UNIVERSITAT DE BARCELONA

Taos Pueblo: A Community-Led Approach for Preserving Tangible and Intangible Heritage

Autor: Simona Mondejar Shade
NIUB: 20543191

Treball Final de Grau

Grau en Conservació-Restauració de Béns Culturals

Tutor: Jorge Otero

Curs: 2024-2025

RESUM

La conservació del patrimoni cultural pot manifestar-se de diverses formes, en alguns casos incloent els professionals de la disciplina i en altres com a acció natural d'una comunitat.
Aquest Treball de Final de Grau explora els diferents plantejaments possibles en un projecte de conservació i restauració de patrimoni cultural. El treball se centra en Taos Pueblo, EE.UU., com a estudi de cas i exemple de projