that are not based solely on considerations of physical decay or aesthetics; more importantly, it is to determine levels of permitted intervention for important elements of the site based on recognition of their cultural significance and value (Avrami et al., 2000). It is, therefore, crucial to determine the perception that local stakeholders have of the site.

In the field of heritage conservation, this inclusive approach has been adopted in order to bridge the gap that began to appear between cultural heritage sites, which are being managed and restored with little integration of their users, stakeholders, and local communities. The Burra Charter, as well as others, points out this gap and offers new definitions for terms such as *cultural significance* of a place as having aesthetic, historic, scientific, social, or spiritual value for past, present, and future generations.¹ Cultural significance, the Burra Charter confirms, is embodied in the place itself—its fabric, setting, uses, associations, meanings, records, related places, and related objects—but recognized and valued by different individuals or groups of individuals who have direct or even indirect relations with that place. Conservation practices and heritage legislations should, therefore, as their primary objective, respect and preserve such cultural significance.

In October 2013, the GCI organized training sessions to introduce the process of investigating and defining the cultural significance and values of Kasbah Taourirt, and to propose a framework to assess the site's significance. In response, CERKAS organized a workshop in which representatives from the Municipality of Ouarzazate participated and shared with the project team their perspectives on the various elements and values that make the kasbah significant (fig. 6.1).

During this workshop, it was important to conduct the discussions primarily in Arabic, with some French translation, so that the participants would relate concepts of cultural significance to common cultural notions (fig. 6.2).

FIGURES 6.1 AND 6.2

Right: Workshop at CERKAS headquarters with representatives of the Municipality of Ouarzazate. Far right: Materials presented in Arabic by Alaa El-Habashi, GCI consultant in charge of the workshop.

Photos: Claudia Cancino, 2013.





FIGURES 6.3 AND 6.4

Top: CERKAS staff and GCI team members and consultants engaging in on-site discussions.

Photo: Emilio Roldán, 2014.

Bottom: Example of new concrete construction that has been systematically replacing cultural heritage sites.

Photo: Claudia Cancino, 2013.

The first step was to define the Arabic and Amazigh equivalents of basic heritage conservation terminology. For *significance*, as an example, the Arabic equivalent *maghza* was used and explained, differentiating it from the usual term *qima*, which literally means “value.”² *Maghza* is an Arabic term that introduces the whole concept of how an object can be meaningful to an individual or group of individuals. For an Arabic speaker, the term hints at the sense of utility that can be inferred from an object, not just value in the monetary sense. A synonym for *maghza* in Arabic is the term *dalala*, or *madlul*, both derived from the same root but relating to attributes of a certain phenomenon. In such an intellectual context, the Burra Charter’s definition of significance was introduced to the participants of the workshop, setting up the basis for writing the Statement of Significance for Kasbah Taourirt. The idea was for the participants to identify all the *maghzas*, or values, they perceive in the site, and to indicate for each set of values a series of *dalalat*, or attributes.

6.1 Significance Assessment Methodology

Writing a Statement of Significance was one of the main goals of this phase of the project. The groundwork for this statement was laid through extensive historical research, comparative analysis, and documentation, described in chapters 3 and 4 (fig. 6.3), while the actual drafting of the statement was done by CERKAS staff. The methodological approach on how to relate the identification of the site’s values and significance to conservation plans was intended not only to benefit CERKAS in conserving and rehabilitating the kasbah but also to set up a pragmatic model for the organization to approach earthen heritage sites in the pre-Saharan area, where cultural heritage sites are quickly deteriorating and traditional building practices and materials are being lost and systematically replaced by reinforced-concrete construction (fig. 6.4).

In order to draft the significance assessment, various models from other heritage organizations were consulted. For the process of site assessment, English Heritage, for example, mandates the identification of individuals and/or the group of individuals who value the place and why they do so, and to relate such value to the fabric of the place (Drury and McPherson, 2008). The Canadian Register of Historic Places requires a Statement of Significance that explains why the place is important to the community, province, and nation (Parks Canada, 2006).



FIGURE 6.5

Bill of 50 Moroccan dirhams, showing an image of the north facade of Kasbah Taourirt. This was pointed out by workshop participants to highlight the national importance of the site.

For Kasbah Taourirt, a methodology was established that is primarily based on the definition of cultural significance established by the Burra Charter, and is shaped by the frameworks followed in various recognized systems. The adopted methodology included eight steps, as follows:

1. Recognize the site at various levels: locally, provincially, and nationally, and through research to attempt to locate all details, documents, and publications concerning the formal recognition of the place (fig. 6.5). Most of the available briefs, photographs, and summaries of significance and research reports have been gathered and analyzed by CERKAS and the GCI team. The results are presented in chapters 3 and 4.
2. Conduct additional research and site visits to draw a fair understanding of the context and the cultural landscape of the Moroccan pre-Saharan area. This helped to draw fair comparative analysis and determine the value of Kasbah Taourirt within the context of the region (fig. 6.6).
3. Write a brief description of the history of the site as it exists today to answer many important questions such as: What is the site? What is the context? What are the sectors in the site? What are the historic boundaries? How did the site develop?



FIGURE 6.6

Ait Ben Haddou, World Heritage Site, located north of Kasbah Taourirt and one of the sites visited by GCI staff and consultants with CERKAS staff to understand the context of Taourirt. There are around 400 kasbahs and 3,000 ksours in the region.

Photo: Claudia Cancino, 2012.

4. Determine the domains (or fields) of heritage values of the site, and discuss and formulate each. Why is the site currently important? What are the elements that matter to the participants, and why?
5. Identify the principal features and attributes of the site that contribute to its heritage value, and relate such features with the fields of values. This complex process of relating features to values was demonstrated through selected examples of similar World Heritage Sites and was then applied to the kasbah.
6. Formulate a draft of the Statement of Significance based on all acquired knowledge, discussion, and exchange of viewpoints. The draft of the Statement of Significance was then associated with an identification of the

**FIGURE 6.7**

Aerial view of the mosque of Al-Ashrafiya, Yemen.

Photo: Alaa El-Habashi, 2010.

**FIGURE 6.8**

Water dispensaries in Cairo, Egypt.

Photo: Alaa El-Habashi, 2010.

**FIGURE 6.9**

Aerial view of Al Jahili Fort, Al Ain, United Arab Emirates.

Photo: Benjamin Marcus, 2011.

**FIGURE 6.10**

Interior view of the James R. Browning U.S. Court of Appeals.

Photo: Benjamin Marcus, 2009.

principal features that represent identified values. For the site to maintain its values, these features, or attributes, need to be preserved.

7. The results of the above are reviewed and refined by all involved and by concerned stakeholders.
8. Finalize a Statement of Significance endorsed by all involved and by concerned stakeholders to be formally recognized by the local authority responsible for the management of the site.

6.2 Statement of Significance: Objectives

In a roundtable discussion that included the five participants from CERKAS, two participants from the Municipality of Ouarzazate, and the GCI team, the concept of the Statement of Significance and its objectives was introduced. The mix of participants, even though representing only two local institutions, certainly enriched the discussion and provided different and often contradictory viewpoints in determining significance and values, adding important cultural considerations to perspectives that often focus on historic, antiquarian, or archaeological significance.

To explain the main objectives of the exercise to the participants from CERKAS and from the Municipality of Ouarzazate, several conservation and rehabilitation projects were presented explaining how permitted levels of interventions are determined, based on recognizing values and significances in addition to conditions and future prospective functions. Most of the selected examples were from the region in order to assure participants that such practice is not a foreign concept but rather simply a core methodological process currently followed worldwide in conserving heritage sites. The selected projects included the reuse of Madrasa Al-Ashrafiya in Ta'iz, Yemen (fig. 6.7); the study of the valorization of water dispensaries (*sabil*), Old Cairo, Egypt (fig. 6.8); identification of values at Al Jahili Fort, United Arab Emirates (fig. 6.9); and the reuse of the James R. Browning U.S. Court of Appeals, a historic government building in San Francisco, California (fig. 6.10).

The first project was initiated by UNESCO in Yemen and funded by the local Social Fund for Development. It is the conservation of an iconic fourteenth-century monument, the main mosque of the Rasulid, who ruled Yemen and large parts of southern Arabia from 1229 to 1454. The mosque of Al-Ashrafiya is the most important structure surviving from that dynasty and contains intact mural paintings and tombs of the dynasty's rulers. While dealing with one of the most important decorative elements in the region, the project, in 2010, gathered the visions and opinions of all involved stakeholders, including members of the local community, to determine the significance of the various components of the historic mosque and to use such recognition in shaping and activating a reuse program in each space in the monument.

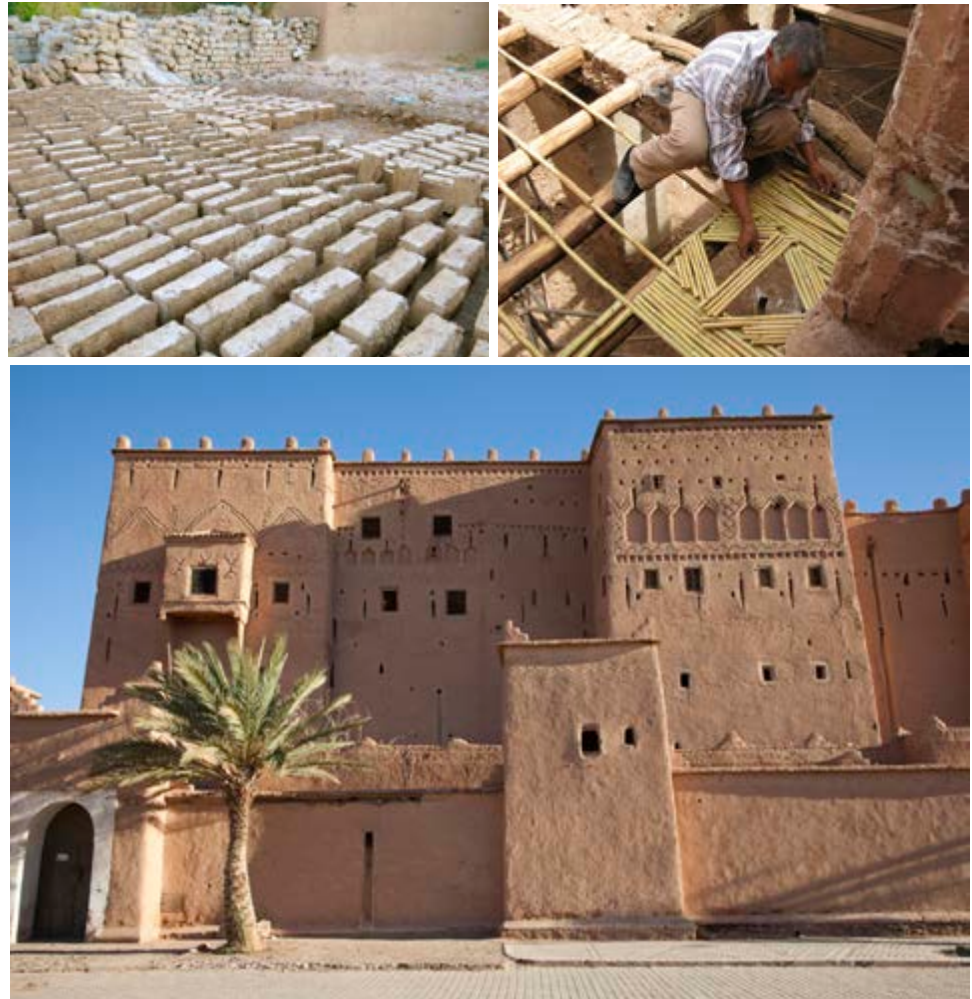
The case of the historic water dispensaries of Cairo is an academic research project to develop a management system for the large number of historic fountains in the city based essentially on a proposed system of valorization. Even though their facades are exquisite and their forms and locations in the urban fabric particularly distinguished, the structures are usually small, though they are connected to large underground water cisterns. The introduction of water pipelines at the turn of the twentieth century made the preservation of all the sabils in the city an impractical decision, seeking their registration as "monuments" to be protected by local antiquities laws. The question addressed is whether a building

can be preserved as a “monument” after depriving it of its function, its interaction with the city fabric, and its role in serving the community. A system of evaluation of the surviving sabils of Cairo through a set of criteria was presented and linked to a set of permitted conservation interventions.

The third example was the identification and mapping of values at Al Jahili Fort, United Arab Emirates. During this project, a historic military fort was converted into a museum and cultural space. Historical, scientific, aesthetic, and cultural values were mapped to prioritize the use of important spaces and identify those that are less significant and that could be used for services such as restrooms. This project also provided an example of how to evaluate the condition of elements within one site in order to prioritize interventions.

The fourth project is from the preservation plan of the James R. Browning U.S. Court of Appeals. It demonstrated that the selection of prospective uses assigned for each space in a historic building should be based on recognizing the significance of each space, and to determine the effect of existing and proposed uses on the preservation of significant elements and character-defining features.

Following these examples, the heritage values of Kasbah Taourirt were discussed and written by CERKAS participants. These values defined why the site and which of its elements are currently important and why these matter to the participants. Those identified values were then related to principal features that exist on site.



FIGURES 6.11, 6.12, AND 6.13

Traditional construction techniques have to be taken into account, as they have a role in every value domain: architectural, cultural, social, and economic. These techniques include the production of mud bricks (upper right) and tataoui (upper far right). The aesthetic values of the architecture that these techniques produced is also a value of the site (lower right).

Photos: Claudia Cancino, 2011 (upper right); Benjamin Marcus, 2013 (upper far right); Scott Warren, 2014 (lower right).

FIGURES 6.14, 6.15, 6.16, AND 6.17

Photos showing different aesthetic and architectural values of the site. Interior courtyards (top right); Amazigh wall paintings in the Caïd Residence (middle left); Marrakech-style decoration in the visited area (middle right); and low reliefs at the Stara East (bottom). Photos: Scott Warren, 2014.





FIGURES 6.18, 6.19, AND 6.20

Examples of different values studied during the cultural significance process: Amazigh decorations of the site (top), the ahouach today (middle), and artisan crafts (bottom).

Photos: Emilio Roldán, 2014 (top); Elena Macchioni, 2014 (middle); Susan Macdonald, 2011 (bottom).

6.3 Value Domains/Fields

To lessen the degree of subjectivity involved in determining heritage values, the concept itself was broken down and defined as various domains (or fields) with the agreement of the participants of the workshop. This was simply an attempt to create common starting points to stimulate participants to start perceiving the site through a series of different views. Those domains were also subject to debate among participants, since they implicitly minimize some kinds of value, prioritize others, or conflict with the cultivation of certain values at the expense of others. For examples of the domains that were discussed, see figures 6.11–6.21.

These domains are also used to identify and characterize heritage values in order to guide policies and conservation decisions. The domains of heritage values “would be an effective guide to characterization and would move conservation stakeholders closer to having a *lingua franca* in which all parties’ values can be expressed and discussed. By use of such a typology—a framework that breaks down significance into constituent kinds of heritage value—the views of experts, citizens, communities, governments, and other stakeholders can be voiced and compared more effectively” (Mason and Avrami, 2002, pp. 9).

One consideration while attempting to infer the value domains for Kasbah Taourirt is that the domains, especially those related to sociocultural aspects, usually overlap. Values such as spiritual/religious could also be defined as a historical, artistic, or social value. While these domains are closely related, it is still important to understand these as different values because they correspond to different ways of conceptualizing the value of the heritage to different stakeholder groups and therefore to different bases for making conservation decisions.

The participants identified several domains/fields that best express the values of the site: historical, anthropological, urban, architectural, artistic, and others. They ranked these values by placing them in various contexts—the local area, the Sahara, the Moroccan landscape, and the Arab world—and globally through basic comparative analyses. They also listed the possible attributes for each, whether tangible or intangible, that are exemplified by the kasbah. The value domains and attributes of each are as follows:

FIGURE 6.21

The inhabitants of the kasbah throughout its history and evolution are considered a value associated with the site that needs to be considered during the design of a management plan. This group was photographed at the beginning of the 20th century.

Photo: CERKAS collection.



Architectural and Aesthetic Value

- Largest kasbah in Morocco built in earth
- Example of a politically and militarily significant kasbah
- Variety of decorative motifs still in context and complete
- Prime example of traditional Amazigh motifs applied to rammed earth
- Includes public spaces, streets, and buildings that serve as a miniature ksar in terms of their spatial arrangement
- Diversity of architectural forms
- Exceptional combination of earthen construction methods (rammed earth and adobe)
- Balance of form and decoration
- Integrity of shapes and colors
- Proportion and balance

Historical Value

- Place of key historical and political events in the history of Morocco (seventeenth to twentieth century)
- Expression of regional domination and status (court, jail, justice, military)
- Strategic location (two valleys, two wadis, main road, caravan routes)

Social and Anthropological Value

- Corporate identity in the region of Ouarzazate, national heritage
- Monetary symbol of national value
- Cultural events
- Live interaction between the ksar and kasbah (CERKAS, Médiathèque, museum)
- Traditional dances (ahouach)
- Marabout a place of continued veneration of Saint Sidi Bouzaid
- Stara occupied between 1955 and 2010

Economic Value

- Tourist activities and revenue
- Artisanal and cultural activities
- Cinematographic activity
- Interaction with palmary

In the identification of domains of value, we have attempted to follow a quantitative approach to provide a tool to prioritize decisions concerning conservation and to understand the economic impact and feasibility of such decisions. This approach was resisted by the participants, however, as it created unnecessary tension in prioritizing one domain over the other. Consequently, the assessment was kept qualitative, confirming that cultural values can be more effectively elicited if based on narratives and analyses. However, it will be important in furthering the assessment of the site to conduct a more quantitative assessment in order to derive an accurate link between conservation decisions to technical and economic feasibility studies for the future of the site.

It was crucial in the case of Kasbah Taourirt to consider “economic value” as one of the essential value domains. As a National Monument, Kasbah Taourirt is currently owned and managed by the Municipality of Ouarzazate. CERKAS is involved as a user of selected spaces in the complex and as a governmental institution responsible for preserving and managing the heritage aspects of the historic site. Such an arrangement of ownership and management has actually resulted in protecting the site and accentuated the need for evaluating the impact of any proposed development projects on heritage values. The owner’s focus on aesthetic and financial aspects is balanced with the concerns of the heritage authority with cultural, historical, and educational benefits. It was, therefore, important to embrace economic value in addition to other value fields, including architectural, aesthetic, historical, social, and anthropological. Those who see in the kasbah only the potential for increased tourism and thus see the kasbah as a catalyst for enhancing the local economy should recognize that those potentials are not sustainable if cultural and historical values are not respected.

6.4 Drafting a Statement

Participants in the workshop were involved in reading various Statements of Significance of World Heritage Sites that share similarities with Kasbah Taourirt, such as the Ma’zab Valley in Algeria, Ghadames in Libya, Aït Ben Haddou in Morocco, and the Old Town of Djenné, Mali. The purpose of this was to provide a better understanding of typical attributes of value and how the Statement of Significance can be drafted by identifying these attributes. The Statements of Significance of those sites were shown in French to the participants, who were able by the second or the third example to infer the attributes themselves.

Once trained, participants engaged in writing a paragraph for each value of the kasbah, identifying all of its attributes (fig. 6.22). The paragraphs were edited live on screen in the classroom to ensure that all opinions were integrated and taken into consideration. The Statement of Significance was then compiled using the endorsed paragraphs (fig. 6.23), and the entire statement was edited once more to make sure it was legible and that it properly reflects the ideas, values, and attributes of the site.

FIGURES 6.22 AND 6.23

Right: Director of CERKAS writing the first draft of the Statement of Significance. Far right: GCI consultant compiling sections of the statement prepared by CERKAS staff.

Photos: Claudia Cancino, 2013.



6.5 Statement of Significance

The following is the completed Statement of Significance for Kasbah Taourirt in English, written and endorsed by the participants of the workshop:

With its imposing mass, diversity of forms, and decorative motifs, Kasbah (tighermt in Amazigh) Taourirt is considered the largest and most important earthen building in Morocco. Formerly housing a Caïdal family, the kasbah is detached from the Iggherm (Ksar) which houses families of different ethnicities, and is surrounded by massive protective walls and towers. As for its various spaces, whether public or private, the tighermt represents a spatial miniature of the ksar, whose forms are monumental but balanced. It is rich in harmonious decorative motifs reflecting a sublime artistic spirit, expressed through abstract, geometric and symbolic motifs typical of Amazigh culture. All of the architectural structure of the Kasbah is integrated within the surrounding environmental and urban space. Local building materials were used in its construction such as earth, wood, reed, various natural colors, etc. Combining two techniques of construction—rammed earth and adobe—the builders created and developed spaces according to their own local and regional culture and socio-economic vision. The Kasbah is composed of several areas symmetrically assembled around patios that provide lighting and ventilation. Thus, Kasbah Taourirt is a testament to the earthen architecture of southern Morocco.

Built in the 17th century according to oral tradition, Kasbah Taourirt was an historical and cultural center of power in pre-Saharan and Saharan Morocco. It was a place of command by a Caïdal power, represented by the family of Glaouia, which dominated political and military life from 1882 until the Independence of Morocco in 1956. Built on a hill, "taourite" in Berber, the Kasbah controlled and dominated the Draa, Mgoun and Togha valleys. In 1972, the Kasbah was purchased by the Ouarzazate Municipality, and in 1989 the Center for conservation and restoration of architectural heritage of the Atlas and Subatlas region (CERKAS) was established in the southeastern part of the Kasbah.

The inclusion of the Kasbah on the Moroccan National Heritage List in 1954 is just one cultural recognition of a region that has long played an important role in trade and cultural exchanges between the Bilad Sudan (Sahel) and the Mediterranean basin. Another recognition of the site's cultural importance is the use of the image of the Kasbah on the Moroccan 50 dirham note. Local people also continue to worship a saint, Sidi Bouzid, who is buried in the middle of the so-called Stara part of the kasbah. Each year before Mouloud (celebrating the birth anniversary of the Prophet), they immolate a calf at the threshold of his marabout. Places inside and outside the Tighermt still echo with large drums (ganga) announcing the commencement of the Ahouach, which are festivities of dance and song practiced by both men and women, who still continue the musical traditions nationally and internationally. Long regarded as a place of power and domestic residence, the Kasbah is now used as the offices of the administrative head of CERKAS, as well as a place of

culture and education through its Médiathèque and cultural activity spaces (exhibition halls, meeting rooms, auditorium, etc.).

The Kasbah today offers potential economic benefits for the province of Ouarzazate, through the use of its occupied areas as well as those which are abandoned. In terms of tourism, it is considered, with the site of Aït Ben Haddou, as one of the most popular destinations, with significant tourist visitation (150,000 to 200,000 tourists per year). Film shoots in the interior of the Kasbah have perpetuated the image of the tighermt throughout the world with renowned international films like "Jewel of the Nile," "Rules of Engagement," "Prince of Persia," etc. Exhibitions of indigenous arts and crafts are a testimony to the unity between local architecture and craftsmanship. In addition to its tourist role, the Kasbah still maintains its relationship with the surrounding palm grove, although farming has become quite rare.

6.6 Identification of Attributes: Significance Maps

The correspondence between values and the physical and intangible attributes of heritage needs to be emphasized. Without establishing the connections between physical or intangible aspects of heritage and specific values, it will be difficult to predict or monitor how values are affected by conservation interventions or management decisions (Mason and Avrami, 2002). Therefore, it was necessary to tie specific values to the physical fabric of the site by mapping significant spaces and character-defining features. GCI staff and consultants worked on a preliminary exercise of significance mapping that would later be implemented by CERKAS staff (fig. 6.24). The maps produced are an important reference both for informing conservation decisions and for evaluating the results.



FIGURE 6.24

GCI staff working to create the mapping exercise on site to be implemented by CERKAS personnel.
Photo: Claudia Cancino, 2013.

It was necessary to explain to the participants the set of attributes that can be associated with the identified values. Those elements can be either tangible features (materials, forms, location, and spatial configurations) or intangible features (uses and cultural associations or meanings). The categories of attributes developed by the Canadian Register were introduced and explained (Parks Canada, 2006).

These elements include the following categories:

- Style, scale, massing, and composition
- Interior layout or exterior spatial configuration
- Functional features
- Materials and craftsmanship
- Relationship between the historic place and its broader setting
- Ways in which people use the historic place
- Customs and traditions that were or continue to be associated with a historic place



FIGURES 6.25 AND 6.26

CERKAS and GCI staff working with consultants during the cultural significance mapping process.

Photos: Benjamin Marcus, 2013.

The participants, including representatives of the Municipality of Ouarzazate, were then asked to identify the attributes of the site values in the complex of the Stara East (figs. 6.25 and 6.26). They were asked to indicate through different colors the type of values that an element would represent (architectural and aesthetic, historical, social and anthropological, and economic). Participants were able to locate those elements that represent more than one value, including some of the modern wall paintings probably made by children who lived in the area in the last decade, as being representative of social and anthropological values, in addition to the walls of the Caïd Residence, where carved and painted decorations represent architectural and aesthetic value. A similar case was the Marabout, located in the Stara, which combines social value with historical and architectural values.

The output of this exercise was integrated into CAD drawings (fig. 6.27). The participants were then asked to apply the same procedure to the entire site of the kasbah. Similar to the first set of significance maps, these new ones were integrated into the CAD drawings.

It is a great asset to have the stakeholders, including CERKAS staff and the municipality, define the values of the site, write a declaration of its significance, and physically identify on a series of maps the correlated attributes. This output is crucial in drafting a rehabilitation proposal (see chapter 7).

FIGURE 6.27

Significance map of the Stara. The different values of each architectural element are represented.

Drawing: Elena Macchioni, 2014.



After agreeing on a Statement of Significance, and after matching the identified values to physical and intangible attributes, the project will analyze threats and opportunities and begin to formulate policies and guidelines for the implementation phase of work. Prior to the next phase, the entire process of producing the Statement of Significance and identifying and mapping the values was presented to several stakeholders. The director of CERKAS presented and discussed the findings of this phase of the project with representatives of the following organizations (fig. 6.28):

- Community (ksar)
- Different associations connected to the kasbah (artisans, guides, etc.)
- District of Ouarzazate
- Ministry of Culture
- Ministry of Tourism
- *Agence Urbaine* (planning office for the city)
- Ministry of Crafts
- Municipality of Ouarzazate
- Province
- Association of Film Extras

FIGURE 6.28

Presentation of the Statement of Significance and values mapping to stakeholders in Ouarzazate.

Photo: Elena Macchioni, 2014.



Notes

- 1 See the definition of *cultural significance* 1.2 in Definitions in ICOMOS (1999). The Australia ICOMOS Charter for Places of Cultural Significance, the Burra Charter Article, p. 2.
- 2 The term *value* is often used in one of two senses: first, as morals, principles, or other ideas that serve as guides to action (individual and collective); and second, in reference to the qualities and characteristics seen in things. The use of the term here is concerned directly with the second definition. As in English, the Arabic term *qima* holds the same duality of meaning. *Maghza*, on the other hand, while also concerned with the second definition, places more emphasis on how meaningful those qualities and characteristics are to the whole.

CHAPTER 7

Conservation and Rehabilitation Policies

The development of a CRP for Kasbah Taourirt involves not only determining potential future uses but also defining policies for intervention that are based on the values of the site and can be adhered to and applied broadly during conservation and future maintenance and management. To shape a plan for Kasbah Taourirt, the project team held a workshop to analyze SWOT (strengths, weaknesses, opportunities, threats) of the site, to define an ideal overall vision for the site's use, and to define specific conservation principles and guidelines (figs. 7.1 and 7.2). For implementation of the rehabilitation plan on a more practical level, participants of the workshop proposed guidelines for both the design phase and operation phase of the project, as well as a list of permitted uses for the site and its structures.

FIGURES 7.1 AND 7.2

Workshop with CERKAS and GCI staff to develop SWOT analysis and conservation policies in April and October 2014.

Photos: Elena Macchioni, 2014 (right); Claudia Cancino, 2014 (far right).



7.1 Kasbah Taourirt: SWOT Analysis

The purpose of the SWOT analysis is to establish a set of recommendations for conservation and rehabilitation of the site based on its points of strengths and the opportunities it holds to overcome its weaknesses, and to address threats to which it may be subjected. The following are the parameters identified during the workshop for each of the four categories:

Strengths

- Kasbah Taourirt is the largest kasbah in pre-Saharan Morocco (fig. 7.4).
- It is in a prime touristic region and considered an important destination.
- It is situated in a strategic location at the confluence of three major valleys and close to the area's only airport.
- Its history and significance are nationally recognized.
- It contains a variety of architectural forms.
- All of its components are built with traditional construction materials and techniques.

- It houses CERKAS, an institution responsible for the safeguarding of heritage (fig. 7.3).



FIGURES 7.3 AND 7.4

Above: CERKAS headquarters, a strength of the site.

Right: Southern view of the site, illustrating the kasbah as the largest in southern Morocco, another strength of the site.

Photos: Scott Warren, 2014.



Weaknesses

- Much of the kasbah is abandoned or unused.
- Many areas have not been maintained, and maintenance is not adequate in restored areas (fig. 7.5).
- Built originally as the residence of the Caïd, one of the most important figures in the southern region, the kasbah occupies a vast surface of land, which makes maintenance, conservation, and possible rehabilitation a complex undertaking.
- The kasbah is a complex administrative structure.
- There has been continuous degradation of its architectural and structural elements.



FIGURE 7.5

East view of the Caïd Residence, abandoned and difficult to maintain, a weakness of the site.

Photo: Emilio Roldán Zamarrón, 2014.

Opportunities

- Existing visited area
- Current rehabilitation project
- Touristic potential of the rest of the site
- Ongoing cultural events (ahouach, weddings, music, theater, etc.) (fig. 7.6)
- Potential arts and crafts development
- Large space that can accommodate several concurrent uses
- Potential for research and study

FIGURE 7.6

View of the visited area entrance, used for ongoing cultural events. Photo: Claudia Cancino, 2011.



FIGURES 7.7 AND 7.8

View of the visited area with tourists (above); daily arrival of tourists in buses to the kasbah (right). Tourism was identified as both an opportunity and a threat by workshop participants.

Photos: Claudia Cancino, 2012.

Threats

- Unstable climate, violent and damaging periodic storms
- Lack of maintenance
- Structural problems due to incompatible additions
- Lack of proper water evacuation.
- Lack of local comprehension of construction materials
- Uncontrolled mass tourism (figs. 7.7 and 7.8)

7.2 Vision for the Site

A group exercise was conducted with CERKAS and the GCI to develop a vision for future use of the site. This exercise produced a one-sentence statement that defines the overall mission and aim of any proposed uses for the site.

English:

“Kasbah Taourirt is a center of culture, economic development, and research for the culture of earthen construction in the south eastern region.”

French:

“Kasbah Taourirt est une Centre Culturel et Economique et Recherche de la Construction en terre de la region Sud Est.”

7.3 Principles for Rehabilitation of Kasbah Taourirt

The following is a set of principles that the CRP for Kasbah Taourirt should follow in order to abide by the Statement of Significance and achieve the project vision. These principles are considered guiding rules for future conservation and management activities.

Principles for Rehabilitation

1. Respect the Statement of Significance proposed for the site and its values and attributes.
2. Respect the criteria for classification as National Heritage in 1954.
3. Preserve the original form/elements of the listed building (building type, traditional architectural morphology, original openings, internal spatial arrangements, and decorative motifs), and put them in evidence whenever possible.
4. Ensure proper interpretation of the significance of the site.



FIGURE 7.9

West view of the kasbah, showing original forms/elements that should be respected as defined in principle no. 3.

Photo: Tim Michiels, 2013.

5. Opt for minimal intervention.
6. Preserve the structural integrity of significant architectural fabric.
7. Opt for the use of traditional materials and techniques in construction.
8. Develop a management structure with administrative and financial autonomy.
9. Respect systems and frameworks of periodic maintenance.
10. Devise activities that would conform to, and not conflict with, those in the surrounding urban fabric.
11. Integrate the local community in activities and events held within the Kasbah.
12. Involve all stakeholders in the management of the site.
13. Preserve and promote the traditions and customs associated with the Kasbah and Ksar.
14. Preserve significant relationships with the natural and urban environment.
15. Respect historical access points and internal circulation, and only introduce new access or openings that are justified by safety or circulation concerns.
16. Prioritize the reuse of existing spaces before considering additions.
17. Provide security to users and to buildings, and minimize possible risks.
18. Document all changes, modifications, and additions.
19. Maintain unity of ownership of the entire Kasbah.
20. Develop a management plan for each area considering its value.
21. Modern services and facilities introduced during the project should have minimal impact on the historic fabric.

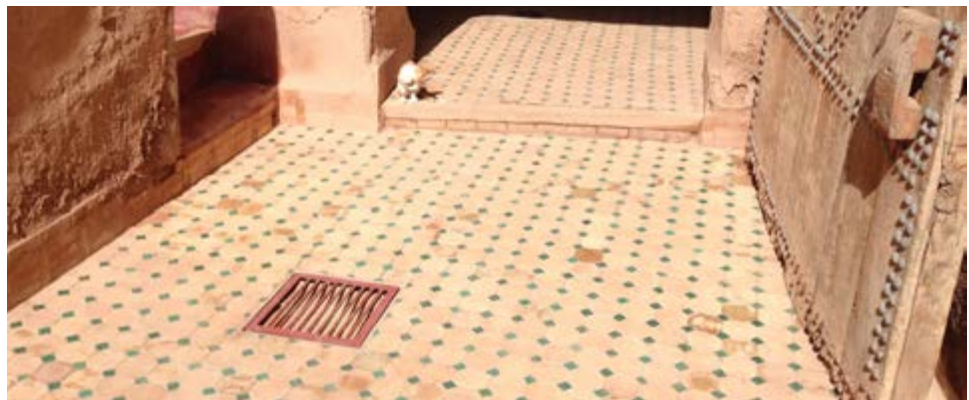


FIGURE 7.10

Drainage installed on site in accordance with principle no. 21.
Photo: Benjamin Marcus, 2014.

Following the development of the set of principles, a workshop was held with the project team to develop specific practical guidelines to ensure implementation of the principles. These guidelines fall into two categories:

- Guidelines for the project's design phase
- Guidelines for future operation of the site

The proposed design-phase guidelines are procedures and requirements that should be followed during development and implementation of the rehabilitation plan of the site. The operation-phase guidelines are a set of procedures and actions that should be integrated into management and agreements with tenants, and that creates an overall framework for future site management and maintenance. The operation phase guidelines also establish the responsibilities and rights of involved stakeholders.

The design and operational guidelines are outlined in section 7.4. Assessment columns can be added after each set of guidelines to describe how the guidelines have been encountered in the design phase (with description, sketches, or drawings) and in the operation phase (with rates, facts, data gathering, etc.).



FIGURES 7.11 AND 7.12

Top: CERKAS staff recording the site in accordance with guideline 3.A, documentation of existing elements.

Photo: Claudia Cancino, 2012.

Bottom: Repairs made to the walls as defined by guideline 7.C, respect the traditional dimensions of walls and other architectural elements.

Photo: Mario Santana, 2015.

7.4 Design and Operational Guidelines

Rehabilitation Principles	Guidelines (Design Phase)	Guidelines (Operation Phase)
1. Respect the Statement of Significance proposed for the site and its identification of values and attributes.	<p>1.A. Organize a stakeholder workshop to refine and update the Statement of Significance proposed for the site prior to design.</p> <p>1.B. Endorse the declaration of significance by all stakeholders to be an abiding official document for the registration of the national monument.</p>	<p>1.a. Revise the statement of significance periodically (every 5 years) to evaluate the state of the values and their attributes.</p> <p>1.b. Conduct a systematic periodic assessment of the state of conservation of the attributes.</p>
2. Respect the National Heritage classification of 1954.	<p>2.A. Integrate the endorsed version of the Statement of Significance as an abiding document in the national classification of the site.</p> <p>2.B. Propose a plan of action whose strategic objective is to achieve the vision for the site, with benchmarks, indicators of development, and time frames.</p>	<p>2.a. Evaluate and update the state of the rehabilitation plan through the set benchmarks, indicators, and time frames.</p>
3. Preserve the original form and decorative elements, and put them in evidence whenever possible.	<p>3.A. Documentation of the existing elements.</p> <p>3.B. Preserve and represent in a new context.</p> <p>3.C. Specify for the consolidation and the stabilization of such elements.</p> <p>3.D. Specify a maintenance plan for such elements.</p> <p>3.E. Specify proper interpretive panels, or other interpretive means for such elements.</p> <p>3.F. Take precautions and all protective means not to damage those elements during the implementation of the conservation works.</p> <p>3.G. Respect the original locations of decorative motifs.</p> <p>3.H. Prevent the addition of contradicting elements, or ones which didn't exist originally.</p>	<p>3.a. Do not change the spatial context of these elements.</p> <p>3.b. Respect the maintenance plan devised for the property.</p> <p>3.c. Do not disturb viewing those elements with movable additions.</p>
4. Ensure proper interpretation of the significance of the site.	<p>4.A. Ensure that all attributes indicated in the Statement of Significance are explained to the public through proper and adequate means of site interpretation.</p>	<p>4.a. Maintain all site interpretation means through a set maintenance budget.</p>

Rehabilitation Principles	Guidelines (Design Phase)	Guidelines (Operation Phase)
5. Opt for minimum intervention, and minimize impact on significant fabric.	<p>5.A. Refer to survey of authentic and significant fabric, and use as reference to decide on interventions.</p> <p>5.B. Assure that consolidation and repairs of authentic and significant fabric are reversible and done at a minimum level, leaving always reference for existing conditions.</p> <p>5.C. Keep all additions and modifications to the minimum possible with least impact on fabric and special configurations.</p>	5.a. Respect the plan for maintenance and upkeep (see 20.A).
6. Preserve the structural integrity of original/significant fabric.	<p>6.A. Restore the structural system and integrity of existing fabric.</p> <p>6.B. Keep structural additions to a minimum, and ensure that they do not alter original load distribution systems.</p> <p>6.C. All new permitted additions shall be set apart structurally, and flexible joints shall be encountered to ensure separation from the original structural system.</p>	7.a. Respect the plan for maintenance and upkeep (see 20.A).
7. Opt for the use of local construction systems and traditional materials.	<p>7.A. Specify earth from local sources (quarries).</p> <p>7.B. Ban the use of cement.</p> <p>7.C. Respect the traditional dimensions of walls and other architectural elements.</p> <p>7.D. Specify rammed earth whenever possible.</p> <p>7.E. Do not specify the use of any destructive machineries or instruments.</p>	7.a. Respect the plan for maintenance and upkeep (see 20.A).
8. Develop a management structure with administrative and financial autonomy.	<p>8.A. Design new additions to be distinguishable but not to detract from the uniformity of the ensemble.</p> <p>8.B. In restoration of missing parts, materials to be used shall be compatible in constituents, color, and texture to the original counterparts.</p>	8.a. Respect the plan for maintenance and upkeep in regards to the choice of materials and equipment specified. Any modifications must be approved by a heritage expert.
9. Respect systems and frameworks of periodic maintenance.	<p>9.A. Establish periodic maintenance program.</p> <p>9.B. Provide adequate accessibility to all indoor and outdoor spaces to conduct maintenance.</p>	<p>9.a. Establish a checklist for periodic maintenance tasks.</p> <p>9.b. Appoint a dedicated maintenance team.</p> <p>9.c. Reserve periodic budget for maintenance.</p>
10. Devise activities conforming with those in surrounding urban fabric.	10.A. Conduct a survey of all permanent and temporary activities in the surrounding urban fabric.	10.a. Conduct a periodic update to the survey of activities to modify uses accordingly.

Rehabilitation Principles	Guidelines (Design Phase)	Guidelines (Operation Phase)
11. Integrate the local community in activities and events.	11.A. Conduct a survey of all related intangible heritage assets and integrate suitable ones into the rehabilitation program.	11.a. Budget for and organize local events programmed in the Kasbah.
12. Involve all stakeholders in the management of the site.	12.A. Announce a stakeholders meeting in an official gazette to review design and specifications. 12.B. Publish rehabilitation plan in official media. 12.C. Document and archive all stakeholders meetings, and encounter relevant comments and opinions in rehabilitation plan.	12.a. Form a steering committee of representatives from all involved stakeholders. 12.b. Establish a system to collect opinions from the public and the surrounding community, and act upon them.
13. Preserve and promote the traditions and customs associated with the Kasbah and Ksar.	13.A. Survey and document traditions and customs associated with the Kasbah and Ksar. 13.B. Establish a calendar of the associated events held in the Kasbah and Ksar. 12.C. Reserve adequate space in the Kasbah to promote rituals associated with local customs and traditions. 12.D. Provide adequate services for attendees of events held in the Kasbah and Ksar that are associated with traditions and customs.	13.a. Promote events held in the Kasbah and Ksar associated with local traditions and customs. 13.b. Reserve funds to promote and develop events associated with traditions and customs. 13.c. Periodically maintain services/equipment reserved for events.
14. Preserve significant relationships with surrounding natural and urban environment.	14.A. Ensure that rehabilitation plan complements the surrounding urban and environmental landscape through appropriate view sheds. 14.B. Reestablish direct connections with historic natural and urban features confirmed through the historic studies (see chapter 3).	14.a. Respect the plan for maintenance and upkeep (see 20.A) in respect of the visual and functional axes.
15. Respect historical access points and internal circulation and only introduce new access or openings that are justified by safety or circulation concerns.	15.A. New justified access points and openings should be distinguishable, should not overshadow the original ones, and should not create any structural instability to the historic fabric. 15.B. Do not construct barriers in the historic internal corridors and passages. 15.C. Specify the signs for internal circulation. 15.D. New doors should be distinctive from the original and respect the historic and architectural values of the Kasbah.	15.a. Respect the plan for maintenance and upkeep (see 20.A). 15.b. Respect the limits of the space granted for different admitted uses.
16. Prioritize reuse of existing spaces before making additions.	16.A. Assign at least one use for all existing spaces.	16.a. Respect the plan for maintenance and upkeep (see 20.A).

Rehabilitation Principles	Guidelines (Design Phase)	Guidelines (Operation Phase)
17. Provide security to users and to buildings, and minimize possible risks.	17.A. Establish a system of CCTV, fire alarms, and fire detectors that would be controlled through the administration unit and connected to relevant civil service authority. 17.B. Establish and test a plan of evacuation from the site in case of emergency.	17.a. Respect the plan for maintenance and upkeep (see 20.A) in respect to systems of security, monitoring, and firefighting.
18. Document all changes, modifications, and additions.	18.A. Establish an efficient archive where reports on changes, modifications, and additions should be kept. 18.B. Specify means, accuracy, and procedures of periodic documentation and processes of archiving.	18.a. Respect the plan for maintenance and upkeep (see 20.A) in respect to the archiving documentation and periodic documentation.
19. Maintain the unity of ownership of all of the Kasbah.	19.A. Specify legal parameters that would prevent dividing the Kasbah into different ownership entities.	19.A. Central administration of the site shall ensure that ownership remains unified.
20. Develop a management plan for each section of the Kasbah depending on the values derived from the Statement of Significance.	20.A. Develop and empower a plan for maintenance and upkeep that would ensure that values and attributes indicated in the Statement of Significance would not be negatively affected through use of elements and spaces of the Kasbah.	20.a. Respect the plan for maintenance and upkeep (see 20.A).
21. Design modern services and facilities so that they have minimum impact on the historic fabric.	21.A. Set modern services and facilities away from historic fabric, or if necessary install with minimum impact on historic fabric. 21.B. Specify a high standard of equipment and material for all modern services and facilities to minimize maintenance.	21.a. Respect the plan for maintenance and upkeep (see 20.A) and assign regular assessment and check-ups of all services and facilities to assure proper working order.

7.5 Proposed Uses

Following the SWOT analysis and definition of conservation policies and guidelines, participants of the workshop were asked to consider possible uses that are compatible with the overall vision, values, and Statement of Significance of the site. These proposed uses included the following:

- Research center that focuses on earthen architecture and construction with earth
- Ethnographic museum that focuses on the culture of earthen architecture
- Workshops for local traditional crafts (fig. 7.13)
- Cultural exposition hall(s)
- Tourist information office
- Administration unit
- Guest house (boutique hotel)
- Restaurant(s) that serve various traditional local food
- Open space(s) for multiple purposes and open-air events
- Prayer hall



FIGURE 7.13

The proposed use of part of the site as workshops for local traditional craft production is intended to be an alternative to the more commercial and sometimes non-original crafts sold around the site. Photo: Susan Macdonald, 2011.

Implementation at the Stara Area

**FIGURE 8.1**

Schematic map of the kasbah, indicating the Stara area in red.

Drawing: Elena Macchioni, 2014.

**FIGURE 8.2**

Aerial image of the Stara area in 2004, during its occupation by squatters.

Photo: CERKAS, 2004.

8.1 The Rehabilitation Project

“Stara” is the name of the westernmost part of Kasbah Taourirt, an architectural space composed of walls, towers, and multipurpose structures (formerly residences, warehouses, houses, tighermt, a shrine, etc.). It is delimited by avenue Mohamed V to the north and west, by CERKAS offices and the Médiathèque to the south, and by the Caïd Residence to the east (fig. 8.1). The massive walls of the Stara enclose six distinct structures that form the core of the area, including the Stara East, Stara West, the Ateliers, and the Marabout.

The Stara was mostly constructed in the late nineteenth century, though a few earlier structures were extant in that period (see chapter 3). During the time of Hammadi el Glaoui, there were residences for his sons (tighermt), slaves, and cavalymen along with nearby warehouses. After independence in 1956, the kasbah would lose its former grandeur, and the Stara section became occupied by a few families who had previously worked in the kasbah. Since the 1960s, this area has been subject to increasing numbers of illegal squatters.

In 1994, CERKAS conducted a sociological survey of this section, which the occupants had transformed through unsanitary structures in addition to having destroyed interior sections of the historical buildings to create more space. Doors and windows had also been added in the facades, weakening the earthen structures. Forty-eight families, totaling 243 people, resided in forty-one “houses” in the Stara (fig. 8.2). This equates to 5.06 people per family and 5.09 people per house; 95.56 percent of the occupants were from Ouarzazate and the remaining 4.44 percent were from outside the province. One category of occupant resided in the Stara before 1972, that is, before the city of Ouarzazate acquired the kasbah. A second (majority) category occupied the location after 1972. The occupants lived rent-free.

In 2009, the rehousing of the occupants into a new development made it possible to recover the Stara, but it was in a very advanced state of deterioration and the spaces had been heavily modified. Since 2011, the project for the Stara section of the kasbah has provided the opportunity to engage in research and to implement conservation methodologies that will have a positive impact on the promotion of conservation and the use of earthen architecture more broadly.

The project, set to be completed in 2016, was initiated as a joint effort between CERKAS, the GCI, and the Municipality of Ouarzazate, owners of the property. It is a comprehensive rehabilitation program that preserves the historic character of the buildings and envisions the area as a future cultural center and economic driver for the town of Ouarzazate. This chapter describes the organization and technical interventions carried out during the project.

8.2 Planning and Organization of the Worksite

The work was planned in conjunction with CERKAS and the Municipality of Ouarzazate. As described in chapters 3 and 4, it began with the study of the existing architectural form, including assessing conditions; studying the building materials; distinguishing historic walls from those added after 1956, the year the kasbah was listed as a national monument; and identifying additions made by squatters (fig. 8.3; see appendices F and I).

Following this phase, a tender went out to select a contractor qualified in the restoration of earthen buildings. The selected contractor, ArteFAC, specializes in earthen building techniques and has worked with CERKAS on several other projects, including the restoration of a large kasbah in the Draá Valley village of Tenherir, now used as a vocational craft training school (fig. 8.4).

FIGURE 8.3

Architectural drawing showing structures that were removed along the Stara walls as well as internal spaces, revealing the historical configuration of the site.

Drawing: Oriol Domínguez Martínez, 2016.



ArteFAC was commissioned and supervised primarily by CERKAS and the project team, with input from the municipality. Several ma'alem, or specialized craftsmen, were also employed. These craftsmen in turn supervised approximately eighty laborers in various aspects of earthen building construction and restoration, including preparing mud bricks and rammed

FIGURE 8.4

Kasbah rehabilitated as a school in Tenherir, Draá Valley, restored by ArteFAC.

Photo: Emilio Roldán Zamarrón, 2015.



**FIGURE 8.5**

Production of mud bricks in the Stara area.

Photo: Benjamin Marcus, 2014.

earth, processing and installing roofing material, and building and plastering walls. A workshop for producing mud bricks was established on the site, usually relocating the site of production to wherever bricks were being used (fig. 8.5). The materials and techniques used in the rehabilitation are described in more detail in the following section.

8.3 Interventions

8.3.1 Cleaning and Selective Demolition

First, the site was cleaned of several tons of accumulated debris and refuse (figs. 8.6 and 8.7). This was a large task involving the removal of more than a century's worth of animal and human waste in addition to general refuse and collapsed roofing materials, which were putting significant pressure on the walls.

Following this important step, partition walls and temporary structures built along the defensive walls and within the Stara West were removed to reveal the original configuration of the buildings (fig. 8.8).

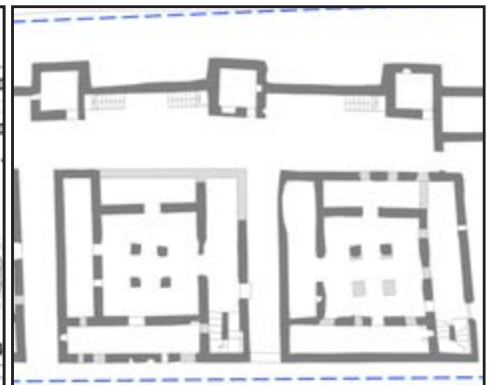
**FIGURES 8.6, 8.7, AND 8.8**

Stara walls after removal of squatter structures (above). Views of the western wall before removal (right) and after removal (far right) of squatter structures.

Photos: Elena Macchioni, 2014 (above); Claudia Cancino, 2013 (right); Benjamin Marcus, 2015 (far right).



This work was done according to drawings prepared by the GCI and CERKAS, the result of years of intensive study and survey of the site. The work was carried out in two phases, beginning first with the walls, Ateliers, and Stara West. Demolitions removed structures that had encapsulated the walls, revealing the original form and rhythm of the walls and towers. On the interiors, the traditional four-columned courtyard spaces within the Ateliers and Stara West were revealed and restored (figs. 8.9 and 8.10).

**FIGURES 8.9 AND 8.10**

Two Atelier buildings before intervention (right) and after removal of partition walls (far right). Cross-hatched areas indicate reconstructed elements.

Drawings: CIMS, 2013 (right); Elena Macchioni, 2014 (far right).

**FIGURE 8.11**

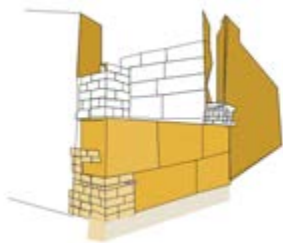
An area of basal erosion and a large crack repaired with lime and fired brick.

Photo: Elena Macchioni, 2014.

**FIGURE 8.12**

Repair of a large structural crack with wooden stitches (already installed) and fired brick.

Photo: Benjamin Marcus, 2014.

**FIGURES 8.13, 8.14, AND 8.15**

Schematic view of wall repair (above). Views of a dangerously leaning wall before reconstruction (right) and after reconstruction (far right).

Drawing: CERKAS. Photos: Claudia Cancino, 2011 (right); Benjamin Marcus, 2014 (far right).

8.3.2 Structural Repairs

The buildings of the Stara suffered from numerous structural problems resulting from roof collapse, which affected the upper walls, and from basal erosion at the base of the walls. These conditions caused large cracks in several structures, significant weakening of the lower walls, and in some extreme cases leaning and collapse of walls. For more detail on the conditions, see chapter 4.

Structural repairs carried out as part of the work in the Stara included stabilization of deteriorated wall bases, stitching of cracks, and selective reconstruction of lost wall sections. Repair of basal erosion was carried out using fired-clay brick/tiles and a hydraulic lime mortar to fill lost areas, as this repair is durable in the long term against future water incursion and is compatible with the rammed earth walls. The bricks used for repair are a low-fire, 0.24 x 0.12 x 0.03 m thin brick used commonly in historical construction in Marrakech and surrounding areas (fig. 8.11). Hydraulic lime is also sourced from outside of Marrakech where it is produced and purchased in bulk quantity (not bagged). Currently there is no lime production in Ouarzazate.

The bricks are laid horizontally and keyed into the rammed earth and used in this way to fill large cracks and gaps in walls (fig. 8.12). Major structural cracks are also reinforced with wooden stitches. The stitches are large pieces of laurel or palm wood fashioned into an “I” shape and inserted into a channel cut into the wall that bridges the gap. The stitches are fixed in place with gypsum plaster or lime mortar and are placed approximately every meter, though this spacing depends on the length and severity of the crack.

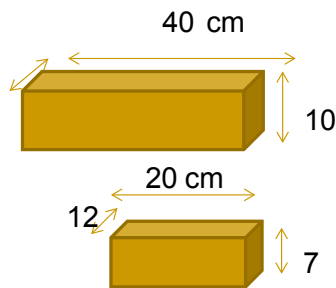
In several areas, rammed earth walls were missing or were too weak to be saved, and were reconstructed with new rammed earth that was integrated into the historic fabric. This was done by stitching the new section of wall into the historic surrounding material. Examples of such a repair can be seen in the Stara West (figs. 8.14 and 8.15). Here, a wall that was leaning dangerously due to basal erosion was beyond repair, and the decision was made to demolish and rebuild it in rammed earth. The new section was tied into the historic walls by using mud bricks and wooden stitches to create a strong connection between new and historic fabric. The wooden stitches, about a meter in length, were inserted into the historic wall with each lift of rammed earth, and spaces at the ends of the new section were keyed into the historic fabric with mud bricks. A schematic illustration is shown in figure 8.13.



**FIGURE 8.16**

Construction of rammed earth walls with metal form and pneumatic hammer.

Photo: Benjamin Marcus, 2014.

**FIGURES 8.17, 8.18, AND 8.19**

Above: Illustrations of typical brick dimensions used in the rehabilitation work. Right: Wet earth left to saturate for a few days to prepare mud bricks. Far right: Ma'alem preparing mud bricks on site.

Drawing: CERKAS, 2014. Photos: Claudia Cancino, 2014.

**FIGURE 8.20**

Example of smaller-size bricks used in decoration.

Photo: Benjamin Marcus, 2014.

8.3.3 Walls

Restoration of walls was carried out using both rammed earth and mud bricks. Earth for producing these materials came from a site 15 km from Ouarzazate. The earth from this site is composed of 67 percent sand and 33 percent clay, which is considered an adequate ratio for producing rammed earth. It matches the earth used in the original construction, which was mined from the site of Taourirt itself and tested by the project team. Using earth from the site is no longer possible, as the site is now a listed monument, which limits excavations or changes to its topography.

The soil obtained for construction is slightly moistened, placed in a metal formwork, and compacted with the aid of a pneumatic hammer (fig. 8.16). This method has often replaced the laborious use of the wooden manual rammer in southern Morocco, though the rammer is used in more remote communities and in those without access to an air compressor. The rammed-earth form is approximately 85 x 250 x 60 cm in dimension, producing a similar wall section. These are unified by inserting wooden stitches that bridge each section of rammed earth.

Also used extensively in the rehabilitation were mud bricks. These were produced for the project from a mixture of approximately 65 percent finer clay, 33 percent coarse sand, and 2 percent to 5 percent straw, and are made in two different sizes (fig. 8.17). There are usually five people involved in brick making, including a master brick maker and assistants. First, raw earth is passed through a screen to remove large stones. The earth is then formed into a pile with a depression on top where water is added. The wet earth is left for several days to saturate (fig. 8.18). It is then mixed with a small percentage of straw and again left several days to ferment, which gives the earth a more plastic consistency and reduces cracking. The material is prepared for forming into mud bricks by trampling the mud by foot into a workable consistency. The mud is then placed into wooden or metal forms that are promptly removed, and the fresh bricks are placed in a partially shady area to reduce cracking (fig. 8.19).

The bricks are left to dry for three to five days, depending on humidity, before they can be used for construction. A ma'alem and his assistants can make between 150 and 200 bricks per day. The smaller-size bricks are traditionally used for decorative elements at the top of walls (fig. 8.20) or around roofing beams, while larger bricks are used in constructing pillars and walls that are not built with rammed earth. Three people work in the construction of a mud brick wall: the mason, who places the bricks; an assistant who prepares and serves the mortar; and a carrier who transports bricks to the wall.

8.3.4 Reconstruction of Collapsed Areas

Several areas of the Stara East collapsed over the course of time. The southern side collapsed sometime in the 1960s or 1970s, destroying most of the southern facade and rooms. This area was filled in by squatters with poorly constructed partition walls in plaster and mud bricks. In addition, the southwestern tower of the Stara East collapsed sometime in this same period. More recently, a tower on the northern side, which served as a toilet, collapsed in heavy rain. As part of the rehabilitation work, it was important to reestablish these key features of the Stara. The southern part of the Stara East was well documented in historical photographs (see chapter 3). However, the configuration of the interior was not known.

Removal of the later additions and excavation of the ground helped to uncover traces of the original floor plan. The floor plan was reestablished to reflect a two-story space with pillars and two light wells to provide natural lighting. The southwestern tower and northern tower were also reconstructed (figs. 8.21 and 8.22). The reconstructions were carried out by integrating new rammed earth walls of the same dimension into the historic fabric. Upper sections of the walls and decorative features of the northern tower were constructed in mud brick.

FIGURES 8.21 AND 8.22

Views looking north of the southern facade of the Stara East, which had collapsed in the past (right) and was reconstructed as part of the CRP (far right).

Photos: CERKAS, 2013 (right); Benjamin Marcus, 2015 (far right).



8.3.5 Roofs

Roofs in the Stara were primarily utilitarian and without decoration. They were traditionally built with a combination of poplar wood principal beams, palm or poplar sub-beams, and reed matting, with a thick layer of earth forming the roof surface. The majority of roofing in the Stara had accumulated a significant weight of built-up earthen material and debris and had suffered from deterioration or collapse. Thus they were mostly replaced, though original roofs were kept in certain key spaces. In addition, the principal roof beams mostly remained in sound condition and were preserved in place or reused where possible.

New roofing and flooring were installed using traditional materials (fig. 8.23), though palm wood is no longer available. This is due to environmental regulations in effect throughout southern Morocco that limit the harvesting of palm trees.

The intermediate floors are also made of wood framing (eucalyptus beams, joists, and reeds). The main or principal beams of the frame are made of poplar trunks 20 to 30 cm diameter in section. They must be set in a wall so that the weight of the roof is evenly distributed in a room and are usually placed on wooden plates or beams installed along the top of the wall to avoid imposing a point load directly to the earth wall. The principal beams are spaced 55 cm between axes and held in place by mud bricks laid in earth mortar.



FIGURE 8.23

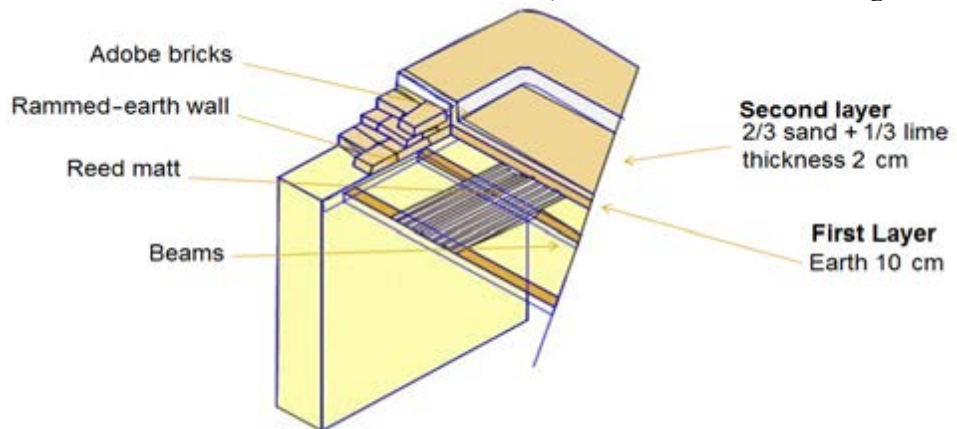
A craftsman shaping eucalyptus beams with an adze. Reed for making the roof matt can be seen in the foreground.

Photo: Benjamin Marcus, 2013.

**FIGURE 8.24**

Workers installing a simple reed matt over roofing beams. This will then be covered with a layer of earth and lime to form a weather-proof surface.

Photo: Elena Macchioni, 2013.

**FIGURE 8.28**

Axonometric view of a typical traditional roof structure in the Stara.

Drawing: CERKAS, 2013.

**FIGURES 8.25, 8.26, AND 8.27**

Craftsman making a decorative tataoui ceiling of three layers from cut reed.

Photos: Elena Macchioni, 2013.

Next, a bed of reeds is laid, either in simple configuration (fig. 8.24) or arranged in complex geometric tataoui (figs. 8.25–8.27). Tataoui ceilings are made primarily with laurel wood harvested in the mountain valleys near Ouarzazate, or with reed made from groves near the river. The standard reed matt ceiling is prepared by drying the stalk and stripping the exterior of any leafy growths. It is then cut to size with a saw and woven together to form a roofing matt.

Once the roofing beams and matt are installed, they are covered with approximately 10 cm of earth (fig. 8.28). On skyward surfaces, this layer of earth is then protected with either flat stones or a layer of compacted lime. The stones or lime are angled slightly to direct water toward drainage spouts (fig. 8.28). These spouts are made out of hollowed pieces of birch wood and are angled to deposit water several meters from the base of the wall, where it could cause damage.

8.3.6 Finishes and Services

The complete reuse plan for the spaces of the Stara is still being developed, and further modifications to spaces to accommodate individual tenants are expected. In the current project, buildings have been outfitted with basic services, including lighting, plumbing, and toilets. Bathrooms were added to each building and are constructed within the historic fabric but are separate structures, built with at least 10 cm of space between the concrete walls of the bathroom and the historic earthen walls. The modern bathrooms are finished with traditional ceramic tile.

Electrical lighting has been routed primarily through replaced ceilings. Each space has been fitted with a traditional hanging metal lighting fixture, known as a *fnar*. As these do not provide a great deal of light, there are generally two to four *fnar* in each space, including stairwells. Exterior spaces have also been provided with modern flood lighting, including along the entire length of the walls in order to highlight them at night.

Water is provided to the Stara from a municipal source that enters the Stara from the northern side. Sewage empties to the south, feeding into the municipal sewer system.

Interior finishes are mainly gypsum or lime plaster. In darker spaces, a white gypsum plaster is used to increase reflected natural light. In spaces that receive more light, a finish made of gypsum plaster mixed with earth is used, which creates a light brown, earth-colored finish (figs. 8.29 and 8.30).

FIGURES 8.29 AND 8.30

Typical exterior finishes in the Stara, including earth and lime plaster, wooden window frames, and ceramic tile.

Photos: CERKAS, 2013; Benjamin Marcus, 2015.



Original wooden doors and windows were largely lost during the occupation by squatters, though the openings remained and could in most cases be reused for new windows and doors. The few remaining historic doors have been preserved where possible. An example of this can be seen at the entrance to the Stara East, where the original heavy wooden door, constructed with wrought-iron nails and hinges, is kept in place. However, the majority of doors and windows were fabricated new, using traditional styles and techniques. They are made of pine wood, often with chamfered edges. Window screens are produced locally and are made of wrought iron following a traditional design used widely in the pre-Saharan valleys (figs. 8.31 and 8.32).

Floors throughout the complex vary considerably but have been finished mainly with stone or ceramic tile. The tiles are a mixture of high-fire clay and green glaze producing a mosaic effect. On roofs, in courtyards, and within public spaces, flat stone slabs from local mountain quarries have been used. The stone paving is angled to direct water into a central drainage system. Public spaces have been outfitted with palm trees to provide shade.

The extent and nature of structural interventions required in the Caïd Residence and the current condition of the wall paintings indicate that there is a high risk of loss and damage occurring to the decorated surfaces during construction work. The campaign in October–November 2014 looked at indirect measures of protection (see chapter 4) and began to develop emergency stabilization and protective measures for the wall paintings. Campaigns in 2015 and 2016 undertook direct stabilization measures and training for CERKAS staff in the Caïd Residence in order to demonstrate the recommended emergency stabilization and protection measures.

**FIGURES 8.31 AND 8.32**

Above: Interior view of upper floor of the Stara East, where windows have been opened following rehabilitation work.

Right: South facade of the Stara East, where exterior windows have been reestablished.

Photos: Benjamin Marcus, 2015.



**FIGURE 8.33**

Lectures on wall painting conservation methods were undertaken as part of the work at Kasbah Taourirt.

Photo: Lorinda Wong, 2014.

8.4 Decorated Surfaces in the Caïd Residence

Work on the decorated surfaces in the Caïd Residence encompassed research into the significance, original technique, iconography, physical history, and condition of the painted decoration that included both a photographic survey and a graphic documentation condition assessment of all painted surfaces (see chapters 2 and 5 and appendix H). Many areas were found to be at serious risk of loss as large areas of painted plaster were detached. Furthermore, the extent and nature of necessary structural interventions, required to stabilize the earthen architecture, resulted in a high risk of loss and damage to the decorated surfaces.

Following the condition assessment, emergency stabilization measures were assessed. Areas were recorded graphically (appendix J) and both direct treatment measures and indirect measures of protection were established.

As part of the direct treatment measures, testing and trials were undertaken in order to develop suitable treatment methods to stabilize the painted surfaces prior to any structural intervention on the buildings. These emergency stabilization measures included development of suitable grouting and plaster repair materials. The treatments have been designed with locally available materials and were done with the primary aim of securing paintings during construction work. Treatment material design was based on results of earthen analysis undertaken by W. Carazas. Throughout the treatment development process, training was undertaken with CERKAS staff through lectures and didactic exercises (fig. 8.33).

Indirect measures included communication on the significance, values, and extent of wall painting in the Caïd Residence and discussion with CERKAS staff about modifications to existing building work methods and practice in order to avoid damage to painted areas. Such revisions include working slowly and carefully in areas with painting and reducing vibration and minimizing water use. These measures also included protecting paintings with plastic sheeting and facing, using mesh and tarps to prevent debris created during construction work from falling on the paintings, and raising awareness of areas of decoration that may not be readily visible to those working on the building fabric.

The east section of the North-rear room was selected as a demonstration area to exhibit the treatment approaches and to undertake training with CERKAS staff.

FIGURES 8.34 AND 8.35

Members of the wall painting team.

Photos: Lorinda Wong, 2014.



FIGURES 8.36 AND 8.37

The wall painting demonstration area in the Northwest room, with protection measures in place, including plastic sheeting and mesh and frame to protect the paintings during structural interventions on the building.

Photos: Lorinda Wong, 2014.



The painting in this area was entirely stabilized by the wall painting team (figs. 8.34 and 8.35). Following treatment, protective materials, including plastic sheeting, mesh, and a wooden frame, were installed in the demonstration area using locally available materials (figs. 8.36 and 8.37). Another extensive area of exterior exposed wall paintings in the collapsed West 2 room was also covered with plastic sheeting for protection (fig. 8.38).

Structural work including the re-roofing of all painted rooms and reconstruction of the walls and floor of the collapsed West 2 room was carried out by CERKAS between April and October 2015. Wall painting stabilization then continued in November 2015 and was completed in April 2016. The Caïd Residence has 350 m² of painted surfaces. The work undertaken as part of the GCI project at Kasbah Taourirt included only emergency stabilization measures. A complete conservation program is still recommended for the wall paintings that includes grouting, plaster repairs, cleaning, and presentation.

**FIGURE 8.38**

Installing the protective plastic sheeting to protect the paintings in the West rooms.

Photo: Lorinda Wong, 2014.



FIGURES 8.39 AND 8.40

Above: Many of the painted rooms have severe structural issues. Large structural cracks are visible in West 1 room.

Right: Detailed view of loss and detached painted surfaces in the Caïd Residence.

Photos: Lorinda Wong, 2015 (above); Samuel Whittaker, 2014 (right).



8.4.1 Condition Summary

The structural stability of the Caïd Residence in Kasbah Taourirt was extremely compromised and led to substantial loss and deterioration of wall paintings. For many years, the buildings have been neglected, leading to leaking roofs that allowed significant water (and mud) infiltration into the buildings, causing large portions of the painted rooms to collapse and leaving many of the paintings exposed to and unprotected from the elements. These structural instabilities have also led to complete separation of the walls in some areas and serious cracking throughout the buildings. In addition, a large bat colony inhabited the rooms for many years, covering the painted walls and floors with excreta. All of this has taken a substantial toll on the painted decoration. Large areas of the wall paintings were unstable at the start of the project (including detached plaster layers, structural cracks, and exposed and poorly adhered plaster edges) and were at extreme risk of collapse (figs. 8.39 and 8.40).

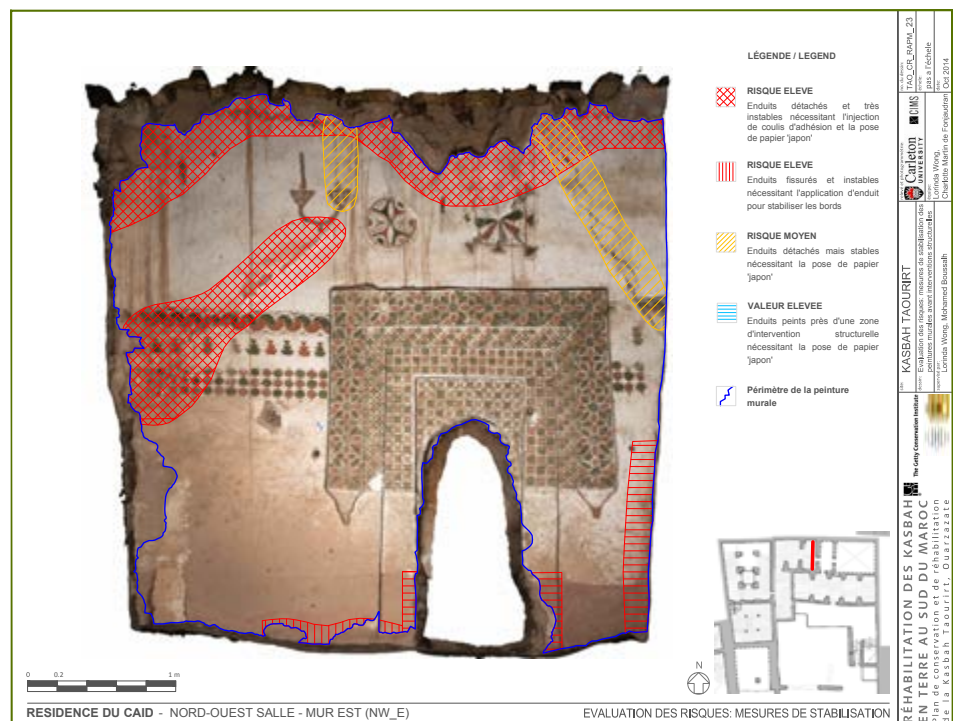


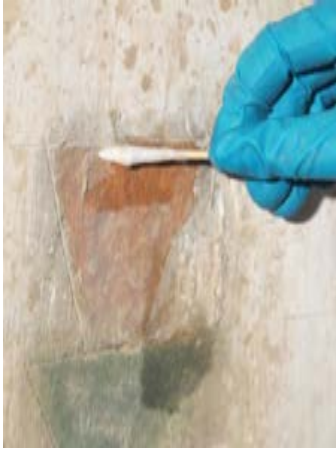
FIGURES 8.41 AND 8.42

Above: A wall painting conservator performing graphic documentation of areas requiring emergency stabilization.

Right: Sample of one of the emergency stabilization documentation sheets and proposed actions.

Photos: Lorinda Wong, 2014 (above); GCI, 2014 (right).



**FIGURE 8.43**

Solubility trials were conducted with water on the wall paintings at the Caïd Residence. The paintings were found to be extremely water sensitive.

Photo: Lorinda Wong, 2015.

8.4.2 Graphic Documentation of Emergency Stabilization Interventions

Areas presenting high risk of loss and damage during structural interventions, and related necessary stabilization intervention including grouting, edge repair, and protective facing, were manually recorded onto photographic basemaps and transferred to CAD (figs. 8.41 and 8.42). Such records are essential to planning and prioritizing interventions and resource requirements (appendix J).

8.4.3 Characteristics of the Original Painted Plaster

Results of earthen analysis of the original plaster revealed a higher amount of clay (10%) compared to the locally available "red" earth (2%) typically used by CERKAS for plaster repairs. A "white" earth, also available from the local quarry, was included in the testing because of its likely higher clay content, which would impart better cohesive and adhesive properties as well as its neutral color. Solubility tests of the original plaster and paint layers were also undertaken (fig. 8.43). The upper white plaster (likely gypsum-based) was found to be extremely water sensitive: rigid and brittle when dry and subject to softening and disintegration when wet. This made interventions challenging and the materials and methods of treatment needed to be adapted to these conditions.

8.4.4 Emergency Stabilization Treatment Development

Treatment testing focused on grouting, edging repairs, facing application, and cleaning. As much as possible, locally available materials were favored.

Grouting

In developing the grouting intervention, the following performance characteristics and working properties were determined:

Performance characteristics:

- No physical or chemical alteration to original materials
- Adequate adhesion
- Low density
- Vapor permeability similar to the original material
- Mechanical resistance comparable or less than the original plaster
- Porosity comparable to the original plaster
- Hydric and thermal properties comparable to the original plaster
- No shrinkage or drying cracks
- Resistance to microbiological deterioration

Working properties:

- Ease of injection
- Adequate adhesion
- Good initial adhesion
- Short drying time
- Minimal water absorption
- Low toxicity

**FIGURES 8.44 AND 8.45**

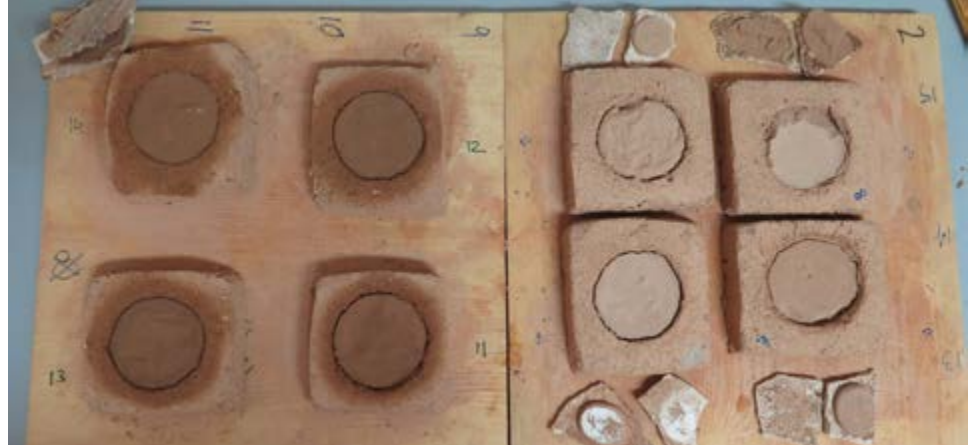
Flow tests were performed and assessed with the different grout mixtures.

Photos: Lorinda Wong, 2015.

An earthen grout was favored as it was compatible with the substrate and the materials were locally available. Several mixtures were tested, using earth with sieved sand and hollow glass microsphere added to reduce shrinkage and to keep the overall wet and dry weight at an acceptable level.

FIGURE 8.46

Tests were conducted with the different grout mixtures to examine shrinkage, cracking, and adhesion. Photo: Lorinda Wong, 2015.



Initial testing compared the following properties and performances (figs. 8.44, 8.45, and 8.46):

- Flow (semiquantitative evaluation)
- Cohesion and adhesion (qualitative evaluation)
- Shrinkage (qualitative evaluation)
- Minimal salt-forming ions (semiquantitative evaluation)



A grout with minimal water was desired with suitable bulk to create anchor points rather than to fill all of the voids. The rationale behind this decision was that grout failure was likely to occur in some areas during structural work. Localized grouting allows for retreatment in the future (figs. 8.47 and 8.48). All component materials, including the earth, sand, and water (both tap and locally available deionized water), were tested with Merck ion test strips to establish their anion content. Fifteen grout mixtures were tested (table 1).

Table 1. Results of grout mixture testing.

Grout Test #	Earth : Sand : Scotchlite™ (vol)	Liquid (vol*)	Additive (vol)
0	1 : 0.5 : 0	Water : 1	X
1	1 : 0.5 : 0.5	Water : 1	X
2	1 : 0.5 : 1	Water : 1	X
3	1 : 0.5 : 1	Water : 0.5	Ethanol (1)
4	1 : 0.5 : 1	Water : 1	Glycerine (0.04)
5	1 : 0.5 : 0.5	Water : 1.5	X
6	1 : 0.5 : 1	Water : 1.5	X
7	1 : 0.5 : 0.5	Water : 1	Egg white (0.3)
8	1 : 0.5 : 0.5	Water : 1	Glycerine (0.2)
9	1 : 0.5 : 0	Water : 0.8	X
10	1 : 0.5 : 0.5	Water: 0.8	X
11	1 : 0.8 : 0.8	Water : 0.9	Glycerine (0.2)
12	1 : 0.8 : 0.8	Water : 0.8	Glycerine (0.2)
13	1 : 1 : 1	Water : 1	Glycerine (0.2)
14	1 : 1 : 1.2	Water : 1	Glycerine (0.2)

* 1 vol = 50 ml

**FIGURES 8.47 AND 8.48**

Grouting tests were undertaken in situ, which allows for future retreatments.

Photos: Lorinda Wong, 2015.

**FIGURE 8.49**

Grouting with mixture 14 was conducted throughout the rooms with paintings.

Photo: Lorinda Wong, 2015.

Grout mixture 14 was selected for use in the demo area because it performed the best, exhibiting little shrinkage and cracking, good adhesion and cohesion, and adequate flow (fig. 8.49, table 2).

Table 2. Breakdown of grout mixture 14, selected for use in the demo area.

Material	Volume
"White" earth (rammed earth) sieved < 0.38 mm	1
Local gray sand < 0.5 mm	1
Scotchlite™ K15 glass microsphere	1.2
Glycerine	0.2
Deionized water	1

Plaster edging repair

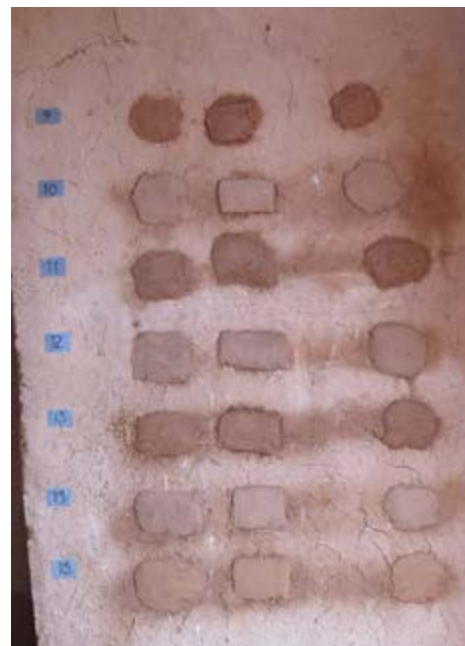
Repair plasters were developed for edging repairs and crack fills and were based on the earthen analysis results of the historic plasters. Particle size was matched as closely as possible and different mixtures were tested using the following materials (showing sieved particle-size range):

- "Red" earth sieved < 5 mm and < 2 mm
- "White" earth sieved < 5 mm and < 2 mm
- Local gray sand sieved < 4 mm and between 1.27 and 0.5 mm
- Deionized water

Initial testing aimed to compare the following properties and performance (figs. 8.50 and 8.51):

- Workability and ease of application (qualitative evaluation)
- Shrinkage and cracking (qualitative evaluation)
- Color (qualitative evaluation)

Fifteen edging repair mixtures were tested (table 3).

**FIGURES 8.50 AND 8.51**

Tests were done on the 15 plaster edging repair mixtures to assess workability, shrinkage, cracking, and color.

Photos: Lorinda Wong, 2015.

**FIGURES 8.52 AND 8.53**

Wall painting team implementing edging repairs to secure edges of a wall painting in the Caïd Residence demo area.

Photos: Lorinda Wong, 2015.

**FIGURE 8.54**

Detail of edging of a section of a wall painting in the Caïd Residence. Photo: Lorinda Wong, 2015.

Table 3. Results of edging repair mixture testing.

#	Earth : Sand (vol)	Earth (type/ sieving size)	Sand (sieving size)	Water (vol)	Cracking	Color	Ease of Application
1	1 : 1	Red earth Sieve #4 (< 4.75 mm)	Sieve #18 (< 1 mm)	0.5	No	–	–
2	2 : 1	Red earth Sieve #4 (< 4.75 mm)	Sieve #18 (< 1 mm)	0.75	Yes	–	–
3	1 : 1	Red earth Sieve #4 (< 4.75 mm)	Sieve #40 (< 0.4 mm)	0.5	Yes	–	–
4	2 : 1	Red earth Sieve #4 (< 4.75 mm)	Sieve #40 (< 0.4 mm)	0.75	Yes	–	–
5	1 : 1	Red earth + Rammed earth (50 : 50) Sieve #4 (< 4.75 mm)	Sieve #40 (< 0.4 mm)	0.5	Yes	–	+
6	1 : 1	White earth Sieve #4 (< 4.75 mm)	Sieve #40 (< 0.4 mm)	0.5	Yes	+	+
7	1 : 2	Red earth Sieve 12 mesh (< 2 mm)	Sieve 50 mesh (< 0.5 mm)	0.75	Yes	–	–
8	1 : 2	White earth Sieve 12 mesh (< 2 mm)	Sieve 50 mesh (< 0.5 mm)	0.75	Yes	+	–
9	1 : 1	Red earth Sieve 12 mesh (< 2 mm)	Sieve 20–50 mesh 1.27 < sand > 0.5 mm	0.35	No	–	–
10	1 : 1	White earth Sieve 12 mesh (< 2 mm)	Sieve 20–50 mesh 1.27 < sand > 0.5 mm	1	No	+	–
11	1 : 2	Red earth Sieve 12 mesh (< 2 mm)	Sieve 20–50 mesh 1.27 < sand > 0.5 mm	1	No	–	–
12	1 : 2	White earth Sieve 12 mesh (< 2 mm)	Sieve 20–50 mesh 1.27 < sand > 0.5 mm	1	No	+	–
13	1 : 1.5	Red earth Sieve 12 mesh (< 2 mm)	Sieve 20–50 mesh 1.27 < sand > 0.5 mm	1	No	–	–
14	1 : 1.5	White earth Sieve 12 mesh (< 2 mm)	Sieve 20–50 mesh 1.27 < sand > 0.5 mm	1	No	+	+
15	1 : 1.5	Red earth + Rammed earth (50 : 50) Sieve 12 mesh (< 2 mm)	Sieve 20–50 mesh 1.27 < sand > 0.5 mm	1	No	+	+

**FIGURES 8.55 AND 8.56**

Tissue facing and gauze were applied with Paraloid B-72 in acetone to protect the top edge of the paintings during roofing work and structural interventions. Other fragile areas of painting were also protected with tissue. Photos: Lorinda Wong, 2015.

Edging repair mixtures 14 and 15 were selected for use in the demo area because they did not show shrinkage or cracking, had good workability, and were a good color match to the original painted plaster (figs. 8.52, 8.53, and 8.54). Two mixtures were selected in order to have the option of two different colored plasters for use depending on the area (table 4):

Table 4. Breakdown of plaster mixtures 14 and 15, selected for use in the demo area.

Mix #	Material	Volume
14	"White" earth (rammed earth) sieved < 2 mm	1
	Local grey sand between 1.27 and 0.5 mm	1.5
	Deionized water	0.6
15	"White" earth (rammed earth) sieved < 2 mm	0.5
	"Red" earth (plaster) sieved < 2 mm	0.5
	Local gray sand between 1.27 and 0.5 mm	1.5
	Deionized water	0.6

Protective facing

Trials were undertaken to assess the solubility of paint layers in preparation for the application and removal of facing materials and to inform potential scope and limitations of preliminary cleaning. The plaster and paint layers are extremely water sensitive, thus precluding the use of aqueous-based adhesives. The plaster and paint layers were not soluble in ethanol and acetone.

Paraloid B-72 in acetone was selected to apply facing tissues. A high percentage (30%) was decided upon to limit its desorption in depth within the original plaster. Trials also aimed to assess the removability of facing and its impact on underlying original materials. Facing was applied to the upper, fragile edges of the painted plaster near the roof and in particularly unstable areas (figs. 8.55 and 8.56). The facing consisted of tissue with, in some cases, a final application of gauze.

Cleaning

Given the water sensitivity of the painted plaster, rapid and easily achievable water-based cleaning is difficult. The cleaning tests were therefore restricted to mechanical methods that used soft brushes to remove surface dust and mud drips (figs. 8.57 and 8.58). Because of time limitations, only small cleaning tests were undertaken.

**FIGURES 8.57 AND 8.58**

Cleaning trials undertaken on the north wall of West 1 room, showing before cleaning (right) and after cleaning (far right). Mud drips were removed with soft brushes and mechanical action. Photos: Charlotte Martin de Fonjaudran, 2015.

**FIGURES 8.59 AND 8.60**

Exterior views of the Caïd Residence looking north, showing before structural interventions (top) and after structural interventions (right). The paintings in the West rooms were enclosed and all roofs remade. Photos: Samuel Whittaker, 2014 (top); Lorinda Wong, 2015 (right).



Substantial building work was done in the Caïd Residence in 2015 (figs. 8.59 and 8.60). As a result, some mud drips were inadvertently "cleaned," causing smearing of the painted surfaces (figs. 8.61 and 8.62). Treatment undertaken by the GCI in April 2016 aimed to improve the appearance of paintings in the front room by removing this smearing.

FIGURES 8.61 AND 8.62

Detail of the wall paintings in the North-front room before (bottom left) and after (bottom right) re-roofing and subsequent "cleaning" of the surfaces. The cleaning caused smearing and loss of original material.

Photos: Lorinda Wong, 2015.

8.4.5 Structural Crack Filling

A significant amount of structural interventions was undertaken in the Caïd Residence on the rooms with decoration. As part of this work, a large structural crack was filled as a demonstration of how to treat cracks in the vicinity of areas of painting. The paintings were first stabilized, areas grouted and edges secured, and were then protected with plastic wrap (figs. 8.63 and 8.64). Conservators worked with the ma'alem to fill the crack and plaster it (fig. 8.65).



**FIGURES 8.63, 8.64, AND 8.65**

Before filling a structural crack, wall paintings in the Caïd Residence were stabilized and protected (top, right) by ma'alem under the supervision of CERKAS staff member Noufissa Ouberchkik (far right). Photos: Lorinda Wong, 2015.



8.4.6 Bat Exclusion

Significant time was dedicated to the design and installation of temporary doors and to the filling of entry points to prevent bats from entering the painted rooms in the Caïd Residence. The bat exclusion measures proved successful as no bats have yet returned, but a permanent door closure system has still been determined necessary (figs. 8.66 and 8.67).

**FIGURES 8.66 AND 8.67**

Above: Floor plan showing the location of temporary doors (in red) and openings that were sealed (in blue) to prevent bat entry to the Caïd Residence.

Right: Temporary door placed in front of the north terrace door. Drawing: CIMS, 2013. Photo: Lorinda Wong, 2015.



Conclusions and Recommendations

This report summarizes the research, analysis, and activities carried out in collaboration with CERKAS from March 2011 to May 2016. The early results of this project highlighted issues fundamental to the conservation of earthen sites that were in need of further consideration. Among these were the lack of methodologies for adapting historic urban settlements made of earth to safe and modern living conditions.

The CRP for the earthen ensemble of Taourirt in southern Morocco aims to develop a methodology for the conservation and rehabilitation of this traditional earthen ensemble that can be used as a model for similar earthen sites across the Maghreb. The CRP's objective is to establish a conservation process that demonstrates appropriate reuse of such sites, respects the original building fabric, and preserves technical knowledge and traditions.

The following are the conclusions of this plan, which are intended to provide guidance regarding next steps to ensure sustainability of the project activities and to suggest further areas of research:

- The vast Amazigh cultural heritage needs further study and analysis. Despite the fact that the project has compiled a preliminary list of papers and documents published on this subject, there is still much to do regarding investigating this culture and, most particularly, its highly significant earthen architecture. The ksour and kasbahs of southern Morocco, and their decorated surfaces and elements are examples of sustainable use of local resources and imaginative creation of spaces and functions to serve the population inhabiting them.
- This earthen heritage needs to be part of a general inventory. CERKAS has been collecting information on some of the sites around the Draá Valley as well as other important sites such as Aït Ben Haddou. However, further resources need to be provided so the more than 4,000 ksour and 300 kasbah, can be properly studied.
- The collection of information on this vast earthen heritage should include detailed and complete architectural surveys before conservation work begins. The drawings produced for Kasbah Taourirt served as a recording of the site and, most importantly, as a tool to investigate historic configurations. Without an accurate survey of a site, it is impossible to make decisions regarding the original functions of the spaces and/or potential adaptive reuse. The architectural survey also served as a tool to graphically incorporate information collected through oral history and to understand the site's current condition.
- The wall paintings that were investigated and stabilized as part of the project are highly significant for Amazigh culture and southern Morocco. However, there is still work to be done, including full conservation treatment and long-term protection. Scientific materials and treatments need to be further developed and resources and staff allocated to ensure the continued conservation and maintenance of these valuable artworks.

- As important as the recording of the physical fabric is the identification of the site's cultural values. Cultural significance is used here to mean the importance of a site as determined by the aggregate of values attributed to it. The values considered in this process should include those held by experts—anthropologists, archaeologists, architects, and others who were part of the project team—as well as values brought forth by other stakeholders, such as social and economic values. These identified values are not an end in themselves but a means to facilitate the decision-making process. Without them, it is difficult to make decisions regarding rehabilitation as well as potential uses. The core attribute of the site that needs to be preserved is the value attributed to it from all parties involved.
- The process of identifying and assessing cultural values of a site should include all stakeholders. In the case of Morocco, an important part of this group are the inhabitants and ultimate users of the site. Involving them requires open communication regarding what the project's intentions are and to listen to their input on how the site could be used. However, every meeting that was held as part of this project was properly prepared and carried out at specific milestones. The articulation of the cultural values as part of the Statement of Significance was prepared by the project team and later presented and discussed with the other stakeholders.
- A project open to all stakeholders raises questions about who is in charge of which part of the process. It seems that a conservation plan has evolved into playing the dual role of a specialized document and a repository of articulated information from different groups. The tasks associated with the latter role call for new ways of thinking as well as for team members with managerial skills.
- The methodology known as SWOT analysis is essential. SWOT analysis is a structured planning method that evaluates these four elements of a project or business venture. A SWOT analysis can be carried out for a product, place, industry, or even a person. It involves specifying the vision for a site based on recognized cultural values and identifying the internal and external factors that are favorable and unfavorable to achieve that vision. An effective conservation and rehabilitation proposal cannot be developed without a clear assessment of the factors affecting its implementation. This analysis is even more applicable for the site in southern Morocco, where a number of interested groups are responsible for the site's maintenance and potential rehabilitation. All of these groups need to be involved in this part of the process.
- The next step of the CRP involves the design of the rehabilitation principles. These are a set of norms to be followed by the groups designing the rehabilitation plan. In the case of Taourirt, the team decided to involve the owners of the site in the creation of these principles so that any action designed as part of the plan, as well as any future interventions and/or maintenance of the site, will follow and respect these principles.
- As a further step, the CRP includes a set of guidelines for the design and operation phases of the project. These guidelines are intended to delineate the action plan for the conservation, rehabilitation, and proper future use of the site. The commitment of CERKAS to make sure that any action on site respects the principles and guidelines defined as part of this project ensures the sustainability of the project.

- The Caïd Residence, Stara, visited area, and other spaces of the kasbah are a single entity and their conservation and management should be approached as such. As part of this use of space, the current visited area of the Caïd Residence should be integrated into a larger museum development plan, and both CERKAS and the current Médiathèque should remain within the kasbah, as they constitute important and appropriate uses of the space.
- Although it is not within the scope of the present project, future development of the site needs to be integrated into a larger urban planning and tourism management strategy for Taourirt and Ouarzazate. The ksar of Taourirt is a living heritage site and the conservation of its houses and streets requires planning measures that protect historic buildings, regulate the design of new construction, and provide social development opportunities to retain its inhabitants.
- Planning measures need to be implemented that protect and conserve not only the built spaces of the kasbah and ksar but also the surrounding oasis, cemeteries, agricultural lands, and open spaces that make up the complete cultural landscape of Taourirt. These important border zones should not be encroached upon by new development, thus ensuring the preservation of traditional views both to and from the kasbah. The cultural landscape of the kasbah also needs to be recognized at an official level by formally updating the boundaries of the listed site to include surrounding open spaces.
- CERKAS cannot play the same role in other sites in the region unless further financial and human resources are allocated to this institution. In the meantime, CERKAS and the GCI intend to make all information accessible to other site managers not only with the publication of this report but also with the creation of a CERKAS website with all materials developed as part of the project.

This is a summary of the conclusions and recommendations identified as part of the project. The task ahead for CERKAS and the Ministry of Culture of Morocco is quite complex. This report is intended as a resource to assist in carrying out similar rehabilitation projects at other sites and ensuring the preservation of the significant earthen heritage of the region while involving critical stakeholders and respecting the authenticity and values of the historic fabric.

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Introduction to the Bibliography

Objectives

As a part of the Conservation and Rehabilitation Plan for Kasbah Taourirt, this bibliography aims to contribute to a better understanding of the context in which the project was developed and carried out. The bibliography includes references related to several different research areas of the project. These include the historical and cultural background of the site within southern Morocco, surveys and documentation related to Amazigh decorative arts and wall paintings, and case studies and guidelines for rehabilitation projects in Morocco and the wider region.

Another important objective of the bibliography is to present technical literature related to the conservation and construction of earthen buildings in Morocco and to provide reliable references for a better understanding of earth as a building material, particularly rammed earth and its use in the region.

Scope and Limitations

Conservation of earthen architectural heritage is still a rather recent field, in contrast with the historical use of the material, which is linked to the earliest human settlements. Since the 1970s, the body of literature on earthen architecture has grown steadily. This is reflected in the development of the Terra conferences in 1972, a series of international gatherings devoted to the preservation of earthen architecture. With each conference, the number of participants has increased, along with their geographic and professional diversity. Similarly, professional associations and conferences addressing new earthen construction are numerous and have expanded significantly in recent decades.

As the exchange of ideas within the field has expanded, so have opportunities for research and collaboration. However, a more effective collaboration between research institutions is necessary in order to guarantee the quality of the research results. In some cases, there is a lack of consensus between researchers, for instance with regard to parameters, both qualitative and quantitative, to characterize the material. Another problem is the limited number of guidelines or codes for both new earthen construction and conservation of historic earthen buildings and sites.

For these reasons, the present bibliography attempts to limit its scope only to works where technical information is provided that allows the comparison of data. For historical references, case studies, and works related to wall paintings, the focus is largely on the south of Morocco, and especially on the history, culture, and architecture of the pre-Saharan valleys.

We hope that this bibliography provides useful references for researchers, heritage specialists, and others working on the conservation of earthen architectural heritage in Morocco and the wider region.

Earthen Heritage Sites in Southern Morocco

History and Context

- Barrère-Affre, Marie. 1930. *Le balcon sur le désert: Roman*. Paris: Bonne Presse.
- Bordeaux, Henry. 1931. *Un printemps au Maroc*. Paris: Plon.
- Boussalh, Mohamed. 1990. Interview of a Glaoui descendant who lived in Kasbah Taourirt, by Mohamed Boussalh, Ouarzazate, Morocco 1990. Archives of CERKAS, Ouarzazate, Morocco.
- . 2008. Ksar of Ait-Ben-Haddou: Hopes and perils. *World Heritage* (48): 18–25.
- . 2011. Interview with M. Da Lmahjoub, former Caïd servant, by Mohamed Boussalh, Ouarzazate, Morocco, 2011. Archives of CERKAS, Kasbah Taourirt, Ouarzazate, Morocco.
- Carver, Norman F., Jr. 1989. *North African Villages: Morocco, Algeria, Tunisia*. Kalamazoo, MI: Documan Press.
- Caumes, Philippe. 2005. *Villes de mémoire: Anciens ksour de Mauritanie*. Paris: UNESCO, Centre du patrimoine mondial.
- CERKAS. 1985. Tamdakht research. Archives of CERKAS, Kasbah Taourirt, Ouarzazate, Morocco.
- . 1990. Tamnougalt research. Archives of CERKAS, Kasbah Taourirt, Ouarzazate, Morocco.
- Chardon, B. 1919. Considérations générales sur le territoire de Ouarzazate. In *Manuscrits des officiers du Protectorat français*. Archives Diplomatiques de Nantes.
- Chatinières, Paul. 1919. *Dans le Grand Atlas marocain: Extraits du carnet de route d'un Médecin d'assistance médicale indigène 1912–1916*. Paris: Plon-Nourrit.
- Col·legi d'Aparelladors i Arquitectes Tècnics de Barcelona. 1998. *Marruecos presahariano: Hábitat y patrimonio = Le Maroc présaharien: Habitat et patrimoine*. Barcelona: Col·legi d'Aparelladors i Arquitectes Tècnics de Barcelona.
- Dumas, Pierre. 1942. *Le Maroc*. Les beaux pays 21. Grenoble: Arthaud.
- Duquaire, Henri. 1947. *Images du Maroc berbère*. Paris: Plon.
- Felze, Jacques. 1935. *Au Maroc inconnu dans le Haut-Atlas et le sud marocain*. Collection Art et paysages. Grenoble: Arthaud.
- Foucauld, Charles de, and François de Bondy. 1939. *Reconnaissance au Maroc 1883–1884*. Paris: Société d'éditions géographiques, maritimes et coloniales.
- Gandini, Jacques. 2014. Ouarzazate au temps du Protectorat.
<http://www.ouarzazate-1928-1956.com/>

- Gaultier-Kurhan, Caroline. 2003. *Le patrimoine culturel marocain*. Paris: Maisonneuve et Larose.
- Gelbart, Jean-Jacques. 2009. *Patrimoine mondial de l'UNESCO: Les sites marocains*. Toulouse: Gelbart.
- Gentil, Louis. 1924. *Voyages d'exploration dans l'Atlas marocain, 1923*. Paris: Comité de l'Afrique Française.
- Homet, Marcel. 1937. *Méditerranée mer impériale: Le conflit méditerranéen La France et le problème marocain*. Paris: Éditions de la Nouvelle revue critique.
- Jacques-Meunié, D. 1982. *Le Maroc saharien des origines à 1670*. [Paris]: Librairie Klincksieck.
- Le Chatelier, Alfred. 1891. *Tribus du Sud-Ouest marocain: Bassins côtiers entre Sous et Drâa*. Publications de l'Ecole des lettres d'Alger 6. Paris: E. Leroux.
<http://gallica.bnf.fr/ark:/12148/bpt6k1035508>
- Madras, Didier. 1950. *Au sud de l'Atlas vers le pays des casbahs*. Casablanca: P. Bory.
- Marocantan. 2008. Documents et souvenirs du Maroc d'autrefois.
<http://www.marocantan.com/ouarzazate/>
- Maroc du Nord au Sud. 1938. Ouarzazate et sa région. Special issue, *Maroc du Nord au Sud: Revue mensuelle de Tourisme: Aviation et Automobile*.
<http://www.ouarzazate-1928-1956.fr/de-1930-a-1940/1938-le-premier-guide-sur-ouarzazate-et-sa-region.html>
- Martin, A. G. P. 1908. *Les oasis sahariennes: (Gourara-Touat-Tidikelt)*. Paris: A. Challamel.
- Maxwell, Gavin. 1966. *Lords of the Atlas: The Rise and Fall of the House of Glaoua, 1893–1956*. New York: Dutton.
- Mazieres, M., and Joseph Goulven. 1932. *Les Kasba du Haut Atlas*. Casablanca: La vie Marocaine Illustrée.
- Michon, Jean-Louis. 2000. Deux sites architecturaux en terre inscrits à la Liste du Patrimoine mondial: Le ksar des Aït Benhaddou au Maroc, le Fort et oasis de Bahla à Oman: Problèmes de conservation et de gestion. In *Terra 2000: 8th International Conference on the Study and Conservation of Earthen Architecture, Torquay, Devon, UK, May 2000: Preprints*, 65–72. London: James & James.
- Mimó, Roger. 1996. *Fortalezas de barro en el sur de Marruecos*. Madrid: Compañía Literaria.
- Montagne, Robert. 1930. *Les Berbères et le makhzen dans le sud du Maroc: Essai sur la transformation politique des Berbères sédentaires (groupe chleuh)*. Travaux de l'Année sociologique. Paris: F. Alcan.
- . 1930. *Villages et kasbas berbères: Table.au de la vie sociale des Berbères sédentaires dans le sud du Maroc*. Paris: F. Alcan.

- Naji, Salima, and Lahoucine Rah. 2011. Le ksar d'Assa: Mémoire des lieux et compétence d'édifier dans le Maroc présaharien. In *Terra 2008: Proceedings of the 10th International Conference on the Study and Conservation of Earthen Architectural Heritage, Bamako, Mali, February 1–5, 2008*, eds. Leslie Rainer, Angelyn Bass Rivera, and David Gandreau. 338–43. Los Angeles: Getty Conservation Institute.
http://hdl.handle.net/10020/gci_pubs/terra_2008
- Nijst, A. L. M. T. 1973. *Living on the Edge of the Sahara: A Study of Traditional Forms of Habitation and Types of Settlement in Morocco*. The Hague: Govt. Pub. Office.
- Ravéreau, André. 2003. *André Ravéreau: L'atelier du désert*. Marseille: Parenthèses.
- Royaume du Maroc, Ministère de la Culture. 2007. *Ksar Aït Ben Haddou: Patrimoine mondial: Plan de gestion, 2007–2012*. Rabat: Ministère de la Culture, Royaume du Maroc.
http://craterre.org/diffusion:ouvrages-telechargeables/download/id/d0a193e19a2ba464279e7b91394clf27/file/plan_de_gestion_ait_ben_haddou.pdf
- Royaume du Maroc, Ministère des Affaires Culturelles, Direction du Patrimoine. 1990. *Patrimoine architectural des zones atlasiques et subatlasiques*. Morocco: Division de l'inventaire du patrimoine culturel.
- Soriano Alfaro, Vicent. 2006. *Arquitectura de tierra en el sur de Marruecos: El oasis de Skoura*. Colección Arquítemas, no. 18. Barcelona: Fundación Caja de Arquitectos.
- Terrasse, Henri. 1938. *Kasbas berbères de l'Atlas et des oasis: Les grandes architectures du Sud marocain*. Paris: Éditions des horizons de France.
- Tharaud, Jérôme, and Jean Tharaud. 1920. *Marrakech ou, Les seigneurs de l'Atlas*. Paris: Plon Nourrit.
<http://catalog.hathitrust.org/api/volumes/oclc/4155526.html>

Amazigh Architecture and Decorative Arts

- Becker, Cynthia J. 2006. *Amazigh Arts in Morocco: Women Shaping Berber Identity*. Austin: University of Texas Press.
- Bernasek, Lisa. 2008. *Artistry of the Everyday: Beauty and Craftsmanship in Berber Art*. Cambridge, MA: Peabody Museum Press; Chichester: John Wiley [distributor].
- Cherradi Akbil, F. 2012. Earthen architecture in Southern Morocco. In *Rammed Earth Conservation: Proceedings of the First International Conference on Rammed Earth Conservation, Restapia 2012, Valencia, Spain, 21–23 June 2012*, eds. Camilla Mileto, Fernando Vegas, and Valentina Cristini, 487–91. Boca Raton, FL: CRC Press.
- García Ramos, Alberto, Blanca Marín Zofío, M^a del Mar Carrión Ramírez, Juan M. Mateos Delgado, and Pedro García Sáez. 2012. Earth's role on Moroccan High Atlas villages' urban evolution. In *Rammed Earth Conservation: Proceedings of the First International Conference on Rammed Earth Conservation, Restapia 2012, Valencia, Spain, 21–23 June 2012*, eds. Camilla Mileto, Fernando Vegas, and Valentina Cristini, 517–22. Boca Raton, FL: CRC Press.

- Hensens, Jean. 1986. *Qsours et qasbas du Maroc: Réflexion sur l'évolution de l'habitat rural traditionnel*. Singapore: Aga Khan Awards.
- Huet, Karin, and Titouan Lamazou. 2012. *Onze lunes au Maroc chez les Berbères du Haut-Atlas*. Paris: Gallimard.
- Jacques-Meunié, D. 1961. *Cités anciennes de Mauritanie: Provinces du Tagannt et du Hodh*. Paris: Klincksieck.
- . 1962. *Architectures et habitats du Dadès, Maroc présaharien*. Paris: Klincksieck.
- Mahindad, Naima (Abderrahim). 2012. Ksar of Timinoun: A Saharan traditional earthen architecture heritage. In *Rammed Earth Conservation: Proceedings of the First International Conference on Rammed Earth Conservation, Restapia 2012, Valencia, Spain, 21–23 June 2012*, eds. Camilla Mileto, Fernando Vegas, and Valentina Cristini, 433–38. Boca Raton, FL: CRC Press.
- Manumed (Project) and Institut de recherches et d'études sur le monde arabe et musulman. 2007. *Les manuscrits berbères au Maghreb et dans les collections européennes: Localisation, identification, conservation et diffusion: Actes des journées d'étude d'Aix-en-Provence, 9 et 10 décembre 2002*. Kitab Tabulae 3. Méolans-Revel: Atelier Perrousseaux.
- Marçais, Georges. 1956. *L'art des Berbères*. Les Conférences-visites du Musée Stéphane Gsell. Alger: Impr. officielle.
- Mouline, Said. 1991. *Habitats des qsour et qasbas des vallées présahariennes*. Rabat: Ministère de l'habitat.
- Naji, Salima. 2008. *Art et architectures berbères du Maroc: Atlas et vallées présahariennes*. 2nd ed. Casablanca: Editions la Croisée des chemins.
- Paccard, André. 1980. *Traditional Islamic Craft in Moroccan Architecture*. Translated from the French by Mary Guggenheim. Saint-Jorioz, France: Atelier 74.
- Paris, André. 1925. *Documents d'architecture berbère: Sud de Marrakech*. Collection Hespéris, no. 2. Paris: E. Larose.
- Retnani, A., ed. 2011. *Arts et architecture amazighes du Maroc = Tasgda d tẓurīwin n Imazigh n Lmgrib*. Rabat: Institut royal de la culture amazighe.
- Sierra Ochoa, Alfonso de. 1960. *Vivienda Marroquí (Notas para una teoría)*. Cuadernos de Arquitectura Popular Marroquí 2. Ceuta: Editorial Cremades.
- Sijelmassi, Mohamed, Abdelkebir Khatibi, and El Houssaïn El Moujahid. 1996. *Civilisation marocaine: Arts et cultures*. Casablanca: Editions Oum; Arles: Actes Sud; Paris: Sindbad.
- Terrasse, Henri. 2010. *Kasbas berbères de l'Atlas et des oasis: Les grandes architectures du Sud marocain*. Originally published by Editions des horizons de France, 1938.
- Terrasse, Henri, and Jean Hainaut. 1925. *Les arts décoratifs au Maroc*. Paris: Henri Laurens.
- Ucel, Jeanne d'. 1932. *Berber Art: An Introduction*. Norman: University of Oklahoma Press.
- Vandenbroeck, Paul. 2000. *Azetta: L'art des femmes berbères*. Gand: Ludion; Paris: Flammarion; Bruxelles: Société des expositions du Palais des Beaux-Arts.

Rehabilitation in Practice: Planning and Intervention

- Achenza, Maria Maddalena. 2012a. Elements for the definition of good practices for the conservation and the restoration of the historical urban fabric of a Moroccan Pre-Saharan oasis. In *Rammed Earth Conservation: Proceedings of the First International Conference on Rammed Earth Conservation, Restapia 2012, Valencia, Spain, 21–23 June 2012*, eds. Camilla Mileto, Fernando Vegas, and Valentina Cristini, 607–13. Boca Raton, FL: CRC Press.
- . 2012b. *Il manuale del recupero dell'architettura storica dell'oasi di Figuig (Marocco): Criticità e buone pratiche*. Dottorato di Ricerca in Architettura, Università degli Studi di Cagliari.
- Aga Khan Program for Islamic Architecture at Harvard University and Massachusetts Institute of Technology. 1983. *Adaptive Reuse: Integrating Traditional Areas into the Modern Urban Fabric*. Cambridge, MA: The Program.
- Australia ICOMOS, Héritage Montréal for ICOMOS Canada, and ICOMOS. 2001. *La Charte de Burra: Charte d'ICOMOS Australie pour la conservation de lieux et des biens patrimoniaux de valeur culturelle*. http://www.international.icomos.org/charters/burra1999_fre.pdf
- Avrami, Erica C., Randall Mason, and Marta de la Torre. 2000. *Values and Heritage Conservation: Research Report*. Los Angeles: Getty Conservation Institute. http://hdl.handle.net/10020/gci_pubs/values_heritage_research_report
- Bandyopadhyay, Soumyen. 2011. *Manah: An Omani Oasis, an Arabian Legacy: Architecture and Social History of an Omani Settlement*. Liverpool: Liverpool University Press.
- Berriane, Mohamed. 1999. A slow rescue for Morocco's earthen citadels. *UNESCO Courier* 52 (78): 47–49.
- Boubeta Santomé, José Manuel. 2008. *La rehabilitación actual: Diagnóstico e intervención*. Madrid: Colegio Oficial de Aparejadores y Arquitectos Técnicos de Madrid.
- Bouché, Nancy. 1997. Vieux quartiers, vie nouvelle: Les quartiers anciens comme patrimoine social: Quelles implications et quelles priorités d'action? In *New Life for Old Cities = La renaissance des villes anciennes*, 19–21. Scientific Journal = Journal scientifique, 8. Paris: International Council on Monuments and Sites.
- Boussalh, Mohamed. 2009. Quel avenir pour les architectures de terre au Maroc? In *Mediterra 2009: la conferenza Mediterranea sull'architettura in terra cruda = 1ère conférence Méditerranéenne sur l'architecture de terre = 1st Mediterranean Conference on Earth Architecture*, eds. Maddalena Achenza, Mariana Correia, and Hubert Guillaud, 259–68. Architettura sostenibile. Documenti. Monfalcone, Gorizia: Edicom Edizioni.
- Casanovas, Xavier. 2008a. *Rehabilitation and Social Action in Marrakech, Morocco: Improving the Traditional Living Environment*. Brussels: Centre Méditerranéen de l'environnement Marrakech (CMEM) Morocco. http://1.static.e-corpous.org/download/notice_file/1929958/OP%20Marrakech%20EN.pdf
- . 2008b. *RehabiMed Method: Traditional Mediterranean Architecture: I Rehabilitation: Town and Territory; II Rehabilitation: Buildings*. Barcelona:

Col·legi d'Aparelladors, Arquitectes Tècnics i Enginyers d'Edificació de Barcelona.

- Drury, Paul, and Anne McPherson. 2008. *Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment*. London: English Heritage.
- Ferrari, Bruno, Benedetta Biondi, Abderrahmane Chorfi, Chiara Cirinnà, Dahaman Elkarimi, and Saverio Mecca. 2005. La formazione professionale per l'innovazione delle tecniche costruttive tradizionali: Progetto per un Centro a Chefchaouene, Marocco. In *1st International Research Seminar on Architectural Heritage and Sustainable Development of Small and Medium Cities in South Mediterranean Regions: Results and Strategies of Research and Cooperation, Thursday 27–Friday 28 May 2004, Florence, Italy*, ed. Benedetta Biondi, 823–29. Architettura in costruzione, 5. Pisa: ETS.
- Giorgi, Debora, and Mohammed Charafi. 2005. Amuggar n'latlas: Le carrefour de l'Atlas di Khénifra: Un'esperienza di progettazione partecipativa nel Medio Atlante, Marocco. In *1st International Research Seminar on Architectural Heritage and Sustainable Development of Small and Medium Cities in South Mediterranean Regions: Results and Strategies of Research and Cooperation, Thursday 27–Friday 28 May 2004, Florence, Italy*, ed. Benedetta Biondi, 787–99. Architettura in costruzione, 5. Pisa: ETS.
- Jodidio, Philip, ed. 2011. *The Aga Khan Historic Cities Programme: Strategies for Urban Regeneration*. Munich and New York: Prestel.
- Kölbl, Otto, Mohamed Boussahl, and Hans Hostettler. 2005. Requirements in an inventory on cultural heritage in Morocco and reflections on the presentation of the information. In *1st International Research Seminar on Architectural Heritage and Sustainable Development of Small and Medium Cities in South Mediterranean Regions: Results and Strategies of Research and Cooperation, Thursday 27–Friday 28 May 2004, Florence, Italy*, ed. Benedetta Biondi, 39–45. Architettura in costruzione, 5. Pisa: ETS.
- Kölbl, Otto, Amina Fadli, Mohamed Boussalh, Hans Hostettler, and Christophe Hunziker. 2002. An integrated 3D-GIS for an inventory of the historic monuments applied to the south of Morocco. In *Surveying and Documentation of Historic Buildings, Monuments, Sites: Traditional and Modern Methods: Potsdam (Germany), September 18–21, 2001: Proceedings of the XVIII International Symposium, CIPA 2001*, ed. Jörg Albertz, 78–85. International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences, vol. 34, Pt. 5/C7. Berlin: CIPA 2001 Organising Committee.
- Mahdy, Hossam, and ATHĀR Programme ICCROM. 2008. *Glossary of Arabic Terms for the Conservation of Cultural Heritage*. [S.l.]: ATHĀR Programme, Conservation of Cultural Heritage in the Arab Region. http://www.iccrom.org/ifrcdn/pdf/ICCROM_16_ATHARGlossary_en-ar.pdf
- Mason, Randall, and Erica Avrami. 2002. Heritage values and challenges of conservation planning. In *Management Planning for Archaeological Sites: An International Workshop Organized by the Getty Conservation Institute and Loyola Marymount University, 19–22 May 2000, Corinth, Greece*, eds. Jeanne Marie Teutonico and Gaetano Palumbo, 13–26. Los Angeles: Getty Conservation Institute.

- http://hdl.handle.net/10020/gci_pubs/planning_arch_sites
- McCarthy, John. 2014. Multi-image photogrammetry as a practical tool for cultural heritage survey and community engagement. *Journal of Archaeological Science* 43: 175–85.
- Pagand, Bernard. 2003. Patrimoine et développement local: Tamesloht (Maroc). In *Regards croisés sur le patrimoine dans le monde à l'aube du XXI^e siècle*, ed. Maria Gravari-Barbas and Sylvie Guichard-Anguiss, 335–48. Paris: Université de Paris-Sorbonne.
- Parks Canada. 2006. *Canadian Register of Historic Places: Writing Statements of Significance*. Winnipeg: Historic Places Program Branch, National Historic Sites Directorate, Parks Canada.
<http://www.historicplaces.ca/media/5422/sosguideen.pdf>
- Rava, Antonio. 2005. La Zaouia di Tamesloht: Un edificio sconosciuto rappresentativo di cinque secoli di cultura in Marocco. In *1st International Research Seminar on Architectural Heritage and Sustainable Development of Small and Medium Cities in South Mediterranean Regions: Results and Strategies of Research and Cooperation, Thursday 27–Friday 28 May 2004, Florence, Italy*, ed. Benedetta Biondi, 567–78. Architettura in costruzione, 5. Pisa: ETS.
- RehabiMed. 2003. *Expériences de réhabilitation méditerranéennes = Experiencias de rehabilitación mediterráneas = Mediterranean Rehabilitation Experiences*. Barcelona: Col·legi d'Aparelladors i Arquitectes Tècnics de Barcelona.
http://www.rehabimed.net/Publicacions/Experiencies_rehabilitacio_Mediterranies/Experiencias_de_rehabilitacion_mediterraneas/Experiencias%20ES_4.pdf
- Serageldin, Mona. 2004. Monitoring processes of change in historic centres: A case study of Fes, Morocco. In *Monitoring World Heritage: World Heritage 2002: Shared Legacy, Common Responsibility Associated Workshops, 11–12 November 2002 Vicenza-Italy*, 53–58. World Heritage Papers 10. Paris: UNESCO World Heritage Centre.
<http://whc.unesco.org/en/series/10/>
- Skalli, Mustapha, ed. 1990. *Colloque international sur les méthodes modernes de documentation du patrimoine architectural et urbain au Maroc: La photogrammétrie: Kasbah de Taourirt, Ouarzazate, du 5 au 9 novembre 1989*. Veröffentlichungen aus dem Deutschen Bergbau-Museum Bochum Nr 46. Bochum: Dt Bergbau-Museum.
- UNESCO and CRAterre–ENSAG. 2006. *Handbook on Cultural Heritage and Local Development for African Local Governments*.
<http://whc.unesco.org/en/activities/25/>
- UNESCO, UNDP Morocco. 1991. *Maroc: Sauvegarde du Ksar de Ait Ben Haddou*. Paris: UNESCO, UNDP.
- . 1993. *Maroc: Aménagement de la Kasbah de Taourirt, sauvegarde du Ksar de Ait Ben Haddou et projet de l'inventaire d'urgence du patrimoine atlasique*. Paris: UNESCO, UNDP.
- World Bank. 1999. *Rehabilitation of the Fez Medina: Case Study: Fez, Morocco*. Washington, DC: World Bank.
<http://documents.worldbank.org/curated/en/1999/05/440861/case-study-fez-morocco-rehabilitation-fez-medina>

Conservation of Rammed Earth

Case Studies and Practical References

- Agnew, Neville, Michael Taylor, Alejandro Alva Balderrama, and Hugo Houben, eds. 1990. *6th International Conference on the Conservation of Earthen Architecture Adobe 90 Preprints: Las Cruces, New Mexico, U.S.A., October 14–19, 1990*. Los Angeles: Getty Conservation Institute.
http://hdl.handle.net/10020/gci_pubs/adobe90
- Alejandro Sánchez, Francisco Javier, Juan Jesús Martín-del-Río, Francisco Javier Blasco López, and Vicente Flores Alés. 2012. Methodological proposal for rammed-earth wall characterization: Understanding of material in preliminary studies. In *Rammed Earth Conservation: Proceedings of the First International Conference on Rammed Earth Conservation, Restapia 2012, Valencia, Spain, 21–23 June 2012*, eds. Camilla Mileto, Fernando Vegas, and Valentina Cristini, 41–47. Boca Raton, FL: CRC Press.
- Avrami, Erica, Hubert Guillard, and Mary Hardy, eds. 2008. *Terra Literature Review: An Overview of Earthen Architecture Conservation*. Los Angeles: Getty Conservation Institute.
http://hdl.handle.net/10020/gci_pubs/terra_literature_review
- Baglioni, Eliana, L. Rovero, and U. Tonietti. 2012. The Moroccan Drâa Valley earthen architecture: Pathology and intervention criteria. In *Rammed Earth Conservation: Proceedings of the First International Conference on Rammed Earth Conservation, Restapia 2012, Valencia, Spain, 21–23 June 2012*, eds. Camilla Mileto, Fernando Vegas, and Valentina Cristini, 257–62. Boca Raton, FL: CRC Press.
- Biondi, Benedetta. 2005. Morfologia degli elementi costruttivi nello ksar di Tamnougalt, Marocco. In *1st International Research Seminar on Architectural Heritage and Sustainable Development of Small and Medium Cities in South Mediterranean Regions: Results and Strategies of Research and Cooperation, Thursday 27–Friday 28 May 2004, Florence, Italy*, ed. Benedetta Biondi, 157–69. Architettura in costruzione, 5. Pisa: ETS.
- Boussalh, Mohamed. 2005. *Conservation Manual for Earth Architecture Heritage in the Pre-Saharan Valleys of Morocco*. Ouarzazate, Morocco: CERKAS; Grenoble: CRAterre-EAG.
https://issuu.com/doc_aecc/docs/maroc_2004_manuel_conservation_eng?e=16991132/35916413
- Houben, H., and H. Guillaud. 1994. *Earth Construction: A Comprehensive Guide*. Earth Construction Series. London: Intermediate Technology Publications.
- Hughes, R. 1983. Material and structural behavior of soil constructed walls. *Monumentum* 26 (3): 175–88.

- Jaquin, Paul, and Charles Auteur. 2012. *Earth Building History, Science and Conservation*. Bracknell: IHS BRE Press.
- Jaquin, P. A., C. E. Augarde, and C. M. Gerrard. 2007. Analysis of historic rammed earth construction. In *Proceedings of the 5th International Conference [on] Structural Analysis of Historical Constructions: Possibilities of Numerical and Experimental Techniques*, eds. Paulo B. Lourenço, Pere Roca, and S. Agrawal. Vol. 2, 1091–98. Macmillan Advanced Research Series. Delhi: Macmillan.
- Jeannet, Jacky, Gérard Pollet, and Pascal Scarato. 1985. *Le Pisé: Patrimoine, restauration, technique d'avenir*. Cahiers de construction traditionnelle, no 9. Nonette: Editions CREER.
- Keefe, Laurence. 2005. *Earth Building: Methods and Materials, Repair and Conservation*. New York: Routledge.
- López Martínez, Francisco Javier. 2012. Restoration of rammed earth structures. In *Rammed Earth Conservation: Proceedings of the First International Conference on Rammed Earth Conservation, Restapia 2012, Valencia, Spain, 21–23 June 2012*, eds. Camilla Mileto, Fernando Vegas, and Valentina Cristini, 21–26. Boca Raton, FL: CRC Press.
- López Osorio, José Manuel, Alberto Montiel Lozano, and Úrsula Martín Codes. 2012. Rammed-earth construction in Southern Morocco: A reappraisal of the technology. In *Rammed Earth Conservation: Proceedings of the First International Conference on Rammed Earth Conservation, Restapia 2012, Valencia, Spain, 21–23 June 2012*, eds. Camilla Mileto, Fernando Vegas, and Valentina Cristini, 169–75. Boca Raton, FL: CRC Press.
- Maniatidis, Vasilios, and Peter Walker. 2003. *A Review of Rammed Earth Construction for DTi Partners in Innovation Project “Developing Rammed Earth for UK Housing,” May 2003*. University of Bath.
<http://people.bath.ac.uk/abspw/rammedearth/review.pdf>
- Mesbah, A., J. C. Morel, J. M. Gentilleau, and M. Olivier. 2000. Solutions techniques pour la restauration des remparts de Taroudannt (Maroc). In *Terra 2000: 8th International Conference on the Study and Conservation of Earthen Architecture, Torquay, Devon, UK, May 2000: Preprints*, 266–71. London: James & James.
- Miccoli, Lorenzo, Urs Müller, and Patrick Fontana. 2014. Mechanical behaviour of earthen materials: A comparison between earth block masonry, rammed earth and cob. *Construction and Building Materials* 61: 327–39.
- Michon, Jean-Louis. 1987. Earth architecture in South Morocco: Problems of conservation. In *Old Cultures in New Worlds: Washington, District of Columbia, United States of America, Oct. 10–15, 1987: Symposium Papers = Cultures anciennes dans les mondes nouveaux, Washington, District of Columbia, Etats-Unis d’Amerique, 10–15 octobre 1987: Communications du colloque*. Vol. 2, 961–68. ICOMOS 8th General Assembly and International Symposium = ICOMOS 8ème Assemblée générale et colloque international. Washington, DC: US/ICOMOS.
- Minke, Gernot. 2000. *Earth Construction Handbook: The Building Material Earth in Modern Architecture*. International Series on Advances in Architecture, vol. 10. Southampton: WIT Press; Computational Mechanics.
- Modica, Carlo. 2005. Il solaio in legno di palma e canne: Tecnica e processi costruttivi in un’esperienza di cantiere a Tamnougalt, Valle del Drâa. In *1st International Research Seminar on Architectural Heritage and Sustainable Development*

- of Small and Medium Cities in South Mediterranean Regions: Results and Strategies of Research and Cooperation, Thursday 27–Friday 28 May 2004, Florence, Italy*, ed. Benedetta Biondi, 179–84. Architettura in costruzione, 5. Pisa: ETS.
- Morel, J. C., Q.-B. Bui, and E. Hamard. 2012. Weathering and durability of earthen material and structures. In *Modern Earth Buildings: Materials, Engineering and Applications*, eds. M. R. Hall, R. Lindsay, and M. Krayenhoff, 282–303. Cambridge, England: Woodhead.
- Reddi, L. N., A. K. Jain, and H.-B. Yun. 2012. Soil materials for earth construction: Properties, classification and suitability testing. In *Modern Earth Buildings: Materials, Engineering and Applications*, eds. M. R. Hall, R. Lindsay, and M. Krayenhoff, 155–71. Cambridge, England: Woodhead.
- Richter, Anke. 2004. Erhaltung der traditionellen Lehmarchitektur in Südmarokko. In *Lehm 2004: Tagungsbeiträge der 4. Internationalen Fachtagung für Lehmbau = 4th International Conference on Building with Earth*, ed. Julian Reisenberger, 98–105. Weimar: Dachverband Lehm e.V.
- Rodríguez Navarro, Pablo, Francisco Juan Vidal, and Teresa Gil Piqueras. 2012. Earth construction techniques in the northern High Atlas, Morocco. In *Rammed Earth Conservation: Proceedings of the First International Conference on Rammed Earth Conservation, Restapia 2012, Valencia, Spain, 21–23 June 2012*, eds. Camilla Mileto, Fernando Vegas, and Valentina Cristini, 569–74. Boca Raton, FL: CRC Press.
- Röhlen, Ulrich, and Christof Ziegert. 2011. *Earth Building Practice: Planning, Design, Building*. Berlin: Beuth.
- Silva, Rui A., Paul Jaquin, Daniel V. Oliveira, Tiago F. Miranda, Luc Schueremans, and Nuno Cristelo. 2014. Conservation and new construction solutions in rammed earth. In *Structural Rehabilitation of Old Buildings*, eds. Anibal Costa, João Miranda Guedes, and Humberto Varum, 77–108. Building Pathology and Rehabilitation, vol. 2. Berlin: Springer.
- Zerhouni, Selma, Hubert Guillaud, Elie Mouyal, and Michel Lebrun. 2001. *L'architecture de terre au Maroc*. Paris: ACR.

Contents

Appendices

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Appendix B: Rapid Assessment

Appendix C: Architectural Survey

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Appendix E: Significance Assessment: Caïd Residence and Stara Area

Appendix F: Identification before/after 1956: Stara Area

Appendix G: Condition Assessment: Caïd Residence (CR)

Appendix H: Condition Assessment of the CR Wall Paintings

Appendix I: Action Plan: Intervention Proposal

Appendix J: Emergency Stabilization of the CR Wall Paintings

APPENDIX A

Survey Forms



Inventory number: _____
Name of the investigator: _____

Other inventory number: _____
Survey date (D/M/Y): ____/____/____

GENERAL SURVEY FORM OF THE BUILDING

ADMINISTRATIVE SECTION – General Data :

Name of the site: _____ Geographical location: _____

Administrative location (Region/Province/Municipality/Locality/Douar): _____

Geographical coordinates: _____ North _____ West

Land-register reference(s): _____

Legal protection: ☐ Not classified ☐ National Heritage ☐ World Heritage

Easement area: ☐ Yes ☐ No ☐ To review ☐ To propose

Property : ☐ Public ☐ Communal ☐ Private / Owner: _____

Local Contact: Name, Surname: _____ Phone : _____

Position: _____

Heritage Conservation Association(s) : _____

DESCRIPTION OF THE BUILDING

- | | | |
|--|---|--|
| <input type="checkbox"/> Ksar | <input type="checkbox"/> Kasbah | <input type="checkbox"/> Dwelling |
| <input type="checkbox"/> Town (Locality) | <input type="checkbox"/> Simple Kasbah | <input type="checkbox"/> Mosque |
| <input type="checkbox"/> Granary | <input type="checkbox"/> Command Kasbah | <input type="checkbox"/> Marabout-Zaouia |
| | <input type="checkbox"/> Tower | <input type="checkbox"/> Other: _____ |

Short description of the building and its different parts:

Picture :

Plan / sketch: (Indicate access, entries, open areas, and orientations)

Ground surface: _____ m²

PHYSICAL ATTRIBUTES

Materials

- ☐ Earth
☐ Stone
☐ Fired brick
☐ Unfired brick
☐ Others: _____

Particular elements

- ☐ Exterior decorations
☐ Interior decorations
☐ Wall paintings
☐ Decorated ceilings

Architectural Elements

- ☐ Tower
☐ Courtyard
☐ Arches
☐ Columns
☐ Others: _____

Transformations

Architecture

- ☐ Volumes
☐ Structural elements
☐ Materials

Used materials

- ☐ Cement / Concrete
☐ Terre
☐ Fired brick
☐ Other materials: _____

Comments : _____

LANDSCAPE

Context

- ☐ Valley
☐ Palm grove
☐ Urban area (city)
☐ Rural area (town)
☐ Isolated construction
☐ Part of a whole

Topography

- ☐ Flat terrain
☐ Inclined terrain
☐ Steep terrain

USE

Previous uses:

Current uses:

- ☐ Completely inhabited
☐ Mono familial ☐ Multi familial
☐ Partially inhabited
☐ Abandoned
☐ Inhabited but used for:
☐ Barn
☐ Business
☐ Tourism
☐ Film industry
☐ Pilgrimage
☐ Other: _____

Impact of uses:

- ☐ Appropriate (contribute to the preservation of the significance)
☐ Inappropriate (accelerates the alteration of the building)

Intended uses:

- ☐ Not defined
☐ Proposed: _____
☐ Project manager: _____
☐ Comments: _____

Networks

Water:

- ☐ Working
☐ Defective
☐ Nonexistent

Power:

- ☐ Working
☐ Defective
☐ Nonexistent

Plumbing:

- ☐ Working
☐ Defective
☐ Nonexistent

STATE OF CONSERVATION

Landscape

- ☐ Unaltered
☐ Partially altered
☐ Completely altered

If altered :

- ☐ Reversible alterations
☐ Non-reversible alterations

Architecture

- ☐ Good
☐ Deteriorated (recoverable)
☐ Partially ruined
☐ Completely ruined

Comments:

Alteration extent

Landscape: _____ % of the surrounding landscape
 Architecture: _____ % of the volume of the building
 Materials: _____ % of the walls intervened with new materials

VULNERABILITIES/THREATS

Landscape

- ☐ Urban development
☐ Natural disaster

☐ Others: _____

Architecture

- | | | |
|---|--------------------------------------|---|
| <input type="checkbox"/> Depreciate | <input type="checkbox"/> Floods | <input type="checkbox"/> Water leakage |
| <input type="checkbox"/> Loss of the know-how | <input type="checkbox"/> Rains | <input type="checkbox"/> Pipes/drains |
| <input type="checkbox"/> New materials | <input type="checkbox"/> Earthquakes | <input type="checkbox"/> Roofs |
| <input type="checkbox"/> Inappropriate use | <input type="checkbox"/> Animals | <input type="checkbox"/> Capillary rise |

☐ Others: _____

Level of threat

to the landscape	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Low	<input type="checkbox"/> Nonexistent
to the architecture	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Low	<input type="checkbox"/> Nonexistent
to the materials	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Low	<input type="checkbox"/> Nonexistent

GENERAL ASSESSMENT

Architectural interest

- ☐ Extraordinary ☐ High ☐ Medium ☐ Low

Values

Historical	<input type="checkbox"/> Extraordinary	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Low
Religious	<input type="checkbox"/> Extraordinary	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Low
Social	<input type="checkbox"/> Extraordinary	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Low
Economic	<input type="checkbox"/> Extraordinary	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Low
Cultural	<input type="checkbox"/> Extraordinary	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Low
Ethnographic	<input type="checkbox"/> Extraordinary	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Low
Other:	<input type="checkbox"/> Extraordinary	<input type="checkbox"/> High	<input type="checkbox"/> Medium	<input type="checkbox"/> Low

[illegible]



Inventory number : _____

Other inventory number : _____

Name of the investigator: _____

Survey date (D/M/Y) : ____/____/____

VISUAL INSPECTION FORM SECTOR/BUILDING

Sector/Building name _____

GENERAL DESCRIPTION

DESCRIPTION

Type of building

☐ Isolated building☐ Main building☐ Group :# units _____☐ Secondary building(s)

Type of structure according to the function

Kasbah :

☐ Primary residence☐ Courtyard☐ Kitchen☐ Reception hall☐ Tower☐ Granary☐ Stable☐ Walls☐ Dwelling☐ Room☐ Service☐ Other : _____

Ksar / town :

☐ School☐ Koranic school☐ Mosque☐ Dwelling☐ Kasbah☐ Square/market☐ Public square☐ Marabout☐ Other : _____

Granary :

☐ Workshop☐ Mosque☐ Tower☐ Kitchen☐ Hive

Architectural elements

☐ Levels : # _____☐ Entry :☐ Single☐ Multiple : # _____☐ Courtyard(s) :☐ Central : # _____☐ Eccentric : # _____☐ Tour(s) : # _____☐ Façade(s) :☐ Single☐ Multiple : # _____

Sketch

Picture :

Plan / Sketch : (Indicate access, entries, open areas, and orientations)

Ground surface : _____ m²

USE

Previous uses :

Current uses :

- | | | |
|-------------------------------------|---|------------------------------------|
| <input type="checkbox"/> Inhabited | <input type="checkbox"/> Not inhabited but occupied (animals) : | <input type="checkbox"/> Abandoned |
| <input type="checkbox"/> Partially | <input type="checkbox"/> Partially | |
| <input type="checkbox"/> Completely | <input type="checkbox"/> Completely | |

Type of use :

- | | | |
|--|---|--|
| <input type="checkbox"/> Residential : | <input type="checkbox"/> Administrative | <input type="checkbox"/> Film industry |
| <input type="checkbox"/> Single-family | <input type="checkbox"/> Workshop | <input type="checkbox"/> Pilgrimage |
| <input type="checkbox"/> Multi-family | <input type="checkbox"/> Business | <input type="checkbox"/> Other : |
| | <input type="checkbox"/> Religious | |

Impact of uses:

- | |
|---|
| <input type="checkbox"/> Appropriate (contribute to the preservation of the significance) |
| <input type="checkbox"/> Inappropriate (accelerates the alteration of the building) |

Intended uses:

- | | |
|--------------------------------------|--|
| <input type="checkbox"/> Not defined | <input type="checkbox"/> Proposed : _____ |
| | <input type="checkbox"/> Project manager : _____ |

Comments : _____

Networks

- | | | |
|-------------------------------------|-------------------------------------|-------------------------------------|
| Water: | Power: | Plumbing: |
| <input type="checkbox"/> Working | <input type="checkbox"/> Working | <input type="checkbox"/> Working |
| <input type="checkbox"/> Defective | <input type="checkbox"/> Defective | <input type="checkbox"/> Defective |
| <input type="checkbox"/> Inexistent | <input type="checkbox"/> Inexistent | <input type="checkbox"/> Inexistent |

CONSTRUCTIVE ELEMENTS

FOUNDATIONS

Foundations

- | | | | |
|---|---------------------------------------|--|--|
| <input type="checkbox"/> Without foundation | <input type="checkbox"/> Foundations: | On : | Materials : |
| <input type="checkbox"/> Rocky soil | <input type="checkbox"/> Masonry | <input type="checkbox"/> Flat terrain | <input type="checkbox"/> Stone |
| <input type="checkbox"/> Soft soil | <input type="checkbox"/> Conglomerate | <input type="checkbox"/> Hilly terrain | <input type="checkbox"/> Adobe |
| | | | <input type="checkbox"/> Unfired brick |

Bedrock

- | | | |
|------------------------------|--------------------------------|--|
| <input type="checkbox"/> Yes | <input type="checkbox"/> Stone | <input type="checkbox"/> Unfired brick |
| <input type="checkbox"/> No | <input type="checkbox"/> Adobe | <input type="checkbox"/> Rammed earth |

Significance of the foundation and of the bedrock

- | | | | |
|--|--|--|------------------------------------|
| Original materials: | Materials (intervention) : | Impact of the intervention: | Alteration %: |
| <input type="checkbox"/> Intact | <input type="checkbox"/> Cement / Concrete | <input type="checkbox"/> Intrusive | <input type="checkbox"/> 100%– 0% |
| <input type="checkbox"/> Preserved | <input type="checkbox"/> Adobe | <input type="checkbox"/> Jeopardizing of the structure | <input type="checkbox"/> 75%– 25% |
| <input type="checkbox"/> Extraordinary | <input type="checkbox"/> Rammed earth | <input type="checkbox"/> Reversible | <input type="checkbox"/> 50%– 50% |
| <input type="checkbox"/> Good construction | <input type="checkbox"/> Other: _____ | | <input type="checkbox"/> 25% – 75% |
| <input type="checkbox"/> Bad construction | | | <input type="checkbox"/> %– 100% |

WALLS

Description	Material :	Shape :	Structural function :
	<input type="checkbox"/> Rammed earth <input type="checkbox"/> Adobe	<input type="checkbox"/> Pyramidal <input type="checkbox"/> Straight	<input type="checkbox"/> Load bearing <input type="checkbox"/> Not-load bearing
Openings	<input type="checkbox"/> Windows : <input type="checkbox"/> Plastered reveal <input type="checkbox"/> Gable flashing <input type="checkbox"/> Wood / Metal carpentry <input type="checkbox"/> Decorative grid		<input type="checkbox"/> Doors : <input type="checkbox"/> Decorated frame <input type="checkbox"/> Traditional decoration / not decorated <input type="checkbox"/> Metallic door <input type="checkbox"/> Gutter
Decorative features	<input type="checkbox"/> Walls : <input type="checkbox"/> Niches <input type="checkbox"/> Wall paintings <input type="checkbox"/> Ceramic <input type="checkbox"/> Plasterwork	<input type="checkbox"/> Ceilings	Location : <input type="checkbox"/> Interior <input type="checkbox"/> Courtyard <input type="checkbox"/> Cornice <input type="checkbox"/> Corbel

Significance of the walls

Quality:	Type :	Materials (intervention) :	Impact of the intervention:	Alteration %:
<input type="checkbox"/> Intact	<input type="checkbox"/> Superficial	<input type="checkbox"/> Adobe	<input type="checkbox"/> Intrusive	<input type="checkbox"/> 100%– 0%
<input type="checkbox"/> Preserved	<input type="checkbox"/> Affixed	<input type="checkbox"/> Rammed earth	<input type="checkbox"/> Non-Intrusive	<input type="checkbox"/> 75%– 25%
<input type="checkbox"/> Extraordinary	<input type="checkbox"/> Encased	<input type="checkbox"/> Unfired brick	<input type="checkbox"/> Jeopardizing of the structure	<input type="checkbox"/> 50%– 50%
<input type="checkbox"/> Good construction	<input type="checkbox"/> Reconstructed	<input type="checkbox"/> Cement / Concrete	<input type="checkbox"/> Reversible	<input type="checkbox"/> 25% – 75%
<input type="checkbox"/> Bad construction		<input type="checkbox"/> Other:_____		<input type="checkbox"/> %– 100%

SLABS

Floor slabs	Structure:	Finishing of the ceiling:	Finishing of the floor:
	<input type="checkbox"/> Timber beam <input type="checkbox"/> Timber joist <input type="checkbox"/> Mulch	<input type="checkbox"/> Painted reed canes <input type="checkbox"/> Plaster <input type="checkbox"/> Paint	<input type="checkbox"/> Earth <input type="checkbox"/> Cement <input type="checkbox"/> Ceramic
Roof slabs	<input type="checkbox"/> Timber beam <input type="checkbox"/> Timber joist <input type="checkbox"/> Mulch		<input type="checkbox"/> Rendering <input type="checkbox"/> Finishing work on the walls

Significance of the slabs

Quality:	Type :	Materials (intervention) :	Impact of the intervention:	Alteration %:
<input type="checkbox"/> Intact	<input type="checkbox"/> Superficial	<input type="checkbox"/> Cement / Concrete	<input type="checkbox"/> Intrusive	<input type="checkbox"/> 100%– 0%
<input type="checkbox"/> Preserved	<input type="checkbox"/> Affixed	<input type="checkbox"/> Timber	<input type="checkbox"/> Non-Intrusive	<input type="checkbox"/> 75%– 25%
<input type="checkbox"/> Extraordinary	<input type="checkbox"/> Encased	<input type="checkbox"/> Other:_____	<input type="checkbox"/> Jeopardizing of the structure	<input type="checkbox"/> 50%– 50%
<input type="checkbox"/> Good construction	<input type="checkbox"/> Reconstructed		<input type="checkbox"/> Reversible	<input type="checkbox"/> 25% – 75%
<input type="checkbox"/> Bad construction				<input type="checkbox"/> %– 100%

FAÇADES

Plastering

INTERIOR:

- | | | |
|---------------------------------------|---------------------------------------|---------------------------------------|
| <input type="checkbox"/> Earth : | <input type="checkbox"/> Lime : | <input type="checkbox"/> Cement : |
| <input type="checkbox"/> Substructure | <input type="checkbox"/> Substructure | <input type="checkbox"/> Substructure |
| <input type="checkbox"/> Walls | <input type="checkbox"/> Walls | <input type="checkbox"/> Walls |

☐ Other :

EXTERIOR :

- | | | |
|---------------------------------------|---------------------------------------|---------------------------------------|
| <input type="checkbox"/> Earth : | <input type="checkbox"/> Lime : | <input type="checkbox"/> Cement : |
| <input type="checkbox"/> Substructure | <input type="checkbox"/> Substructure | <input type="checkbox"/> Substructure |
| <input type="checkbox"/> Walls | <input type="checkbox"/> Walls | <input type="checkbox"/> Walls |

☐ Other :

Façade elements

- ☐
- Decorative features :
- ☐ First period (until 1850)
 - ☐ Second period (second half of the 19th century)
 - ☐ Third period (first half of the 20th century)
- ☐
- Acroterion / top of the wall eave
-
- ☐
- Wall extension

Towers

Number of towers :

Shape/Plan :

Materials :

- ☐
- Pyramidal
-
- ☐
- Quadrangular
-
- ☐
- Rectangular

- ☐
- Rammed earth
-
- ☐
- Adobe
-
- ☐
- Other :

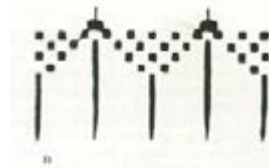
Number of levels / tower :

Typology

☐ Type A


Location :

- ☐
- Interior
-
- ☐
- Courtyard
-
- ☐
- Cornice / strip
-
- ☐
- Cantilever

☐ Type B


Situation :

- ☐
- Interior
-
- ☐
- Courtyard
-
- ☐
- Cornice / strip
-
- ☐
- Cantilever

☐ Type C


Situation :

- ☐
- Interior
-
- ☐
- Courtyard
-
- ☐
- Cornice / strip
-
- ☐
- Cantilever

☐ Other:

Significance of the façades

Quality:	Type :	Materials (intervention) :	Impact of the intervention:	Alteration %:
<input type="checkbox"/> Intact	<input type="checkbox"/> New decoration	<input type="checkbox"/> Cement / Concrete	<input type="checkbox"/> Intrusive	<input type="checkbox"/> 100%– 0%
<input type="checkbox"/> Preserved	<input type="checkbox"/> Filled decoration	<input type="checkbox"/> Timber	<input type="checkbox"/> Non-Intrusive	<input type="checkbox"/> 75%– 25%
<input type="checkbox"/> Extraordinary	<input type="checkbox"/> New plastering	<input type="checkbox"/> Other:_____	<input type="checkbox"/> Jeopardizing of the structure	<input type="checkbox"/> 50%– 50%
<input type="checkbox"/> Good construction	<input type="checkbox"/> New paint		<input type="checkbox"/> Reversible	<input type="checkbox"/> 25% – 75%
<input type="checkbox"/> Bad construction				<input type="checkbox"/> %– 100%

ARCHITECTURAL SIGNIFICANCE OF THE BUILDING

ORIGINAL	INTERVENTIONS		
Quality:	Type :	Impact of the intervention:	Original vs intervention :
<input type="checkbox"/> Intact : _____%	<input type="checkbox"/> Superficial : _____%	<input type="checkbox"/> Intrusive : _____%	<input type="checkbox"/> 100%– 0%
<input type="checkbox"/> Preserved : _____%	<input type="checkbox"/> Affixed : _____%	<input type="checkbox"/> Non-Intrusive : _____%	<input type="checkbox"/> 75%– 25%
<input type="checkbox"/> Extraordinary : _____%	<input type="checkbox"/> Encased : _____%	<input type="checkbox"/> Jeopardizing of the structure : _____%	<input type="checkbox"/> 50%– 50%
<input type="checkbox"/> Good construction : _____%	<input type="checkbox"/> Reconstructed : _____%	<input type="checkbox"/> Reversible : _____%	<input type="checkbox"/> 25% – 75%
<input type="checkbox"/> Bad construction : _____%			<input type="checkbox"/> %– 100%
VALUE	<input type="checkbox"/> Extraordinary <input type="checkbox"/> High <input type="checkbox"/> Meaningful <input type="checkbox"/> Not meaningful <input type="checkbox"/> Insignificant		

STATE OF CONSERVATION	IDENTIFICATION IN THE PLANS		PICTURE
Sector/building collapse <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Walls <input type="checkbox"/> Roof <input type="checkbox"/> Floors		
<div> <input type="checkbox"/> Active : <input type="checkbox"/> Jeopardizing of the structure <input type="checkbox"/> Superficial impact <input type="checkbox"/> Not active </div> <div> If active : <input type="checkbox"/> Repairable <input type="checkbox"/> Not repairable </div>			
Partial collapse <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Walls <input type="checkbox"/> < 50% of the walls <input type="checkbox"/> > 50% of the walls <input type="checkbox"/> Roof <input type="checkbox"/> < 50% of the walls <input type="checkbox"/> > 50% of the walls <input type="checkbox"/> Floor <input type="checkbox"/> < 50% of the walls <input type="checkbox"/> > 50% of the walls		
<div> <input type="checkbox"/> Active : <input type="checkbox"/> Jeopardizing of the structure <input type="checkbox"/> Superficial impact <input type="checkbox"/> Not active </div> <div> If active : <input type="checkbox"/> Repairable <input type="checkbox"/> Not repairable </div>			
Block due to debris <input type="checkbox"/> Yes <input type="checkbox"/> No	Location : <input type="checkbox"/> In the building <input type="checkbox"/> Exterior <input type="checkbox"/> Beside the walls <input type="checkbox"/> Top of the roof		
<div> <input type="checkbox"/> Active : <input type="checkbox"/> Jeopardizing of the structure <input type="checkbox"/> Superficial impact <input type="checkbox"/> Not active </div> <div> If active : <input type="checkbox"/> Repairable <input type="checkbox"/> Not repairable </div>			
Collapse of the walls <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Centre <input type="checkbox"/> Corner		
<div> <input type="checkbox"/> Active : <input type="checkbox"/> Jeopardizing of the structure <input type="checkbox"/> Superficial impact <input type="checkbox"/> Not active </div> <div> If active : <input type="checkbox"/> Repairable <input type="checkbox"/> Stop deterioration <input type="checkbox"/> Slow deterioration <input type="checkbox"/> Reverse the trend <input type="checkbox"/> Not repairable </div>			

STATE OF CONSERVATION	IDENTIFICATION IN THE PLANS	PICTURE
Leaking over the walls <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Punctual <input type="checkbox"/> Upper part <input type="checkbox"/> Lower part <input type="checkbox"/> All along the wall	
<div> <input type="checkbox"/> Active : <input type="checkbox"/> Jeopardizing of the structure <input type="checkbox"/> Superficial impact <input type="checkbox"/> Not active </div> <div> If active : <input type="checkbox"/> Repairable <input type="checkbox"/> Stop deterioration <input type="checkbox"/> Slow deterioration <input type="checkbox"/> Reverse the trend <input type="checkbox"/> Not repairable </div>		
Detachment of the plaster <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Centre <input type="checkbox"/> Corners <input type="checkbox"/> Upper part <input type="checkbox"/> Lower part	
<div> <input type="checkbox"/> Active : <input type="checkbox"/> Jeopardizing of the structure <input type="checkbox"/> Superficial impact <input type="checkbox"/> Not active </div> <div> If active : <input type="checkbox"/> Repairable <input type="checkbox"/> Stop deterioration <input type="checkbox"/> Slow deterioration <input type="checkbox"/> Reverse the trend <input type="checkbox"/> Not repairable </div>		
Deterioration of the corners <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Towards interior <input type="checkbox"/> Towards exterior	
<div> <input type="checkbox"/> Active : <input type="checkbox"/> Jeopardizing of the structure <input type="checkbox"/> Superficial impact <input type="checkbox"/> Not active </div> <div> If active : <input type="checkbox"/> Repairable <input type="checkbox"/> Stop deterioration <input type="checkbox"/> Slow deterioration <input type="checkbox"/> Reverse the trend <input type="checkbox"/> Not repairable </div>		
Structural cracks <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Horizontal <input type="checkbox"/> Vertical <input type="checkbox"/> Diagonal <input type="checkbox"/> L-shaped <input type="checkbox"/> X-shaped	
<div> <input type="checkbox"/> Active : <input type="checkbox"/> Jeopardizing of the structure <input type="checkbox"/> Superficial impact <input type="checkbox"/> Not active </div> <div> If active : <input type="checkbox"/> Repairable <input type="checkbox"/> Stop deterioration <input type="checkbox"/> Slow deterioration <input type="checkbox"/> Reverse the trend <input type="checkbox"/> Not repairable </div>		

STATE OF CONSERVATION	IDENTIFICATION IN THE PLANS	PICTURE
Detachment of the structure <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Between walls : <input type="checkbox"/> Corner <input type="checkbox"/> T-wall intersection <input type="checkbox"/> Floor and walls : <input type="checkbox"/> Centre <input type="checkbox"/> Corner <input type="checkbox"/> Perimeter <input type="checkbox"/> Slabs and walls : <input type="checkbox"/> Centre <input type="checkbox"/> Corner <input type="checkbox"/> Perimeter <input type="checkbox"/> Lintel : <input type="checkbox"/> Centre <input type="checkbox"/> Perimeter	
<div> <input type="checkbox"/> Active : <input type="checkbox"/> Jeopardizing of the structure <input type="checkbox"/> Superficial impact <input type="checkbox"/> Not active </div> <div> If active : <input type="checkbox"/> Repairable : <input type="checkbox"/> Not repairable </div>		
Erosion <input type="checkbox"/> Yes: <input type="checkbox"/> Light <input type="checkbox"/> Important <input type="checkbox"/> No	<input type="checkbox"/> Centre <input type="checkbox"/> Corner <input type="checkbox"/> Higher parts <input type="checkbox"/> Lower parts	
<div> <input type="checkbox"/> Active : <input type="checkbox"/> Jeopardizing of the structure <input type="checkbox"/> Superficial impact <input type="checkbox"/> Not active </div> <div> If active : <input type="checkbox"/> Repairable <input type="checkbox"/> Stop deterioration <input type="checkbox"/> Slow deterioration <input type="checkbox"/> Reverse the trend <input type="checkbox"/> Not repairable </div>		
Capillary <input type="checkbox"/> Yes : <input type="checkbox"/> Light <input type="checkbox"/> Important	Location : <input type="checkbox"/> Local <input type="checkbox"/> Overall	<input type="checkbox"/> Together with : <input type="checkbox"/> Efflorescences <input type="checkbox"/> Microorganisms <input type="checkbox"/> Vegetation <input type="checkbox"/> No
<div> <input type="checkbox"/> Active : <input type="checkbox"/> Jeopardizing of the structure <input type="checkbox"/> Superficial impact <input type="checkbox"/> Not active </div> <div> If active : <input type="checkbox"/> Repairable <input type="checkbox"/> Stop deterioration <input type="checkbox"/> Slow deterioration </div>		

STATE OF CONSERVATION		IDENTIFICATION IN THE PLANS	PICTURE
		<input type="checkbox"/> Reverse the trend <input type="checkbox"/> Not repairable	
Leaks	<input type="checkbox"/> Yes : <input type="checkbox"/> Light <input type="checkbox"/> Important <input type="checkbox"/> Together with : <input type="checkbox"/> Efflorescences <input type="checkbox"/> Microorganisms <input type="checkbox"/> Vegetation <input type="checkbox"/> No <input type="checkbox"/> Active : <input type="checkbox"/> Jeopardizing of the structure <input type="checkbox"/> Superficial impact <input type="checkbox"/> Not active	Location : <input type="checkbox"/> Pipes <input type="checkbox"/> Roof <input type="checkbox"/> Base <input type="checkbox"/> Loss of adhesion <input type="checkbox"/> Loss of cohesion If active : <input type="checkbox"/> Repairable <input type="checkbox"/> Stop deterioration <input type="checkbox"/> Slow deterioration <input type="checkbox"/> Reverse the trend <input type="checkbox"/> Not repairable	
Deterioration due to animals	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Active : <input type="checkbox"/> Jeopardizing of the structure <input type="checkbox"/> Superficial impact <input type="checkbox"/> Not active	<input type="checkbox"/> Centre <input type="checkbox"/> Corner <input type="checkbox"/> Higher parts <input type="checkbox"/> Lower parts If active : <input type="checkbox"/> Repairable <input type="checkbox"/> Not repairable	
STATE OF CONSERVATION			
State of conservation	<input type="checkbox"/> Good <input type="checkbox"/> Deteriorated (recoverable) <input type="checkbox"/> Partially ruined <input type="checkbox"/> Ruined		
Damages	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Active : _____ % <input type="checkbox"/> Jeopardizing of the structure : _____ % <input type="checkbox"/> Superficial impact : _____ % <input type="checkbox"/> Not active : _____ %		

STATE OF CONSERVATION

IDENTIFICATION IN
THE PLANS

PICTURE

INTERVENTIONS

Summary

Architectural value :

- ☐ Extraordinary
☐ High
☐ Meaningful
☐ Not meaningful
☐ Insignificant

Damages :

- ☐ Active :
☐ Jeopardizing of the structure
☐ Superficial impact
☐ Not active

PROPOSALS

☐ Emergency
interventions

☐ Cleaning
☐ Protection

☐ Demolition
☐ Stabilization

☐ Preservation :

Term :

- ☐ Emergency
☐ Mid-term

☐ Repair :

Term :

- ☐ Emergency
☐ Mid-term

☐ Restauration :

Term :

- ☐ Emergency
☐ Mid-term

☐ Reconstruction :

Term :

- ☐ Emergency
☐ Mid-term

APPENDIX B

Rapid Assessment



INTEGRATED CONSERVATION PLAN FOR TAOURIRT

PHASE I 2011 - 2013

METHODOLOGY FOR THE DOCUMENTATION, EMERGENCY STABILIZATION AND REHABILITATION PLAN FOR TAOURIRT

PROPOSAL:

THE PHASE I OBJECTIVE IS TO DEVELOP A METHODOLOGY FOR THE DOCUMENTATION, EMERGENCY STABILIZATION AND THE REHABILITATION PLANNING OF THE EARTHEN KASBAH TAOURIRT IN OUARZAZATE MOROCCO, INVOLVING KEY PLAYERS IN THE PROCESS. PHASE I IS A FIRST STEPS/SMALL BITE TOWARDS BUILDING AN INTEGRATED CONSERVATION PROJECT METHODOLOGY THAT COULD BE APPLIED TO THE ENTIRE ENSEMBLE OF TAOURIRT (KSAR, OTHER KASBAS AND ASSOCIATED LANDSCAPE AND OTHER SITES IN SOUTHERN MOROCCO). USING A SECTION OF THE KASBAH CURRENTLY BEING CONSIDERED FOR REHABILITATION AS A CASE STUDY, THE PROJECT AIMS TO DEVELOP THE PROPOSED METHODOLOGY WITH THE KEY STAKEHOLDERS AND APPLY IT. IT INVOLVES WORKING WITH AUTHORITIES TO ESTABLISH AN APPROPRIATE CONSERVATION PROCESS THAT RESPECTS THE ORIGINAL FABRIC, PRESERVE THE TECHNICAL KNOWHOW, PROMOTE EARTHEN ARCHITECTURE AS A VIABLE CONSTRUCTION SYSTEM, DEVELOPS APPROPRIATE PARTICIPATORY PROCESSES AND BUILDS LOCAL CAPACITY IN THESE AREAS.

OBJECTIVES:

- DESIGN A DOCUMENTATION METHODOLOGY (INCLUDING BASE MAPPING, CONDITIONS AND VALUES ASSESSMENT) TO BE USED AS A DECISION MAKING TOOL TO PRIORITIZE AREAS FOR EMERGENCY STABILIZATION AND CONSERVATION PLANNING.
- IMPLEMENT EMERGENCY STABILIZATION IN A SECTOR OF THE KASBAH (EITHER WITHIN THE STARA OR THE CAID RESIDENCE) AND DESIGN GUIDELINES FOR EMERGENCY STABILIZATION OF MOROCCAN EARTHEN STRUCTURES IN STATE OF ABANDONMENT.
- USE THE INFORMATION COLLECTED AFTER THE DOCUMENTATION OF THE KASBAH TO DESIGN, IN COLLABORATION WITH KEY STAKEHOLDERS, A CONSERVATION PLAN FOR THE REHABILITATION OF THE KASBAH.
- BUILD THE KNOWLEDGE AND UNDERSTANDING OF MOROCCAN KEY STAKEHOLDERS/COLLABORATORS IN RELEVANT CONSERVATION APPROACHES TO ENHANCE THEIR CAPACITY AND ASSIST IN SECURING IMPROVED OUTCOMES.
- DEVELOP A REHABILITATION PROPOSAL FOR THE KASBAH, CONSIDERING THE WHOLE SITE AND EACH OF ITS SECTORS, AS WELL AS THE CONNECTION WITH THE KSAR AND THE URBAN CONTEXT.
- OBTAIN THE RECOGNITION, APPROVAL AND PROMOTION OF THE PROPOSED METHODOLOGY AND CONSERVATION PLAN BY LOCAL AUTHORITIES THROUGH THEIR INVOLVEMENT IN THE PROCESS.

DETAILED ACTIVITIES OF THE FEASIBILITY OF PHASE:

ALL PLAN ACTIVITIES CAN BE DIVIDED IN: 1) PRELIMINARY PLANNING, 2) DOCUMENTATION AND ASSESSMENT, 3) CONSERVATION AND REHABILITATION PLAN, AND, 4) IMPLEMENTATION.

PRELIMINARY PLANNING:

METHODOLOGY AND OBJECTIVES: ORGANIZE A MEETING WITH PRIMARY STAKEHOLDERS OF THE KASBAH THE MUNICIPALITY OF OUARZAZATE, PRESIDENT AND PLANNING DEPARTMENT (OWNER); CERKAS; AGENCE URBAINE; THE PROVINCIAL URBAN DIVISION (GOVERNORAT); AND GCI (STAFF AND CONSULTANT -GATERED) TO DEFINE THE PROJECT OBJECTIVES OF PHASE I AND ESTABLISH THE WORKING METHODOLOGY.

DEFINITION OF WORKING TEAM: DESIGNATE TEAM MEMBERS TO WORK ON THE DEVELOPMENT OF THE FEASIBILITY PHASE DESIGN DIFFERENT ACTIVITIES ESTABLISH FINANCIAL COMMITMENTS AND DEFINE RESPONSIBILITIES.

DOCUMENTATION: ASSESS EXISTING DOCUMENTATION AND DOCUMENTATION NEEDS; DOCUMENT SITE CLEANING IN THE SELECTED AREA OF THE STARA AND CAID RESIDENCE SECTIONS OF THE KASBAH.

DOCUMENTATION AND ASSESSMENT:

DOCUMENTATION: DESIGN A METHODOLOGY AND CARRY ON THE DOCUMENTATION OF THE SITE TRAINING AND ENGAGING THE LOCAL TEAM TO CARRY IT OUT HERE AND IN THE FUTURE ON OTHER SITES.

SITE ANALYSIS FOR EMERGENCY STABILIZATION: IDENTIFICATION AND PRIORITIZATION OF AREAS IN NEED OF EMERGENCY STABILIZATION, DESIGN AND IMPLEMENTATION OF PROPER STABILIZATION TECHNIQUES TRAINING THE LOCAL TEAM TO CARRY THEM LATER IN OTHER SITES.

EMERGENCY STABILIZATION GUIDELINES: DESIGN GUIDELINES FOR THE DOCUMENTATION AND EMERGENCY STABILIZATION OF MOROCCAN EARTHEN STRUCTURES IN STATE OF ABANDONMENT.

STATEMENT OF SIGNIFICANCE: PREPARE IN COLLABORATION WITH PRIMARY STAKEHOLDERS A DETAILED ANALYSIS OF THE VALUES OF THE KASBAH AND ESTABLISH ITS STATEMENT OF SIGNIFICANCE. SET THE PRINCIPLES THAT WILL DRIVE THE CONSERVATION AND HABITATION PLAN AND REVIEW THE ARCHITECTURAL PROGRAM OF THE KASBAH.

CHARTER: REVIEW THE KSAR AND KASBAH PRELIMINARY STATEMENT OF AND ORGANIZE A COMMUNITY STAKEHOLDERS' AND INTERESTED PARTIES MEETINGS TO DEVELOP THE "CHARTER FOR THE CONSERVATION OF TAOURIRT". DEVELOP ENHANCED PROTECTIVE MECHANISMS FOR THE ENTIRE ENSEMBLE OF TAOURIRT THAT ADEQUATELY PROTECTS ITS CULTURAL HERITAGE SIGNIFICANCE.

CAPACITY BUILDING ACTIVITIES: ORGANIZE WORKSHOPS AND WORKING SESSION TO DISSEMINATE THE PROCESS, MECHANISMS AND RESULTS OF THE WORK AND BUILD LOCAL CAPACITY.

THE CONSERVATION AND REHABILITATION PLAN:

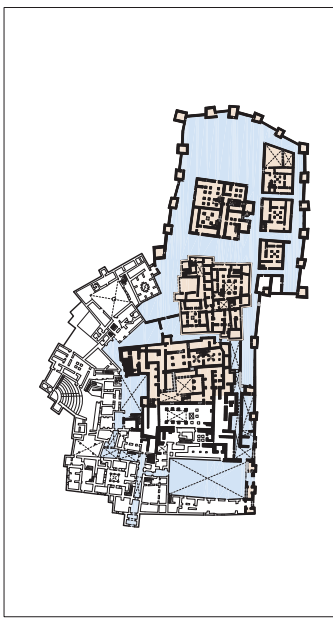
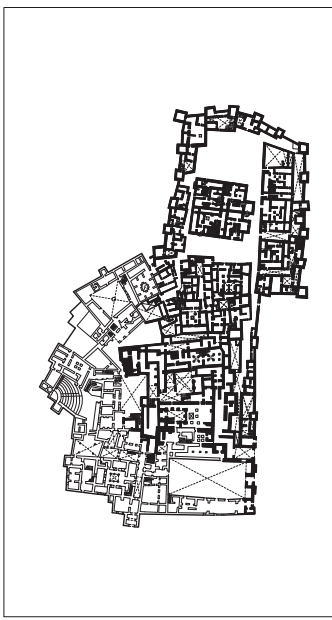
DEVELOPMENT OF THE CONSERVATION PLAN: SERIES OF ORGANIZED MEETINGS TO DEVELOP THE CONSERVATION PLAN OF THE KASBAH WITH PRIMARY STAKEHOLDERS, DISCUSSING A PROPOSED USE OF THE SITE STRENGTHENING ITS RELATIONSHIP WITH THE ENTIRE KSAR.

DEFINITION OF PLAN AND DIFFERENT PHASES OF IMPLEMENTATION: DEVELOP A DETAILED WORKING PLAN FOR THE IMPLEMENTATION OF THE CONSERVATION AND REHABILITATION PLAN OF THE KASBAH, ASSIGNING CLEAR RESPONSIBILITIES FOR EACH OF THE ACTIVITIES.

CAPACITY BUILDING ACTIVITIES: PRESENT AND DISCUSS THE GUIDELINES TO OBTAIN RECOGNITION, APPROVAL AND PROMOTION OF THE PROPOSED METHODOLOGY.

THE PROJECT IMPLEMENTATION:

PROJECT IMPLEMENTATION: CARRY ON A SERIES OF CAMPAIGNS TO ASSIST IN MANAGING THE IMPLEMENTATION OF THE REHABILITATION PROPOSAL AND ENGAGE AUTHORITIES ON THE DEVELOPMENT AND IMPLEMENTATION OF SIMILAR CONSERVATION PLANS IN OTHER SITES AND THE KSAR.



KASBAH OF TAOURIRT - ENTIRE ENSEMBLE
AROUND 1940 AND IN CAD



Scale 1:2000

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

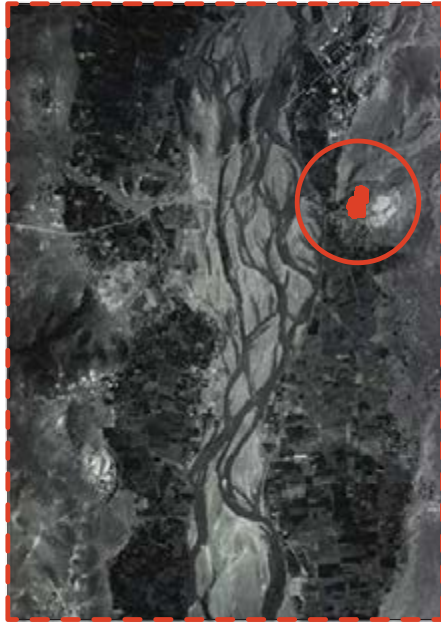
The Getty Conservation Institute



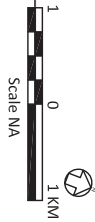
Site:	KASBAH TAOURIRT	
Drawing:	PROJECT PROPOSAL	
Reviewed by:	M. Boussal, F. Deschamps	Created by: C. Cancino

Base map compile from:	CERKAS Survey Stara East
Scale 1:200 and 1:100	CERKAS Roof plan ensemble
Scale 1:200	CERKAS Microstation Caïd Residence

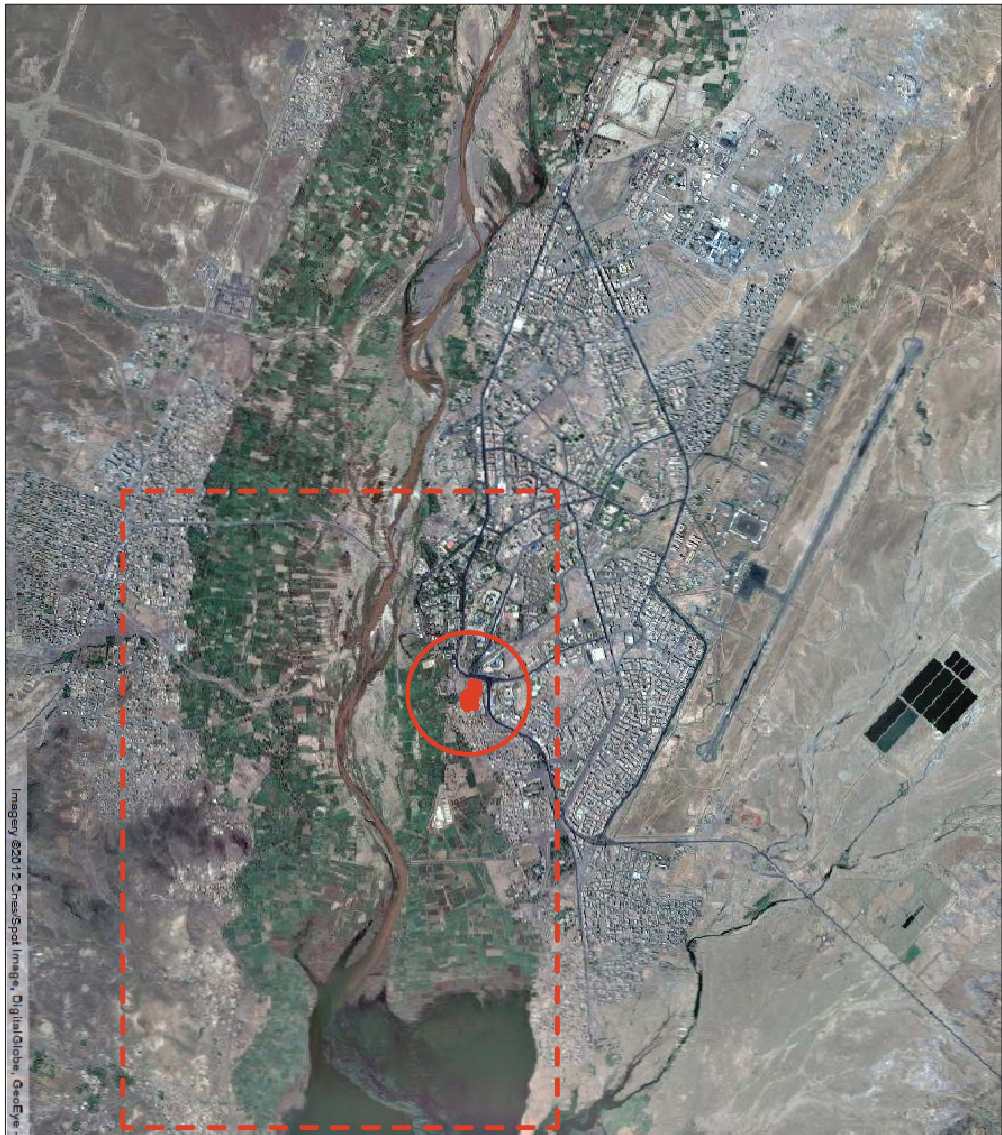
Drawing number:	TAO_TP_01
Scale:	1:2000
Date:	February 2014



KASBAH OF TAOURIPT - ENTIRE ENSEMBLE AROUND 1940 AND IN 2012



TAOURIPT WITHIN ITS CONTEXT:
THE FOLLOWING IMAGES HAVE BEEN
TAKEN FROM HISTORICAL ARCHIVES
AT CERKAS AND GOOGLE EARTH AND
MAPS.
THE LOCATION OF THE SITE IS
ACCURATE BUT THE SCALE OF THE
IMAGES NEEDS TO BE VERIFIED.



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIPT, MOROCCO



Site: KASBAH TAOURIPT		Drawing number: TAO_TC_01	
Drawing: ENSEMBLE IN CONTEXT		Scale: Not to scale	
Reviewed by: M. Boussal, F. Deschamps	Created by: C. Cancino	Date: February 2014	

Base map compile from:
CERKAS Survey Stara East
Scale 1:200 and 1:100
CERKAS Roof plan ensemble
Scale 1:200
CERKAS Microstation Caïd
Residence

NOTE:
THE FOLLOWING DRAWING IS A
COMPILATION OF HAND
ARCHITECTURAL SURVEY AND
ASSUMPTIONS MADE ON SITE.
THE HYPOTHESIS OF HISTORICAL
CONFIGURATION ARE UP FOR
REVISION AS WELL AS THE FINAL
CONFIGURATION OF THE EXISTING
STRUCTURES

KASBAH OF TAOURIRT - ENTIRE ENSEMBLE FIRST FLOOR PLAN EXISTING



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
Drawing: **FIRST FLOOR EXISTING STRUCTURES**
Reviewed by: **M. Boussal, F. Deschamps**
Created by: **C. Cancino**

Base map compile from:
CERKAS Survey Stara East
Scale 1:200 and 1:100
CERKAS Roof plan ensemble
Scale 1:200
CERKAS Microstation Caïd
Residence

Drawing number:
TAO_ TA_01
Scale:
1:500
Date:
February 2014

NOTE:
THE FOLLOWING DRAWING IS A
COMPILATION OF HAND
ARCHITECTURAL SURVEY AND
ASSUMPTIONS MADE ON SITE. THE
HYPOTHESIS OF HISTORICAL
CONFIGURATION ARE UP FOR
REVISION AS WELL AS THE FINAL
CONFIGURATION OF THE EXISTING
STRUCTURES

KASBAH OF TAOURIRT - ENTIRE ENSEMBLE SECOND FLOOR PLAN EXISTING



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
Drawing: **SECOND FLOOR EXISTING STRUCTURES**
Reviewed by: **M. Boussal, F. Deschamps**
Created by: **C. Cancino**

Base map compile from:
CERKAS Survey Stara East
Scale 1:200 and 1:100
CERKAS Roof plan ensemble
Scale 1:200
CERKAS Microstation Caïd
Residence

Drawing number:
TAO_ TA_02
Scale:
1:500
Date:
February 2014

NOTE:
THE FOLLOWING DRAWING IS A
COMPILATION OF HAND
ARCHITECTURAL SURVEY AND
ASSUMPTIONS MADE ON SITE. THE
HYPOTHESIS OF HISTORICAL
CONFIGURATION ARE UP FOR
REVISION AS WELL AS THE FINAL
CONFIGURATION OF THE EXISTING
STRUCTURES

KASBAH OF TAOURIRT - ENTIRE ENSEMBLE FIRST FLOOR PLAN SECTORS



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**

Drawing: **FIRST FLOOR SECTORS**

Reviewed by: **M. Boussal, F. Deschamps**

Created by: **C. Cancino**

Base map compile from:
CERKAS Survey Stara East
Scale 1:200 and 1:100
CERKAS Roof plan ensemble
Scale 1:200
CERKAS Microstation Caid
Residence

Drawing number:
TAO_ TA_03

Scale: **1:500**

Date: **February 2014**

NOTE:
THE FOLLOWING DRAWING IS A
COMPILED OF HAND
ARCHITECTURAL SURVEY AND
ASSUMPTIONS MADE ON SITE. THE
HYPOTHESIS OF HISTORICAL
CONFIGURATION ARE UP FOR
REVISION AS WELL AS THE FINAL
CONFIGURATION OF THE EXISTING
STRUCTURES

KASBAH OF TAOURIRT - ENTIRE ENSEMBLE FIRST FLOOR HISTORIC



CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO



Site:	KASBAH TAOURIRT	
Drawing:	FIRST FLOOR HISTORIC STRUCTURES	
Reviewed by:	M. Boussal, F. Deschamps	Created by: C. Cancino

Base map compile from:
CERKAS Survey Stara East
Scale 1:200 and 1:100
CERKAS Roof plan ensemble
Scale 1:200
CERKAS Microstation Caïd
Residence

Drawing number:	TAO_ TA_04
Scale:	1:500
Date:	February 2014

NOTE:
THE FOLLOWING DRAWING IS A
COMPILATION OF HAND
ARCHITECTURAL SURVEY AND
ASSUMPTIONS MADE ON SITE. THE
HYPOTHESIS OF HISTORICAL
CONFIGURATION ARE UP FOR
REVISION AS WELL AS THE FINAL
CONFIGURATION OF THE EXISTING
STRUCTURES

KASBAH OF TAOURIRT - ENTIRE ENSEMBLE SECOND FLOOR HISTORIC



CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO

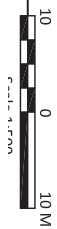


Site:	KASBAH TAOURIRT	
Drawing:	SECOND FLOOR HISTORIC STRUCTURES	
Reviewed by:	M. Boussal, F. Deschamps	Created by: C. Cancino

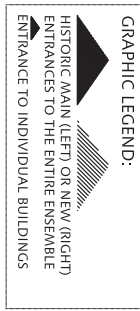
Base map compile from:
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Scale 1:200 and 1:100
CERKAS Roof plan ensemble
Scale 1:200
CERKAS Microstation Caïd
Residence

Drawing number:	TAO_ TA_05
Scale:	1:500
Date:	February 2014

KASBAH OF TAOURIRT - ENTIRE ENSEMBLE FIRST FLOOR HISTORIC PLAN CIRCULATION



NOTE:
THE FOLLOWING DRAWING IS A
COMPILED OF HAND
ARCHITECTURAL SURVEY AND
ASSUMPTIONS MADE ON SITE.
THE HYPOTHESIS OF HISTORICAL
CONFIGURATION ARE UP FOR
REVISION AS WELL AS THE FINAL
CONFIGURATION OF THE EXISTING
STRUCTURES





CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT

Drawing: FIRST FLOOR EXISTING STRUCTURES AREAS OF STABILIZATION

Reviewed by: M. Boussal, F. Deschamps

Created by: C. Cancino

Base map compile from:
CERKAS Survey Stara East
Scale 1:200 and 1:100
CERKAS Roof plan ensemble
Scale 1:200
CERKAS Microstation Caïd
Residence

Drawing number: TAO_TE_01

Scale: 1:500

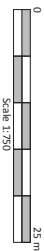
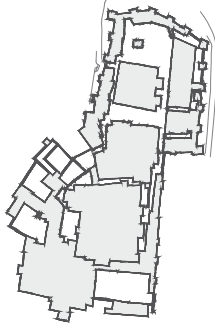
Date: February 2014



KASBAH OF TAOURIRT - ENTIRE ENSEMBLE FIRST FLOOR PLAN EXISTING WITH NEW CONSTRUCTION

APPENDIX C

Architectural Survey



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

Architectural survey

Site: KASBAH TAOURIRT

Drawing: KEY PLAN

Reviewed by: B. Marcus
C. Cancino

Created by: Carleton
UNIVERSITY CIMS

Editing of drawings:

Supervisor: Benjamin Marcus
Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán

Scale:

April, 2016

Date:

1:500

Drawing number:

TAO, arch. survey, P00



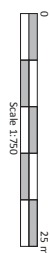
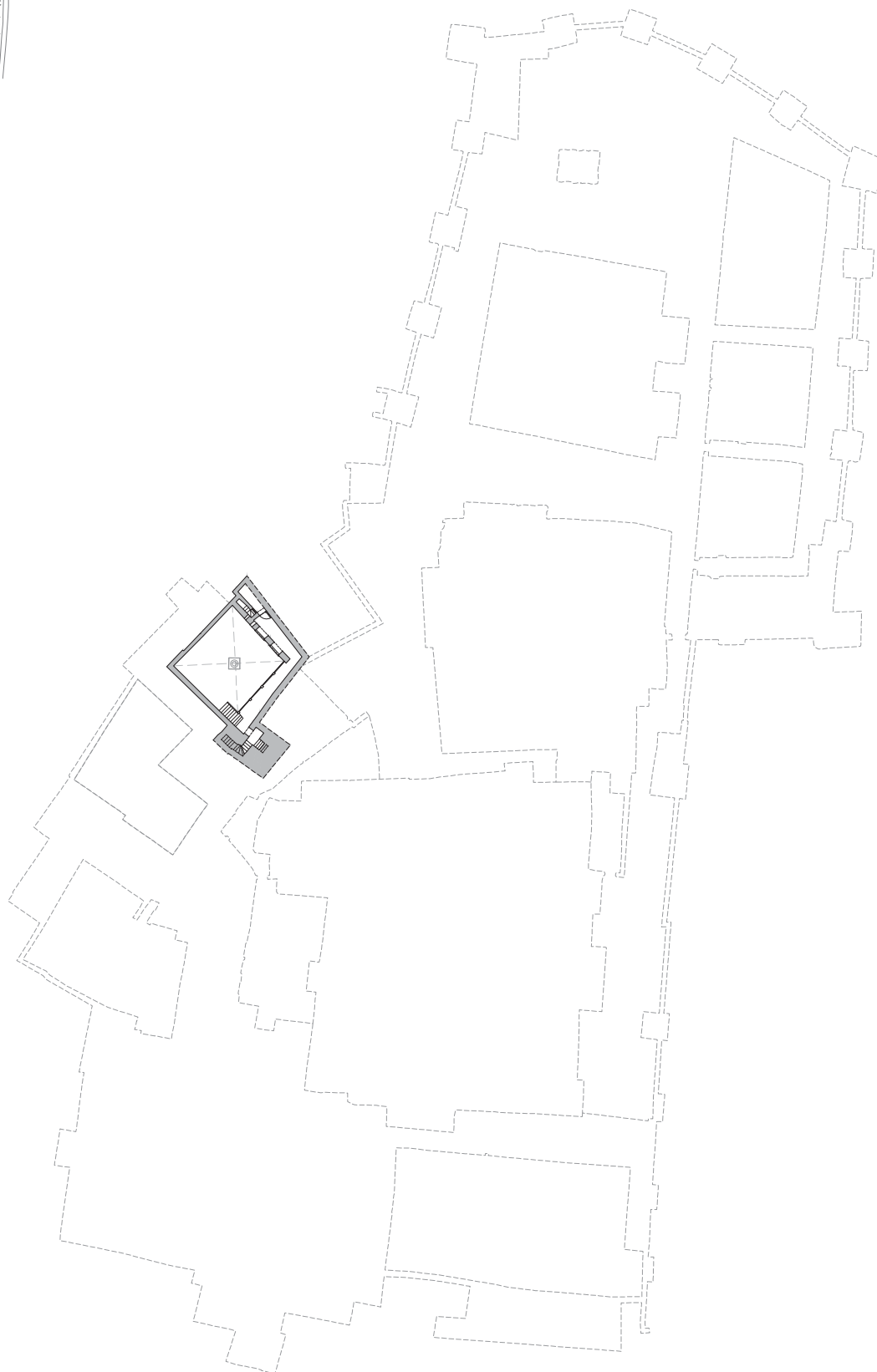
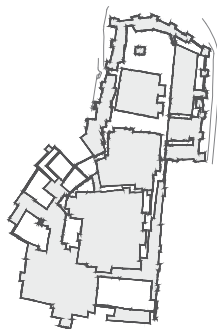
The Getty Conservation Institute



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Ministerio de la Cultura



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

Architectural survey

Site:

KASBAH TAOURIRT

Drawing:

LOWER LEVEL 3

Reviewed by:

B. Marcus
C. Cancino

Created by:

Carleton
UNIVERSITY



Editing of drawings:

Supervisor: Benjamin Marcus

Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán

Scale:

April, 2016

Date:

1:500



The Getty Conservation Institute



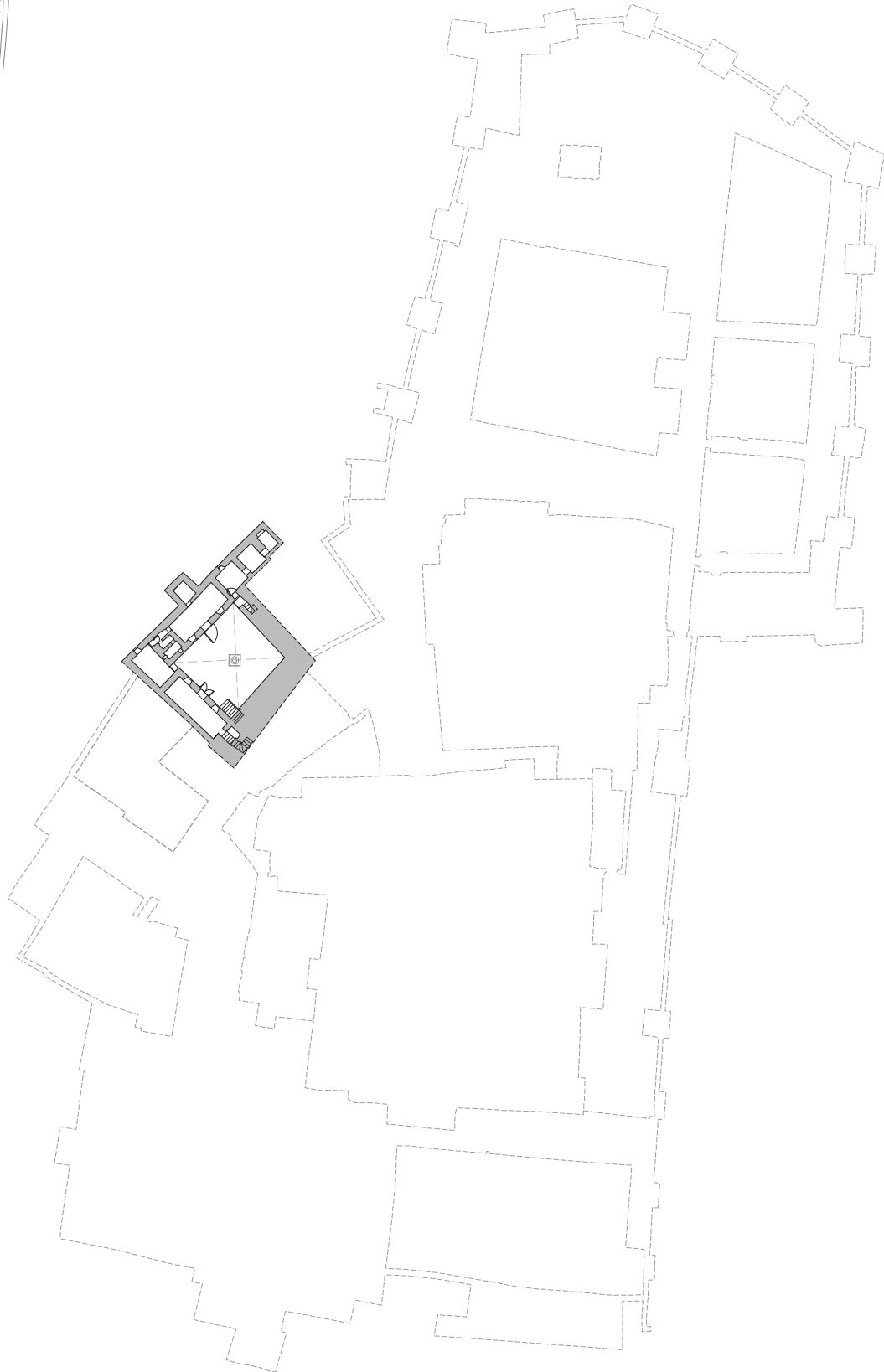
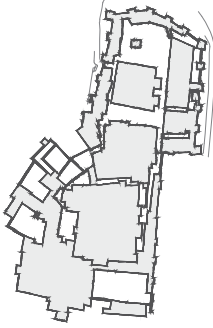
CERKAS



Ministère de la Culture
Ministère de la Culture

Drawing number:

TAO, arch. survey, P01



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

Architectural survey

Site:

KASBAH TAOURIRT

Drawing:

LOWER LEVEL 2

Reviewed by:

B. Marcus
C. Cancino

Created by:

Carleton
UNIVERSITY



Editing of drawings:

Supervisor: Benjamin Marcus

Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán

Scale:

April, 2016

Date:

1:500

Drawing number:

TAO, arch. survey, P02



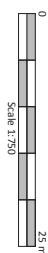
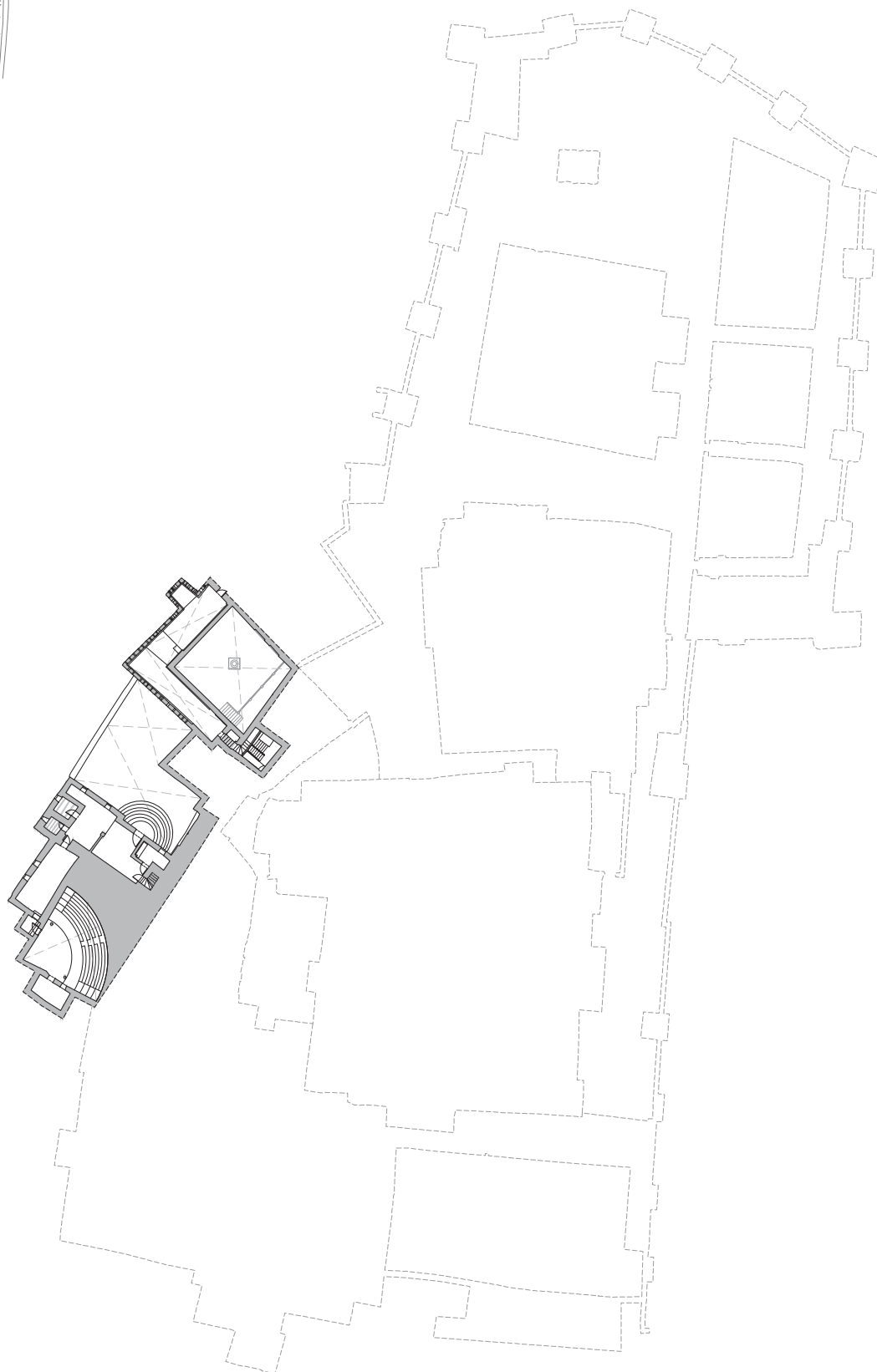
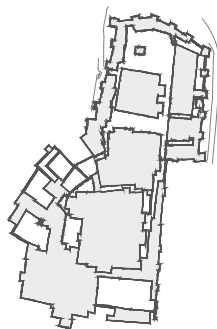
The Getty Conservation Institute



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Ministère de la Culture
Ministère de la Culture



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

Architectural survey

Site:

KASBAH TAOURIRT

Drawing:

LOWER LEVEL 1

Reviewed by:

B. Marcus
C. Cancino

Created by:

Carleton
UNIVERSITY



Editing of drawings:

Supervisor: Benjamin Marcus

Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán

Scale:

April, 2016

Date:

1:500

Drawing number:

TAO, arch. survey, P03



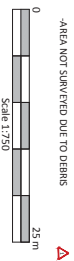
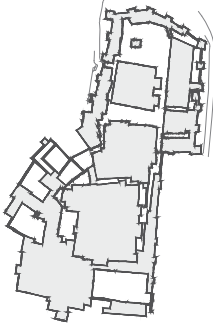
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AREA NOT SURVEYED DUE TO DEBRIS

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

Architectural survey

Site: KASBAH TAOURIRT

Drawing: GROUND LEVEL

Reviewed by:
B. Marcus
C. Cancino

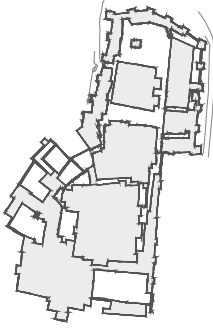
Created by:
Carleton University CIMS

Editing of drawings:
Supervisor: Benjamin Marcus
Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán

Scale: April, 2016 Date: 1:500

Drawing number: TAO, arch. survey, P04





**CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO**

Architectural survey

Site:	KASBAH TAOURIRT	
Drawing:	LEVEL 1	
Reviewed by:	B. Marcus C. Cancino	Created by: Carleton UNIVERSITY CIMS

Editing of drawings:		Supervisor: Benjamin Marcus Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán	
Scale:	Date:	April, 2016	1:500

Drawing number:
TAO, arch. survey, P05



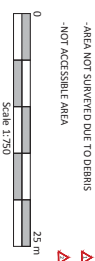
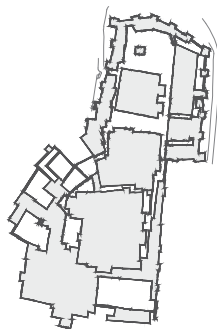
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-AREA NOT SURVEYED DUE TO DEBRIS
-NOT ACCESSIBLE AREA

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

Architectural survey

Site:	KASBAH TAOURIRT	
Drawing:	LEVEL 2	
Reviewed by:	B. Marcus C. Cancino	Created by: Carleton UNIVERSITY CIMS

Editing of drawings:		Supervisor: Benjamin Marcus Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán	
Scale:	Date:	April, 2016	1:500

Drawing number:
TAO, arch. survey, P06



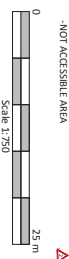
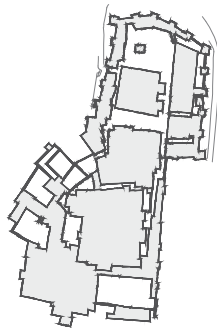
The Getty Conservation Institute



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Ministère de la Culture



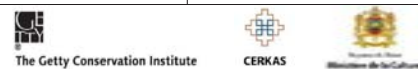
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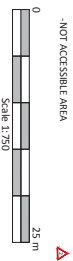
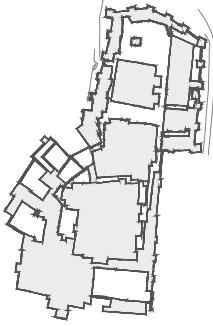
CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO
Architectural survey

Site:	KASBAH TAOURIRT	
Drawing:	LEVEL 3	
Reviewed by:	B. Marcus C. Cancino	Created by: Carleton UNIVERSITY CIMS

Editing of drawings:		Supervisor: Benjamin Marcus Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán	
Scale:	April, 2016	Date:	1:500

Drawing number: TAO, arch. survey, P07





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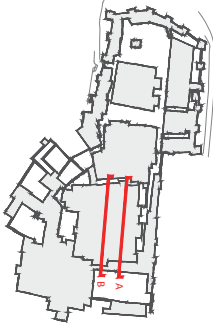
CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO
Architectural survey

Site:	KASBAH TAOURIRT	
Drawing:	LEVEL 4	
Reviewed by:	B. Marcus C. Cancino	Created by: Carleton UNIVERSITY CIMS

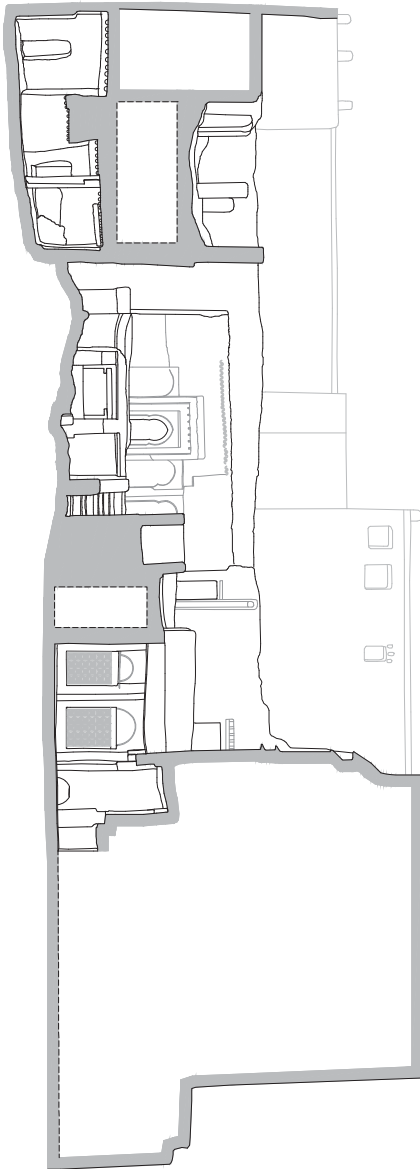
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Drawing number: TAO, arch. survey, P08

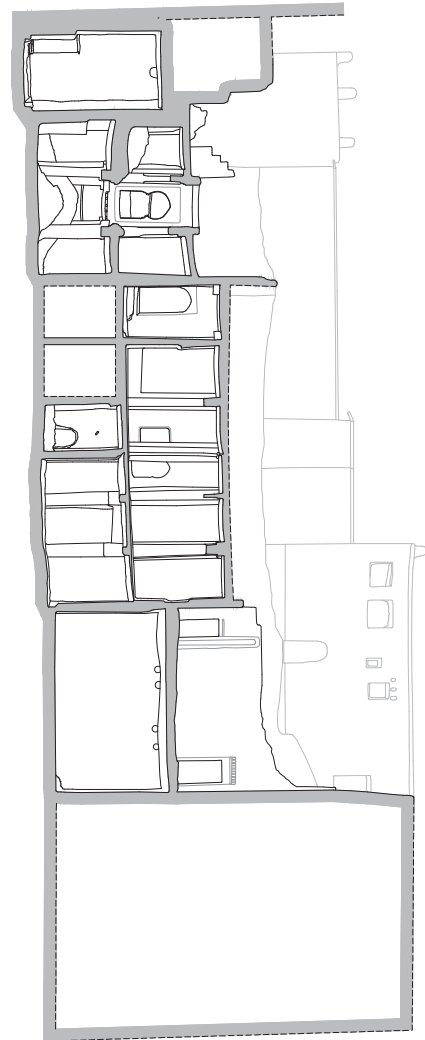


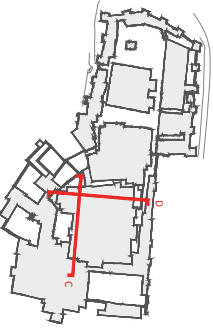


SECTION B



SECTION A

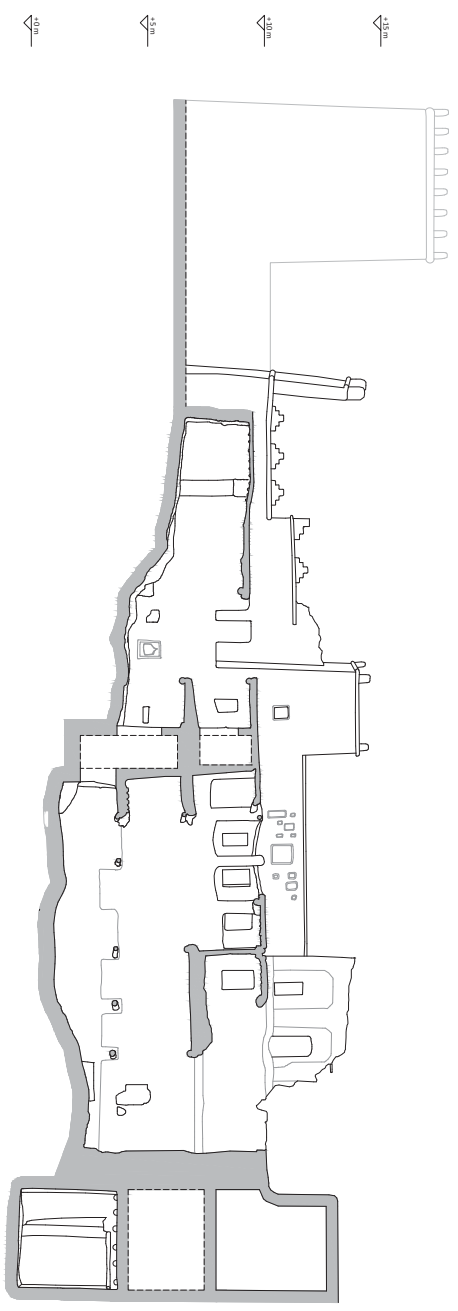


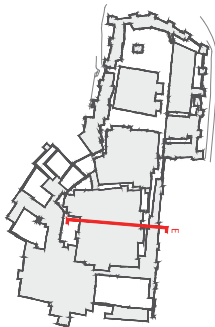


SECTION D

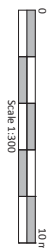
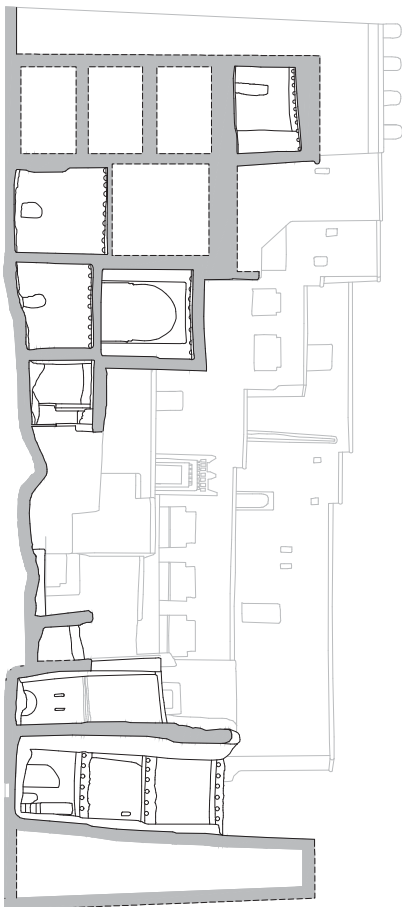


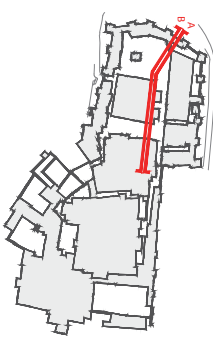
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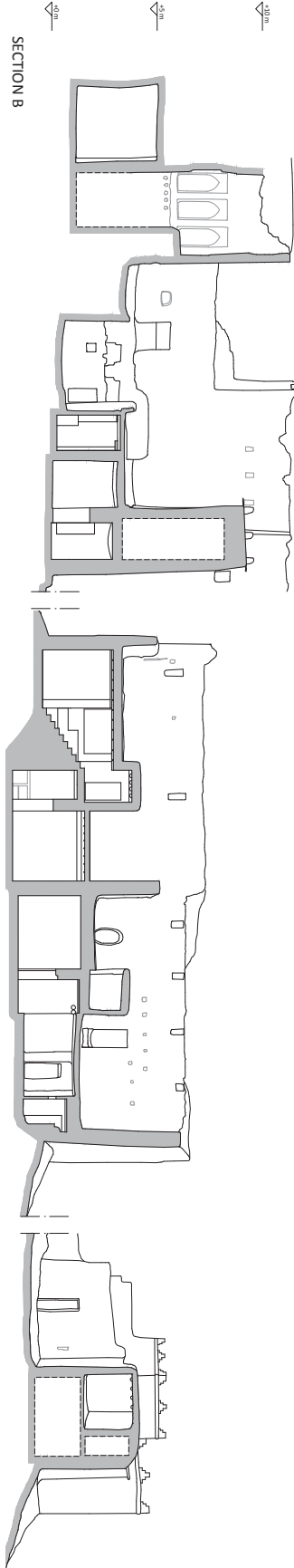


SECTION E

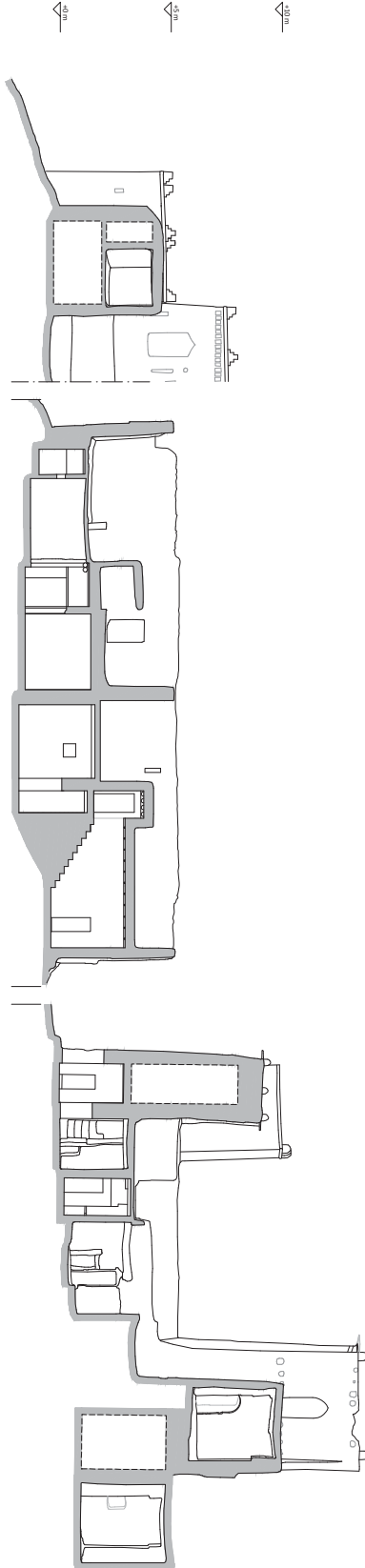


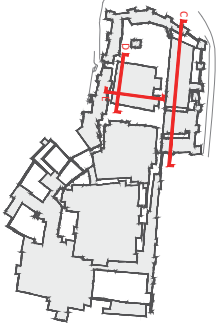


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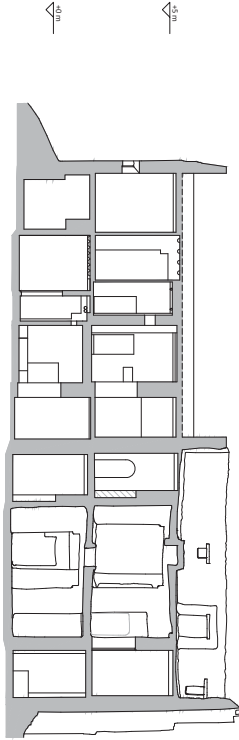


SECTION A

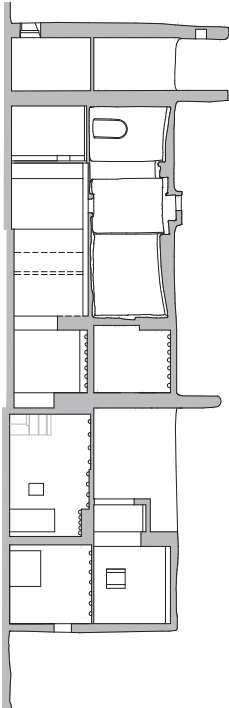




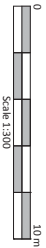
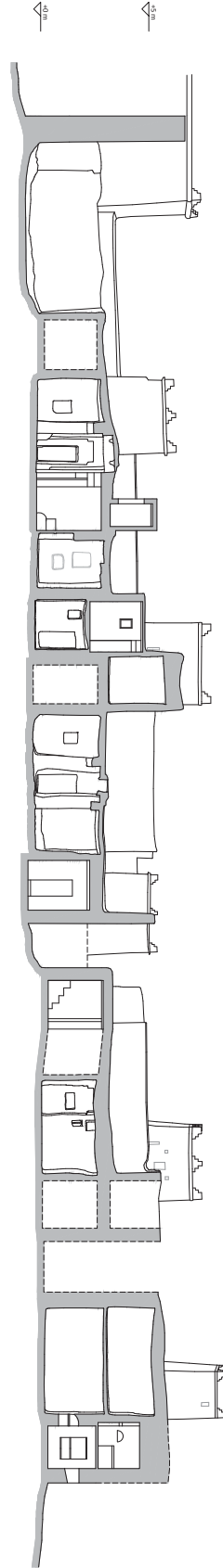
SECTION D

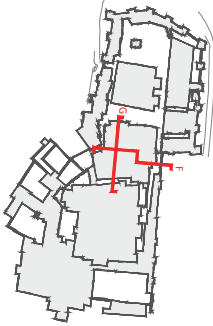


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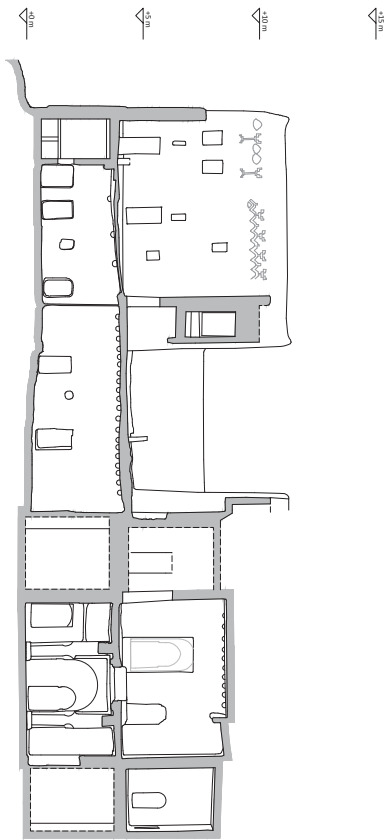


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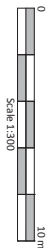
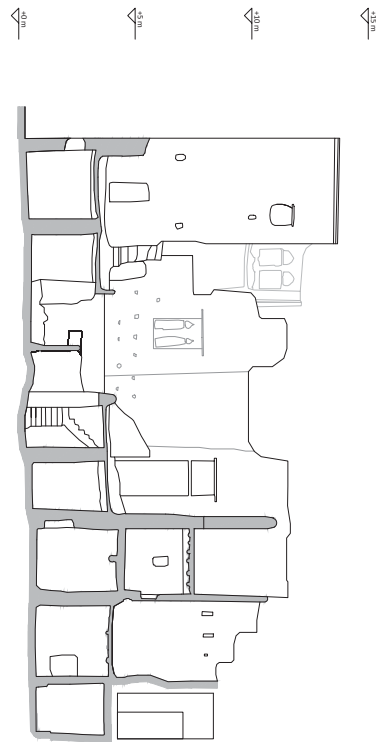


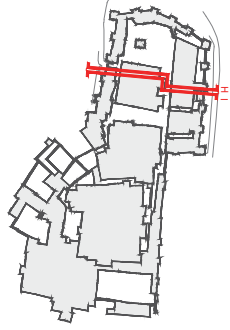


SECTION G

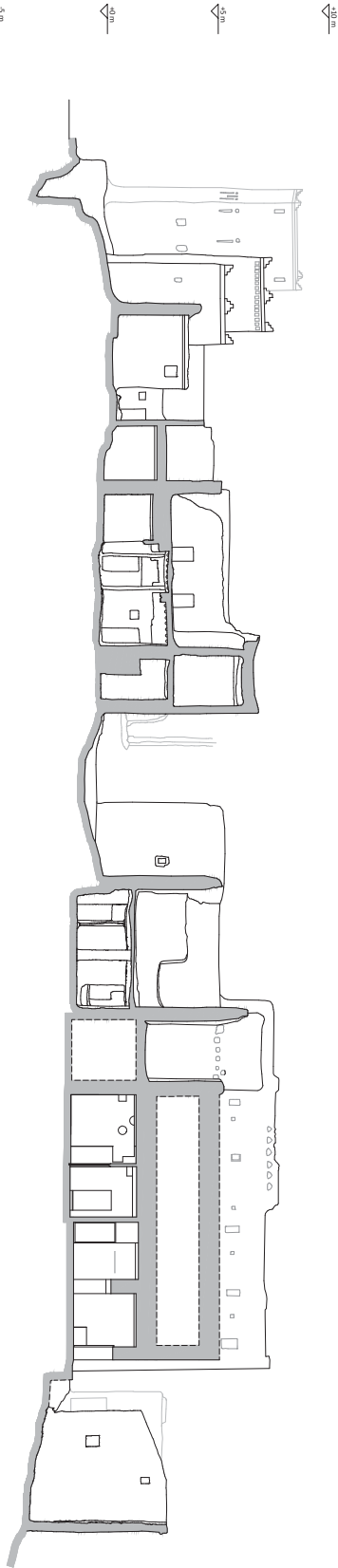


SECTION F

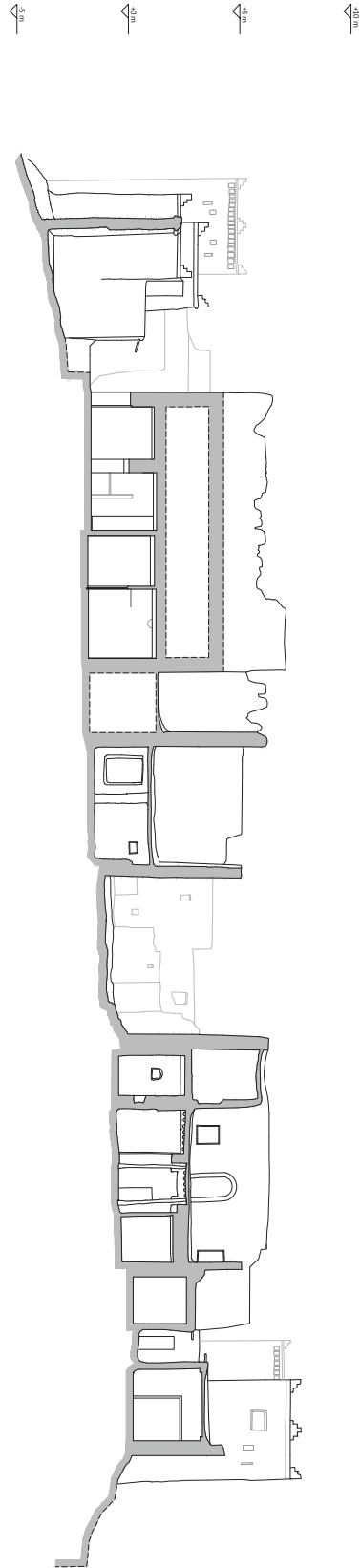


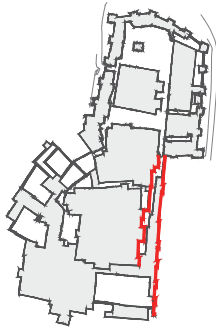


SECTION I



SECTION H

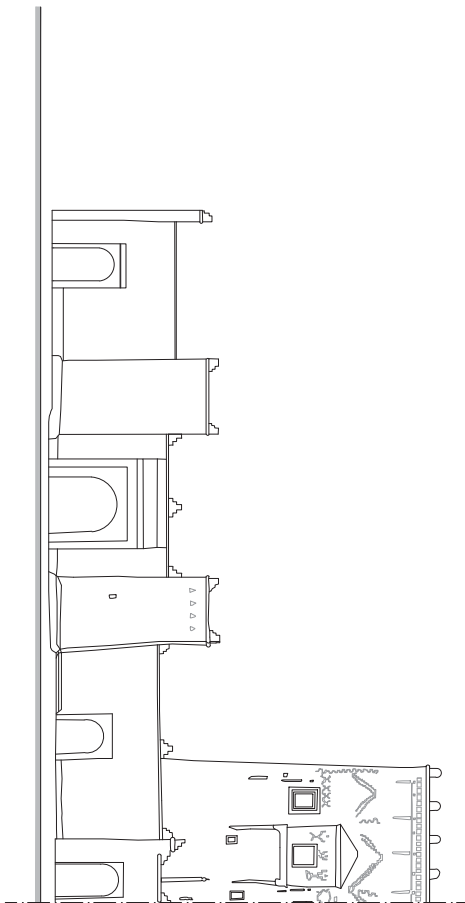
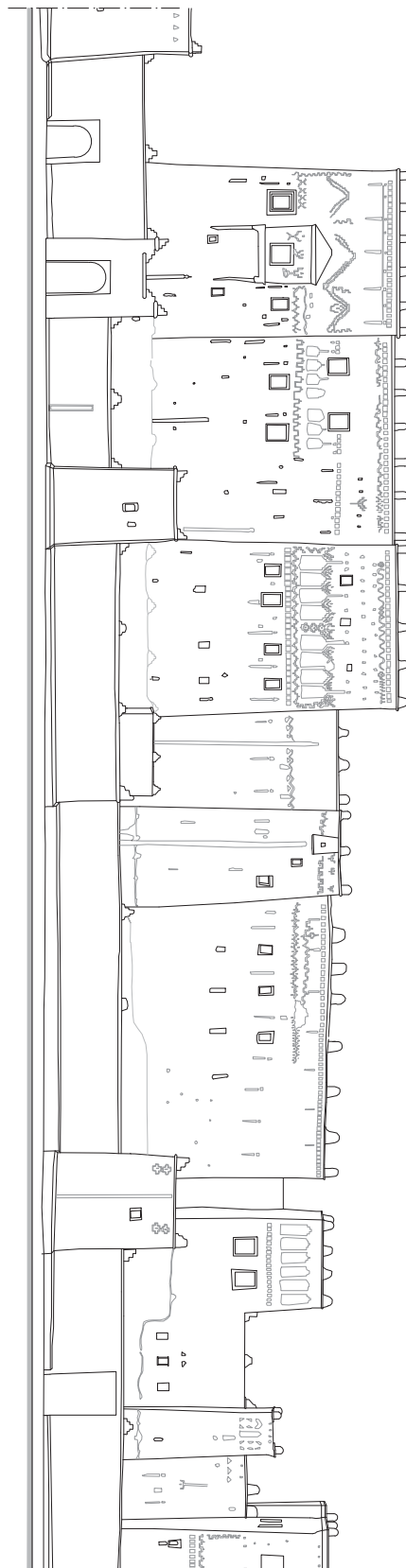




NORTH ELEVATION



NORTH ELEVATION

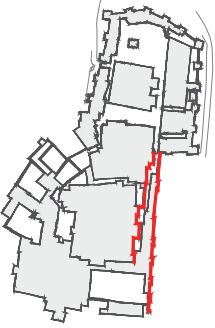




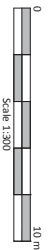
NORTH ELEVATION - ORTOPHOTO

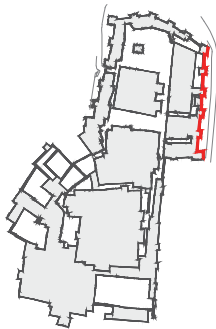


NORTH ELEVATION - ORTOPHOTO



KASBAH TAOURIRT - ARCHITECTURAL SURVEY - NORTH ELEVATION

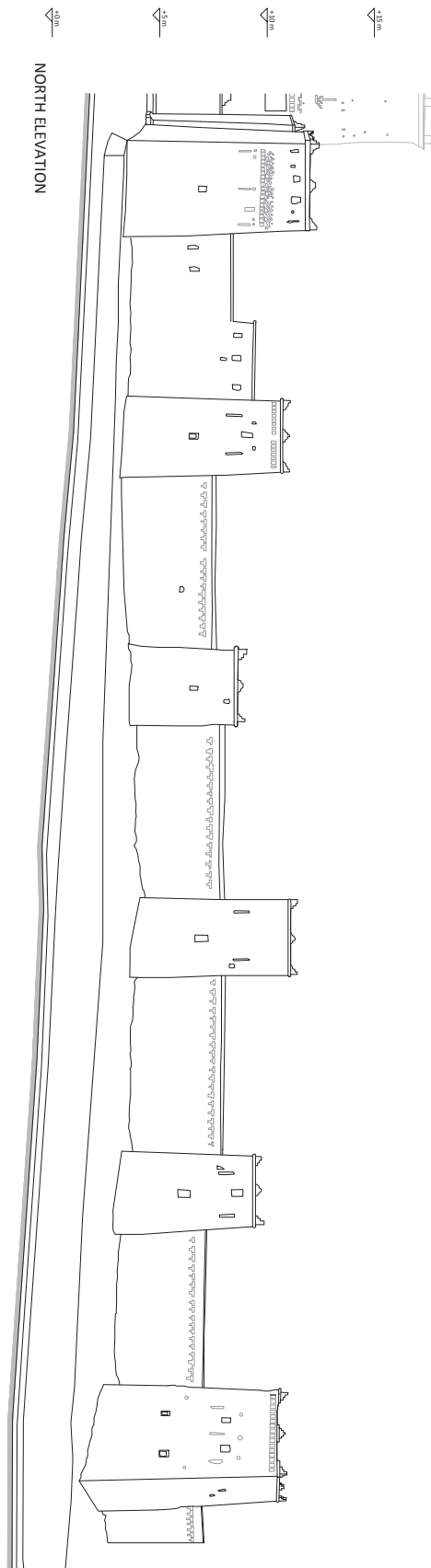


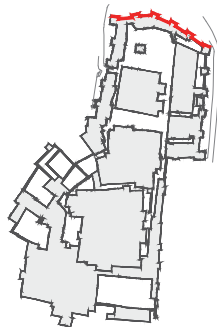


NORTH ELEVATION - ORTOPHOTO



NORTH ELEVATION

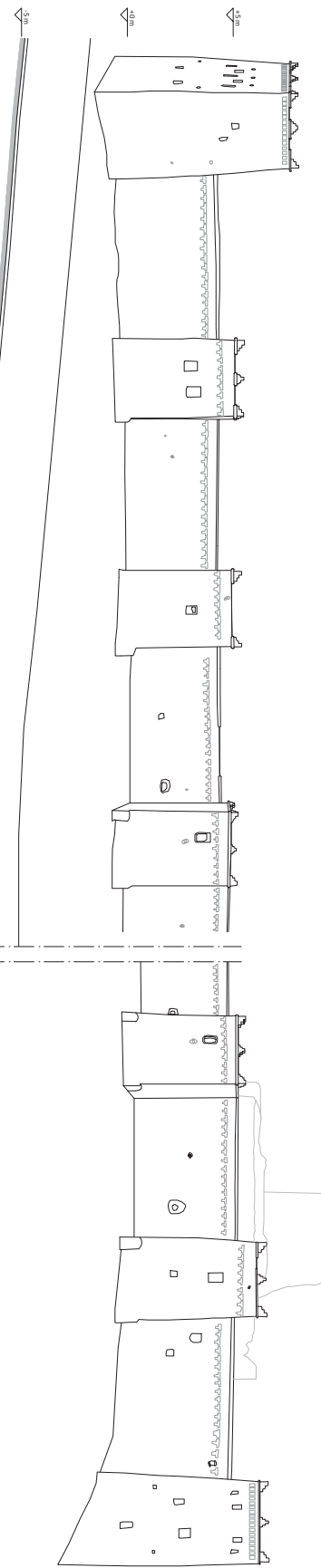


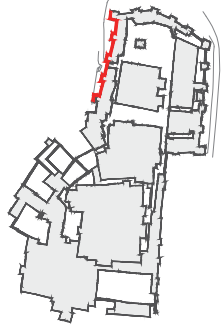


WEST ELEVATION

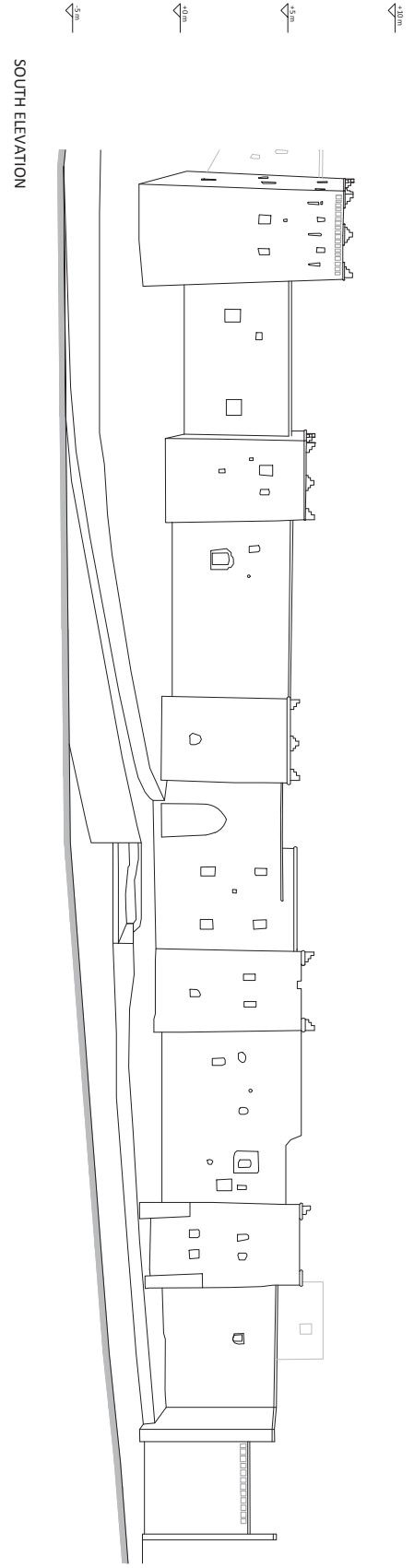


WEST ELEVATION

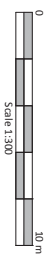


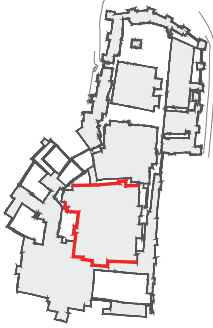


SOUTH ELEVATION - ORTOPHOTO

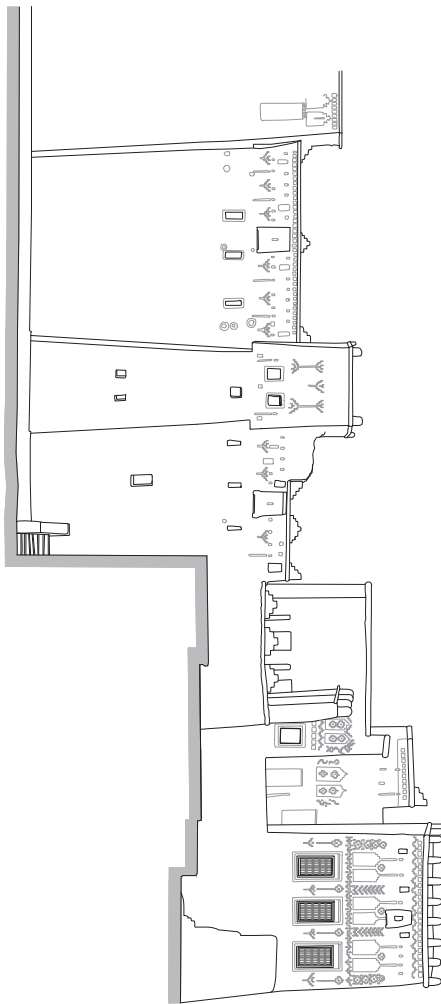


SOUTH ELEVATION

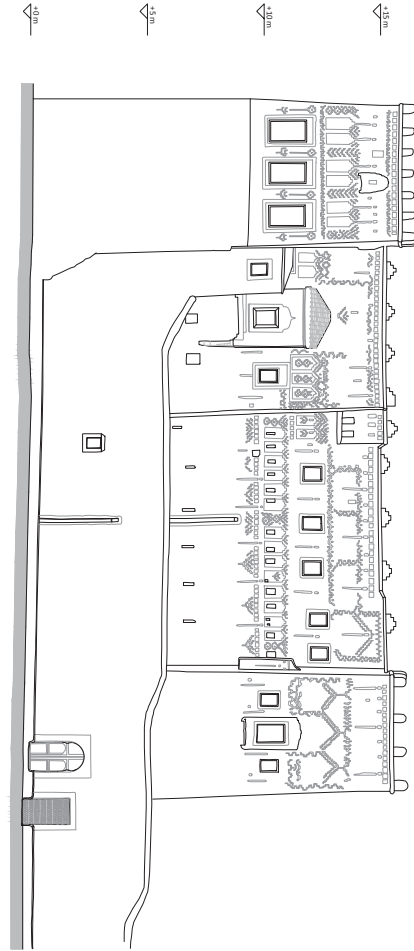




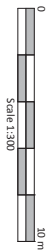
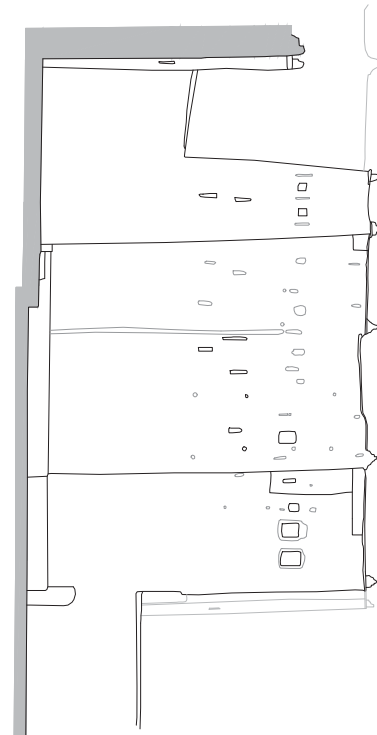
SOUTH ELEVATION



EAST ELEVATION



WEST ELEVATION



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

Architectural survey

Site:

CAID RESIDENCE

Drawing:

ELEVATIONS

Reviewed by:

B. Marcus
C. Cancino

Created by:

Carleton
UNIVERSITY

CIMS

Editing of drawings:

Supervisor: Benjamin Marcus

Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán

Scale:

April, 2016

Date:

1:200

Drawing number:

TAO, arch. survey, E06



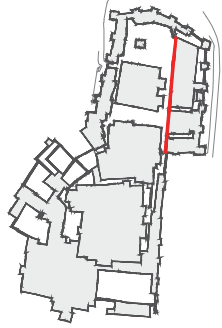
The Getty Conservation Institute



CERKAS



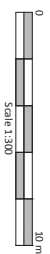
Ministère de la Culture
Ministère de la Culture

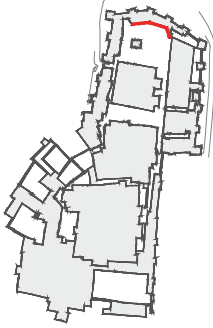


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SOUTH ELEVATION

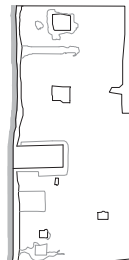
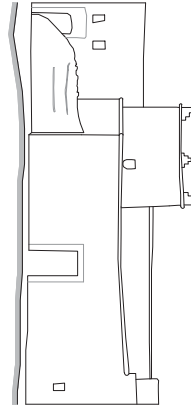




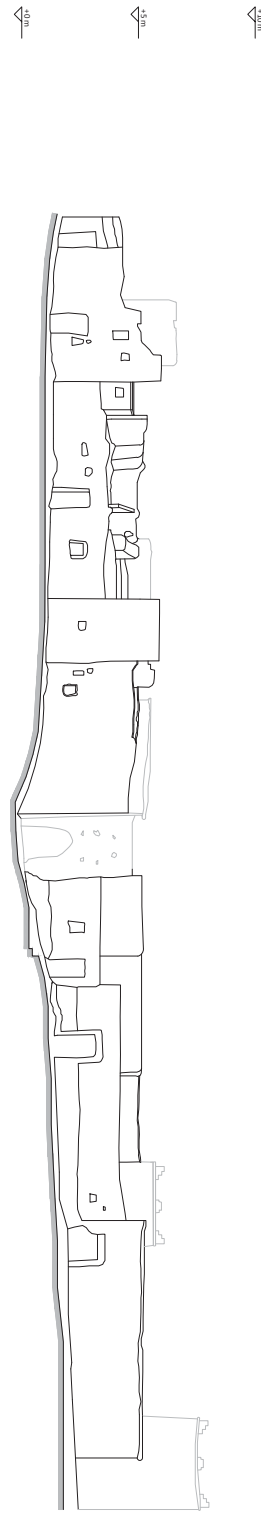
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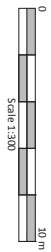
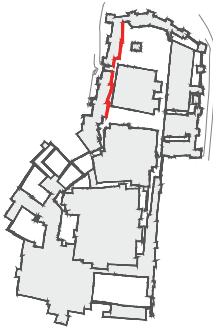
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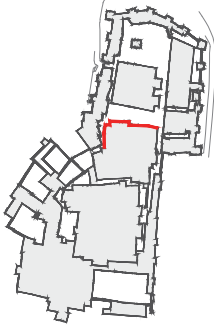


NORTH ELEVATION



NORTH ELEVATION - ORTOPHOTO

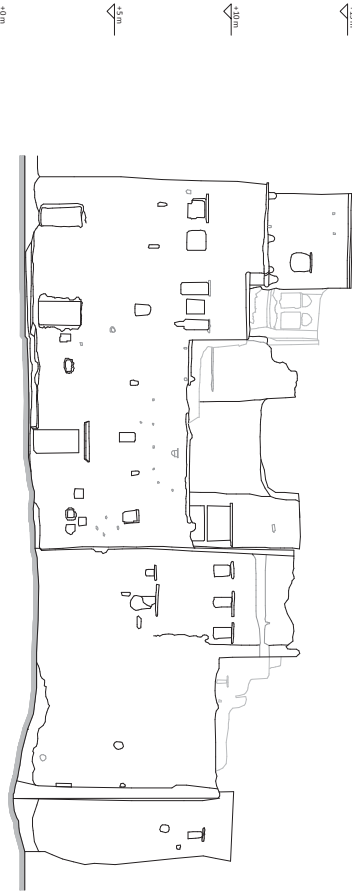




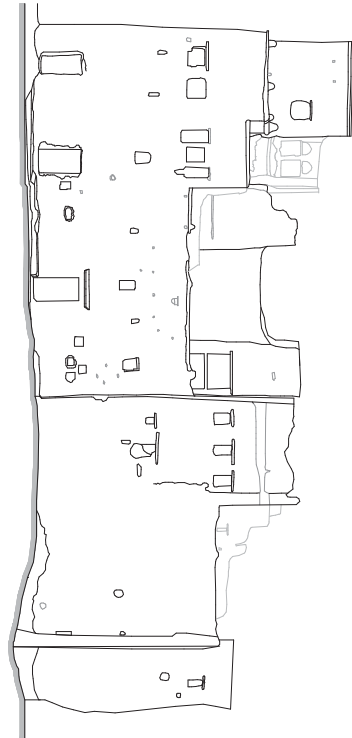
WEST ELEVATION - ORTOPHOTO

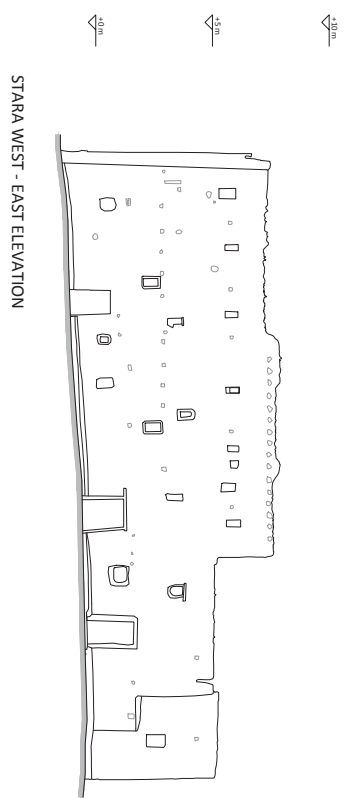
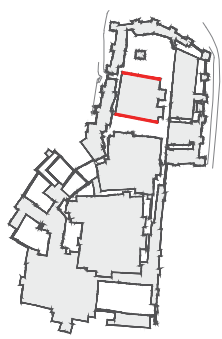


SOUTH ELEVATION



WEST ELEVATION

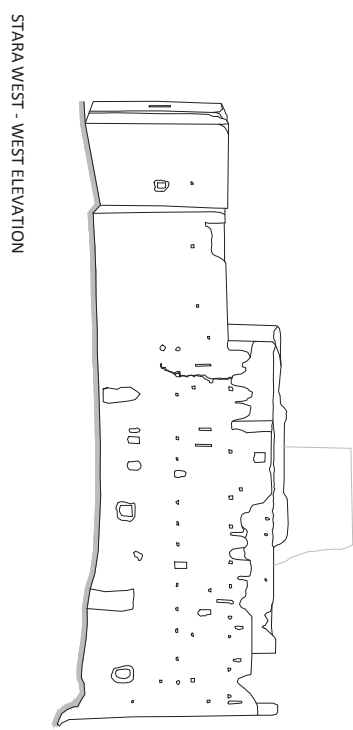




STARA WEST - EAST ELEVATION



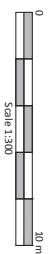
STARA WEST - EAST ELEVATION - ORTOPHOTO



STARA WEST - WEST ELEVATION



STARA WEST - WEST ELEVATION - ORTOPHOTO



APPENDIX D

Database of Archival Images

Archival Images 1920s



Title: Kasbah Taourirt, Oued, 1920s est. (a)
File name: EAI.MOR.Taourirt.KsarAndKasbah.HistoricImages.CERKAS.IMG_1030.Oued_01.jpg
Keywords: Taourirt archival image, 1920s est., Marcelin Flandrin, Editions Mars, oued
Copyright: non_JPGT; Fondation Banque Populaire pour l'éducation et la culture, Royaume du Maroc
Folder: ArchImg



Title: Kasbah Taourirt, Oued, 1920s est. (b)
File name: EAI.MOR.Taourirt.KsarAndKasbah.HistoricImages.CERKAS.IMG_1061.jpg
Keywords: Taourirt archival image, 1920s est., Marcelin Flandrin, Editions Mars, oued
Copyright: non_JPGT; Fondation Banque Populaire pour l'éducation et la culture, Royaume du Maroc
Folder: ArchImg



Title: Kasbah Taourirt, south, 1920s est.
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1033.Oued_Photo_Flandrin.jpg
Keywords: Taourirt archival image, 1920s est., Marcelin Flandrin, Editions Mars
Copyright: non_JPGT; Fondation Banque Populaire pour l'éducation et la culture, Royaume du Maroc
Folder: ArchImg

Archival Images 1920s



Title: Kasbah Taourirt, north-west, 1920s est. (a)

File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_004.JPG

Keywords: Taourirt archival image, 1920s est., Marcelin Flandrin, Editions Mars

Copyright: non_JPGT; Fondation Banque Populaire pour l'éducation et la culture, Royaume du Maroc

Folder: ArchImg



Title: Kasbah Taourirt, north-west, 1920s est. (b)

File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1006.jpg

Keywords: Taourirt archival image, 1920s est., Marcelin Flandrin, Editions Mars

Copyright: non_JPGT; Fondation Banque Populaire pour l'éducation et la culture, Royaume du Maroc

Folder: ArchImg



Title: Kasbah Taourirt, CERKAS entrance, 1920s est. (c)

File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1036.Place_Taourirt.1950.jpg

Keywords: Taourirt archival image, 1920s est., CERKAS entrance, Marcelin Flandrin, Editions Mars

Copyright: Photo Flandrin; Archives J. Gandini, www.ouarzazate-1928-1956.com

Folder: ArchImg

Archival Images 1929



Title: Kasbah Taourirt, north-east, 1928
File name: EAI_TAO_Kasbah_1928_gandini_website.jpg
Keywords: Taourirt archival image, 1928
Copyright: non_JPGT; Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Taourirt, aerial view, 1929
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_1929_aerial-view.jpg
Keywords: Taourirt archival image, 1929, aerial view
Copyright: non_JPGT
Folder: ArchImg



Title: Armande Lafite, Kasbah Taourirt, external walls, south, 1929
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_1929_ArmandeLafite_Kasbah.jpg
Keywords: Taourirt archival image, 1929, Armande Lafite, external walls
Copyright: Archives Armande Lafite; Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg

Archival Images 1929



Title: Armande Lafite, Kasbah Taourirt, cannon square, 1929
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_1930_ArmandeLafite.jpg
Keywords: Taourirt archival image, 1929, Armande Lafite, cannon square
Copyright: Archives Armande Lafite; Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Kasbah Taourirt, cannon square, ahouach, 1929
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_1929_Ahouach-Taourirt.jpg
Keywords: Taourirt archival image, 1929, cannon square, ahouach
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Jacques Majorelle, Kasbah Taourirt, south, est. 1920s-30s, watercolor
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.Majorelle.IMG_1000.1(1).jpg
Keywords: Taourirt archival image, 1920s-30s, Jacques Majorelle, mediatheque entrance, painting
Copyright: non_JPGT; Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg

Archival Images 1930s



Title: Theophile-Jean Delaye, Kasbah Taourirt, north-east, 1930s est., watercolor
File name: EAI.MOR.Taourirt.WC_1915_delaye-theophile-jean_casbah-a-ouarzazate.jpg
Keywords: Taourirt archival image, 1930s est., Theophile-Jean Delaye, cannons square entrance, watercolor
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Taourirt, aerial view, 1930
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_1930_ArmandeLafite_aerial.jpg
Keywords: Taourirt archival image, 1930, Armande Lafite, aerial view
Copyright: Archives Armande Lafite; Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Taourirt, aerial view, 1930s est.
File name: EAI.MOR.Ouarzazate.PhotoAerien.C1920.East.CERKAS.IMG_1064.jpg
Keywords: Taourirt archival image, 1930s est., aerial view
Copyright: non_JPGT
Folder: ArchImg

Archival Images 1930s



Title: Taourirt, aerial view, 1930s est.
File name: EAI.MOR.Taourirt.Ouarzazate.AerialView.ca 1940Detail.jpg
Keywords: Taourirt archival image, 1930s est., aerial view
Copyright: non_JPGT
Folder: ArchImg



Title: Taourirt, aerial view, 1930
Filename: EAI.MOR.Taourirt.KsarAndKasbah.HistoricImages.CERKAS.IMG_1009.Avion_Ouarzazate_1930.jpg
Keywords: Taourirt archival image, 1930, aerial view
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Kasbah Taourirt, north-west, 1930s est.
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1046.Taourirt_4.jpg
Keywords: Taourirt archival image, 1930s est.
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg

Archival Images 1930s



Title: Kasbah taourirt, south, 1931 (a)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1011.Cimetire.Kasbah_1931.jpg
Keywords: Taourirt archival image, 1931, mediatheque entrance, photo Gillot
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Kasbah taourirt, south, 1931 (b)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1003.Amnagement_Avenue.jpg
Keywords: Taourirt archival image, Maroc, MarocAntan, Morocco, Ouarzazate, Casbah
Copyright: MarocAntan
Folder: ArchImg



Title: Kasbah Taourirt, north, 1930s est.
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1047.Taourirt_6.jpg
Keywords: Taourirt archival image, 1930s est.
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg

Archival Images 1930s



Title: Kasbah Taourirt, Caid residence, 1930s est. (c)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_010.JPG
Keywords: Taourirt archival image, 1930s est.
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: La Cigogne, Kasbah Taourirt, Caid residence, 1930s est. (a)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_009_La_cigogne.jpg
Keywords: Taourirt archival image, 1930s est., La Cigogne
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: La Cigogne, Kasbah Taourirt, Caid residence, 1930s est. (a)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_008_La_cigogne.JPG
Keywords: Taourirt archival image, 1930s est., La Cigogne, postcard
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg

Archival Images 1930s



Title: La Cigogne, Kasbah Taourirt, Caid residence, 1930s est. (b)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1051.Terrasse_2.jpg
Keywords: Taourirt archival image, 1930s est., La Cigogne
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Kasbah Taourirt, Caid Residence, 1930s est. (f)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1024.Les_fils_du_cad._vue_oued.jpg
Keywords: Taourirt archival image, 1930s est.
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Kasbah Taourirt, Caid residence, 1930s est. (e)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_013.JPG
Keywords: Taourirt archival image, 1930s est.
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg

Archival Images 1930s



Title: Daniel Rodier, Kasbah Taourirt, Caid residence, 1930s est. (d)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1049.Taourirt_Rodier_2.jpg
Keywords: Taourirt archival image, 1930s est., Daniel Rodier
Copyright: Archives Daniel Rodier; Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Kasbah Taourirt, CERKAS entrance, 1930s est. (a)
File name: EAI.MOR.Taourirt.KsarAndKasbah.HistoricImages.CERKAS.IMG_1027.Ouarzazate_1.jpg
Keywords: Taourirt archival image, 1930s est., CERKAS entrance
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Kasbah Taourirt, CERKAS entrance, 1930s est. (b)
File name: EAI.MOR.Taourirt.KsarAndKasbah.HistoricImages.CERKAS.IMG_1020.Intrieur_Cad.jpg
Keywords: Taourirt archival image, 1930s est., CERKAS entrance
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg

Archival Images 1930s-40s



Title: Antoni Teslar, Kasbah Taourirt, north-east, 1930s est., gouache
File name: EAI.MOR.Taourirt.WC_1930_teslar_antoni_casbah_à_taurirt.jpg
Keywords: Taourirt archival image, 1930s est., Antoni Teslar, cannon square entrance, painting
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Kasbah Taourirt, north-west, 1930s-40s est. (a)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_002.jpg
Keywords: Taourirt archival image, 1930s-40s est., external walls
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Kasbah Taourirt, north-west, 1930s-40s est. (b)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_1941_Decodier_Kasbah_Khalifa.jpg
Keywords: Taourirt archival image, 1930s-40s est., external walls
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg

Archival Images 1930s-40s



Title: Kasbah Taourirt, north-west, 1930s-40s est. (b)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1007.jpg
Keywords: Taourirt archival image, 1930s-40s est., cannon square entrance, Editions d'art Felix
Copyright: Editions d'art Felix; Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Kasbah Taourirt, north-east, 1930s-40s est. (a)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_Decodier_Kasbah_Khalifa_1.jpg
Keywords: Taourirt archival image, 1930s-40s est., cannon square entrance
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Kasbah Taourirt, north-west, 1930s-40s est. (c)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1026.Ouarzazate.jpg
Keywords: Taourirt archival image, 1930s-40s est., cannon square entrance
Copyright: non_JPGT
Folder: ArchImg

Archival Images 1930s-40s



Title: Taourirt, Oued, south, 1930s-40s est. (b)
File name: EAI.MOR.Taourirt.KsarAndKasbah.HistoricImages.CERKAS.IMG_1031.Oued_07.jpg
Keywords: Taourirt archival image, 1930s-40s est., oued
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Kasbah Taourirt, Oued, south, 1930s-40s est. (a)
File name: EAI.MOR.Taourirt.KsarAndKasbah.HistoricImages.CERKAS.IMG_1032.Oued_08.jpg
Keywords: Taourirt archival image, 1930s-40s est., oued
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Kasbah Taourirt, cannon square, 1943
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_1943_Decodier_Kasbah_Khalifa.jpg
Keywords: Taourirt archival image, 1943, Decodier, cannon square, ahouch
Copyright: Archives Decodier, Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg

Archival Images 1951



Title: Taourirt, aerial view, 1951
File name: EAI.MOR.Taourirt.KsarAndKasbah.HistoricImages.CERKAS.IMG_1011.IMG_1019.jpg
Keywords: Taourirt archival image, 1951, aerial view, escadrille Lorraine
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Taourirt, aerial view, 1951
File name: EAI.MOR.Taourirt.KsarAndKasbah.HistoricImages.CERKAS.1951.jpg
Keywords: Taourirt archival image, 1951, aerial view, escadrille Lorraine
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Taourirt, aerial view, 1951 (detail, Stara east)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1058.1940.jpg
Keywords: Taourirt archival image, 1951, aerial view, escadrille Lorraine
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg

Archival Images 1950s



Title: Taourirt, aerial view, 1951 (detail, Stara west, ateliers)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1057.1940.jpg
Keywords: Taourirt archival image, 1951, aerial view, escadrille Lorraine
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Kasbah Taourirt, south-west, 1950s est. (a)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_003.JPG
Keywords: Taourirt archival image, 1950s est., mediatheque entrance, postcard
Copyright: non_JPGT
Folder: ArchImg



Title: Kasbah Taourirt, south-west, e1950s est.
File name: Kasbah_Khalifa_3_Decordier_Gandini_website.jpg
Keywords: Taourirt archival image, 1950s est., south-west
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg

Archival Images 1950s



Title: Kasbah Taourirt, south-west, 1950s est. (b)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_Decodier_Kasbah_Khalifa_2.jpg
Keywords: Taourirt archival image, 1950s est., mediatheque entrance
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Kasbah Taourirt, CERKAS entrance, 1950s est. (b)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1013.DSCF0312.1950.jpg
Keywords: Taourirt archival image, 1950s est., CERKAS entrance
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Kasbah Taourirt, CERKAS entrance, 1950s est. (a)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_Taourirt_cote_oued.jpg
Keywords: Taourirt archival image, 1950s est., CERKAS entrance
Copyright: non_JPGT
Folder: ArchImg

Archival Images 1960s



Title: Kasbah Taourirt, north-east, 1950s est.
File name: Taourirt_10_1950_Gandini_website.jpg
Keywords: Taourirt archival image, 1950s est., north-east, cannon square entrance
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg

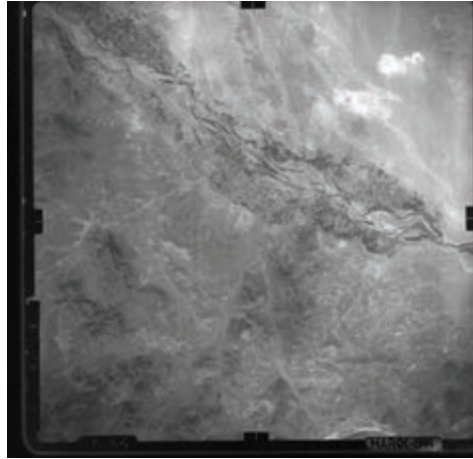


Title: Kasbah Taourirt, north, 1955
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1005.jpg
Keywords: Taourirt archival image, 1955, cannon square entrance, ahouach, photo Antoniou
Copyright: photo Antoniou; Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg



Title: Kasbah Taourirt, north-west, est. 1960s-70s
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_011.JPG
Keywords: Taourirt archival image, 1960s-70s est., cannon square entrance, postcard
Copyright: non_JPGT
Folder: ArchImg

Archival Images 1964

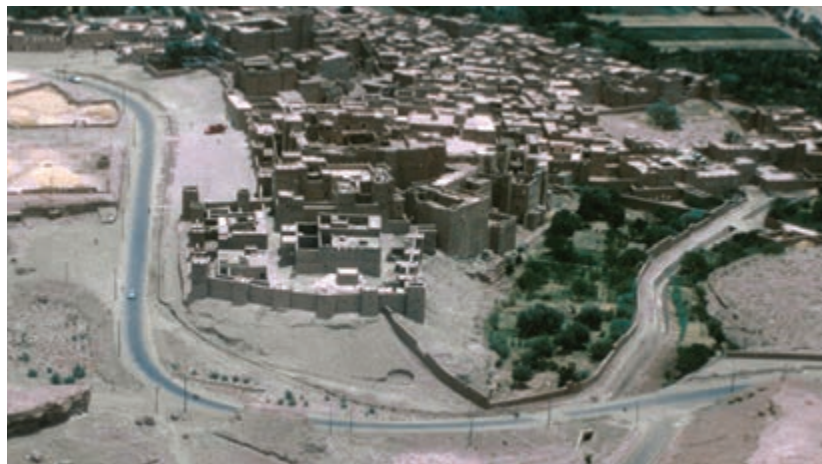


Title: Taourirt, aerial view, 1964
File name: EAI.MOR.Ouarzazate.PhotoAerien.Sc50000.1964_095.ANC FCC.IMG_DC_2501589.jpg
Keywords: Taourirt archival image, 1964, aerial view
Copyright: non_JPGT
Folder: ArchImg

Archival Images After 1967



Title: Taourirt, aerial view, 1967-70 est.
File name: EAI.MOR.Taourirt.KsarAndKasbah.HistoricImages.CERKAS.IMG_1071.Aerial.jpg
Keywords: Taourirt archival image, 1967-70 est., aerial view
Copyright: non_JPGT
Folder: ArchImg



Title: Taourirt, aerial view, 1967-70 est. (detail)
File name: EAI.MOR.Taourirt.KsarAndKasbah.HistoricImages.CERKAS.IMG_1071.196x.jpg
Keywords: Taourirt archival image, 1967-70 est., aerial view
Copyright: non_JPGT
Folder: ArchImg

Archival Images 1970s



Title: Kasbah Taourirt, Caid Residence, 1967-70 est.
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1059..XXXX.CaidRes.jpg
Keywords: Taourirt archival image, 1967-70 est., Caid residence
Copyright: non_JPGT
Folder: ArchImg



Title: Taourirt, aerial view, est. 1960-70
File name: EAI.MOR.Ouarzazate.PhotoAerien.1968.CERKAS.IMG_1062.jpg
Keywords: Taourirt archival image, est 1960-70, aerial view
Copyright: non_JPGT
Folder: ArchImg



Title: Taourirt, aerial view, est. 1960s-70s (detail)
File name: EAI.MOR.Ouarzazate.PhotoAerien.1968.CERKAS.IMG_1062detail.jpg
Keywords: Taourirt archival image, 1960s-70s est., aerial view
Copyright: non_JPGT
Folder: ArchImg

Archival Images 1970s



Title: Kasbah Taourirt, Caid Residence, 1970s est. (b)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1054.Image2.jpg
Keywords: Taourirt archival image, 1970s est., Caid residence
Copyright: non_JPGT
Folder: ArchImg



Title: Kasbah Taourirt, Caid Residence, 1970s est. (c)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1056.Image4.jpg
Keywords: Taourirt archival image, 1970s est., Caid residence
Copyright: non_JPGT
Folder: ArchImg



Title: Kasbah Taourirt, Caid Residence, 1970s est. (a)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1055.Image3.jpg
Keywords: Taourirt archival image, 1970s est., Caid residence
Copyright: non_JPGT
Folder: ArchImg

Archival Images 1970s

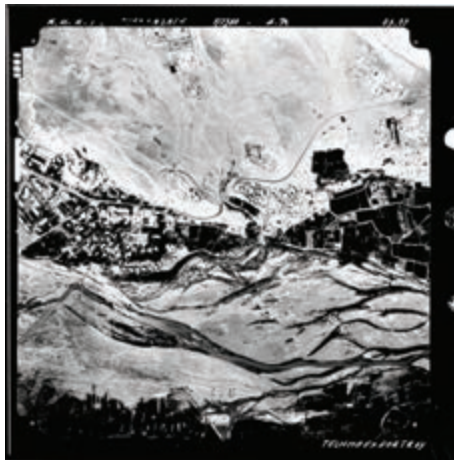


Title: Kasbah Taourirt, north-east, 1974
File name: 1974-ouar.jpg
Keywords: Taourirt archival image, 1974, north-east, cannon square entrance
Copyright: non_JPGT
Folder: ArchImg



Title: Kasbah Taourirt, Stara east, 1970s est.
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_006.JPG
Keywords: Taourirt archival image, 1970s est.
Copyright: Archives J. Gandini, www.ouarzazate-1928-1956.com
Folder: ArchImg

Archival Images 1979



Title: Taourirt, aerial view, 1979
File name: EAI.MOR.Ouarzazate.PhotoAerien.Sc7500.1979_0307.ANCFCC.IMG_DC_2501596.jpg
Keywords: Taourirt archival image, 1979, aerial view
Copyright: non_JPGT
Folder: ArchImg

Archival Images 1980s



Title: Taourirt, aerial view, est. late 1980s
Filename: EAI.MOR.Taourirt.KsarAndKasbah.HistoricImages.CERKAS.IMG_1073.1960_4860.jpg
Keywords: Taourirt archival image, 1980s est., aerial view
Copyright: non_JPGT
Folder: ArchImg



Title: Taourirt, aerial view, est. late 1980s (detail)
File name: EAI.MOR.Taourirt.KsarAndKasbah.HistoricImages.CERKAS.IMG_1073.198x.jpg.jpg
Keywords: Taourirt archival image, 1980s est., aerial view
Copyright: non_JPGT
Folder: ArchImg



Title: Taourirt, aerial view, est. late 1980s (detail)
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1057.Aerial_1977.jpg
Keywords: Taourirt archival image, 1980s est., aerial view
Copyright: non_JPGT
Folder: ArchImg

Archival Images 1980s

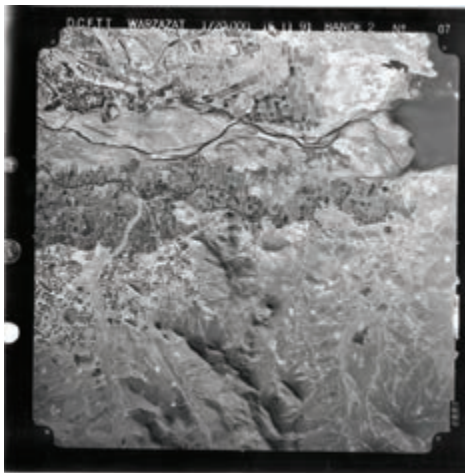


Title: Kasbah Taourirt, south, est. 1980s
File name: EAI.MOR.Taourirt.KsarAndKasbah.HistoricImages.CERKAS.1970s-80s.jpg
Keywords: Taourirt archival image, 1980s est., mediatheque entrance, postcard
Copyright: non_JPGT
Folder: ArchImg



Title: Kasbah Taourirt, north-west, est. 1980s
File name: EAI.MOR.Taourirt.Kasbah.Museum.Postcard.IMG_1000.jpg
Keywords: Taourirt archival image, 1980s est., cannon square entrance, postcard
Copyright: non_JPGT
Folder: ArchImg

Archival Images 1991



Title: Taourirt, aerial view, 1991
File name: EAI.MOR.Ouarzazate.PhotoAerien.Sc20000.1991_B105.ANCFCC.IMG_DC_2501593.jpg
Keywords: Taourirt archival image, 1991, aerial view
Copyright: non_JPGT
Folder: ArchImg

Archival Images 2004



Title: Taourirt, aerial view, 2004 (a)

File name: EAI.MOR.Taourirt.KsarAndKasbah.HistoricImages.CERKAS.IMG_1068.Taourirt.2004.AerialView.jpg

Keywords: Taourirt archival image, 2004, aerial view

Copyright: non_JPGT

Folder: ArchImg



Title: Taourirt, aerial view, 2004 (b)

Filename: EAI.MOR.Taourirt.KsarAndKasbah.HistoricImages.CERKAS.IMG_1070.Taourirt.2004.AerialViewB.jpg

Keywords: Taourirt archival image, 2004, aerial view

Copyright: non_JPGT

Folder: ArchImg



Title: Taourirt, aerial view, 2004 (b)

File name: EAI.MOR.Taourirt.KsarAndKasbah.HistoricImages.CERKAS.IMG_1069.Taourirt.2004.AerialView.jpg

Keywords: Taourirt archival image, 2004, aerial view

Copyright: non_JPGT

Folder: ArchImg

Archival Images 2000s



Title: Kasbah Taourirt, south, 1990-2000s est.
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_001.JPG
Keywords: Taourirt archival image, 1990s-2000s est., mediatheque entrance, postcard
Copyright: non_JPGT
Folder: ArchImg

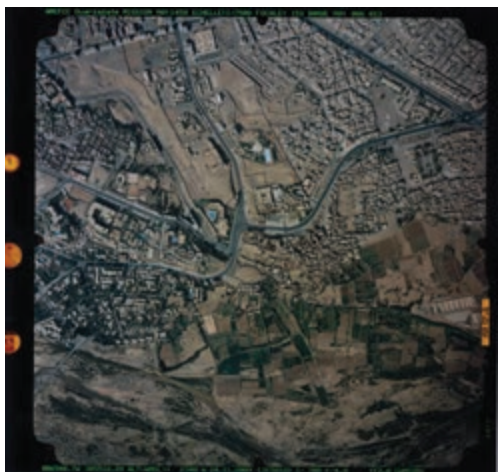


Title: Kasbah Taourirt,south, 2000s est.
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages_005.JPG
Keywords: Taourirt archival image, 2000s est., mediatheque entrance, postcard
Copyright: non_JPGT
Folder: ArchImg



Title: Kasbah Taourirt, north-east, 2005
File name: EAI.MOR.Taourirt.Kasbah.HistoricImages.CERKAS.IMG_1063.jpg
Keywords: Taourirt archival image, 2005, cannon square entrance
Copyright: non_JPGT
Folder: ArchImg

Archival Images 2000s



Title: Taourirt, aerial view, 2009
File name: EAI.MOR.Ouarzazate.PhotoAerien.Sc7500.2009_6013.ANCFCC.IMG_DC_2501599.jpg
Keywords: Taourirt archival image, 2009, aerial view
Copyright: non_JPGT
Folder: ArchImg

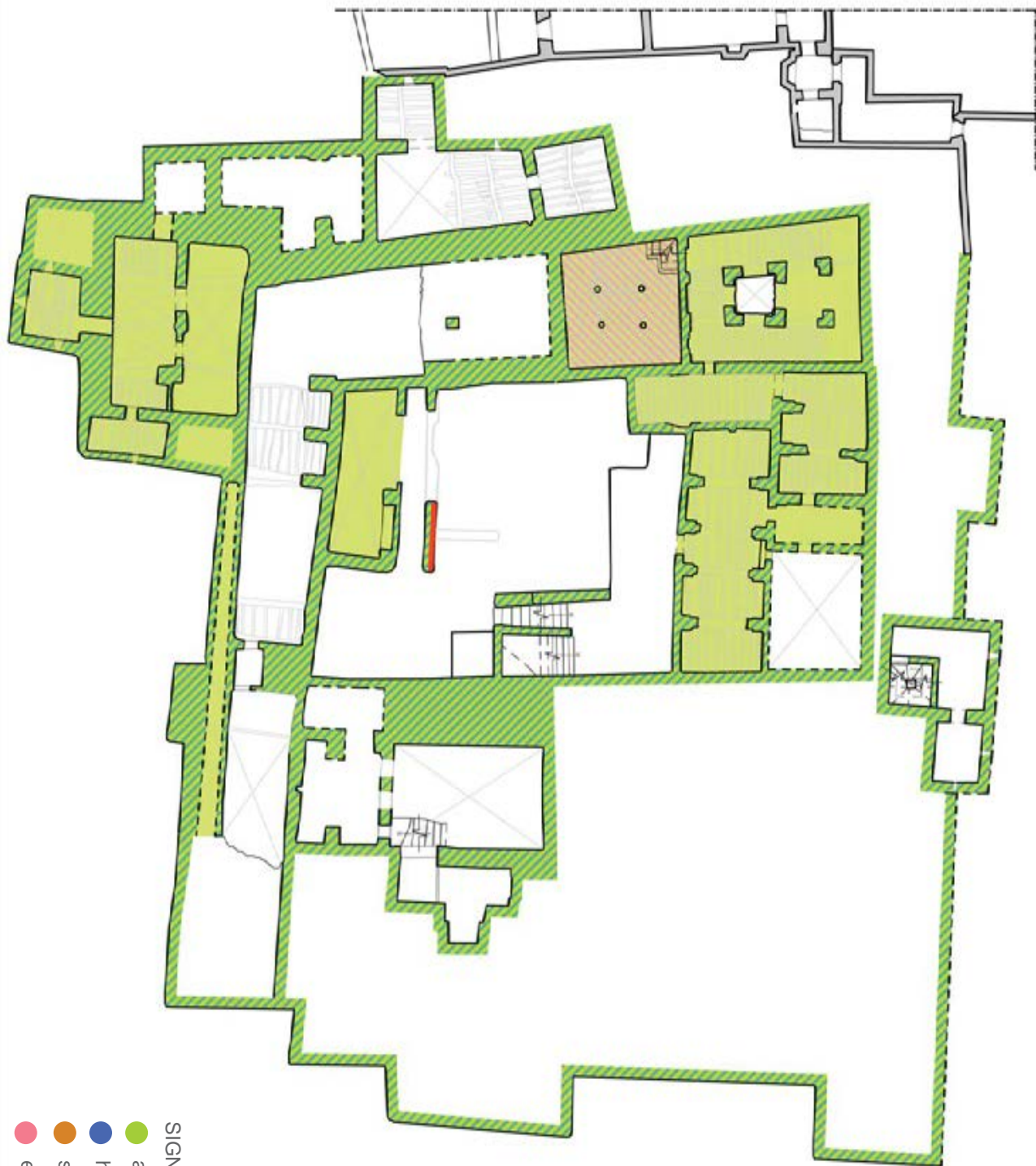


Title: Kasbah Taourirt, south, 2013
File name: EAI.MOR.Taourirt.Kasbah_2013_1.JPG
Keywords: Taourirt archival image, 2013, mediatheque entrance
Copyright: JPGT
Folder: ArchImg

APPENDIX E

Significance Assessment: Caïd Residence and Stara Area

CAID RESIDENCE - LEVEL 1



- SIGNIFICANCE ASSESSMENT**
- architectural value
 - historical value
 - social value
 - economic value
 - no value

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

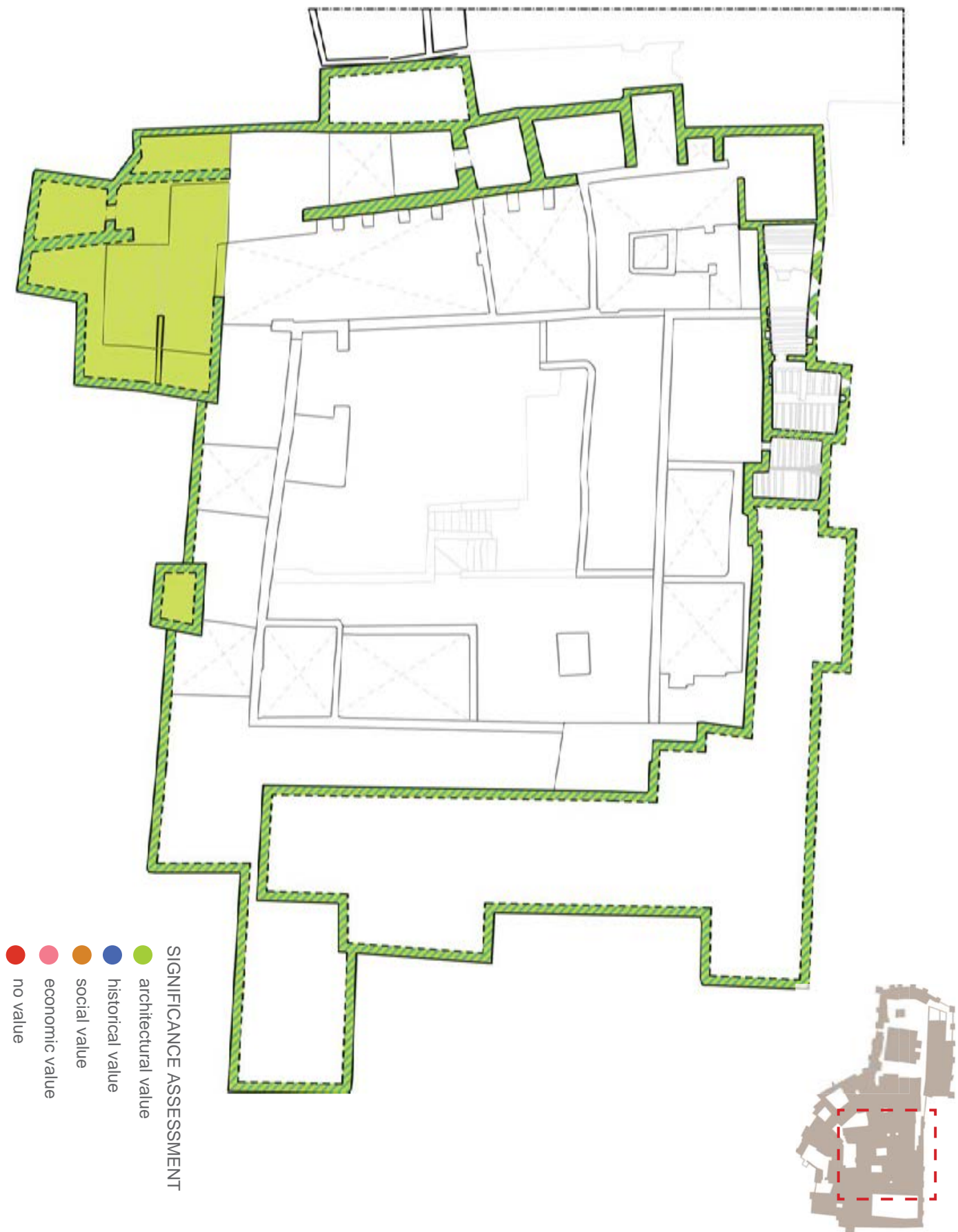


Site: **KASBAH TAOURIRT**
 Drawing: Significance assessment Caid Residence
 Reviewed by: Claudia Cancino, Mohamed Boussalh

Team members:
 Lahcen Abid, Hamid Aghazzaf,
 Sara Doublani, Alaa
 El-Habashi, Elena Macchioni,
 Benjamin Marcus, Noufissa
 Ouberchkik

Drawing number: **TAO_VAL_CR_02**
 Scale: 1:300
 Date: April 2014

CAID RESIDENCE - LEVEL 2



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
 Drawing: **Significance assessment Caïd Residence**
 Reviewed by: **Claudia Cancino, Mohamed Boussalh**

Team members:
 Lahcen Abid, Hamid Aghazzaf,
 Sara Doublani, Alaa
 El-Habashi, Elena Macchioni,
 Benjamin Marcus, Noufissa
 Ouberchkik

Drawing number: **TAO_VAL_CR_03**
 Scale: **1:300**
 Date: **April 2014**

STARA AREA - GROUND LEVEL



- SIGNIFICANCE ASSESSMENT
- architectural value
 - historical value
 - social value
 - economic value
 - no value

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
 Drawing: Significance assessment Caid Residence
 Reviewed by: Claudia Cancino, Mohamed Boussalh

Team members:
 Lahcen Abid, Hamid Aghazzaf,
 Sara Doublani, Alaa
 El-Habashi, Elena Macchioni,
 Benjamin Marcus, Noufissa
 Ouberchik

Drawing number: TAO_VAL_ST_01
 Scale: 1:300
 Date: April 2014

STARA AREA - LEVEL 1

- SIGNIFICANCE ASSESSMENT
- architectural value
 - historical value
 - social value
 - economic value
 - no value



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site:	KASBAH TAOURIRT	Team members:	Lahcen Abid, Hamid Aghazzaf, Sara Doublani, Alaa El-Habashi, Elena Macchioni, Benjamin Marcus, Noufissa Ouberchik	Drawing number:	TAO_VAL_ST_02
Drawing:	Significance assessment Caïd Residence	Scale:	1:300	Date:	April 2014
Reviewed by:	Claudia Cancino, Mohamed Boussalh				



- SIGNIFICANCE ASSESSMENT
- architectural value
 - historical value
 - social value
 - economic value
 - no value

APPENDIX F

Identification before/after 1956: Stara Area



● before 1956 ● after 1956



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
Drawing: Identification of the historican constructions
at the Stara Area.
Reviewed by:
Claudia Cancino, Mohamed Boussalh

Team members:
Lahcen Abid, Hamid Aghazzaf,
Sara Doublani, Alaa
El-Habashi, Elena Macchioni,
Benjamin Marcus, Noufissa
Ouberchkik

Drawing number:
TAO_IH_ST_01
Scale:
Not to scale
Date:
November 2013

● before 1956 ● after 1956



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
Drawing: Identification of the historican constructions
at the Stara Area.
Reviewed by:
Claudia Cancino, Mohamed Boussalh

Team members:
Lahcen Abid, Hamid Aghazzaf,
Sara Doublani, Alaa
El-Habashi, Elena Macchioni,
Benjamin Marcus, Noufissa
Ouberchkik

Drawing number:
TAO_IH_ST_02
Scale:
Not to scale
Date:
November 2013

● before 1956 ● after 1956



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



The Getty Conservation Institute



Site:

KASBAH TAOURIRT

Drawing:

Identification of the historical constructions
at the Stara Area.

Reviewed by:

Claudia Cancino, Mohamed Boussalh

Team members:

Lahcen Abid, Hamid Aghazzaf,
Sara Doublani, Alaa
El-Habashi, Elena Macchioni,
Benjamin Marcus, Noufissa
Ouberchik

Drawing number:

TAO_IH_ST_03

Scale:

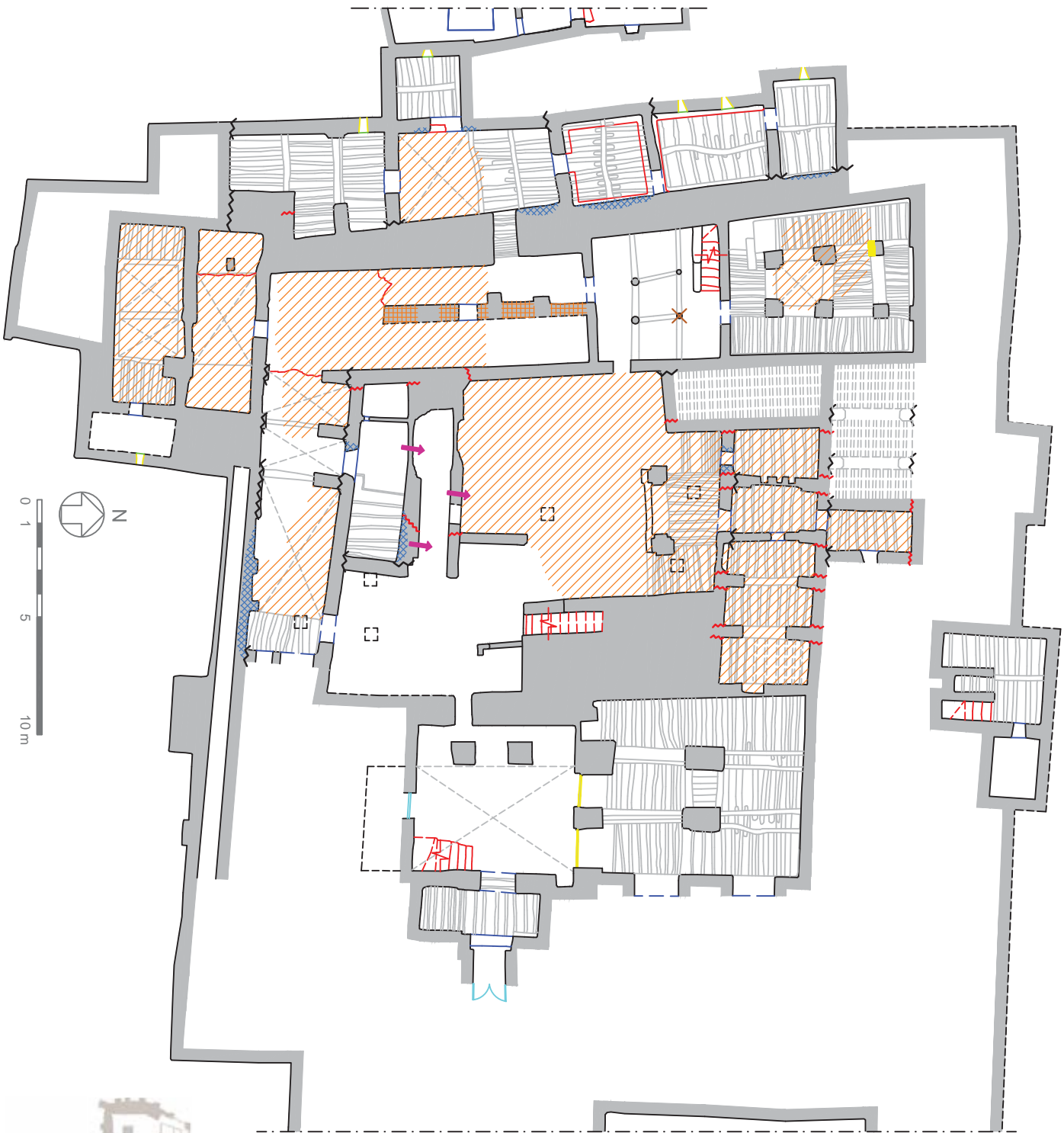
Not to scale

Date:

November 2013

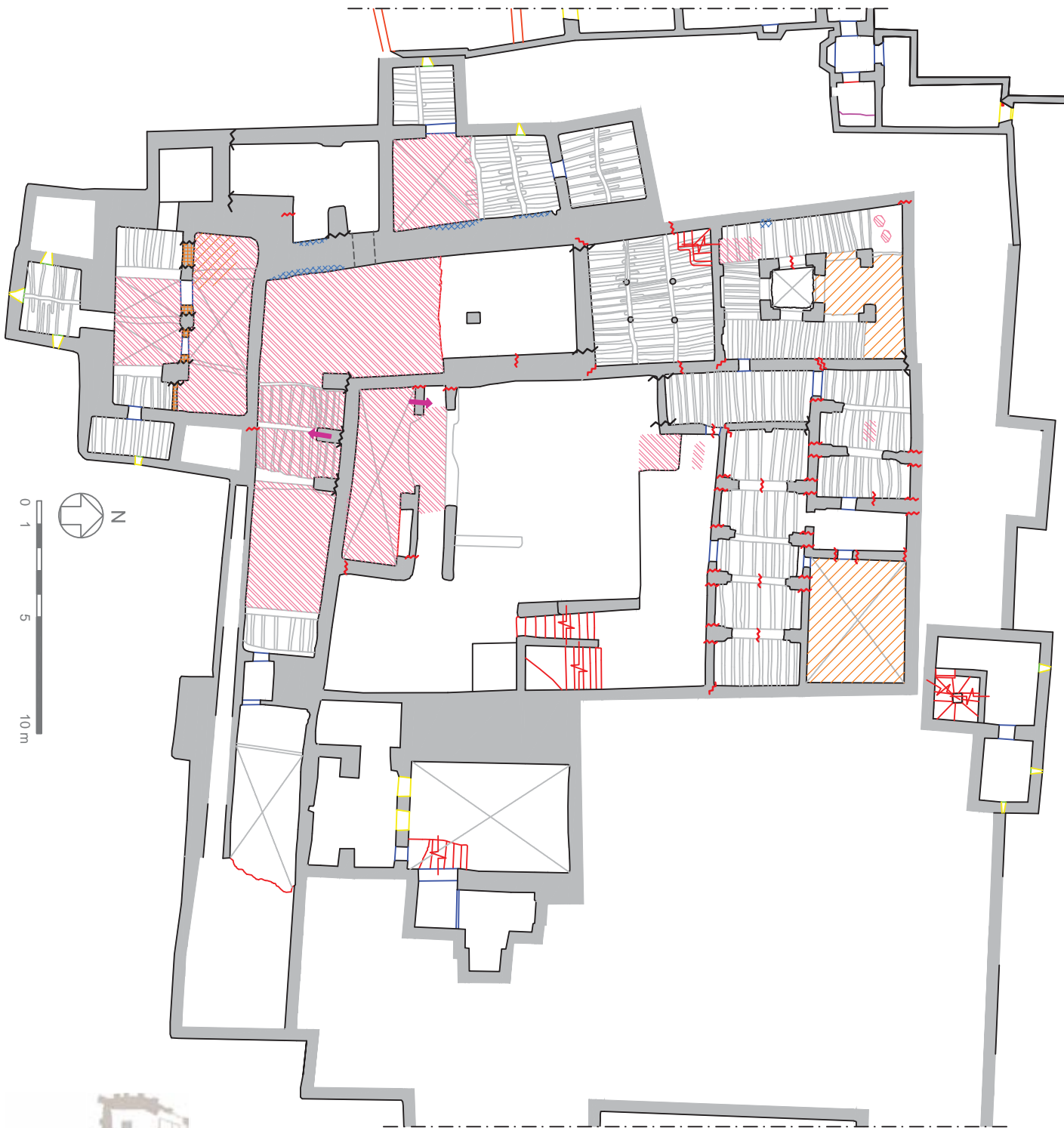
APPENDIX G

Condition Assessment: Caïd Residence (CR)



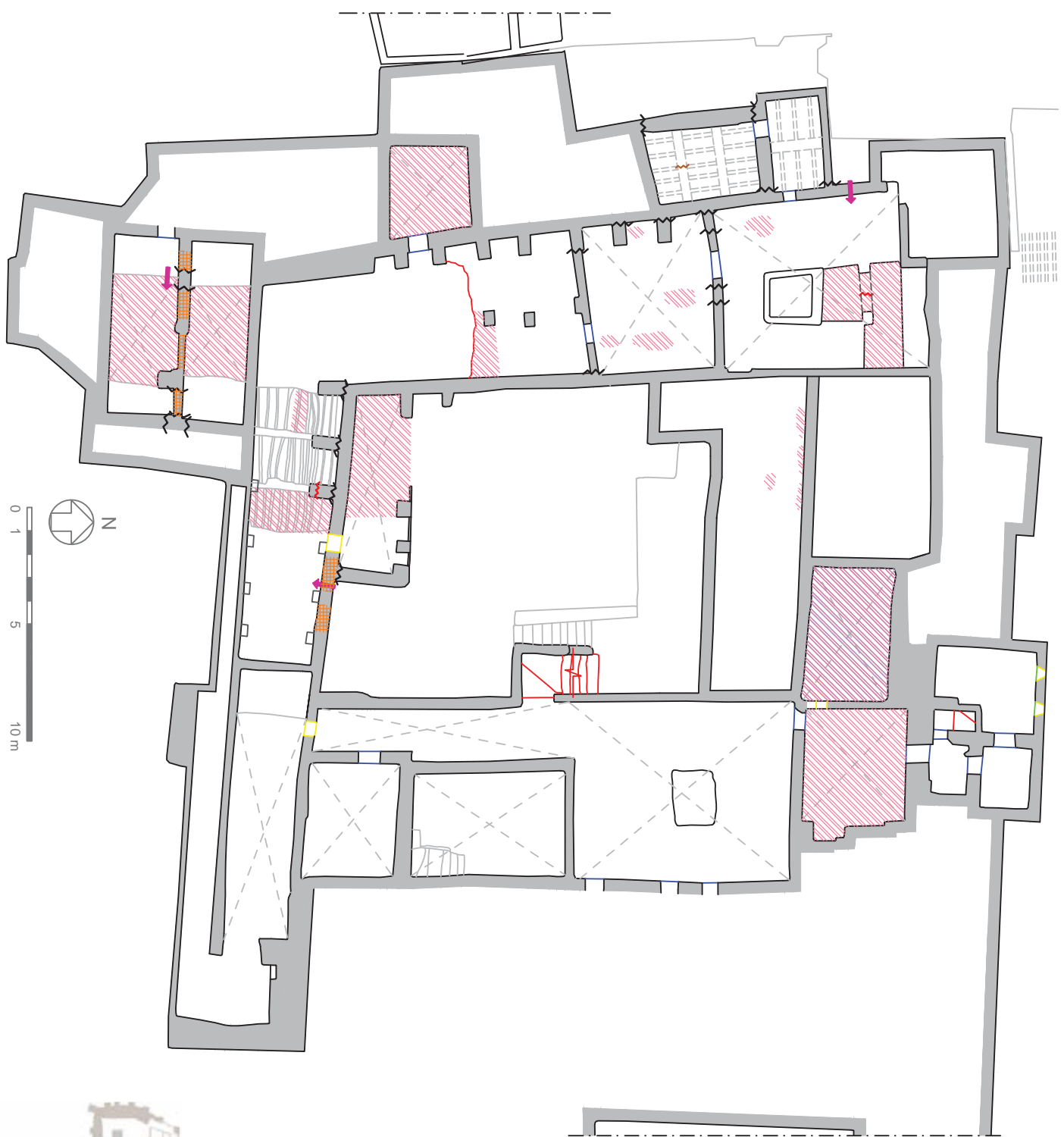
LEGEND

- DEBRIS
- STRUCTURE**
 - UNSTABLE FREE WALL
 - LEANING WALL
 - STRUCTURAL CRACK
 - LOSS (STRUCTURE)
 - INFILL
 - BASAL EROSION (COVING)
 - STRUCTURAL SEPARATION
- ROOFS AND LINTELS**
 - BEAM FAILURE
 - LOSS (ROOF)



	DEBRIS
	STRUCTURE
	UNSTABLE FREE WALL
	LEANING WALL
	STRUCTURAL CRACK
	LOSS (STRUCTURE)
	INFILL
	BASAL EROSION (COVING)
	STRUCTURAL SEPARATION
	ROOFS AND LINTELS
	BEAM FAILURE
	LOSS (ROOF)

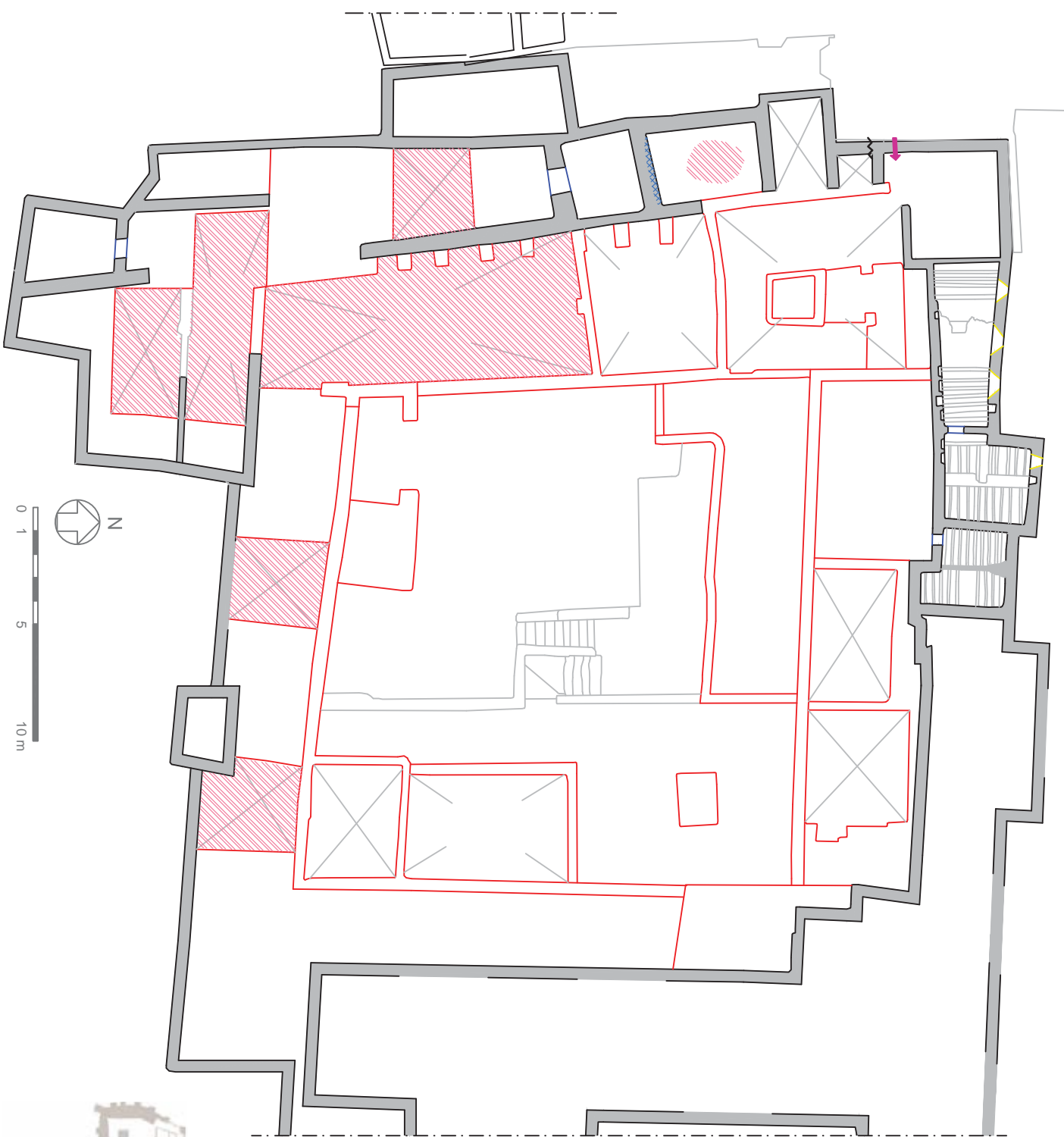




LEGEND

- DEBRIS
- STRUCTURE
- UNSTABLE FREE WALL
- LEANING WALL
- STRUCTURAL CRACK
- LOSS (STRUCTURE)
- INFILL
- BASAL EROSION (COVING)
- STRUCTURAL SEPARATION
- ROOFS AND LINTELS
- BEAM FAILURE
- LOSS (ROOF)

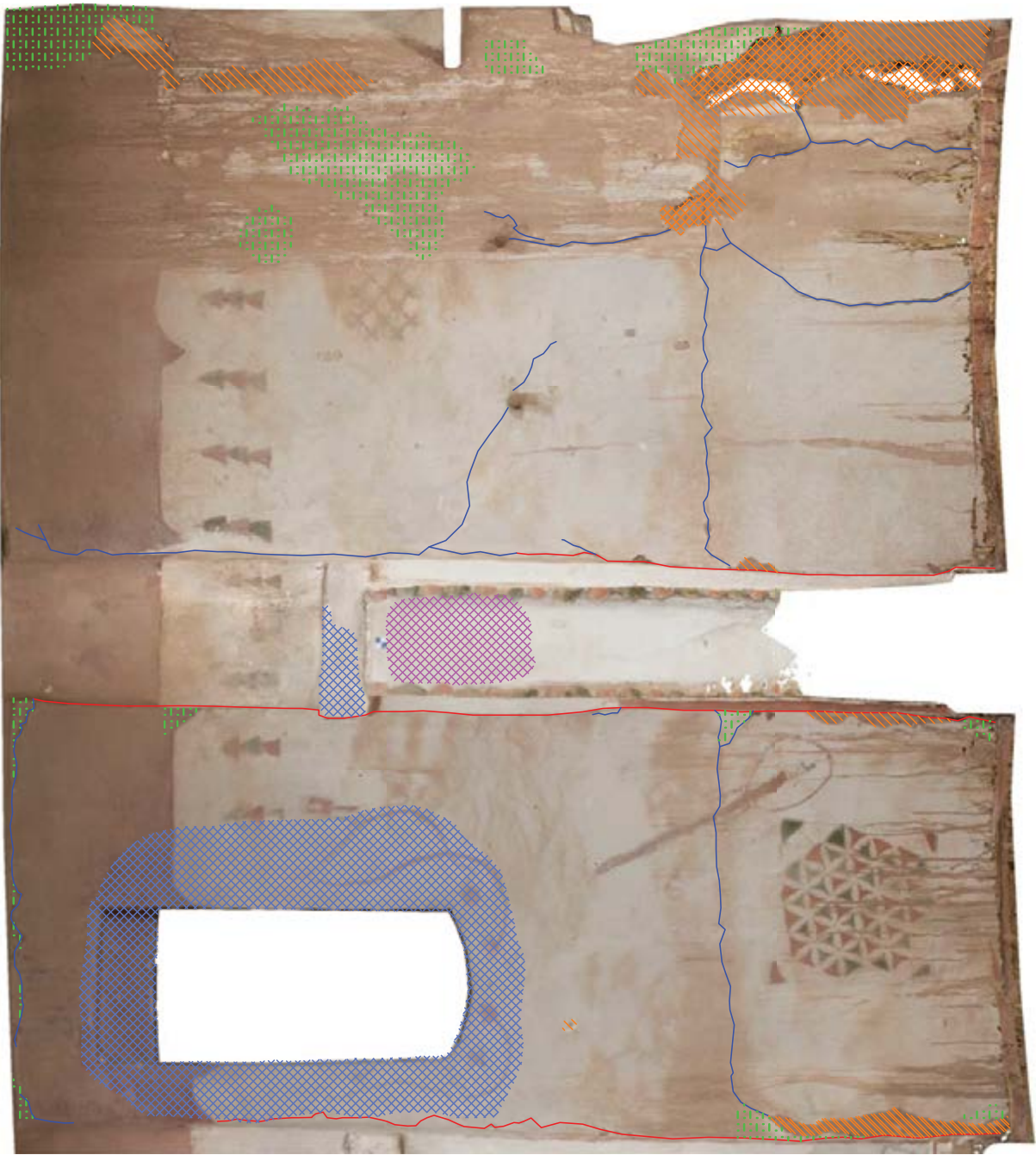




- LEGEND**
- DEBRIS
 - STRUCTURE
 - UNSTABLE FREE WALL
 - LEANING WALL
 - STRUCTURAL CRACK
 - LOSS (STRUCTURE)
 - INFILL
 - BASAL EROSION (GOVING)
 - STRUCTURAL SEPARATION
 - ROOFS AND LINTELS
 - BEAM FAILURE
 - LOSS (ROOF)

APPENDIX H

Condition Assessment of the CR Wall Paintings



- LEGEND**
- STRUCTURAL CRACK
 - LOSS
 - PLASTER
 - DETACHED PLASTER
 - DEEP LOSS
 - CRACK
 - LOSS REVEALING LOWER PAINTED DECORATION
 - PREVIOUS INTERVENTIONS
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

CAID RESIDENCE - NORTHERN FRONT ROOM - NORTHERN WALL (NF_N_S1/A_NCo_S/S2)

CONDITION ASSESSMENT

CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
Drawing: Condition assessment of the CR wall paintings
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:
 CIMS
Team members:
Lorinda Wong,
Samuel Whittaker

Drawing number: TAO_CR_CAPM_01
Scale: Not to scale
Date: April 2014



LEGEND

STRUCTURE



STRUCTURAL CRACK



STRUCTURAL SEPARATION



LOSS

PLASTER



DETACHED PLASTER



LOSS



DEEP LOSS



CRACK



LOSS REVEALING LOWER
PAINTED DECORATION

PREVIOUS INTERVENTIONS



EARTHEN PLASTER



PHASE 1 RESTORATION



PHASE 2 RESTORATION



GREY COURSE PLASTER

CAID RESIDENCE - NORTHERN FRONT ROOM - NORTHERN WALL (NF_B_NCo/ S3/ C_NCo/ S4)



CONDITION ASSESSMENT

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

The Getty Conservation Institute



Site: **KASBAH TAOURIRT**
Drawing: Condition assessment of the CR wall paintings
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:

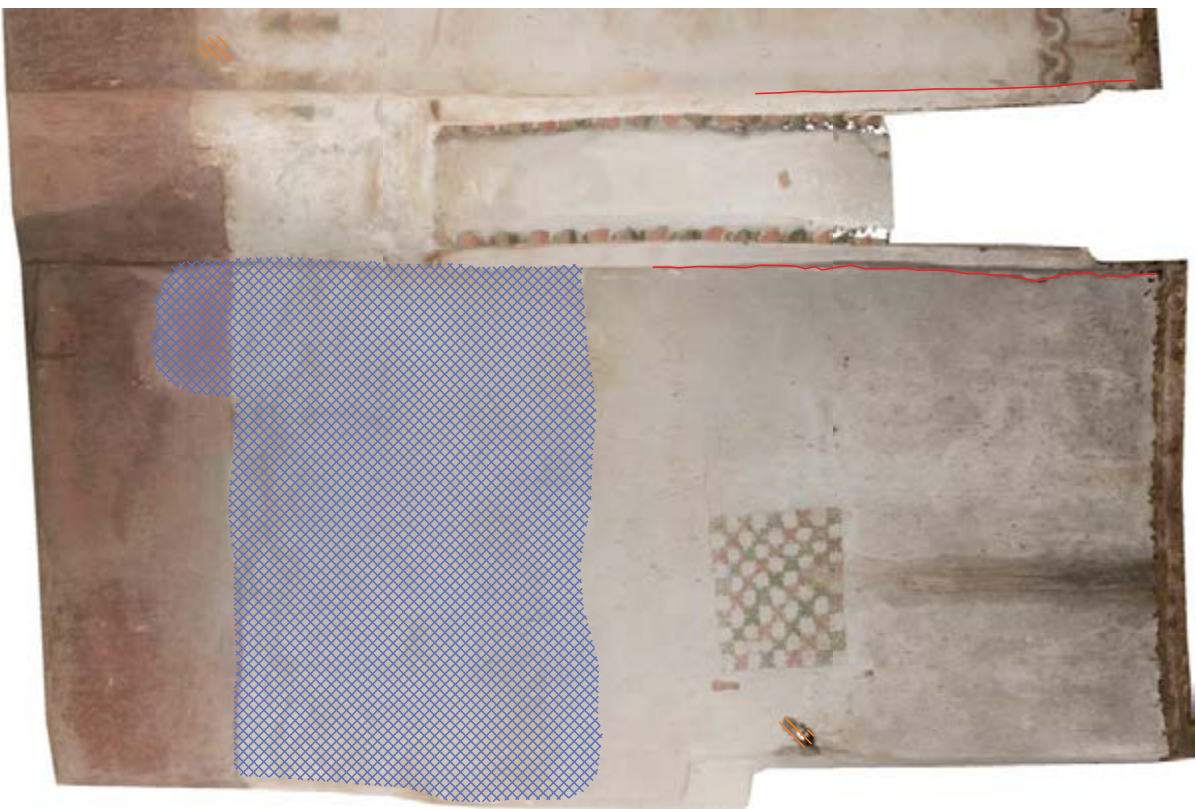


Team members:
Lorinda Wong,
Samuel Whittaker

Drawing number:
TAO_CR_CAPM_02

Scale:
Not to scale

Date:
April 2014



LEGEND

STRUCTURE



STRUCTURAL CRACK



LOSS

PLASTER



DETACHED PLASTER



LOSS



DEEP LOSS



CRACK



LOSS REVEALING LOWER
PAINTED DECORATION

PREVIOUS INTERVENTIONS



EARTHEN PLASTER



PHASE 1 RESTORATION



PHASE 2 RESTORATION



GREY COURSE PLASTER

CAID RESIDENCE - NORTHERN FRONT ROOM - NORTHERN WALL (NF_D_NCo_S/ S5)

CONDITION ASSESSMENT

CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
Drawing: Condition assessment of the CR wall paintings
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:
Team members:
Lorinda Wong,
Samuel Whittaker

Drawing number:
TAO_CR_CAPM_03
Scale:
Not to scale
Date:
April 2014



LEGEND

STRUCTURE



STRUCTURAL SEPARATION



LOSS



PLASTER



LOSS



DEEP LOSS



CRACK



LOSS REVEALING LOWER PAINTED DECORATION

PREVIOUS INTERVENTIONS



EARTHEN PLASTER



PHASE 1 RESTORATION



PHASE 2 RESTORATION



GREY COURSE PLASTER



- LEGEND**
- STRUCTURAL CRACK
 - CRACK
 - LOSS
 - PLASTER
 - DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - LOSS REVEALING LOWER PAINTED DECORATION
 - PREVIOUS INTERVENTIONS
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

CAID RESIDENCE - NORTHERN FRONT ROOM - SOUTHERN WALL (NF_S_S1/A_SCo_N/S2/B_SCo_N)

CONDITION ASSESSMENT

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
 Drawing: Condition assessment of the CR wall paintings
 Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:

 Team members:
 Lorinda Wong,
 Samuel Whittaker

Drawing number:
 TAO_CR_CAPM_05
 Scale:
 Not to scale
 Date:
 April 2014



LEGEND

STRUCTURE

STRUCTURAL CRACK

STRUCTURAL SEPARATION

LOSS

PLASTER

DETACHED PLASTER

LOSS

DEEP LOSS

CRACK

LOSS REVEALING LOWER
PAINTED DECORATION

PREVIOUS INTERVENTIONS

EARTHEN PLASTER

PHASE 1 RESTORATION

PHASE 2 RESTORATION

GREY COURSE PLASTER

CAID RESIDENCE - NORTHERN FRONT ROOM - SOUTHERN WALL (NF_S_N/S3/C_ScO_N/S4)

CONDITION ASSESSMENT

Site: KASBAH TAOURIRT

Drawing: Condition assessment of the CR wall paintings

Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:



Team members:
Lorinda Wong,
Samuel Whittaker

Drawing number:
TAO_CR_CAPM_06

Scale:
Not to scale

Date:
April 2014

CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO





CAID RESIDENCE - NORTHERN FRONT ROOM - SOUTHERN WALL (NF_S_D_SCo_N/S5)



CONDITION ASSESSMENT

LEGEND	
	STRUCTURE
	STRUCTURAL CRACK
	STRUCTURAL SEPARATION
	LOSS
	PLASTER
	DETACHED PLASTER
	LOSS
	DEEP LOSS
	CRACK
	LOSS REVEALING LOWER PAINTED DECORATION
	PREVIOUS INTERVENTIONS
	EARTHEN PLASTER
	PHASE 1 RESTORATION
	PHASE 2 RESTORATION
	GREY COURSE PLASTER

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
 Drawing: Condition assessment of the CR wall paintings
 Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:

 Team members:
 Lorinda Wong,
 Samuel Whittaker

Drawing number:
 TAO_CR_CAPM_07
 Scale:
 Not to scale
 Date:
 April 2014



CAID RESIDENCE - NORTHERN FRONT ROOM - WESTERN WALL (NF_W)



CONDITION ASSESSMENT

- LEGEND**
- STRUCTURAL CRACK
 - STRUCTURAL SEPARATION
 - LOSS
 - PLASTER**
 - DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - CRACK
 - LOSS REVEALING LOWER PAINTED DECORATION
 - PREVIOUS INTERVENTIONS**
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

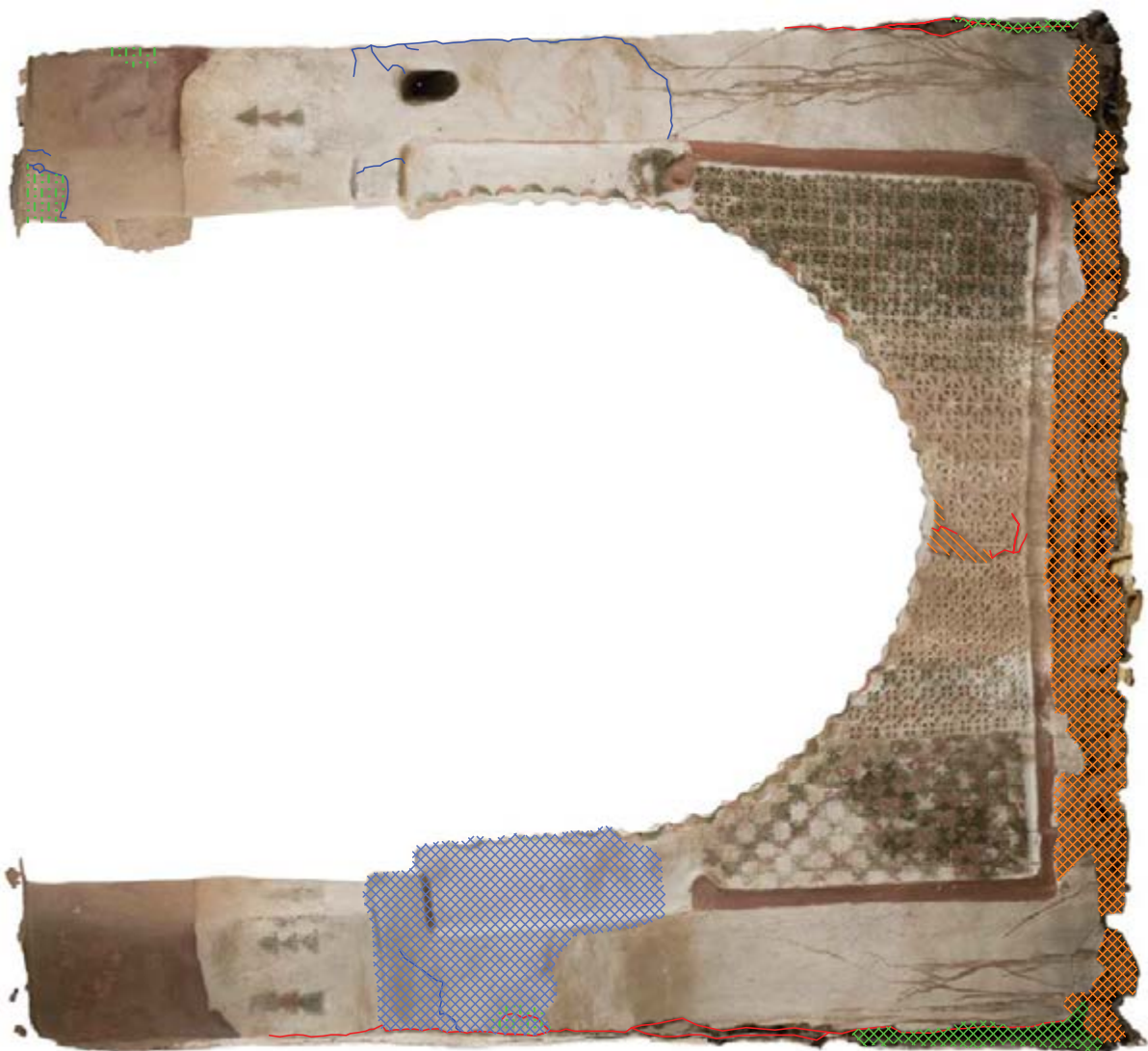


Site: KASBAH TAOURIRT
 Drawing: Condition assessment of the CR wall paintings
 Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:

 Team members:
 Lorinda Wong,
 Samuel Whittaker

Drawing number:
 TAO_CR_CAPM_08
 Scale:
 Not to scale
 Date:
 April 2014



LEGEND

STRUCTURE



STRUCTURAL SEPARATION



LOSS



PLASTER



LOSS



DEEP LOSS



CRACK



LOSS REVEALING LOWER PAINTED DECORATION

PREVIOUS INTERVENTIONS



EARTHEN PLASTER



PHASE 1 RESTORATION



PHASE 2 RESTORATION



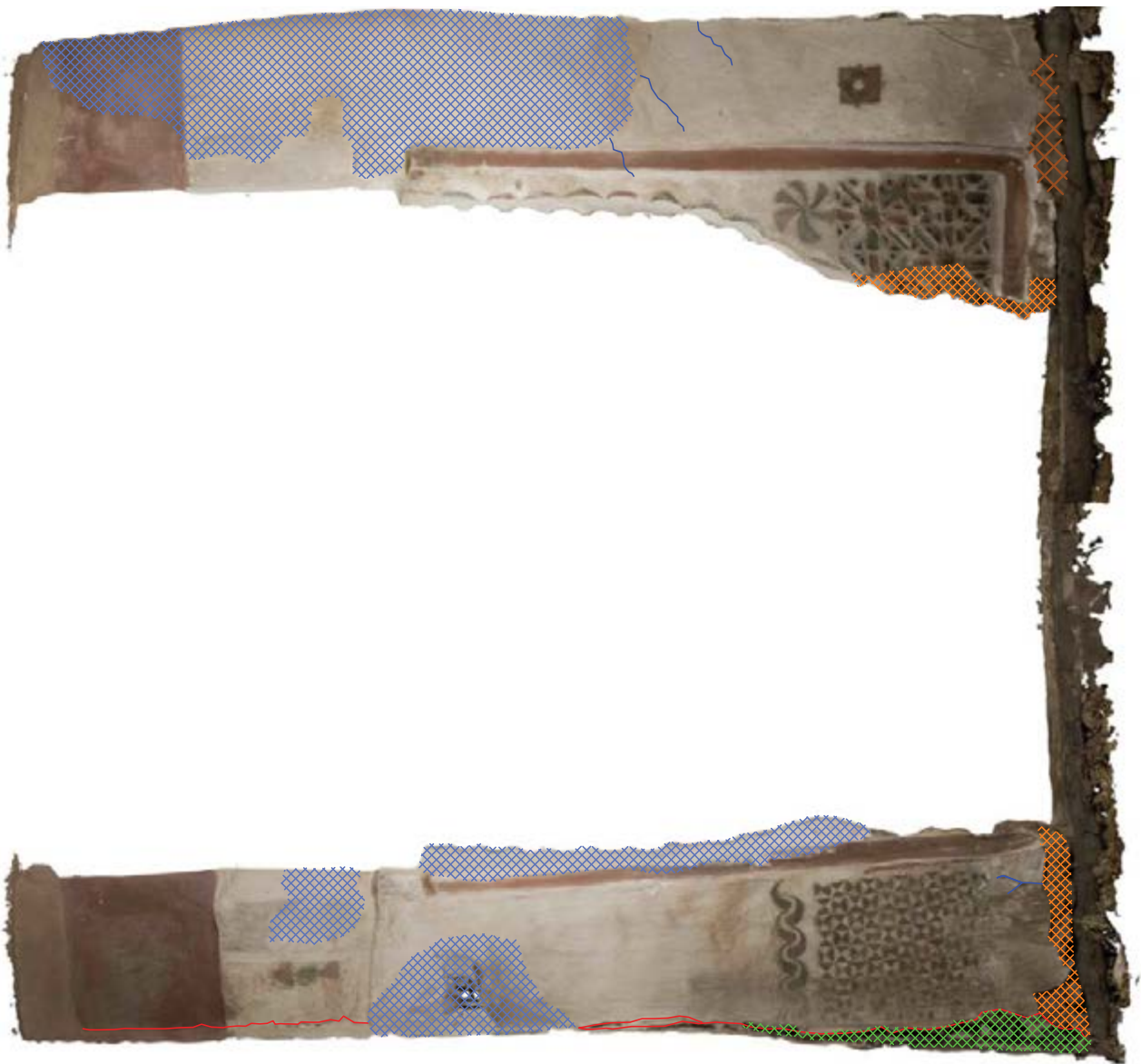
GREY COURSE PLASTER



- LEGEND**
- STRUCTURE**
 - STRUCTURAL CRACK
 - STRUCTURAL SEPARATION
 - LOSS
 - PLASTER**
 - DETACHED PLASTER
 - LOSS
 - LOSS
 - DEEP LOSS
 - CRACK
 - LOSS REVEALING LOWER PAINTED DECORATION
 - PREVIOUS INTERVENTIONS**
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

CAID RESIDENCE - NORTHERN FRONT ROOM - ARCH A (NF_A_WA)

CONDITION ASSESSMENT



- LEGEND**
- STRUCTURAL CRACK
 - STRUCTURAL SEPARATION
 - LOSS
 - PLASTER**
 - DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - CRACK
 - LOSS REVEALING LOWER PAINTED DECORATION
 - PREVIOUS INTERVENTIONS**
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

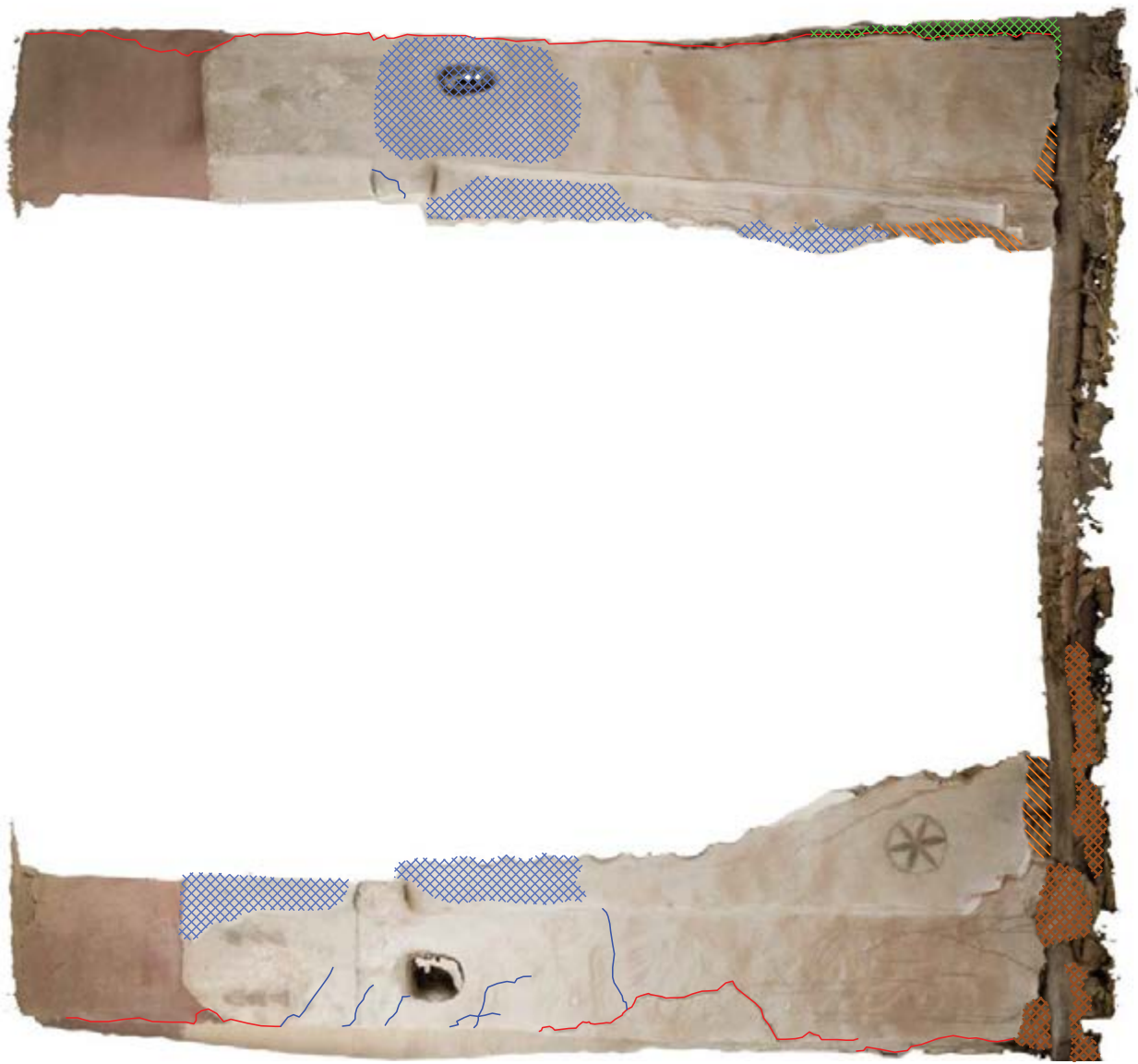
CAID RESIDENCE - NORTHERN FRONT ROOM - ARCH B (NF_B_EA)

CONDITION ASSESSMENT

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site:	KASBAH TAOURIRT		Drawing number:	TAO_CR_CAPM_11
Drawing:	Condition assessment of the CR wall paintings		Scale:	Not to scale
Reviewed by:	Lorinda Wong, Mohamed Boussalh		Date:	April 2014
		Photogrammetry and survey:	Team members: Lorinda Wong, Samuel Whittaker	



- LEGEND**
- STRUCTURE
 - STRUCTURAL CRACK
 - STRUCTURAL SEPARATION
 - LOSS
 - PLASTER
 - DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - CRACK
 - LOSS REVEALING LOWER PAINTED DECORATION
 - PREVIOUS INTERVENTIONS**
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

CAID RESIDENCE - NORTHERN FRONT ROOM - ARCH B (NF_B_WA) - NORTH

CONDITION ASSESSMENT

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site:	KASBAH TAOURIRT	Photogrammetry and survey:		Drawing number:	TAO_CR_CAPM_12
Drawing:	Condition assessment of the CR wall paintings			Scale:	Not to scale
Reviewed by:	Lorinda Wong, Mohamed Boussalh	Team members:	Lorinda Wong, Samuel Whittaker	Date:	April 2014



CAID RESIDENCE - NORTHERN FRONT ROOM - ARCH C (NF_C_EAR)



CONDITION ASSESSMENT

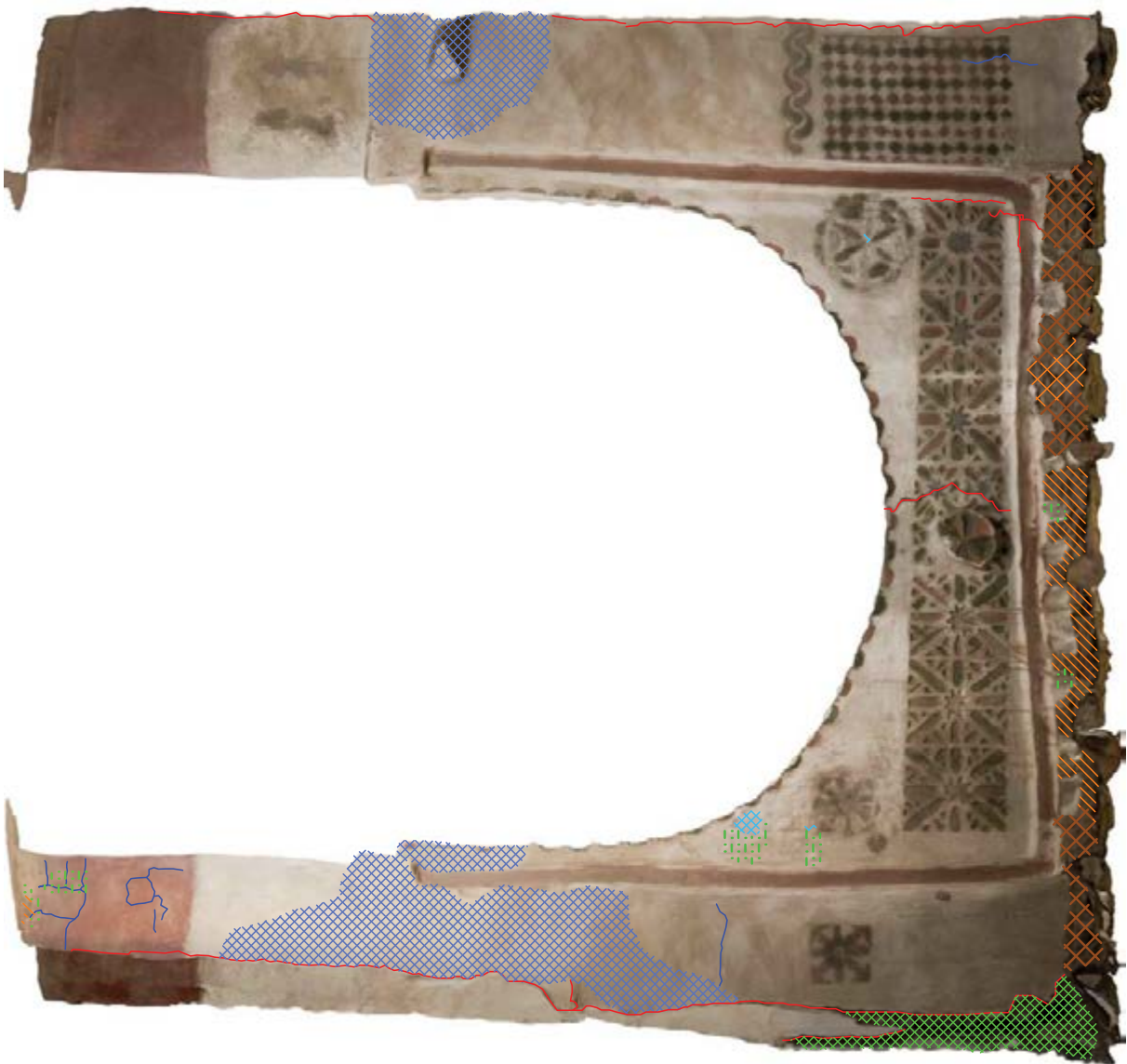
LEGEND	
	STRUCTURE
	STRUCTURAL CRACK
	STRUCTURAL SEPARATION
	LOSS
	PLASTER
	DETACHED PLASTER
	LOSS
	DEEP LOSS
	CRACK
	LOSS REVEALING LOWER PAINTED DECORATION
PREVIOUS INTERVENTIONS	
	EARTHEN PLASTER
	PHASE 1 RESTORATION
	PHASE 2 RESTORATION
	GREY COURSE PLASTER

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site:	KASBAH TAOURIRT
Drawing:	Condition assessment of the CR wall paintings
Reviewed by:	Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:	Drawing number:
	TAO_CR_CAPM_13
Team members:	Scale:
Lorinda Wong, Samuel Whittaker	Not to scale
	Date:
	April 2014



LEGEND

STRUCTURE



PLASTER



PREVIOUS INTERVENTIONS





CAID RESIDENCE - NORTHERN FRONT ROOM - ARCH D (NF_D_EAR)



CONDITION ASSESSMENT

LEGEND	
	STRUCTURE
	STRUCTURAL CRACK
	STRUCTURAL SEPARATION
	LOSS
PLASTER	
	DETACHED PLASTER
	LOSS
	DEEP LOSS
	CRACK
	LOSS REVEALING LOWER PAINTED DECORATION
PREVIOUS INTERVENTIONS	
	EARTHEN PLASTER
	PHASE 1 RESTORATION
	PHASE 2 RESTORATION
	GREY COURSE PLASTER

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site:	KASBAH TAOURIRT
Drawing:	Condition assessment of the CR wall paintings
Reviewed by:	Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:	Drawing number:
	TAO_CR_CAPM_15
Team members:	Scale:
Lorinda Wong, Samuel Whittaker	Not to scale
	Date:
	April 2014



- LEGEND**
- STRUCTURE
 - STRUCTURAL CRACK
 - STRUCTURAL SEPARATION
 - LOSS
 - PLASTER**
 - DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - CRACK
 - LOSS REVEALING LOWER PAINTED DECORATION
 - PREVIOUS INTERVENTIONS**
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

CAID RESIDENCE - NORTHERN FRONT ROOM - ARCH D (NF_D_WA1)

CONDITION ASSESSMENT

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
Drawing: Condition assessment of the CR wall paintings
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:

Team members:
Lorinda Wong,
Samuel Whittaker

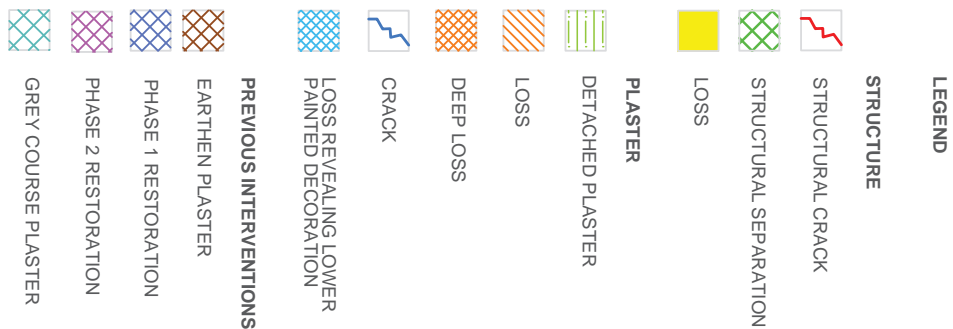
Drawing number:
TAO_CR_CAPM_16
Scale:
Not to scale
Date:
April 2014



CAID RESIDENCE - NORTHERN BACK ROOM - NORTHERN WALL (NR_N)



CONDITION ASSESSMENT





- STRUCTURAL CRACK
- STRUCTURAL SEPARATION
- LOSS
- PLASTER**
- DETACHED PLASTER
- LOSS
- DEEP LOSS
- CRACK
- LOSS REVEALING LOWER PAINTED DECORATION
- PREVIOUS INTERVENTIONS**
- EARTHEN PLASTER
- PHASE 1 RESTORATION
- PHASE 2 RESTORATION
- GREY COURSE PLASTER

LEGEND

STRUCTURE

STRUCTURAL CRACK

STRUCTURAL SEPARATION

LOSS

PLASTER

DETACHED PLASTER

LOSS

DEEP LOSS

CRACK

LOSS REVEALING LOWER PAINTED DECORATION

PREVIOUS INTERVENTIONS

EARTHEN PLASTER

PHASE 1 RESTORATION

PHASE 2 RESTORATION

GREY COURSE PLASTER

CAID RESIDENCE - NORTHERN BACK ROOM - EASTERN WALL (NR_E)

CONDITION ASSESSMENT

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
 Drawing: Condition assessment of the CR wall paintings
 Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:
 CIMS
 Team members:
 Lorinda Wong,
 Samuel Whittaker

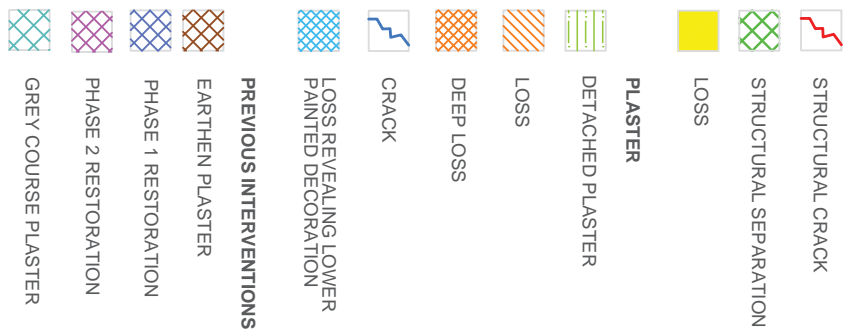
Drawing number:
TAO_CR_CAPM_18
 Scale:
 Not to scale
 Date:
 April 2014



CAID RESIDENCE - NORTHERN BACK ROOM - SOUTHERN WALL (NR_S)



CONDITION ASSESSMENT



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
Drawing: Condition assessment of the CR wall paintings
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:
Team members:
Lorinda Wong,
Samuel Whittaker

Drawing number: TAO_CR_CAPM_19
Scale: Not to scale
Date: April 2014



CAID RESIDENCE - NORTHERN BACK ROOM - WESTERN WALL (NR_W)



CONDITION ASSESSMENT

- LEGEND**
- STRUCTURE
 - STRUCTURAL CRACK
 - STRUCTURAL SEPARATION
 - LOSS
 - PLASTER
 - DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - CRACK
 - LOSS REVEALING LOWER PAINTED DECORATION
 - PREVIOUS INTERVENTIONS
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



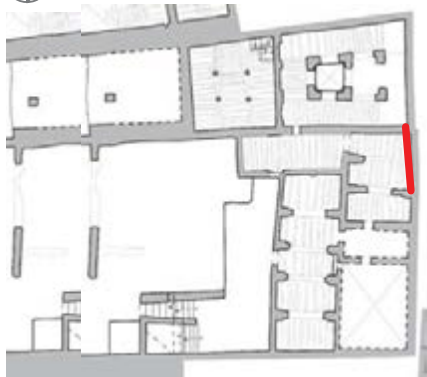
Site: **KASBAH TAOURIRT**
Drawing: Condition assessment of the CR wall paintings
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:
 CIMS
Team members:
Lorinda Wong,
Samuel Whittaker

Drawing number:
TAO_CR_CAPM_20
Scale:
Not to scale
Date:
April 2014



CAID RESIDENCE - NORTH-WESTERN ROOM - NORTHERN WALL (NW_N_S1/S2/B_N_S)



CONDITION ASSESSMENT

- LEGEND**
- STRUCTURE
 - STRUCTURAL CRACK
 - STRUCTURAL SEPARATION
 - LOSS
 - PLASTER
 - DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - CRACK
 - LOSS REVEALING LOWER PAINTED DECORATION
 - PREVIOUS INTERVENTIONS**
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

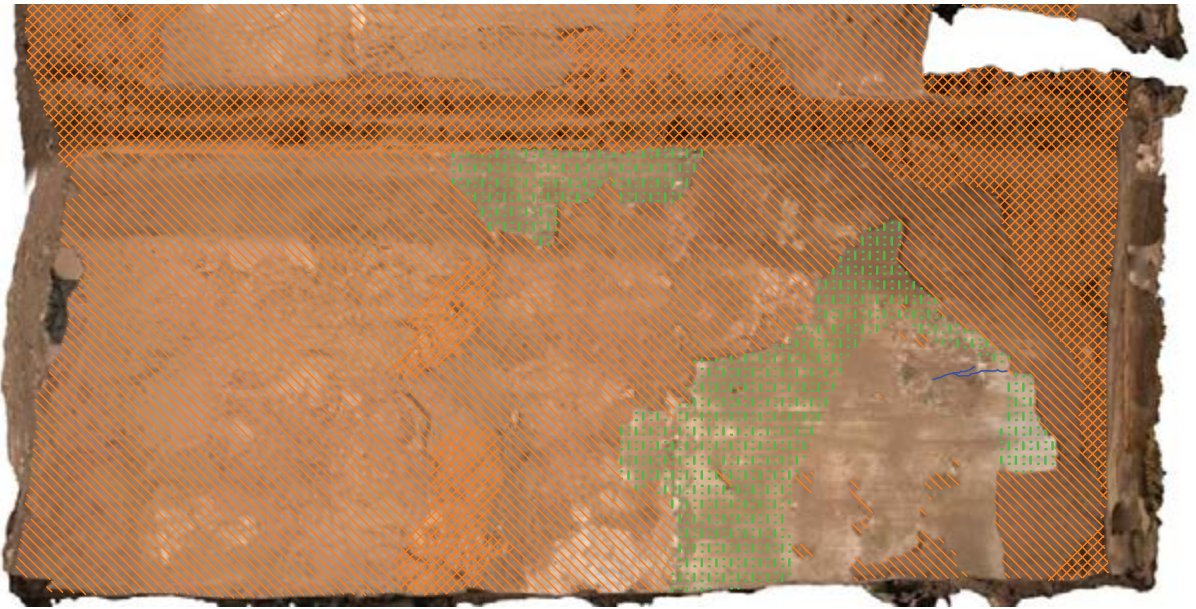
CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
Drawing: Condition assessment of the CR wall paintings
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:
Team members:
Lorinda Wong,
Samuel Whittaker

Drawing number: TAO_CR_CAPM_21
Scale: Not to scale
Date: April 2014



CAID RESIDENCE - NORTH-WESTERN ROOM -NORTHERN WALL (NW_N_S1/S2/A_N_S)



CONDITION ASSESSMENT

- LEGEND**
- STRUCTURE**
 - STRUCTURAL CRACK
 - STRUCTURAL SEPARATION
 - LOSS
 - PLASTER**
 - DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - CRACK
 - PREVIOUS INTERVENTIONS**
 - LOSS REVEALING LOWER PAINTED DECORATION
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

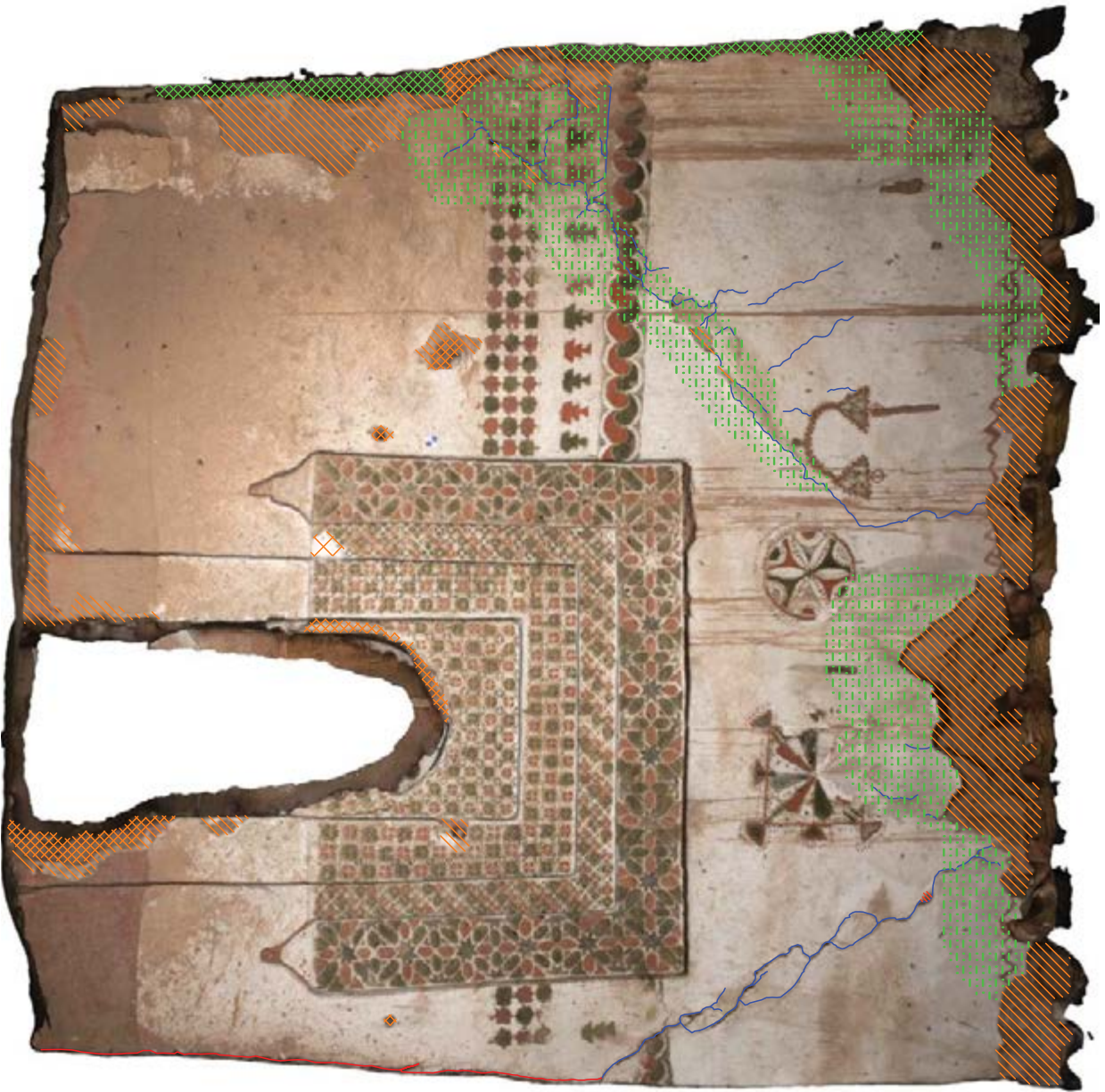
CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
 Drawing: Condition assessment of the CR wall paintings
 Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:
 CIM
 Team members:
 Lorinda Wong,
 Samuel Whittaker

Drawing number:
 TAO_CR_CAPM_22
 Scale:
 Not to scale
 Date:
 April 2014



LEGEND

STRUCTURE

STRUCTURAL CRACK

STRUCTURAL SEPARATION

LOSS

PLASTER

DETACHED PLASTER

LOSS

DEEP LOSS

CRACK

LOSS REVEALING LOWER
PAINTED DECORATION

PREVIOUS INTERVENTIONS

EARTHEN PLASTER

PHASE 1 RESTORATION

PHASE 2 RESTORATION

GREY COURSE PLASTER

CAID RESIDENCE - NORTH-WESTERN ROOM - EASTERN WALL (NW_E)

CONDITION ASSESSMENT

CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
Drawing: Condition assessment of the CR wall paintings
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:
CIMS
Team members:
Lorinda Wong,
Samuel Whittaker

Drawing number:
TAO_CR_CAPM_23
Scale:
Not to scale
Date:
April 2014



LEGEND

STRUCTURE



STRUCTURAL CRACK



STRUCTURAL SEPARATION



LOSS

PLASTER



DETACHED PLASTER



LOSS



DEEP LOSS



CRACK



LOSS REVEALING LOWER
PAINTED DECORATION

PREVIOUS INTERVENTIONS



EARTHEN PLASTER



PHASE 1 RESTORATION



PHASE 2 RESTORATION



GREY COURSE PLASTER

CAID RESIDENCE - NORTH-WESTERN ROOM - SOUTHERN WALL (NW_S-S1/S2/A_SCo_N/B_SCo_N)

CONDITION ASSESSMENT

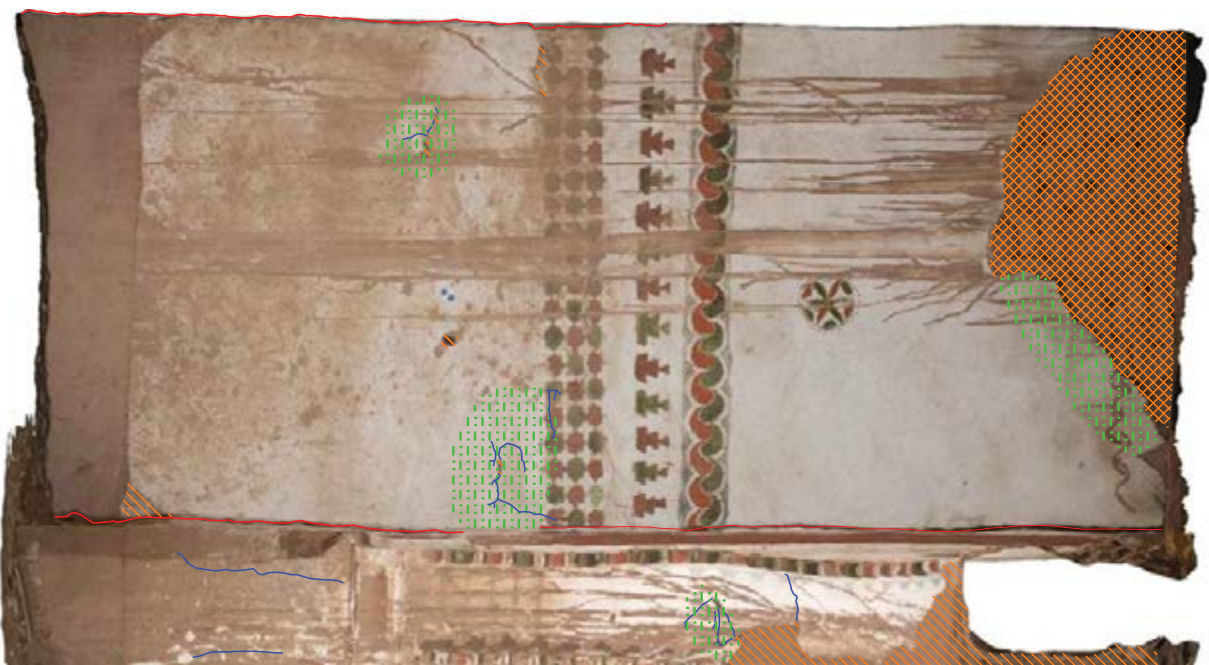
CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
Drawing: Condition assessment of the CR wall paintings
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:
CIMS
Team members:
Lorinda Wong,
Samuel Whittaker

Drawing number:
TAO_CR_CAPM_24
Scale:
Not to scale
Date:
April 2014



CAID RESIDENCE - NORTH-WESTERN ROOM - SOUTHERN WALL (NW_S_S3)



CONDITION ASSESSMENT

LEGEND	
STRUCTURE	
	STRUCTURAL CRACK
	STRUCTURAL SEPARATION
	LOSS
PLASTER	
	DETACHED PLASTER
	LOSS
	DEEP LOSS
	CRACK
	LOSS REVEALING LOWER PAINTED DECORATION
PREVIOUS INTERVENTIONS	
	EARTHEN PLASTER
	PHASE 1 RESTORATION
	PHASE 2 RESTORATION
	GREY COURSE PLASTER



LEGEND

STRUCTURE

STRUCTURAL CRACK

STRUCTURAL SEPARATION

LOSS

PLASTER

DETACHED PLASTER

LOSS

DEEP LOSS

CRACK

LOSS REVEALING LOWER
PAINTED DECORATION

PREVIOUS INTERVENTIONS

EARTHEN PLASTER

PHASE 1 RESTORATION

PHASE 2 RESTORATION

GREY COURSE PLASTER

CAID RESIDENCE - NORTH-WESTERN ROOM - WESTERN WALL (NW_W)



CONDITION ASSESSMENT

**CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO**



Site: **KASBAH TAOURIRT**

Drawing: Condition assessment of the CR wall paintings

Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:

CIMS

Team members:
Lorinda Wong,
Samuel Whittaker

Drawing number:
TAO_CR_CAPM_26

Scale:
Not to scale

Date:
April 2014



- LEGEND**
- STRUCTURE**
- STRUCTURAL CRACK
 - STRUCTURAL SEPARATION
 - LOSS
- PLASTER**
- DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - CRACK
- PREVIOUS INTERVENTIONS**
- LOSS REVEALING LOWER PAINTED DECORATION
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

CAID RESIDENCE - NORTH-WESTERN ROOM - ARCH A (NW_A_Eat_S)

CONDITION ASSESSMENT

CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
Drawing: Condition assessment of the CR wall paintings
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:
CIMS
Team members:
Lorinda Wong,
Samuel Whittaker

Drawing number:
TAO_CR_CAPM_27
Scale:
Not to scale
Date:
April 2014



- LEGEND**
- STRUCTURAL CRACK
 - LOSS
 - STRUCTURAL SEPARATION
 - PLASTER
 - DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - CRACK
 - LOSS REVEALING LOWER PAINTED DECORATION
 - PREVIOUS INTERVENTIONS
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

CAID RESIDENCE - NORTH-WESTERN ROOM - ARCH E B (NW_B_EA)

CONDITION ASSESSMENT

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT

Drawing: Condition assessment of the CR wall paintings

Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:

CIMS

Team members: Lorinda Wong, Samuel Whittaker

Drawing number: TAO_CR_CAPM_28

Scale: Not to scale

Date: April 2014



- LEGEND**
- STRUCTURAL CRACK
 - STRUCTURAL SEPARATION
 - LOSS
 - PLASTER**
 - DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - CRACK
 - LOSS REVEALING LOWER PAINTED DECORATION
 - PREVIOUS INTERVENTIONS**
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

CAID RESIDENCE - NORTH-WESTERN ROOM - ARCH B (NW_B_WA1)

CONDITION ASSESSMENT

CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
Drawing: Condition assessment of the CR wall paintings
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:
 CIMS
Team members:
Lorinda Wong,
Samuel Whittaker

Drawing number:
TAO_CR_CAPM_29
Scale:
Not to scale
Date:
April 2014



CAID RESIDENCE - WEST 2 - NORTHERN WALL (W2_N)



CONDITION ASSESSMENT

LEGEND	
	STRUCTURE
	STRUCTURAL CRACK
	STRUCTURAL SEPARATION
	LOSS
	PLASTER
	DETACHED PLASTER
	LOSS
	DEEP LOSS
	CRACK
	LOSS REVEALING LOWER PAINTED DECORATION
PREVIOUS INTERVENTIONS	
	EARTHEN PLASTER
	PHASE 1 RESTORATION
	PHASE 2 RESTORATION
	GREY COURSE PLASTER

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site:	KASBAH TAOURIRT
Drawing:	Condition assessment of the CR wall paintings
Reviewed by:	Lorinda Wong, Mohamed Boussalhi

Photogrammetry and survey:	
Team members:	Lorinda Wong, Samuel Whittaker

Drawing number:	TAO_CR_CAPM_30
Scale:	Not to scale
Date:	April 2014



CAID RESIDENCE - WEST 2 - EASTERN WALL (1) (W2_E)



CONDITION ASSESSMENT

- LEGEND**
- STRUCTURE
 - STRUCTURAL CRACK
 - STRUCTURAL SEPARATION
 - LOSS
 - PLASTER**
 - DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - CRACK
 - LOSS REVEALING LOWER PAINTED DECORATION
 - PREVIOUS INTERVENTIONS**
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
 Drawing: Condition assessment of the CR wall paintings
 Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:

 Team members:
 Lorinda Wong,
 Samuel Whittaker

Drawing number:
 TAO_CR_CAPM_31
 Scale:
 Not to scale
 Date:
 April 2014



CAID RESIDENCE - WEST 2 - EASTERN WALL (W2_E)



- LEGEND**
- STRUCTURAL CRACK
 - STRUCTURAL SEPARATION
 - LOSS
 - PLASTER**
 - DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - CRACK
 - LOSS REVEALING LOWER PAINTED DECORATION
 - PREVIOUS INTERVENTIONS**
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

CONDITION ASSESSMENT

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT	Photogrammetry and survey: CIMS	Drawing number: TAO_CR_CAPM_32
Drawing: Condition assessment of the CR wall paintings	Team members: Lorinda Wong, Samuel Whittaker	Scale: Not to scale
Reviewed by: Lorinda Wong, Mohamed Boussalh	Date: April 2014	



CAID RESIDENCE - WEST 2 - MUR SUR (W2_S)



CONDITION ASSESSMENT

LEGEND	
STRUCTURE	
	STRUCTURAL CRACK
	STRUCTURAL SEPARATION
	LOSS
PLASTER	
	DETACHED PLASTER
	LOSS
	DEEP LOSS
	CRACK
	LOSS REVEALING LOWER PAINTED DECORATION
PREVIOUS INTERVENTIONS	
	EARTHEN PLASTER
	PHASE 1 RESTORATION
	PHASE 2 RESTORATION
	GREY COURSE PLASTER



LEGEND

STRUCTURE

STRUCTURAL CRACK

STRUCTURAL SEPARATION

LOSS

PLASTER

DETACHED PLASTER

LOSS

DEEP LOSS

CRACK

LOSS REVEALING LOWER
PAINTED DECORATION

PREVIOUS INTERVENTIONS

EARTHEN PLASTER

PHASE 1 RESTORATION

PHASE 2 RESTORATION

GREY COURSE PLASTER

CAID RESIDENCE - WEST 2 - WESTERN WALL (W2_W)

CONDITION ASSESSMENT

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



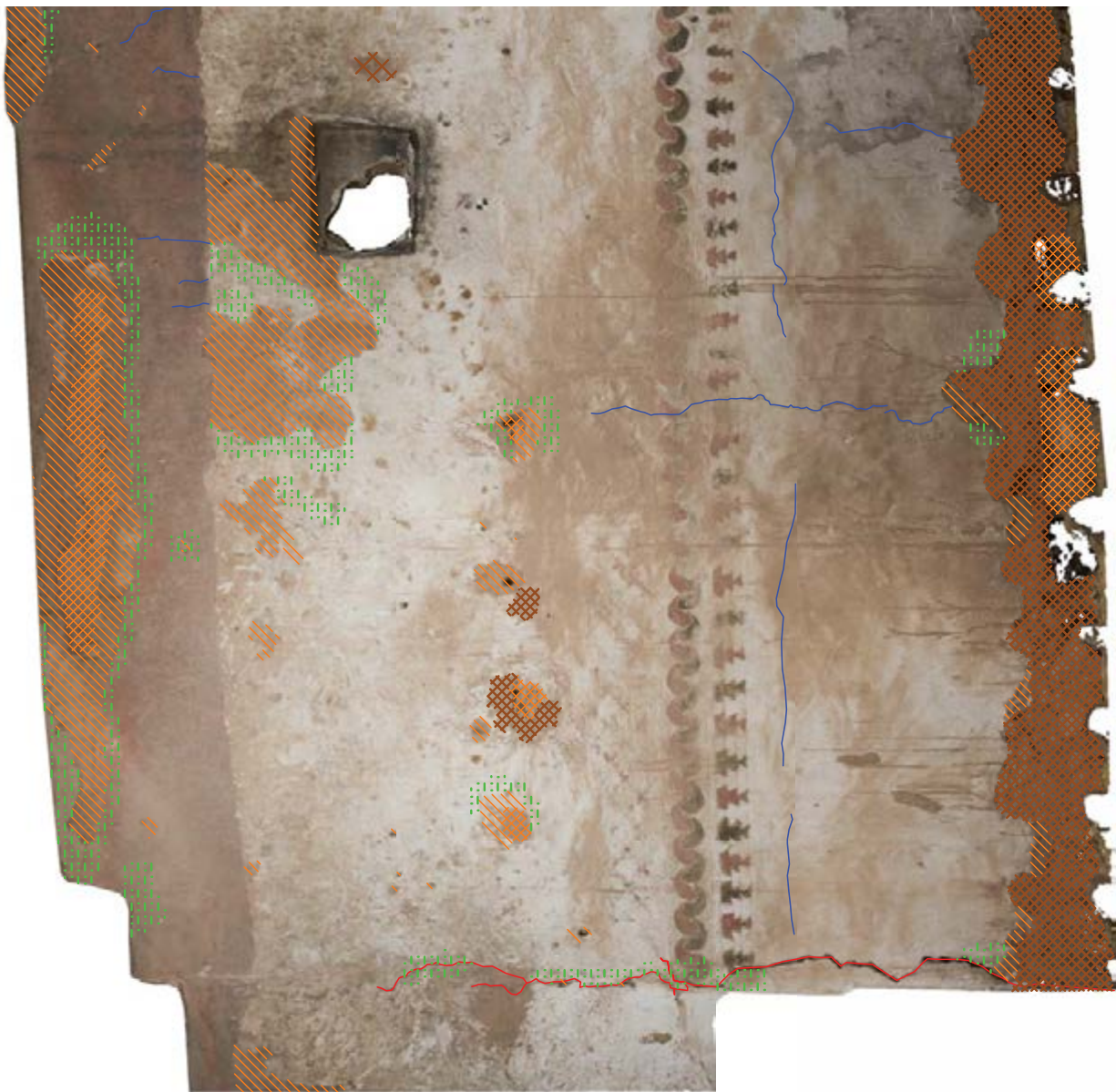
Site: **KASBAH TAOURIRT**
Drawing: Condition assessment of the CR wall paintings
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:



Team members:
Lorinda Wong,
Samuel Whittaker

Drawing number:
TAO_CR_CAPM_34
Scale:
Not to scale
Date:
April 2014



CAID RESIDENCE - WEST 2 - WEST (W2_W)

LEGEND

STRUCTURE



STRUCTURAL SEPARATION



LOSS



PLASTER



LOSS



DEEP LOSS



CRACK



LOSS REVEALING LOWER
PAINTED DECORATION

PREVIOUS INTERVENTIONS



EARTHEN PLASTER



PHASE 1 RESTORATION



PHASE 2 RESTORATION



GREY COURSE PLASTER

CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO



Site:	KASBAH TAOURIRT
Drawing:	Condition assessment of the CR wall paintings
Reviewed by:	Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:	
Team members:	Lorinda Wong, Samuel Whittaker

Drawing number:	TAO_CR_CAPM_35
Scale:	Not to scale
Date:	April 2014



- LEGEND**
- STRUCTURAL CRACK
 - STRUCTURAL SEPARATION
 - LOSS
 - PLASTER**
 - DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - CRACK
 - LOSS REVEALING LOWER PAINTED DECORATION
 - PREVIOUS INTERVENTIONS**
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

CAID RESIDENCE - WEST 1 ROOM - NORTHERN WALL (W1_N)

CONDITION ASSESSMENT

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site:	KASBAH TAOURIRT		Drawing number:	TAO_CR_CAPM_36
Drawing:	Condition assessment of the CR wall paintings		Scale:	Not to scale
Reviewed by:	Lorinda Wong, Mohamed Boussalh		Date:	April 2014
		Photogrammetry and survey:		
		Team members:	Lorinda Wong, Samuel Whittaker	



- LEGEND**
- STRUCTURE
 - STRUCTURAL CRACK
 - STRUCTURAL SEPARATION
 - LOSS
 - PLASTER**
 - DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - CRACK
 - LOSS REVEALING LOWER PAINTED DECORATION
 - PREVIOUS INTERVENTIONS**
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

CAID RESIDENCE - WEST 2 ROOM - WESTERN WALL (W2_W_S1/S2)

CONDITION ASSESSMENT

CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
Drawing: Condition assessment of the CR wall paintings
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:
 CIMS
Team members:
Lorinda Wong,
Samuel Whittaker

Drawing number:
TAO_CR_CAPM_37
Scale:
Not to scale
Date:
April 2014



- LEGEND**
- STRUCTURE
 - STRUCTURAL CRACK
 - STRUCTURAL SEPARATION
 - LOSS
 - PLASTER**
 - DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - CRACK
 - LOSS REVEALING LOWER PAINTED DECORATION
 - PREVIOUS INTERVENTIONS**
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

CAID RESIDENCE - WEST 1 ROOM - WESTERN WALL (W1_W_S2/S3)

CONDITION ASSESSMENT

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
 Drawing: Condition assessment of the CR wall paintings
 Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:

 Team members:
 Lorinda Wong,
 Samuel Whittaker

Drawing number:
 TAO_CR_CAPM_38
 Scale:
 Not to scale
 Date:
 April 2014



CAID RESIDENCE - NORTHERN FAÇADE - NORTHERN WALL (Nfa_N)




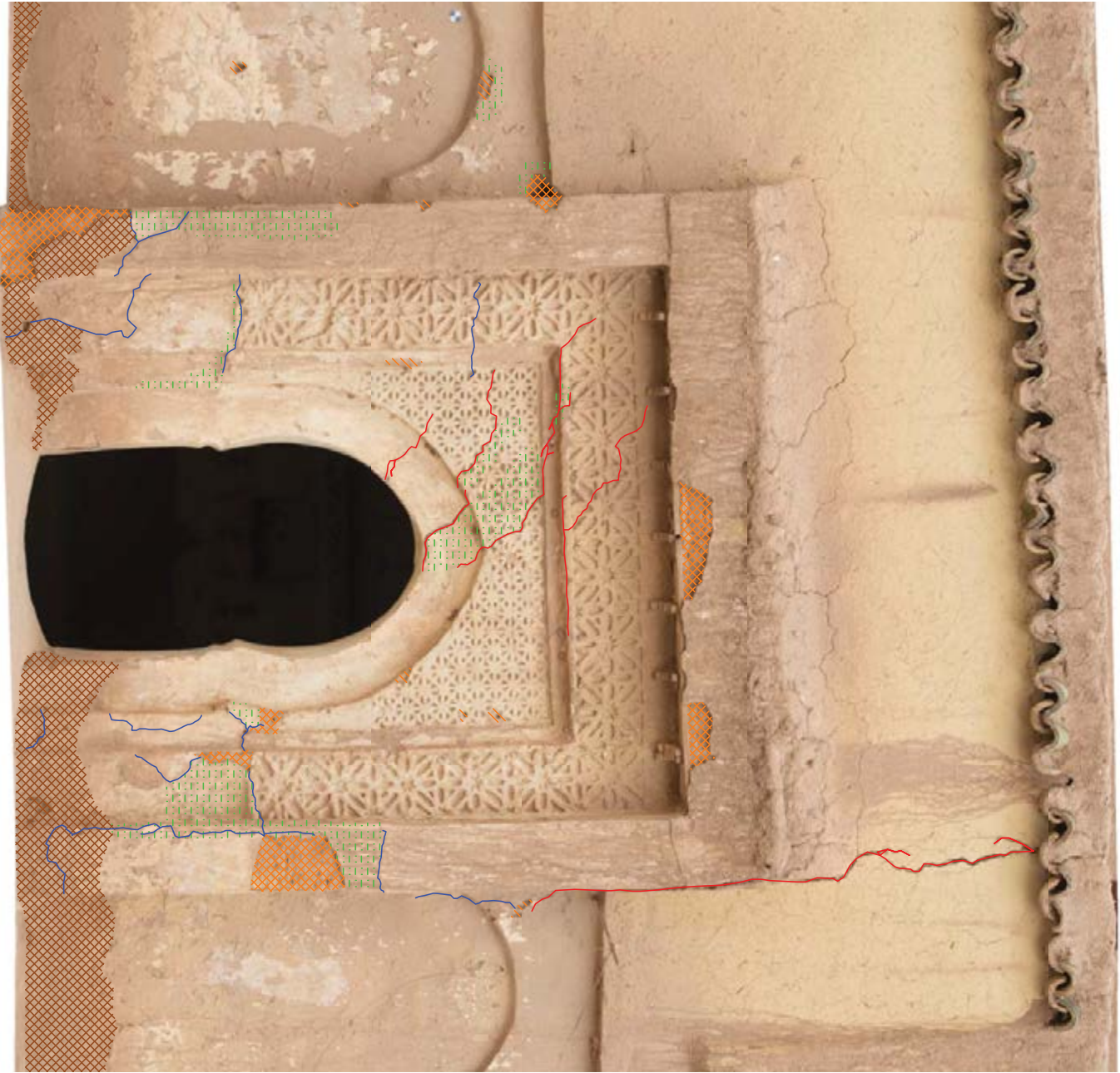
CONDITION ASSESSMENT

- LEGEND**
- STRUCTURE
 - STRUCTURAL CRACK
 - STRUCTURAL SEPARATION
 - LOSS
 - PLASTER**
 - DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - CRACK
 - LOSS REVEALING LOWER PAINTED DECORATION
 - PREVIOUS INTERVENTIONS**
 - EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site:	KASBAH TAOURIRT	Photogrammetry and survey:	Drawing number:
Drawing:	Condition assessment of the CR wall paintings		TAO_CR_CAPM_39
Reviewed by:		Team members:	Scale:
Lorinda Wong, Mohamed Boussalh	Lorinda Wong, Samuel Whittaker	Not to scale	Date:
			April 2014



LEGEND

STRUCTURE



STRUCTURAL SEPARATION



LOSS



PLASTER



LOSS



DEEP LOSS



CRACK



LOSS REVEALING LOWER PAINTED DECORATION

PREVIOUS INTERVENTIONS



EARTHEN PLASTER



PHASE 1 RESTORATION



PHASE 2 RESTORATION



GREY COURSE PLASTER



- LEGEND**
- STRUCTURE**
 - STRUCTURAL CRACK**
 - STRUCTURAL SEPARATION**
 - LOSS**
 - PLASTER**
 - DETACHED PLASTER**
 - LOSS**
 - DEEP LOSS**
 - CRACK**
 - LOSS REVEALING LOWER PAINTED DECORATION**
 - PREVIOUS INTERVENTIONS**
 - EARTHEN PLASTER**
 - PHASE 1 RESTORATION**
 - PHASE 2 RESTORATION**
 - GREY COURSE PLASTER**

CAID RESIDENCE - NORTHERN FAÇADE - NORTHERN WALL (NFa_N)

CONDITION ASSESSMENT



- LEGEND**
- STRUCTURE**
- STRUCTURAL CRACK
 - STRUCTURAL SEPARATION
 - LOSS
- PLASTER**
- DETACHED PLASTER
 - LOSS
 - DEEP LOSS
 - CRACK
 - LOSS REVEALING LOWER PAINTED DECORATION
- PREVIOUS INTERVENTIONS**
- EARTHEN PLASTER
 - PHASE 1 RESTORATION
 - PHASE 2 RESTORATION
 - GREY COURSE PLASTER

CAID RESIDENCE - NORTHERN FAÇADE - WESTERN WALL (NFa_W)

CONDITION ASSESSMENT

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



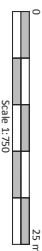
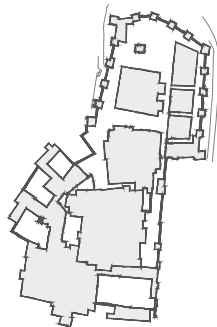
Site: KASBAH TAOURIRT
Drawing: Condition assessment of the CR wall paintings
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:
Team members: Lorinda Wong, Samuel Whittaker

Drawing number: TAO_CR_CAPM_42
Scale: Not to scale
Date: April 2014

APPENDIX I

Action Plan: Intervention Proposal

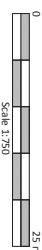
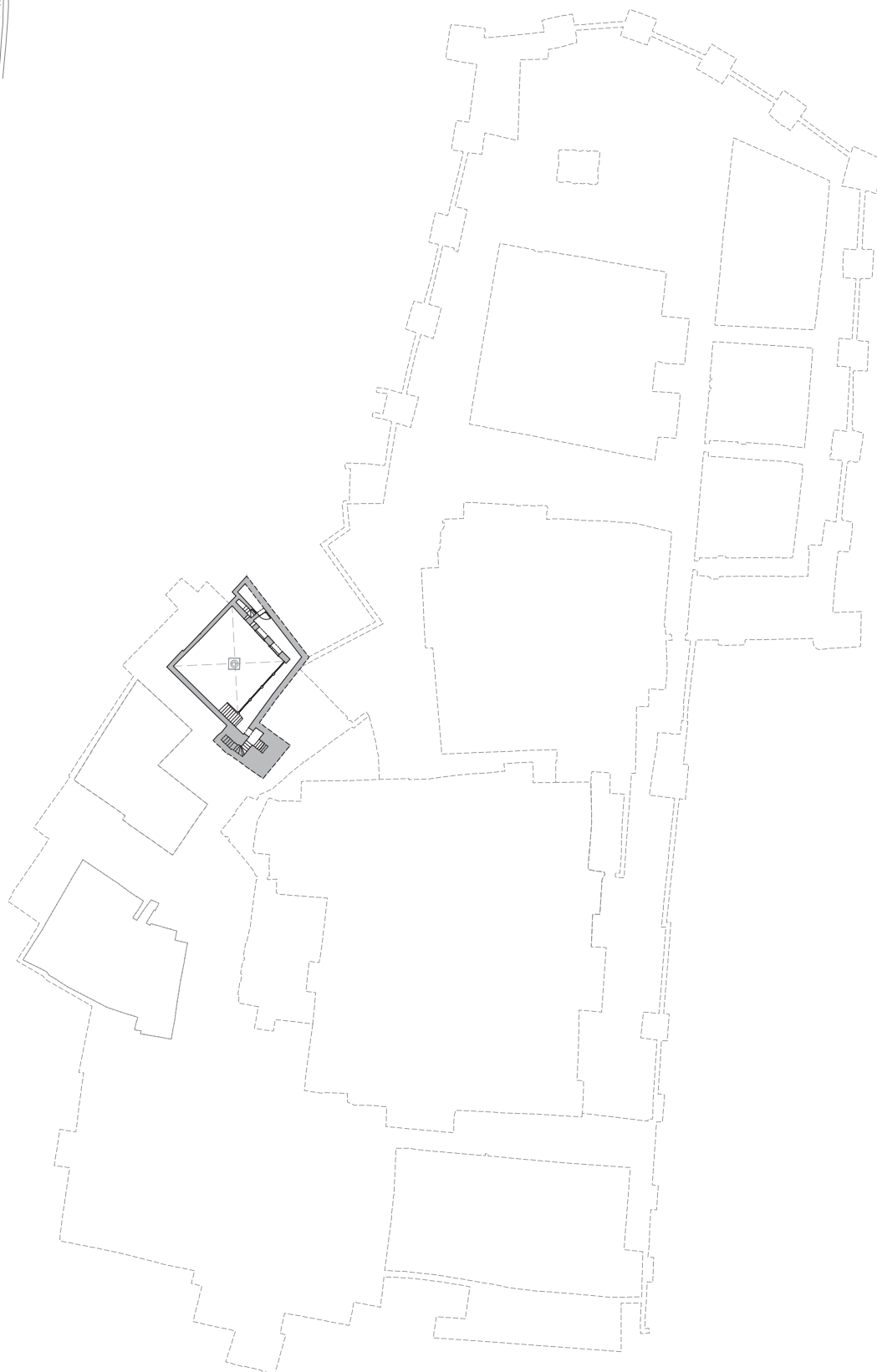
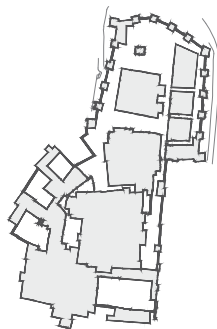


CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO
Intervention Proposal

Site:	KASBAH TAOURIRT
Drawing:	KEY PLAN
Reviewed by:	B. Marcus C. Cancino

Created by:	Supervisor: Benjamin Marcus Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán
Scale:	April, 2016
Date:	1:500

Drawing number:	TAO, intervention, P00

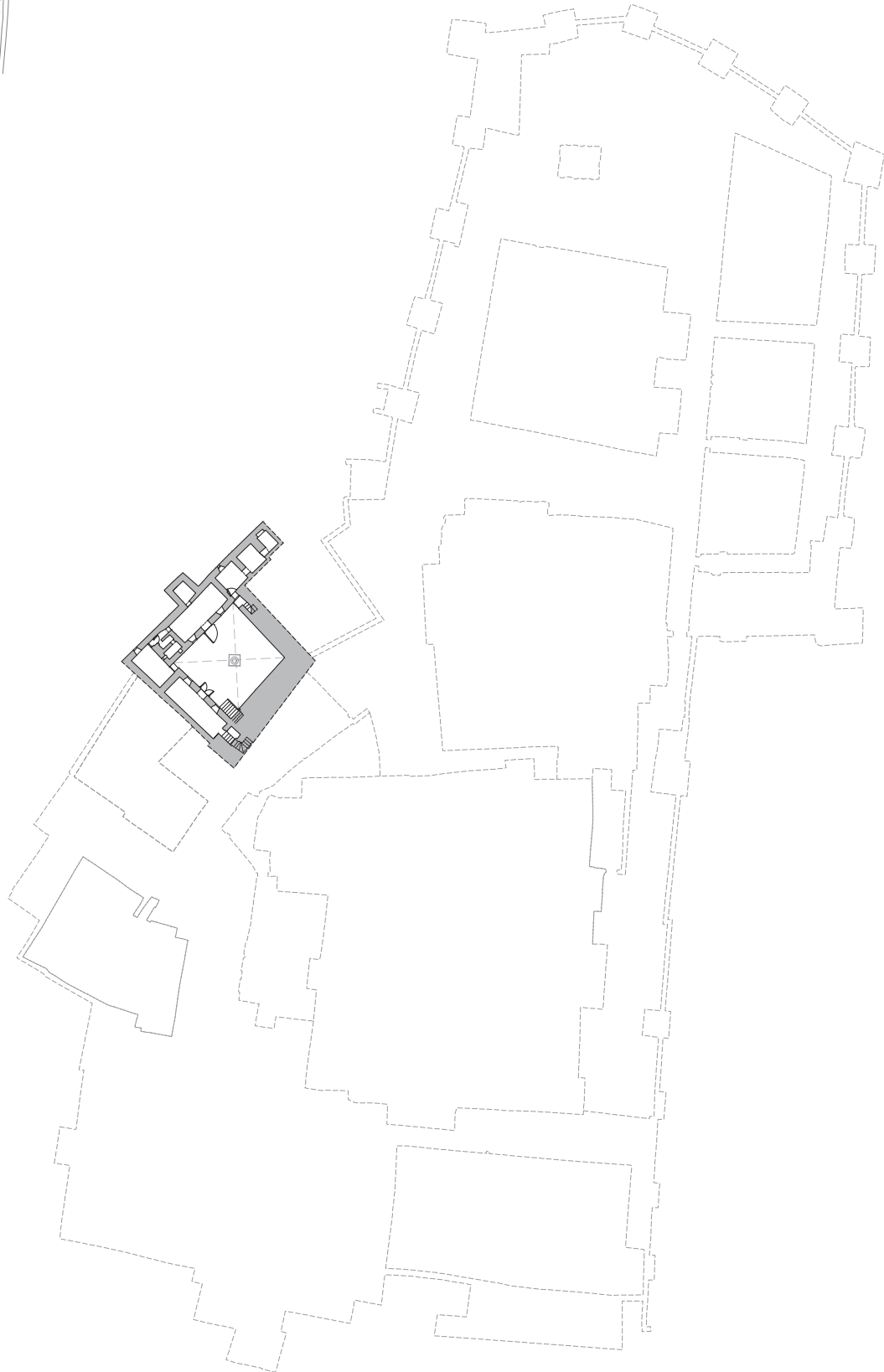
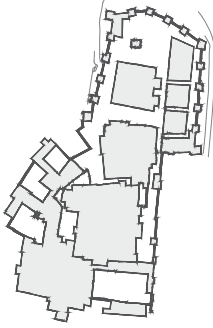


**CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO**
Intervention Proposal

Site:	KASBAH TAOURIRT
Drawing:	LOWER LEVEL 3
Reviewed by:	B. Marcus C. Cancino

Created by:	Supervisor: Benjamin Marcus Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán
Scale:	April, 2016
Date:	1:500

Drawing number:	TAO, intervention, P01



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

Intervention Proposal

Site: KASBAH TAOURIRT

Drawing: LOWER LEVEL 2

Reviewed by:
B. Marcus
C. Cancino

Created by:

Supervisor: Benjamin Marcus

Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán

Scale:

April, 2016

Date:

1:500

Drawing number:

TAO, intervention, P02



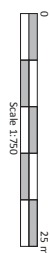
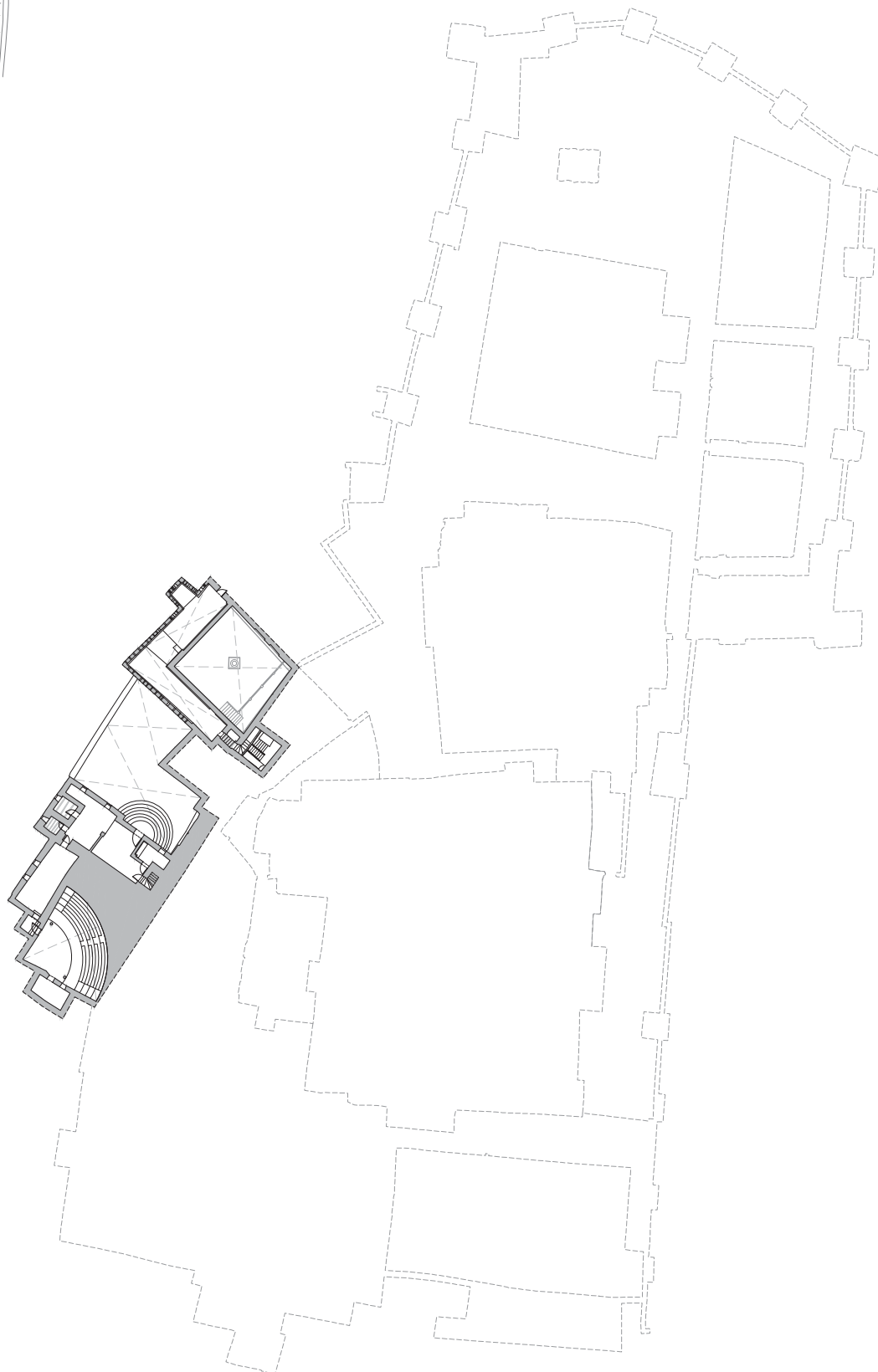
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CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

Intervention Proposal

Site:

KASBAH TAOURIRT

Drawing:

LOWER LEVEL 1

Reviewed by:

B. Marcus
C. Cancino

Created by:

Supervisor: Benjamin Marcus

Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán

Scale:

April, 2016

Date:

1:500

Drawing number:

TAO, intervention, P03



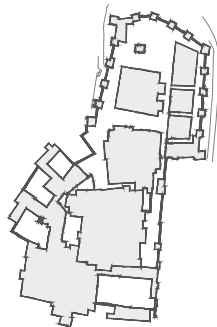
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**CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO**
Intervention Proposal

Site: **KASBAH TAOURIRT**
Drawing: **GROUND LEVEL**
Reviewed by: B. Marcus
C. Cancino

Created by:
Supervisor: Benjamin Marcus
Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán
Scale: April, 2016
Date: 1:500

Drawing number:
TAO, intervention, P04



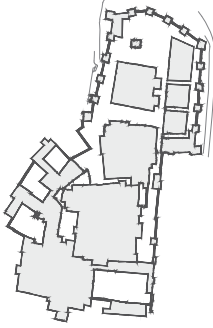
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**CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO**
Intervention Proposal

Site: **KASBAH TAOURIRT**
Drawing: **LEVEL 1**
Reviewed by: B. Marcus
C. Cancino

Created by:
Supervisor: Benjamin Marcus
Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán
Scale: April, 2016
Date: 1:500

Drawing number:
TAO, intervention, P05



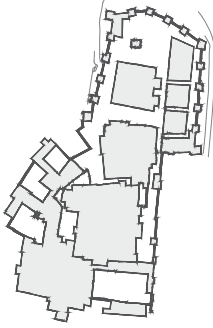
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**CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO**
Intervention Proposal

Site: **KASBAH TAOURIRT**
Drawing: **LEVEL 2**
Reviewed by: B. Marcus
C. Cancino

Created by:
Supervisor: Benjamin Marcus
Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán
Scale: April, 2016
Date: 1:500

Drawing number:
TAO, intervention, P06



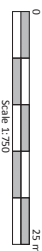
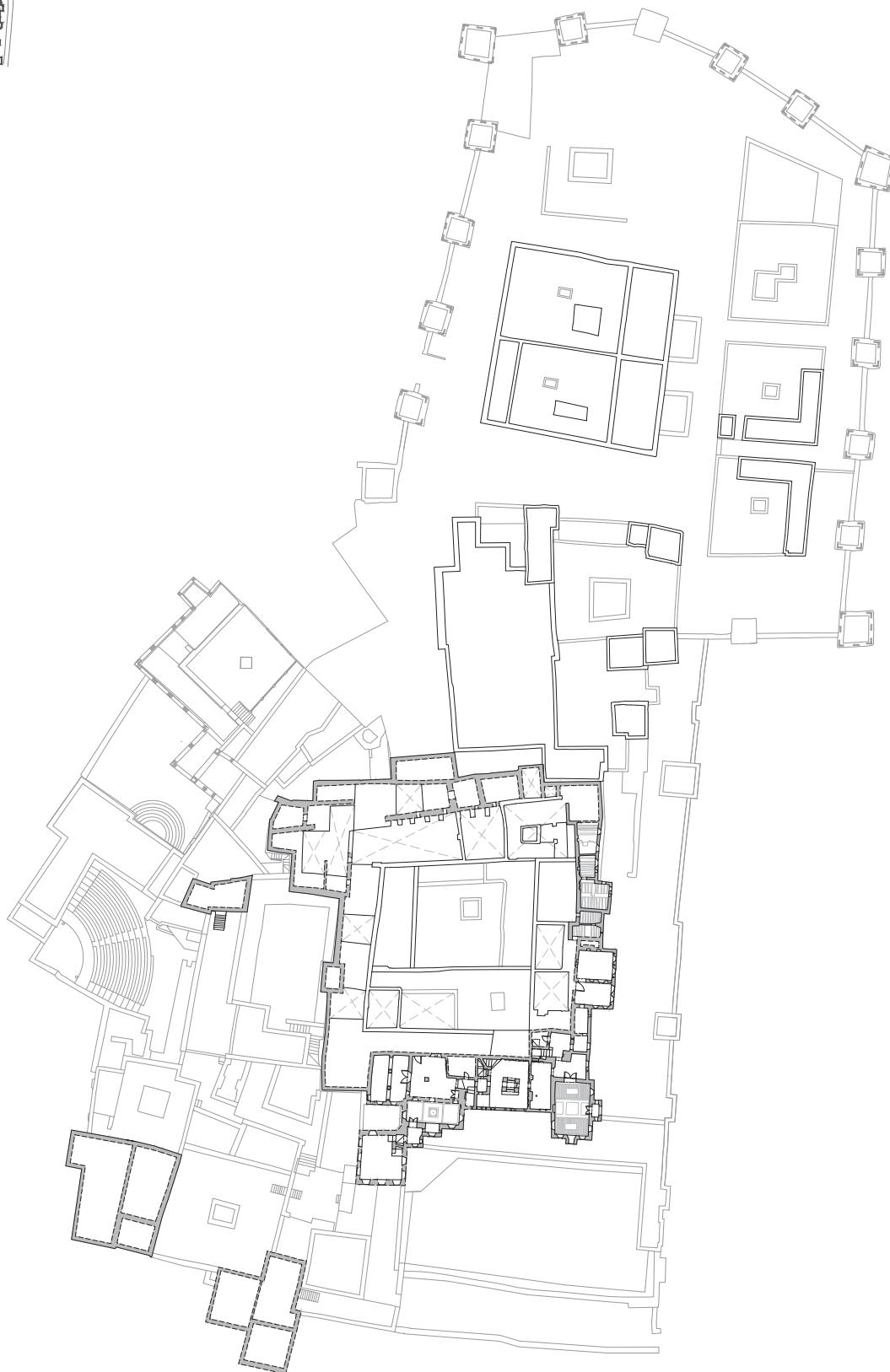
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**CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO**
Intervention Proposal

Site: **KASBAH TAOURIRT**
Drawing: **LEVEL 3**
Reviewed by:
B. Marcus
C. Cancino

Created by:
Supervisor: Benjamin Marcus
Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán
Scale: April, 2016
Date: 1:500

Drawing number:
TAO, intervention, P07



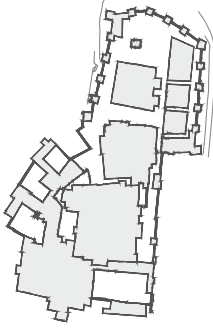
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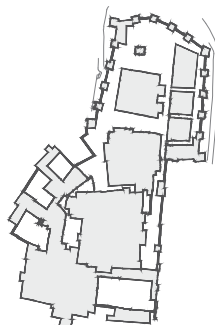
**CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO**
Intervention Proposal

Site:	KASBAH TAOURIRT
Drawing:	LEVEL 4
Reviewed by:	B. Marcus C. Cancino

Created by:	Supervisor: Benjamin Marcus Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán
Scale:	April, 2016
Date:	1:500

Drawing number:	TAO, intervention, P08

KASBAH TAOURIRT - HISTORICAL REHABILITATION - GROUND LEVEL



Wall removal
Wall construction
Wall construction proposal



Scale 1:750



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

Intervention Proposal

Site:

KASBAH TAOURIRT

Drawing:

REHABILITATION - GR. LEVEL

Reviewed by:

B. Marcus
C. Cancino

Created by:

Supervisor: Benjamin Marcus
Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán

Scale:

April, 2016

Date:

1:500

Drawing number:

TAO, intervention, P09



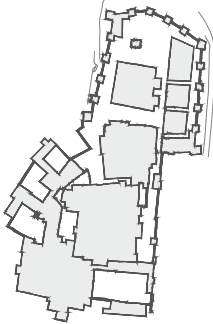
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Wall removal
Wall construction
Wall construction proposal



**CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO**
Intervention Proposal

Site: **KASBAH TAOURIRT**
Drawing: **REHABILITATION - LEVEL 1**
Reviewed by: B. Marcus
C. Cancino

Created by:
Supervisor: Benjamin Marcus
Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán
Scale: April, 2016
Date: 1:500

Drawing number:
TAO, intervention, P10



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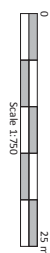


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KASBAH TAOURIRT - HISTORICAL REHABILITATION - LEVEL 2



Wall removal
Wall construction
Wall construction proposal



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

Intervention Proposal

Site: KASBAH TAOURIRT
Drawing: REHABILITATION - LEVEL 2
Reviewed by: B. Marcus
C. Cancino

Created by:
Supervisor: Benjamin Marcus
Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán
Scale: April, 2016
Date: 1:500

Drawing number: TAO, intervention, P11



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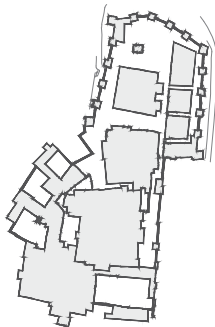


CERKAS

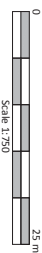


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KASBAH TAOURIRT - HISTORICAL REHABILITATION - LEVEL 3



Wall removal
Wall construction
Wall construction proposal



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

Intervention Proposal

Site: KASBAH TAOURIRT
Drawing: REHABILITATION - LEVEL 3
Reviewed by: B. Marcus
C. Cancino

Created by:
Supervisor: Benjamin Marcus
Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán
Scale: April, 2016
Date: 1:500

Drawing number: TAO, intervention, P12



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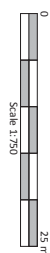
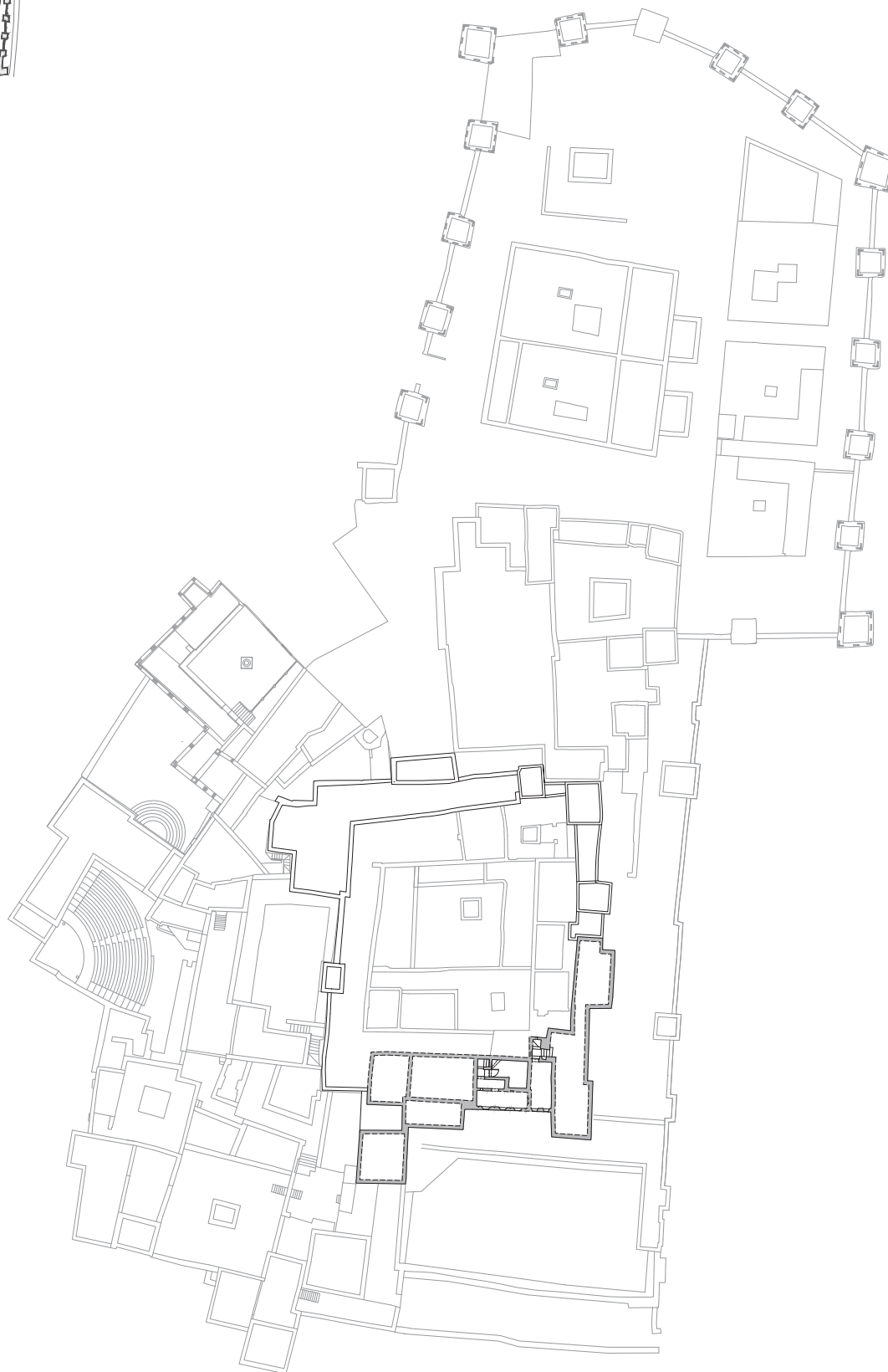


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KASBAH TAOURIRT - HISTORICAL REHABILITATION - LEVEL 4



Wall removal
Wall construction
Wall construction proposal



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

Intervention Proposal

Site: KASBAH TAOURIRT
Drawing: REHABILITATION - LEVEL 4
Reviewed by: B. Marcus
C. Cancino

Created by:
Supervisor: Benjamin Marcus
Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán
Scale: April, 2016
Date: 1:500

Drawing number: TAO, intervention, P13



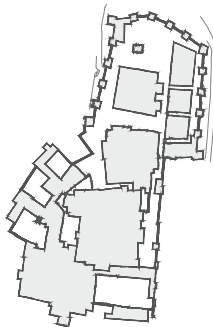
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Vertical connection downstairs
Vertical connection upstairs
Proposed circulation



Scale 1:750



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

Intervention Proposal

Site: KASBAH TAOURIRT
Drawing: CIRCULATION - GR. LEVEL
Reviewed by: B. Marcus
C. Cancino

Created by:
Supervisor: Benjamin Marcus
Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán

Scale: April, 2016
Date: 1:500

Drawing number:
TAO, intervention, P14



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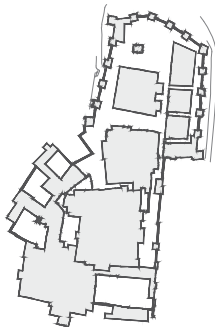


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KASBAH TAOURIRT - CIRCULATION PROPOSAL - LEVEL 1



Vertical connection downstairs
Vertical connection upstairs
Proposed circulation



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO
Intervention Proposal

Site: **KASBAH TAOURIRT**
Drawing: **CIRCULATION - LEVEL 1**
Reviewed by: B. Marcus
C. Cancino

Created by:
Supervisor: Benjamin Marcus
Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán
Scale: April, 2016
Date: 1:500

Drawing number: **TAO, intervention, P15**



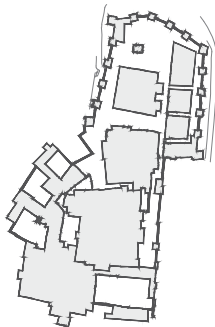
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Vertical connection downstairs
Vertical connection upstairs
Proposed circulation



**CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO**
Intervention Proposal

Site: **KASBAH TAOURIRT**
Drawing: **CIRCULATION - LEVEL 2**
Reviewed by: B. Marcus
C. Cancino

Created by:
Supervisor: Benjamin Marcus
Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán
Scale: April, 2016
Date: 1:500

Drawing number:
TAO, intervention, P16



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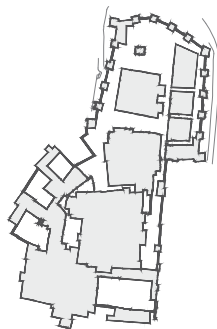


CERKAS

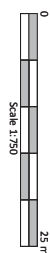
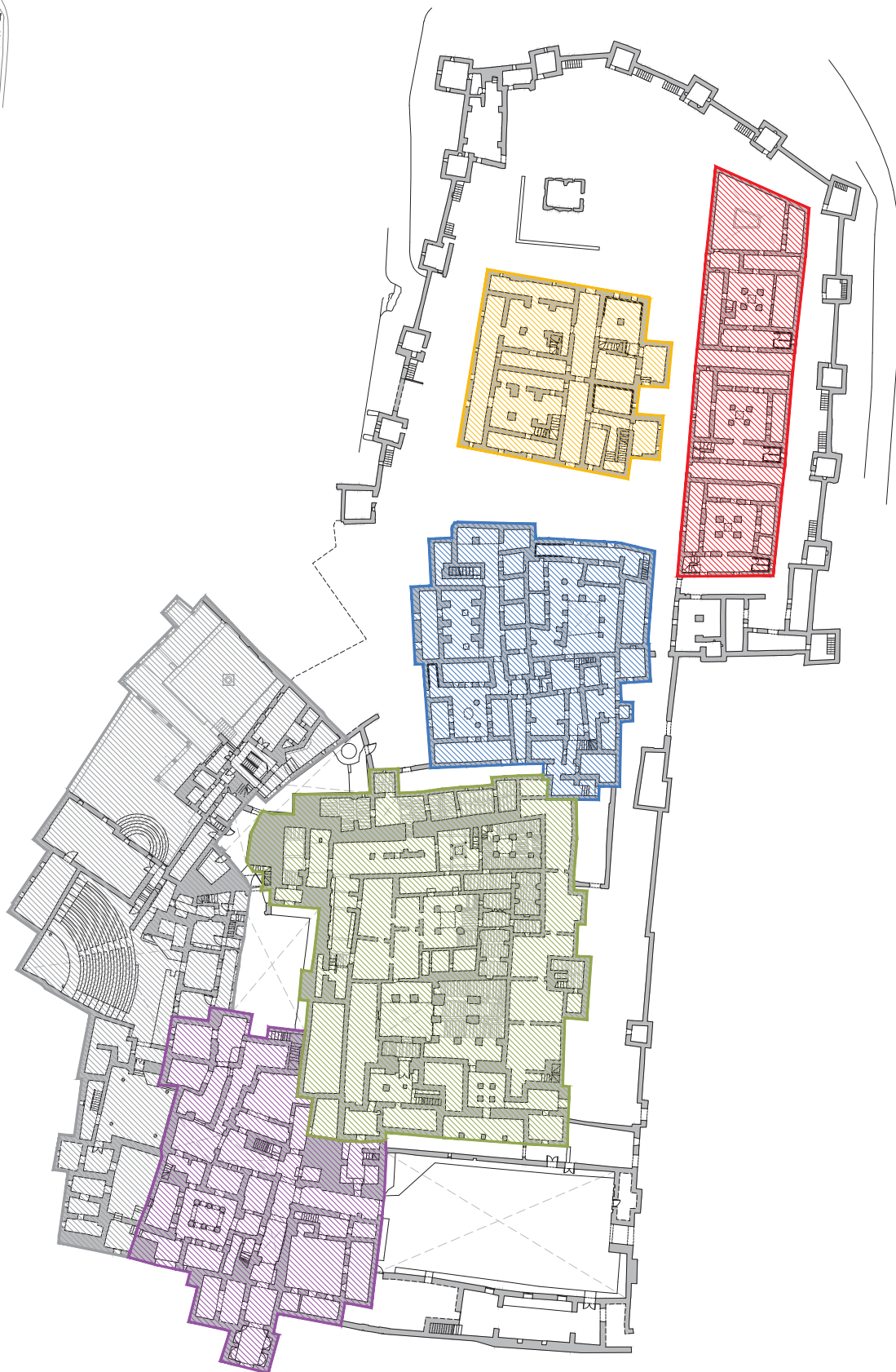


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KASBAH TAOURIRT - BUILDING USE PROPOSAL



CERKAS offices
Cafeteria / Restaurant
Workshops
Lodging
Museum
Mediatheque and theatre



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

Intervention Proposal

Site: KASBAH TAOURIRT
Drawing: BUILDING USE PROPOSAL
Reviewed by: B. Marcus
C. Cancino

Created by:
Supervisor: Benjamin Marcus
Production team: Oriol Domínguez, Elena Macchioni, Emilio Roldán
Scale: April, 2016
Date: 1:500

Drawing number: TAO, intervention, P17



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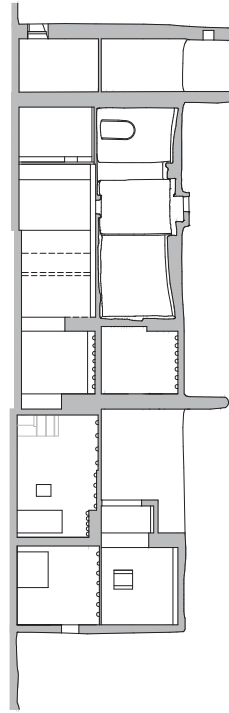


CERKAS



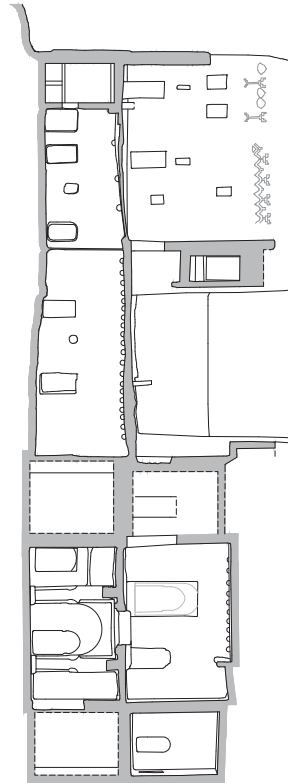
Ministère de la Culture
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0 5m 10m

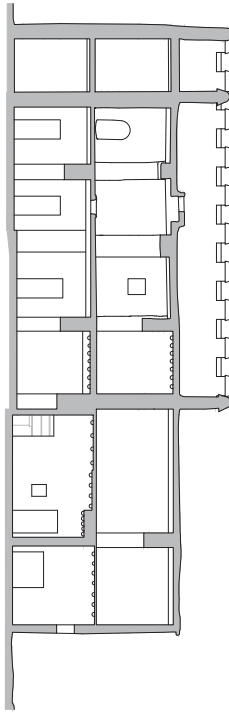


SECTION A - STARA WEST - AS FOUND

SECTION B - STARA EAST - AS FOUND

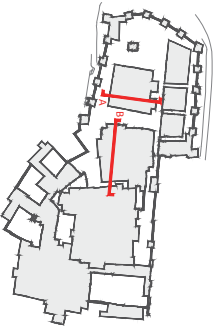
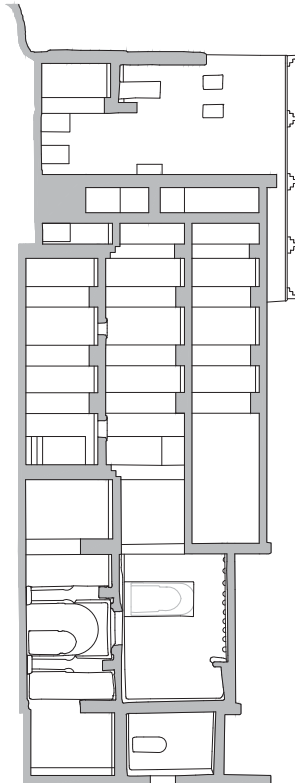


0 5m 10m



SECTION A - STARA WEST - REHABILITATION

SECTION B - STARA EAST - REHABILITATION



KASBAH TAOURIRT - STARA AREA - HISTORICAL REHABILITATION - SECTIONS A AND B



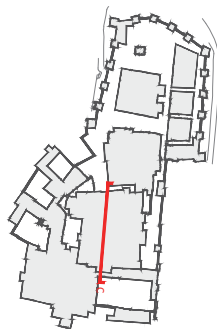
CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO
Intervention Proposal

Site: STARA AREA
Drawing: SECTIONS A, B
Reviewed by: B. Marcus
C. Cancino

Created by:
Supervisor: Benjamin Marcus
Production team: Oriol Dominguez, Elena Macchioni, Emilio Roldán
Scale: April, 2016
Date: 1:500

Drawing number: TAO, intervention, S01

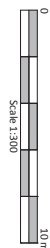
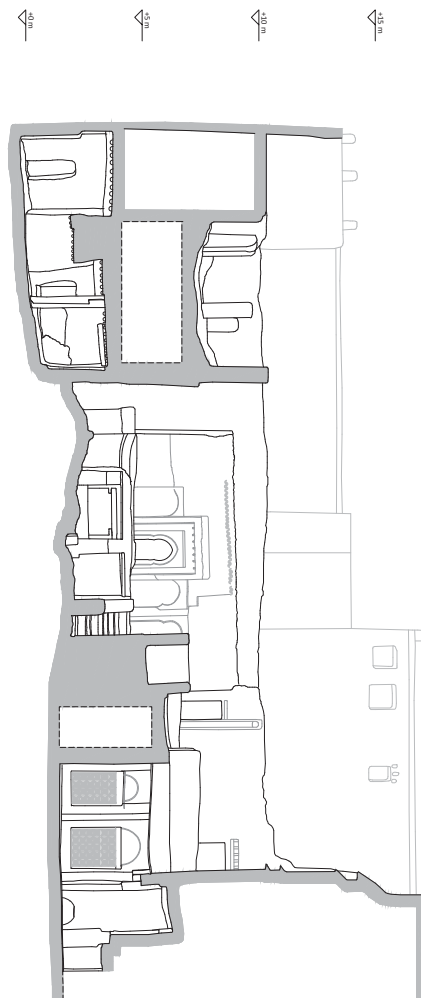


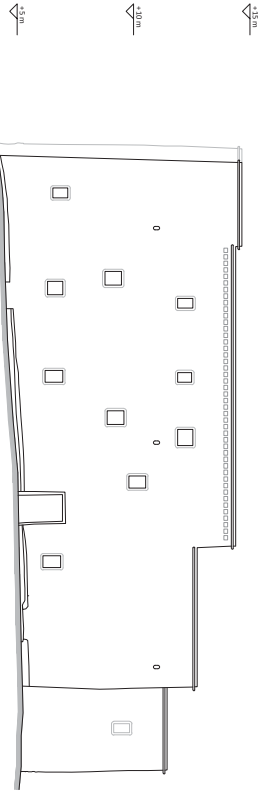
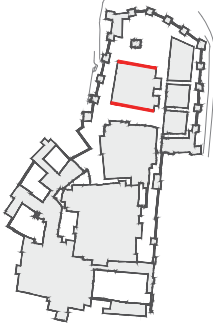


SECTION C - CAID RESIDENCE - PROPOSAL

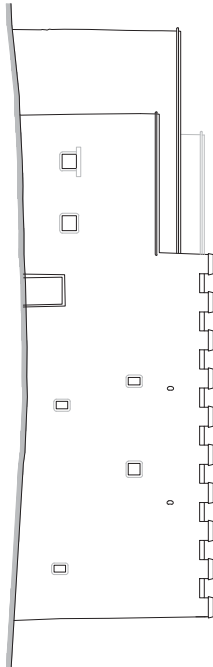


SECTION C - CAID RESIDENCE - AS FOUND

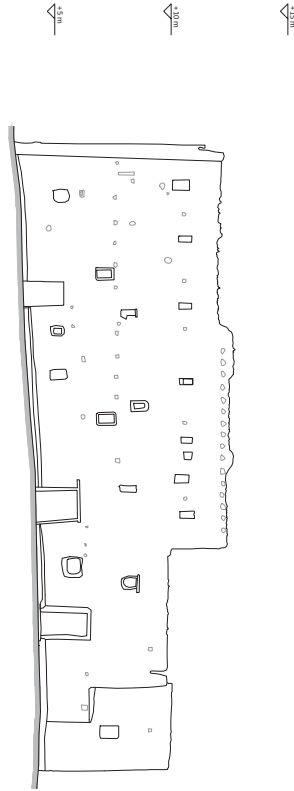




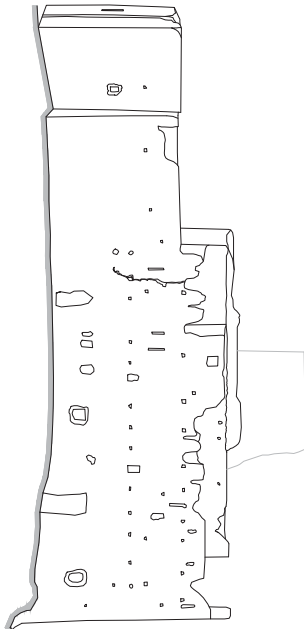
STARA WEST - EAST ELEVATION - REHABILITATION



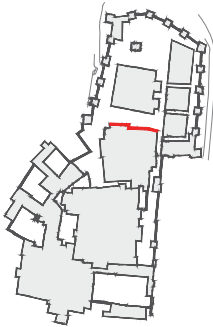
STARA WEST - WEST ELEVATION - REHABILITATION



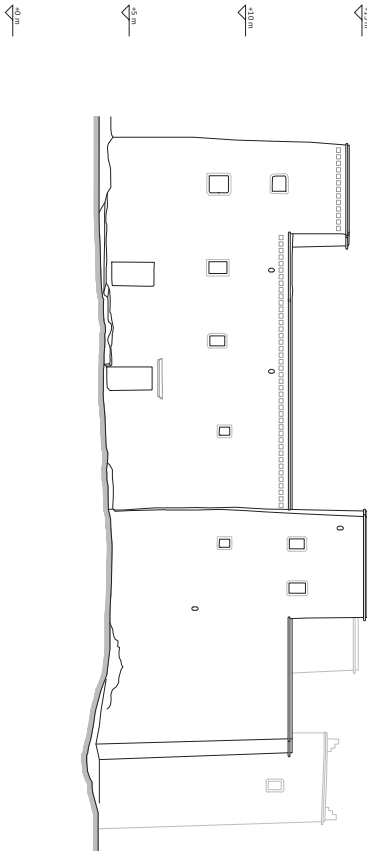
STARA WEST - EAST ELEVATION - AS FOUND



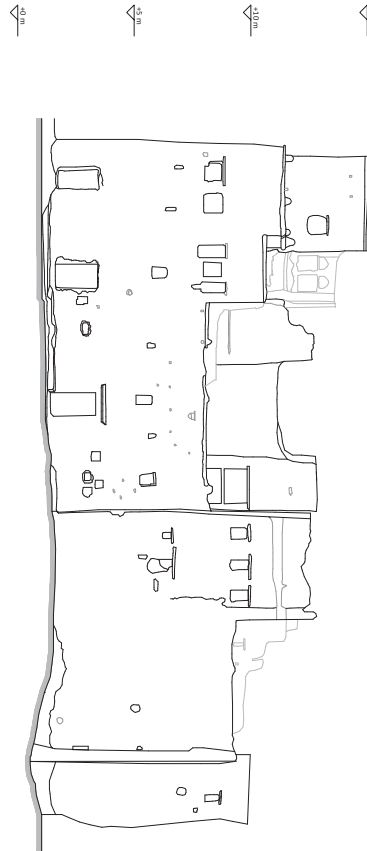
STARA WEST - WEST ELEVATION - AS FOUND

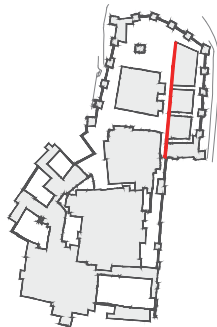


STARA EAST - WEST ELEVATION - REHABILITATION

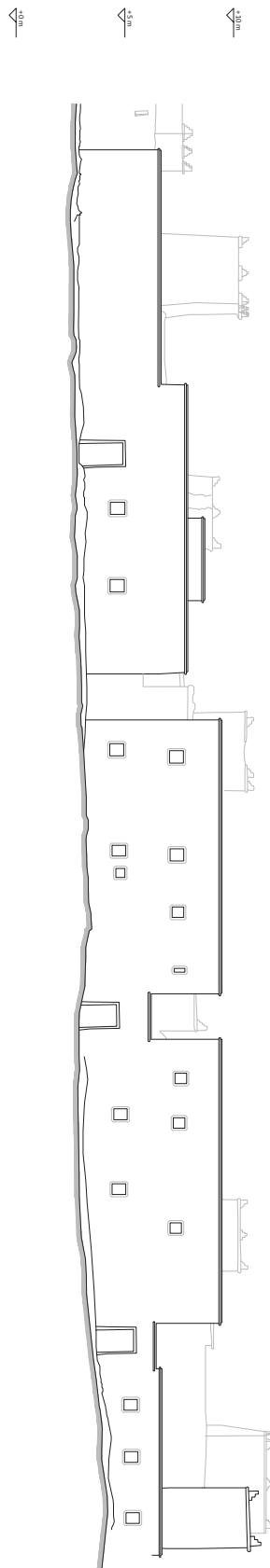


STARA EAST - WEST ELEVATION - AS FOUND





STARA WORKSHOPS - SOUTH ELEVATION - REHABILITATION



STARA WORKSHOPS - SOUTH ELEVATION - AS FOUND



APPENDIX J

Emergency Stabilization of the CR Wall Paintings

SEQUENCING OF INTERVENTIONS

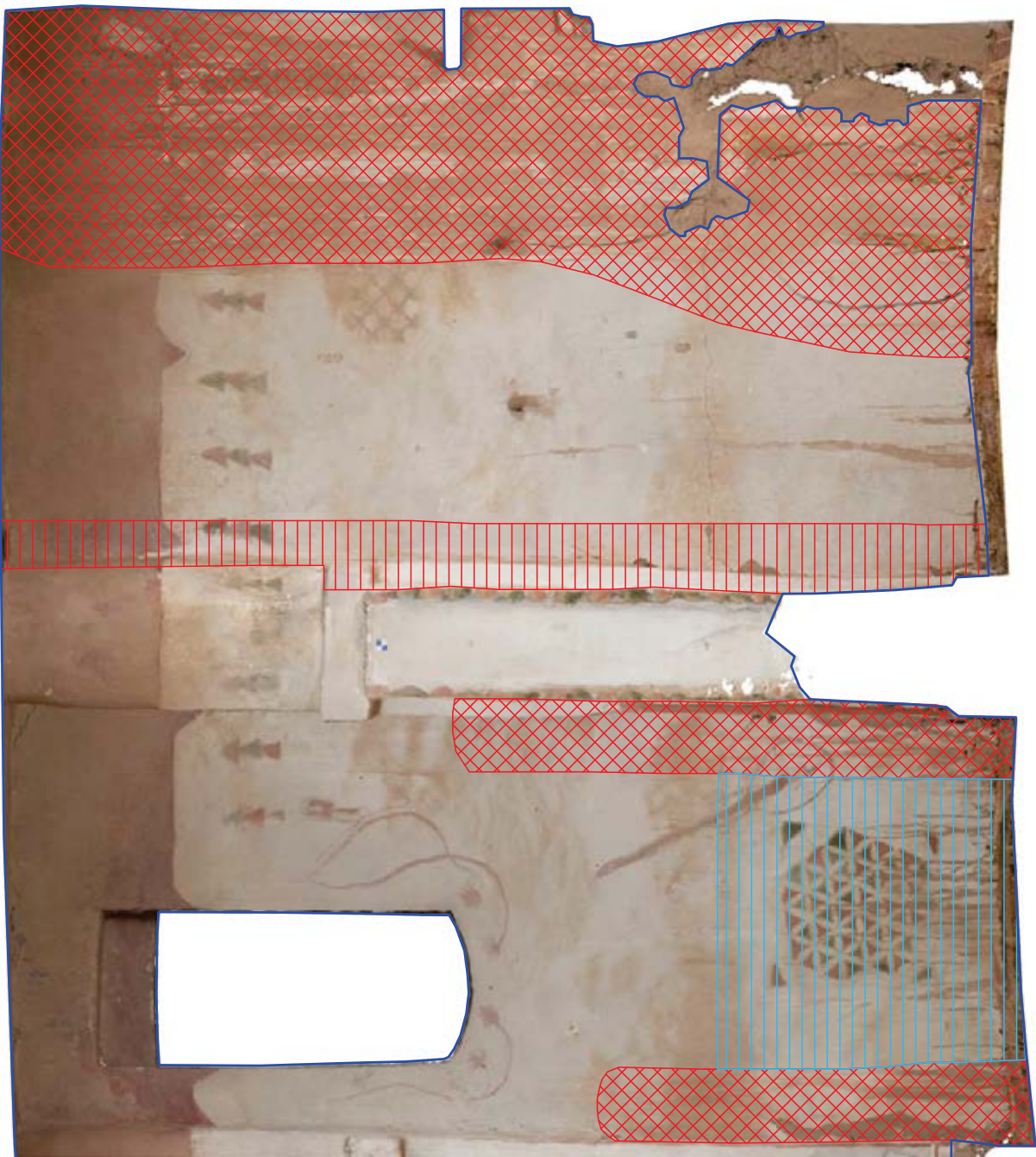
1. Stabilisation interventions at the base of the wall painting and for upper areas after installation of a scaffolding. Grouting, edge repairs and facing are undertaken selectively in order to stabilise the wall paintings as much as necessary while leaving the possibility of re-treatment during and after structural interventions.




2. Installation of protective measures prior to structural intervention including: 1) plastic sheeting covering the wall paintings and protecting them from the deposition of wet earthen materials, water and dust; 2) installation of a rigid frame allowing fixing of a mesh to protect the wall paintings from fallen debris during construction work and 3) Labelling of highly significant areas and areas requiring particular attention and monitoring during structural work.





3. Once structural interventions are complete, remaining conservation work on the wall paintings can be undertaken. These would include final stabilisation plaster layers, removal of facing, cleaning of painted and unpainted plaster as well as final presentation measures (level of conservation, lighting etc.) and preventive conservation measures (maintenance plan)..




LEGEND

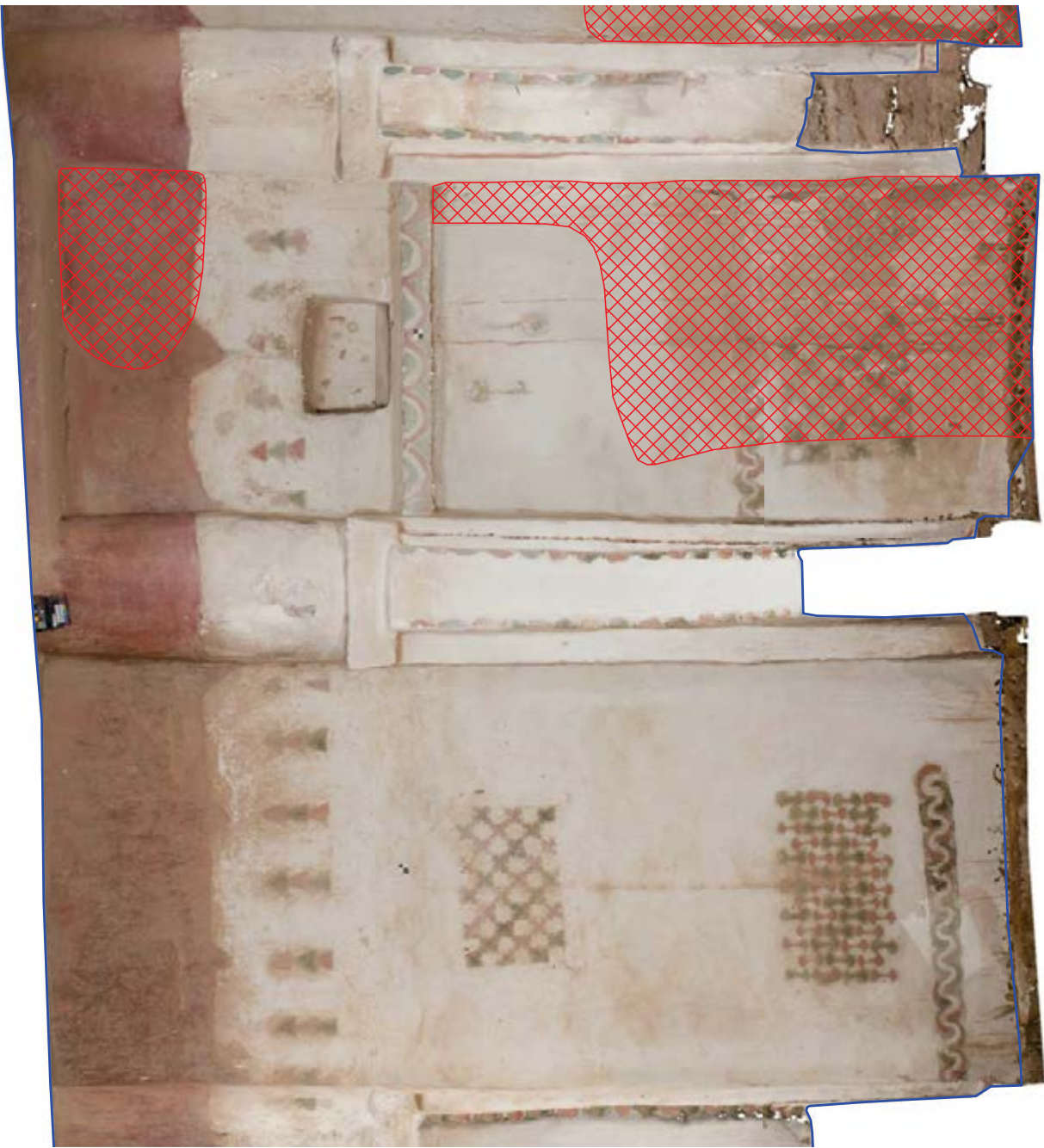
 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**



LEGEND



HIGH RISK
Detached and very unstable plaster requiring selective grouting and facing.



HIGH RISK
Cracked and unstable plaster requiring selective edge repairs.



MEDIUM RISK
Detached but stable plasters requiring facing only.



HIGHLY SIGNIFICANCE
Risk due to position near area of structural interventions requiring facing.



Extent of painted plaster



CAID RESIDENCE - NORTHERN FRONT ROOM - NORTHERN WALL (NF_B_NCo/ S3/ C_NCO/ S4)

RISK ASSESSMENT: EMERGENCY STABILIZATION

CONSERVATION AND
REHABILITATION PLAN FOR
KASBAH TAOURIRT, MOROCCO





Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal


Photogrammetry and survey:
 **Carleton UNIVERSITY**
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran


Drawing number:
TAO_CR_RAPM_02
Scale:
Not to scale
Date:
Oct 2014

LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**



CAID RESIDENCE - NORTHERN FRONT ROOM - NORTHERN WALL (NF_D_NCo_S/S5)

RISK ASSESSMENT: EMERGENCY STABILIZATION

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal

Photogrammetry and survey:
 
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran

Drawing number: **TAO_CR_RAPM_03**
Scale: **Not to scale**
Date: **Oct 2014**





CAID RESIDENCE - NORTHERN FRONT ROOM - EASTERN WALL (NF_E)





RISK ASSESSMENT: EMERGENCY STABILIZATION

LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.



 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO




Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:
 
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran


Drawing number: **TAO_CR_RAPM_04**
Scale: **Not to scale**
Date: **Oct 2014**




LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**

LEGEND



HIGH RISK
Detached and very unstable plaster requiring selective grouting and facing.



HIGH RISK
Cracked and unstable plaster requiring selective edge repairs.



MEDIUM RISK
Detached but stable plasters requiring facing only.



HIGHLY SIGNIFICANCE
Risk due to position near area of structural interventions requiring facing.



Extent of painted plaster



CAID RESIDENCE - NORTHERN FRONT ROOM - SOUTHERN WALL (NF_S_N/ S3/ C_Sco_N/ S4)

RISK ASSESSMENT: EMERGENCY STABILIZATION

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal


Photogrammetry and survey:
Carleton University
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran


Drawing number: TAO_CR_RAPM_06
Scale: Not to scale
Date: Oct 2014





CAID RESIDENCE - NORTHERN FRONT ROOM - SOUTHERN WALL (NF_S_D_Sc0_N/S5)

LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**



RISK ASSESSMENT: EMERGENCY STABILIZATION



CAID RESIDENCE - NORTHERN FRONT ROOM - WESTERN WALL (NF_W)

LEGEND



HIGH RISK
Detached and very unstable plaster requiring selective grouting and facing.



HIGH RISK
Cracked and unstable plaster requiring selective edge repairs.



MEDIUM RISK
Detached but stable plasters requiring facing only.



HIGHLY SIGNIFICANCE
Risk due to position near area of structural interventions requiring facing.



Extent of painted plaster



CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal

Photogrammetry and survey:
Carleton UNIVERSITY **CIMS**
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran

Drawing number:
TAO_CR_RAPM_08
Scale:
Not to scale
Date:
Oct 2014

RISK ASSESSMENT: EMERGENCY STABILIZATION



LEGEND



HIGH RISK
Detached and very unstable plaster requiring selective grouting and facing.



HIGH RISK
Cracked and unstable plaster requiring selective edge repairs.



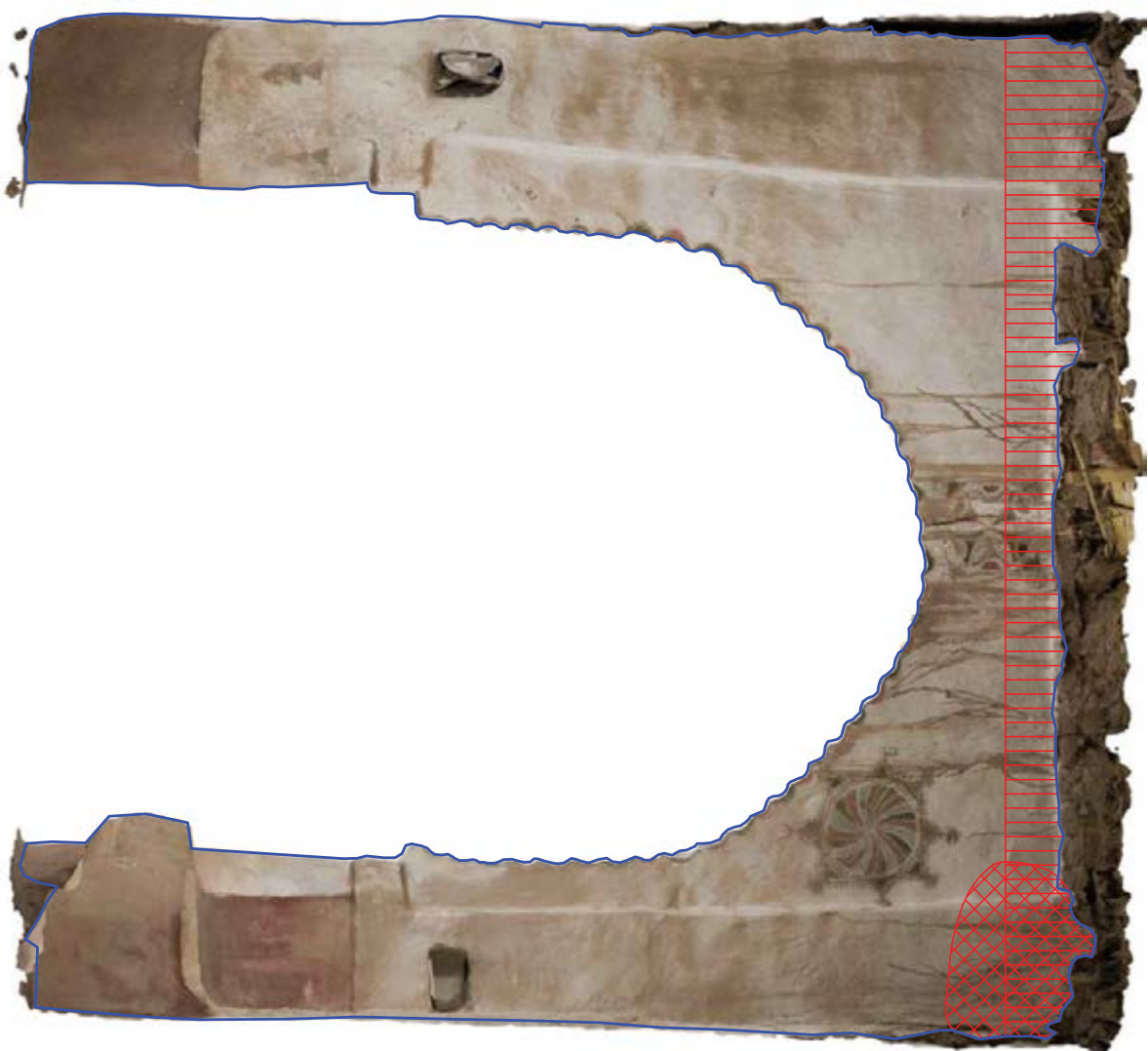
MEDIUM RISK
Detached but stable plasters requiring facing only.



HIGHLY SIGNIFICANCE
Risk due to position near area of structural interventions requiring facing.



Extent of painted plaster



CAID RESIDENCE - NORTHERN FRONT ROOM - ARCH A (NF_A_WA)



RISK ASSESSMENT: EMERGENCY STABILIZATION

LEGEND



HIGH RISK
Detached and very unstable plaster requiring selective grouting and facing.



HIGH RISK
Cracked and unstable plaster requiring selective edge repairs.



MEDIUM RISK
Detached but stable plasters requiring facing only.



HIGHLY SIGNIFICANCE
Risk due to position near area of structural interventions requiring facing.



Extent of painted plaster

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:
Carleton UNIVERSITY **CIMS**
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran

Drawing number:
TAO_CR_RAPM_10
Scale:
Not to scale
Date:
Oct 2014



Extent of painted plaster



HIGHLY SIGNIFICANCE
Risk due to position near area of structural interventions requiring facing.



MEDIUM RISK
Detached but stable plasters requiring facing only.



HIGH RISK
Cracked and unstable plaster requiring selective edge repairs.



HIGH RISK
Detached and very unstable plaster requiring selective grouting and facing.

LEGEND

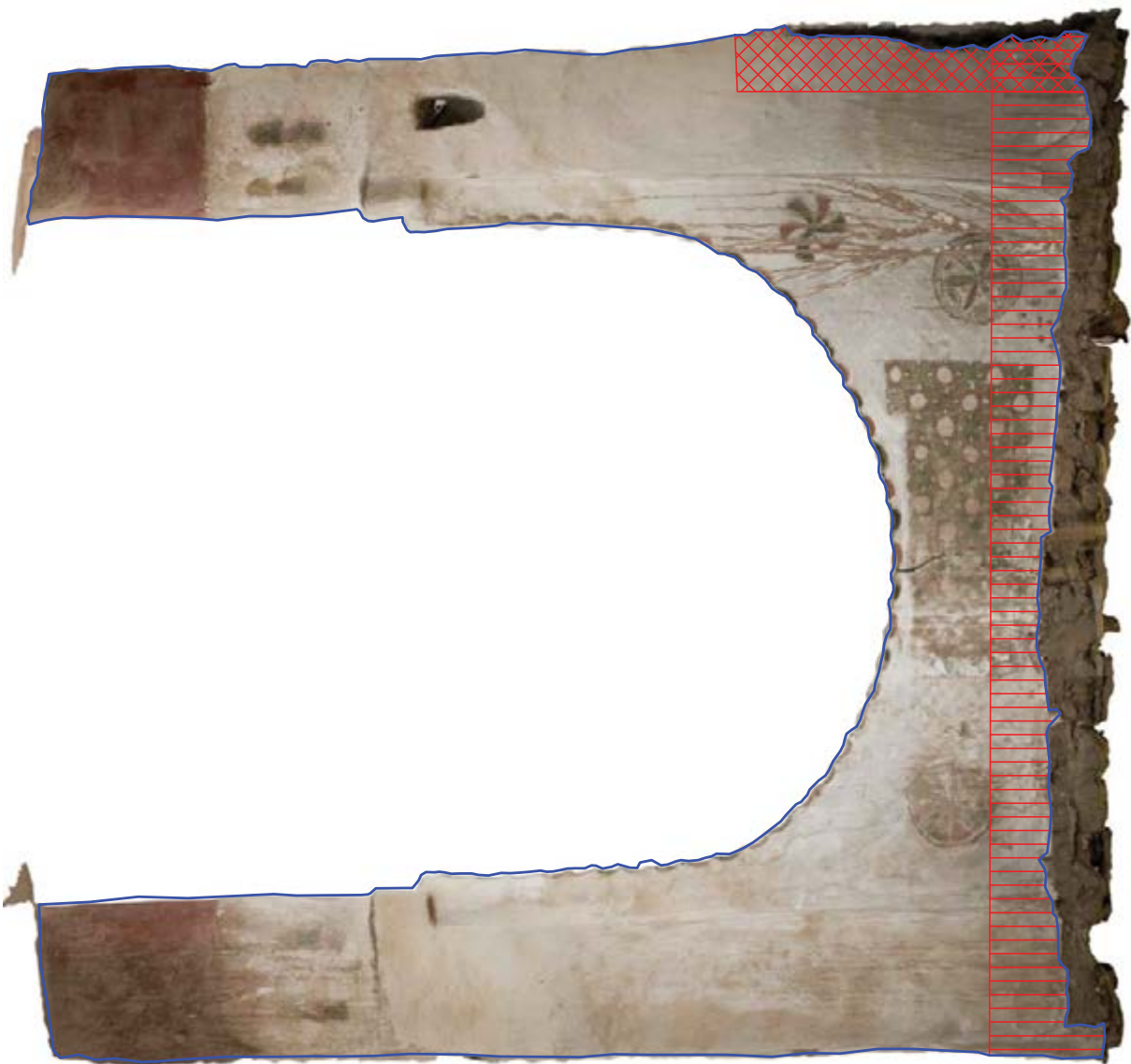


- LEGEND**
- HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.
 - HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.
 - MEDIUM RISK**
Detached but stable plasters requiring facing only.
 - HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.
 - Extent of painted plaster**



CAID RESIDENCE - NORTHERN FRONT ROOM - ARCH B (NF_B_WA1)

RISK ASSESSMENT: EMERGENCY STABILIZATION



CAID RESIDENCE - NORTHERN FRONT ROOM - ARCH C (NF_C_EA1)



LEGEND



HIGH RISK
Detached and very unstable plaster requiring selective grouting and facing.



HIGH RISK
Cracked and unstable plaster requiring selective edge repairs.



MEDIUM RISK
Detached but stable plasters requiring facing only.



HIGHLY SIGNIFICANCE
Risk due to position near area of structural interventions requiring facing.



Extent of painted plaster

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO




Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal


Photogrammetry and survey:
Carleton UNIVERSITY
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran


Drawing number: **TAO_CR_RAPM_13**
Scale: **Not to scale**
Date: **Oct 2014**


RISK ASSESSMENT: EMERGENCY STABILIZATION

LEGEND

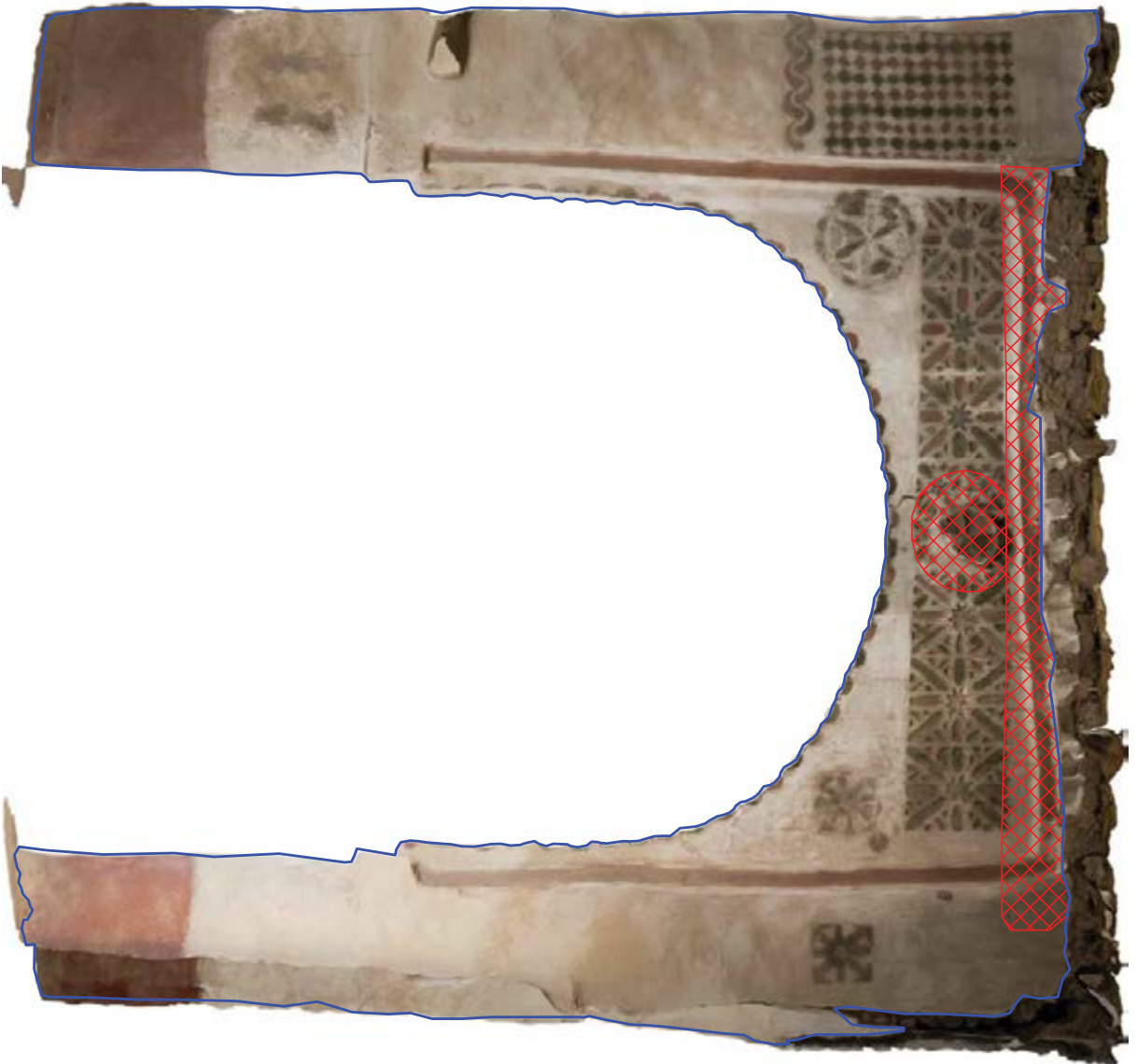
 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**



CAID RESIDENCE - NORTHERN FRONT ROOM - ARCH C (NF_C_WA)

RISK ASSESSMENT: EMERGENCY STABILIZATION

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal

Photogrammetry and survey:
 **Carleton UNIVERSITY**
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran

Drawing number: **TAO_CR_RAPM_14**
Scale: **Not to scale**
Date: **Oct 2014**



CAID RESIDENCE - NORTHERN FRONT ROOM - ARCH D (NF_D_EA1)



LEGEND



HIGH RISK
Detached and very unstable plaster requiring selective grouting and facing.



HIGH RISK
Cracked and unstable plaster requiring selective edge repairs.



MEDIUM RISK
Detached but stable plasters requiring facing only.



HIGHLY SIGNIFICANCE
Risk due to position near area of structural interventions requiring facing.



Extent of painted plaster

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO

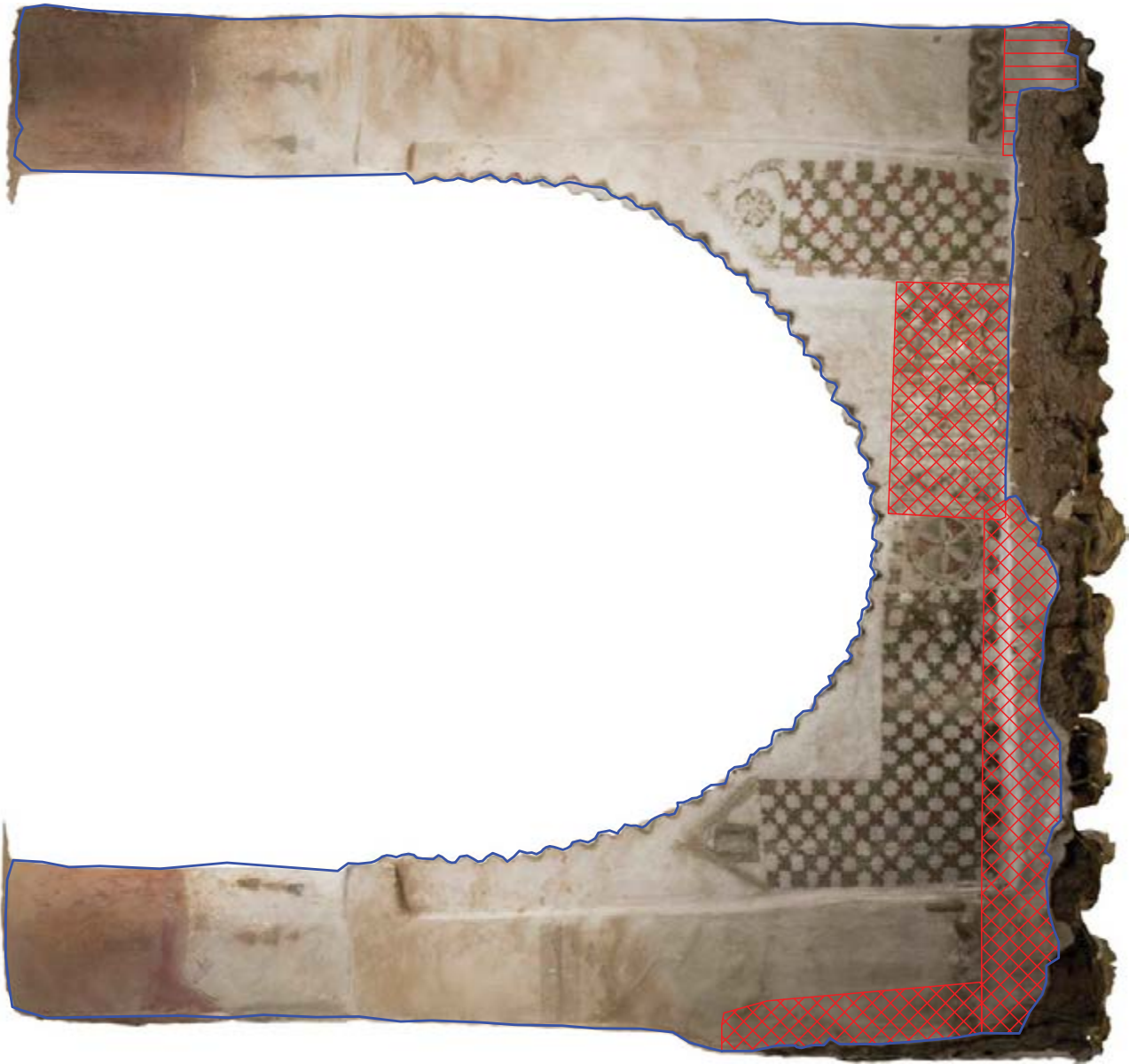


Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal


Photogrammetry and survey:
Carleton UNIVERSITY **CIMS**
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran

Drawing number:
TAO_CR_RAPM_15
Scale:
Not to scale
Date:
Oct 2014


RISK ASSESSMENT: EMERGENCY STABILIZATION




LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.


 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.


 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.


 **Extent of painted plaster**

LEGEND

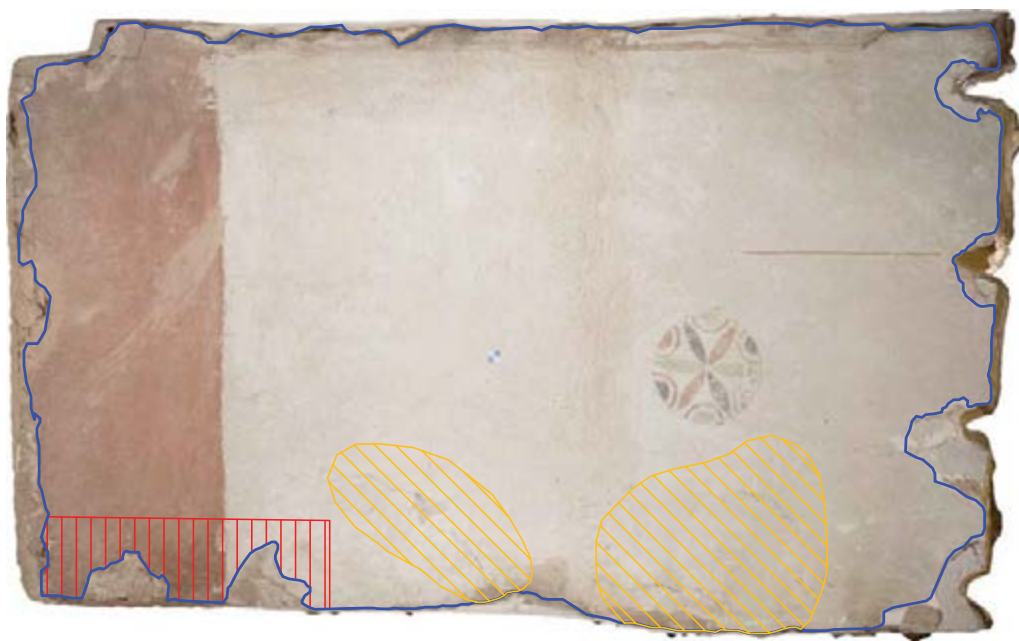
 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**




CAID RESIDENCE - NORTHERN BACK ROOM - NORTHERN WALL (NR_N)

RISK ASSESSMENT: EMERGENCY STABILIZATION

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO





Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussalh


Photogrammetry and survey:
 
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran


Drawing number: **TAO_CR_RAPM_17**
Scale: **Not to scale**
Date: **Oct 2014**

LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**



CAID RESIDENCE - NORTHERN BACK ROOM - EASTERN WALL (NR_E)



RISK ASSESSMENT: EMERGENCY STABILIZATION

LEGEND



HIGH RISK
Detached and very unstable plaster requiring selective grouting and facing.



HIGH RISK
Cracked and unstable plaster requiring selective edge repairs.



MEDIUM RISK
Detached but stable plasters requiring facing only.



HIGHLY SIGNIFICANCE
Risk due to position near area of structural interventions requiring facing.



Extent of painted plaster



CAID RESIDENCE - NORTHERN BACK ROOM - SOUTHERN WALL (NR_S)

RISK ASSESSMENT: EMERGENCY STABILIZATION

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO





Site: KASBAH TAOURIRT
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussalh


Photogrammetry and survey:
Carleton UNIVERSITY
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran


Drawing number:
TAO_CR_RAPM_19
Scale:
Not to scale
Date:
Oct 2014

LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**



CAID RESIDENCE - NORTHERN BACK ROOM - WESTERN WALL (NR_W)



RISK ASSESSMENT: EMERGENCY STABILIZATION

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



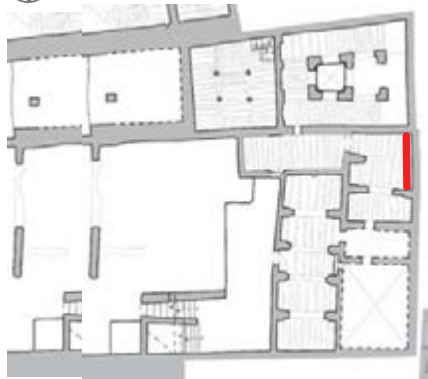
Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal

Photogrammetry and survey:
 **Carleton UNIVERSITY**
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran


Drawing number: **TAO_CR_RAPM_20**
Scale: **Not to scale**
Date: **Oct 2014**




CAID RESIDENCE - NORTH-WESTERN ROOM - NORTHERN WALL (NW_N-S1/S2/B_N-S)




LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO




Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussalh


Photogrammetry and survey:
 
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran


Drawing number: **TAO_CR_RAPM_21**
Scale: **Not to scale**
Date: **Oct 2014**

LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**



CAID RESIDENCE - NORTH-WESTERN ROOM - NORTHERN WALL (NW_N_S1/S2/A_N_S)

RISK ASSESSMENT: EMERGENCY STABILIZATION

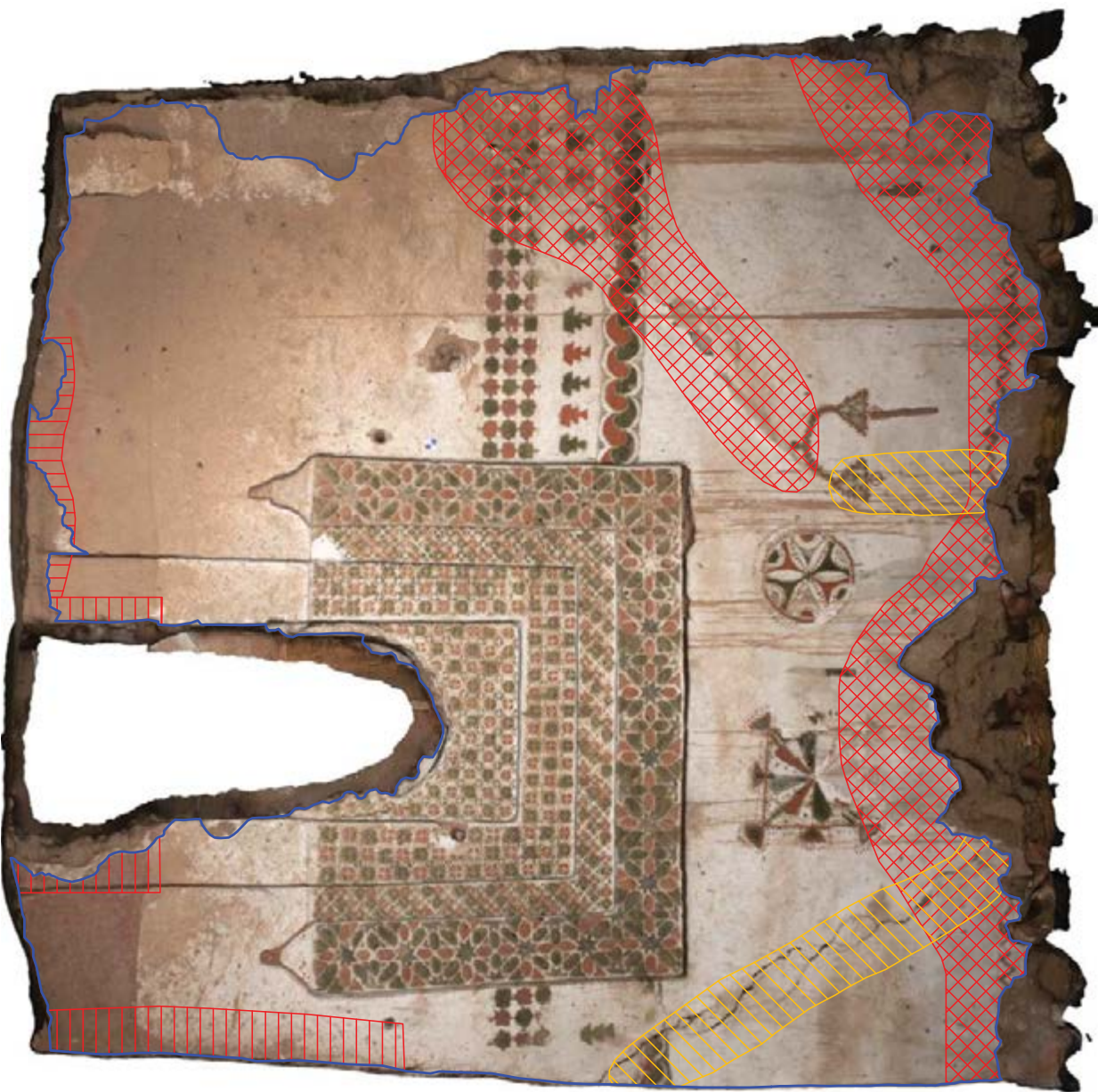
CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO




Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal


Photogrammetry and survey:
 
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran


Drawing number: **TAO_CR_RAPM_22**
Scale: **Not to scale**
Date: **Oct 2014**



LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**



CAÏD RESIDENCE - NORTH-WESTERN ROOM - EASTERN WALL (NW_E)

RISK ASSESSMENT: EMERGENCY STABILIZATION

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussalhi

Photogrammetry and survey:  **Carleton UNIVERSITY** 
Team members: Lorinda Wong, Charlotte Martin de Fonjaudran

Drawing number: **TAO_CR_RAPM_23**
Scale: **Not to scale**
Date: **Oct 2014**



LEGEND



HIGH RISK
Detached and very unstable plaster requiring selective grouting and facing.



HIGH RISK
Cracked and unstable plaster requiring selective edge repairs.



MEDIUM RISK
Detached but stable plasters requiring facing only.



HIGHLY SIGNIFICANCE
Risk due to position near area of structural interventions requiring facing.





Extent of painted plaster





CAID RESIDENCE - NORTH-WESTERN ROOM - SOUTHERN WALL (NW_S_S3)

LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

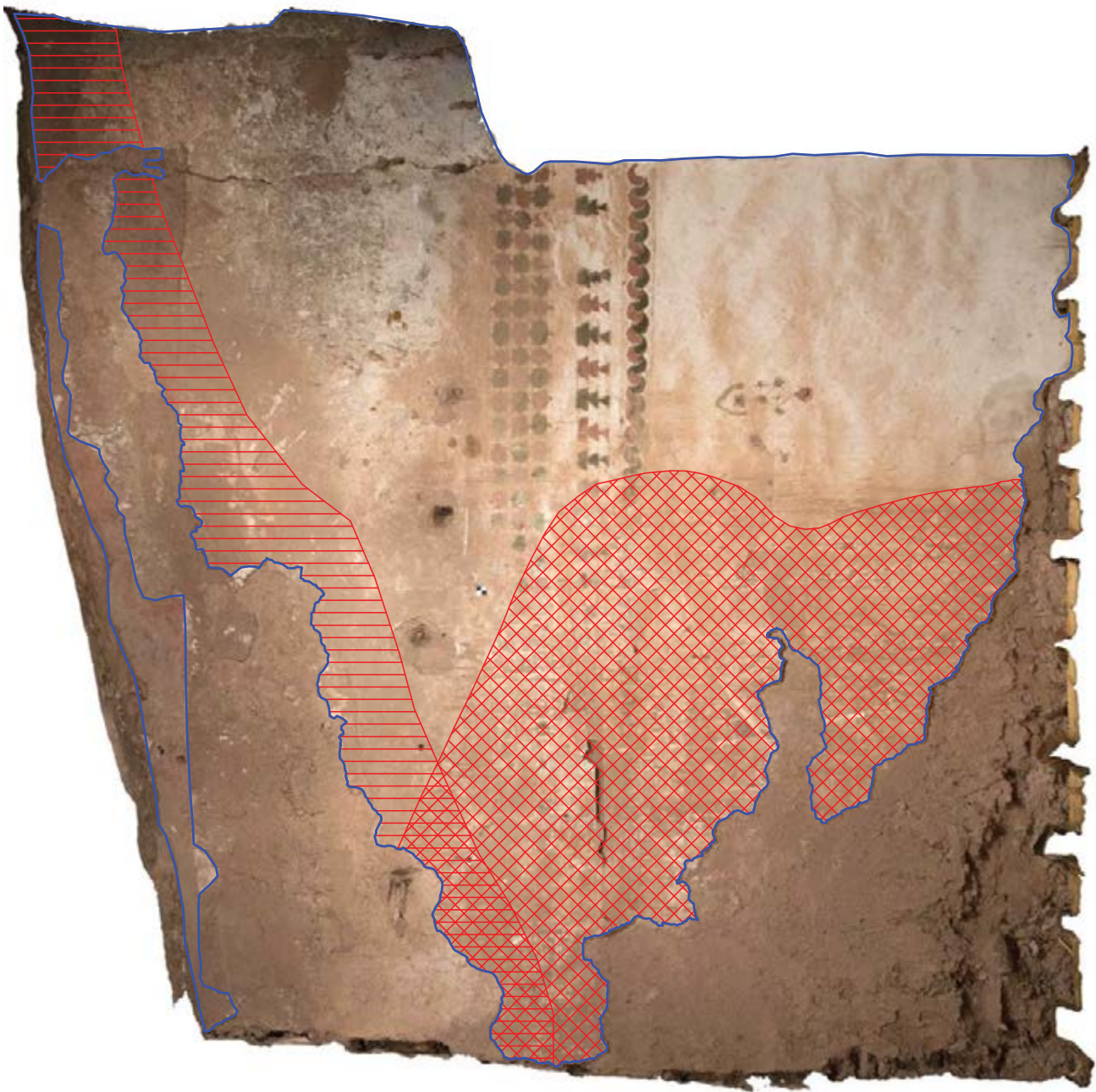
 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**



RISK ASSESSMENT: EMERGENCY STABILIZATION




0 0.2 1 m


CAID RESIDENCE - NORTH-WESTERN ROOM - WESTERN WALL (NW_W)





RISK ASSESSMENT: EMERGENCY STABILIZATION

LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal

Photogrammetry and survey:
 
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran

Drawing number:
TAO_CR_RAPM_26
Scale:
Not to scale
Date:
Oct 2014

LEGEND



HIGH RISK
Detached and very unstable plaster requiring selective grouting and facing.



HIGH RISK
Cracked and unstable plaster requiring selective edge repairs.



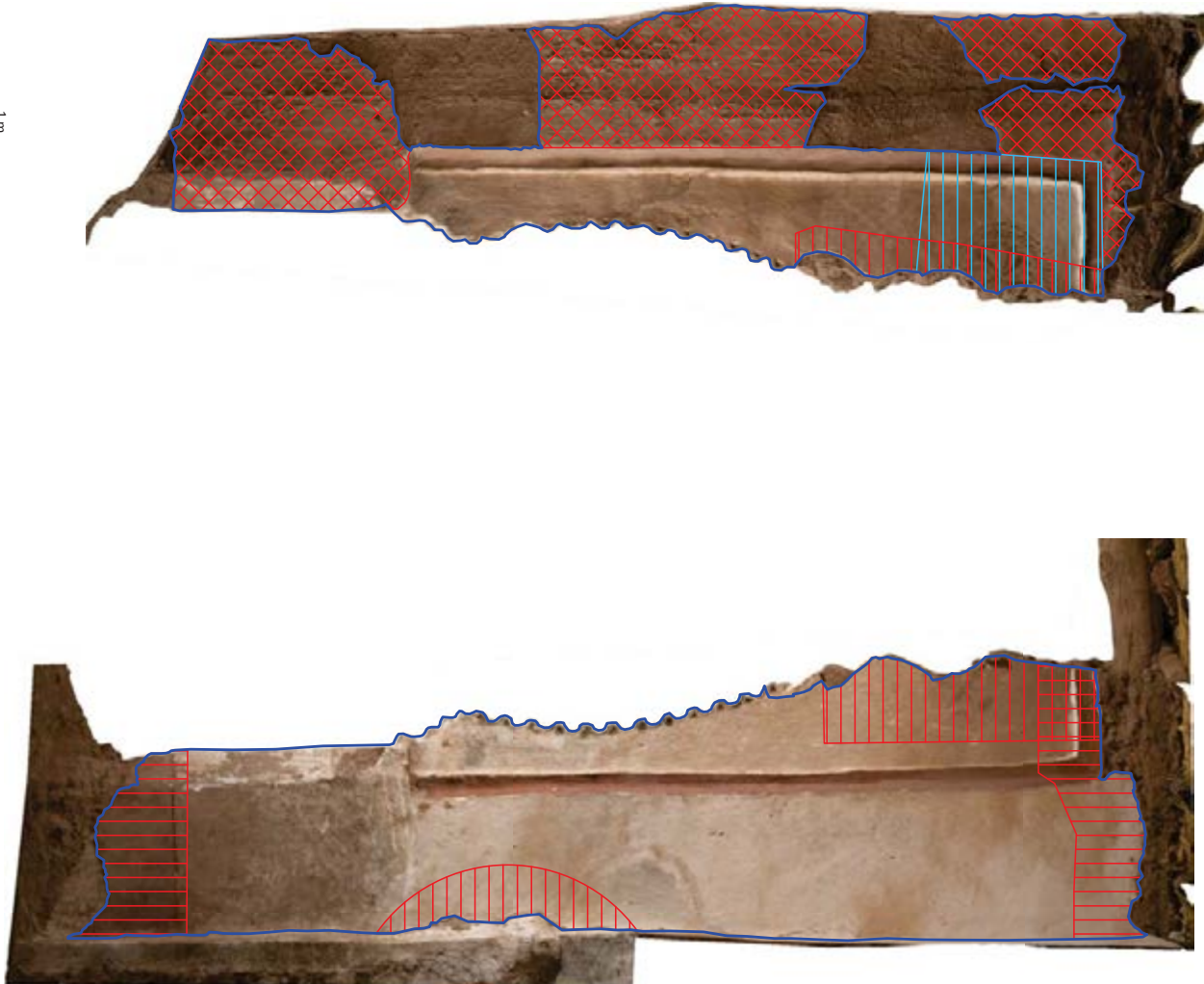
MEDIUM RISK
Detached but stable plasters requiring facing only.



HIGHLY SIGNIFICANCE
Risk due to position near area of structural interventions requiring facing.



Extent of painted plaster



CAID RESIDENCE - NORTH-WESTERN ROOM - ARCH A (NW_A_EAR/WA)

RISK ASSESSMENT: EMERGENCY STABILIZATION

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO




Site: KASBAH TAOURIRT
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal


Photogrammetry and survey:
Carleton University
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran


Drawing number: TAO_CR_RAPM_27
Scale: Not to scale
Date: Oct 2014




LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **MEDIUM RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**



CAID RESIDENCE - NORTH-WESTERN ROOM - ARCHÉ B (NW_B_EA)

RISK ASSESSMENT: EMERGENCY STABILIZATION

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal

Photogrammetry and survey:
 **Carleton UNIVERSITY**
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran

Drawing number: **TAO_CR_RAPM_28**
Scale: **Not to scale**
Date: **Oct 2014**



CAID RESIDENCE - NORTH-WESTERN ROOM - ARCH B (NW_B_war)

LEGEND



HIGH RISK
Detached and very unstable plaster requiring grouting and facing.



HIGH RISK
Cracked and unstable plaster requiring selective edge repairs.



MEDIUM RISK
Detached but stable plasters requiring facing only.



HIGHLY SIGNIFICANCE
Risk due to position near area of structural interventions requiring facing.



Extent of painted plaster



RISK ASSESSMENT: EMERGENCY STABILIZATION

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO





Site:	KASBAH TAOURIRT
Drawing:	Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by:	Lorinda Wong, Mohamed Boussal


Photogrammetry and survey:	Carleton University
Team members:	Lorinda Wong, Charlotte Martin de Fonjaudran


Drawing number:	TAO_CR_RAPM_29
Scale:	Not to scale
Date:	Oct 2014

LEGEND

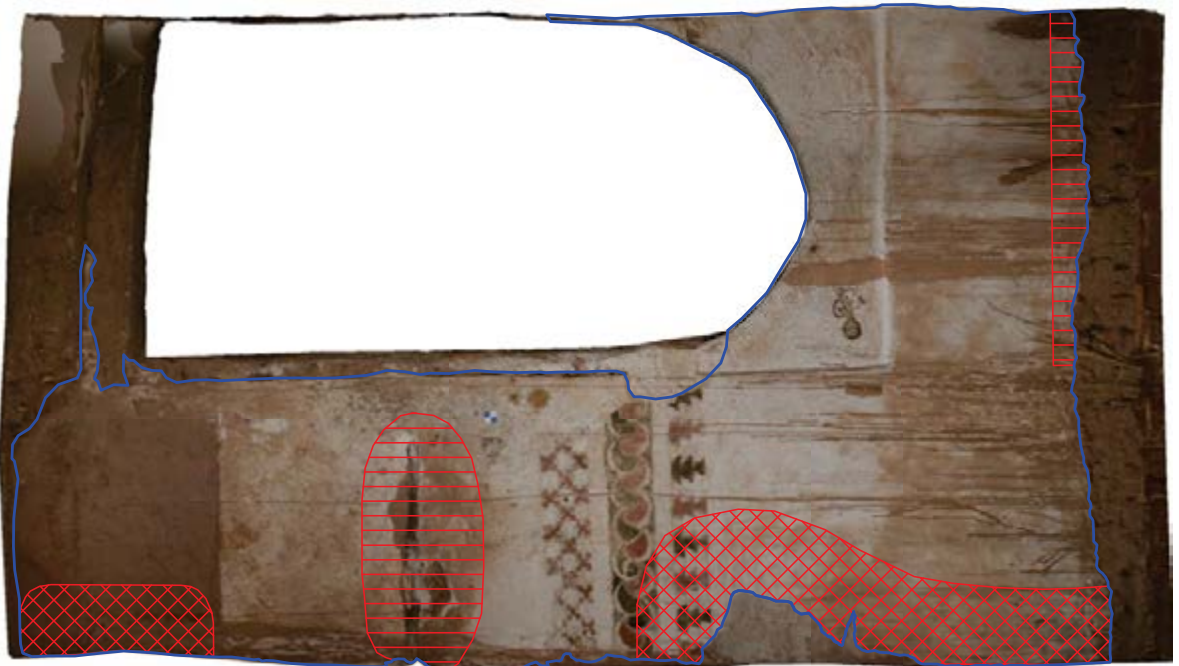
 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**




CAID RESIDENCE - WEST 2 - NORTHERN WALL (W2_N)




RISK ASSESSMENT: EMERGENCY STABILIZATION




LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.


 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**






LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.


 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.


 **Extent of painted plaster**




LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**



CAID RESIDENCE - WEST 2 - SOUTHERN WALL (W2_S)



RISK ASSESSMENT: EMERGENCY STABILIZATION

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal

Photogrammetry and survey:
 
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran

Drawing number: **TAO_CR_RAPM_33**
Scale: **Not to scale**
Date: **Oct 2014**





CAID RESIDENCE - WEST 2 - WESTERN WALL (W2_W)





RISK ASSESSMENT: EMERGENCY STABILIZATION

LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal

Photogrammetry and survey:
 
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran

Drawing number: **TAO_CR_RAPM_34**
Scale: **Not to scale**
Date: **Oct 2014**



LEGEND



HIGH RISK
Detached and very unstable plaster requiring selective grouting and facing.



HIGH RISK
Cracked and unstable plaster requiring selective edge repairs.



MEDIUM RISK
Detached but stable plasters requiring facing only.



HIGHLY SIGNIFICANCE
Risk due to position near area of structural interventions requiring facing.



Extent of painted plaster



CAID RESIDENCE - WEST 2 - WEST (W2_W)

RISK ASSESSMENT: EMERGENCY STABILIZATION

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: KASBAH TAOURIRT
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal

Photogrammetry and survey:
Carleton University
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran

Drawing number: TAO_CR_RAPM_35
Scale: Not to scale
Date: Oct 2014



CAID RESIDENCE - WEST 1 ROOM - NORTHERN WALL (W1_N)



RISK ASSESSMENT: EMERGENCY STABILIZATION

LEGEND



HIGH RISK
Detached and very unstable plaster requiring selective grouting and facing.



HIGH RISK
Cracked and unstable plaster requiring selective edge repairs.



MEDIUM RISK
Detached but stable plasters requiring facing only.



HIGHLY SIGNIFICANCE
Risk due to position near area of structural interventions requiring facing.



Extent of painted plaster

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO




Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal

Photogrammetry and survey:
Carleton UNIVERSITY
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran


Drawing number:
TAO_CR_RAPM_36
Scale:
Not to scale
Date:
Oct 2014




LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**

CAID RESIDENCE - WEST 2 ROOM - WESTERN WALL (W2_W_S1/S2)

RISK ASSESSMENT: EMERGENCY STABILIZATION

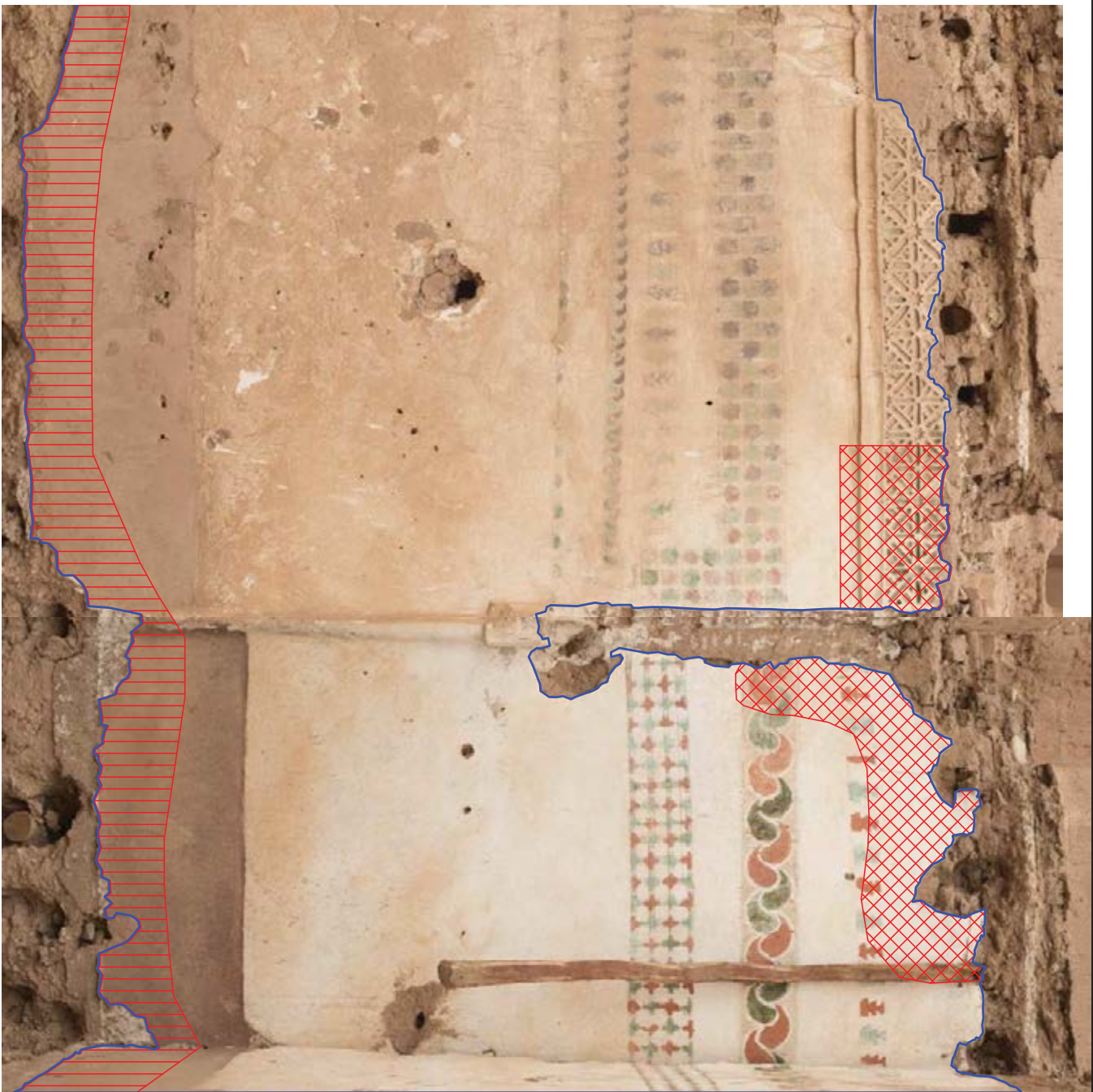
CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal

Photogrammetry and survey:
 **Carleton UNIVERSITY**
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran

Drawing number: **TAO_CR_RAPM_37**
Scale: **Not to scale**
Date: **Oct 2014**





CAID RESIDENCE - WEST 1 ROOM - WESTERN WALL (W1_W_S2/ S3)





RISK ASSESSMENT: EMERGENCY STABILIZATION

LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussal

Photogrammetry and survey:
 
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran

Drawing number: **TAO_CR_RAPM_38**
Scale: **Not to scale**
Date: **Oct 2014**



CAID RESIDENCE - NORTHERN FAÇADE - NORTHERN WALL (NFa_N)



RISK ASSESSMENT: EMERGENCY STABILIZATION

LEGEND



HIGH RISK
Detached and very unstable plaster requiring selective grouting and facing.



HIGH RISK
Cracked and unstable plaster requiring selective edge repairs.



MEDIUM RISK
Detached but stable plasters requiring facing only.



HIGHLY SIGNIFICANCE
Risk due to position near area of structural interventions requiring facing.



Extent of painted plaster

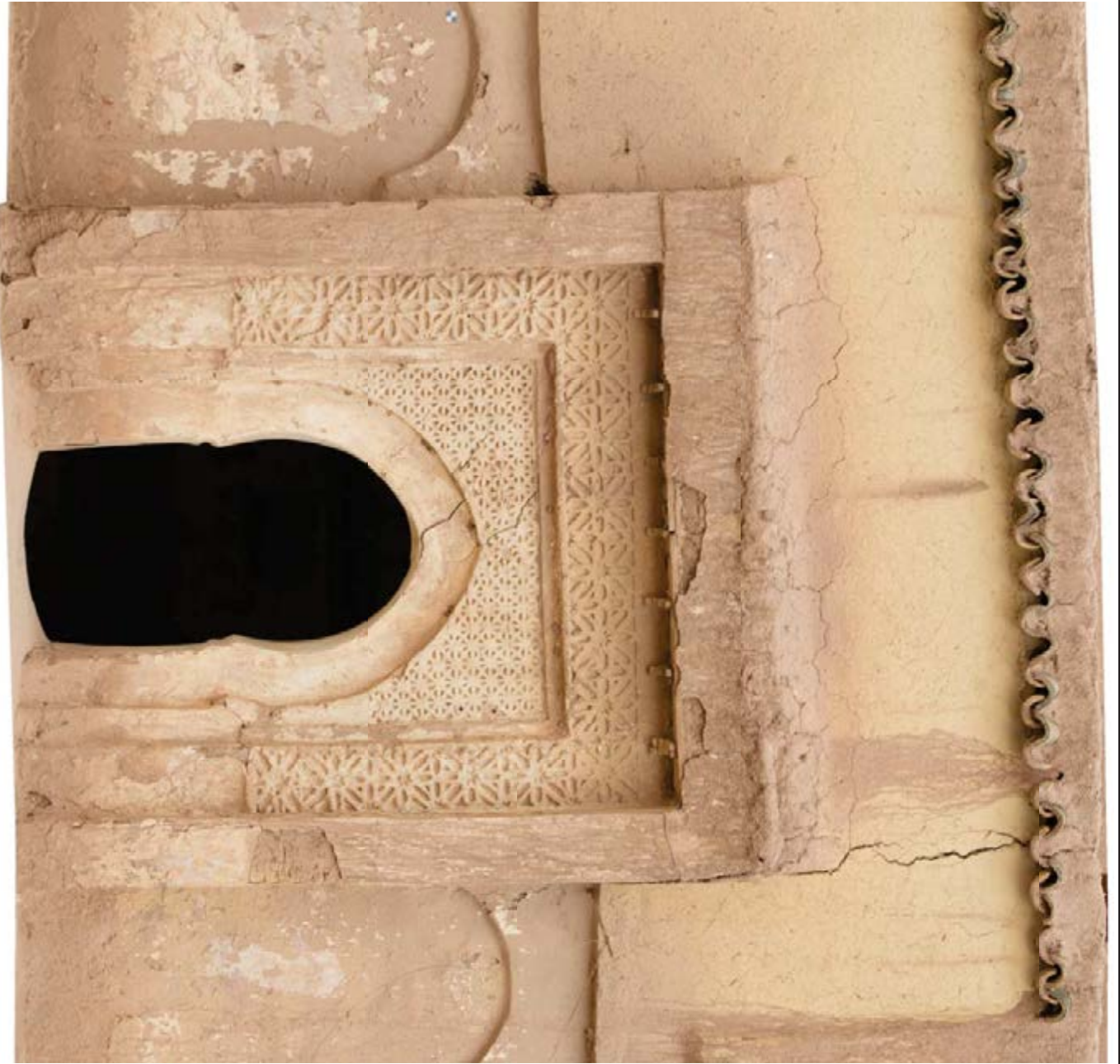
CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:
Carleton UNIVERSITY **CIMS**
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran

Drawing number:
TAO_CR_RAPM_39
Scale:
Not to scale
Date:
Oct 2014




CAID RESIDENCE - NORTHERN FAÇADE - NORTHERN WALL (NFa_N)





RISK ASSESSMENT: EMERGENCY STABILIZATION

LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.


 **Extent of painted plaster**





CAID RESIDENCE - NORTHERN FAÇADE - NORTHERN WALL (NFa_N)




LEGEND

 **HIGH RISK**
Detached and very unstable plaster requiring selective grouting and facing.

 **HIGH RISK**
Cracked and unstable plaster requiring selective edge repairs.

 **MEDIUM RISK**
Detached but stable plasters requiring facing only.

 **HIGHLY SIGNIFICANCE**
Risk due to position near area of structural interventions requiring facing.

 **Extent of painted plaster**

CONSERVATION AND REHABILITATION PLAN FOR KASBAH TAOURIRT, MOROCCO



Site: **KASBAH TAOURIRT**
Drawing: Risk assessment: Emergency stabilization of the wall paintings before the structural intervention
Reviewed by: Lorinda Wong, Mohamed Boussalh

Photogrammetry and survey:
 
Team members:
Lorinda Wong,
Charlotte Martin de Fonjaudran

Drawing number:
TAO_CR_RAPM_41
Scale:
Not to scale
Date:
Oct 2014



CAID RESIDENCE - NORTHERN FAÇADE - WESTERN WALL (Nfa_w)



RISK ASSESSMENT: EMERGENCY STABILIZATION

LEGEND

HIGH RISK
Detached and very unstable plaster requiring selective grouting and facing.

HIGH RISK
Cracked and unstable plaster requiring selective edge repairs.

MEDIUM RISK
Detached but stable plasters requiring facing only.

HIGHLY SIGNIFICANCE
Risk due to position near area of structural interventions requiring facing.

Extent of painted plaster



Royaume du Maroc
Ministère de la Culture



Centre de Conservation et de Réhabilitation
du Patrimoine Architectural Atlasique et
Subatlasique



The Getty Conservation Institute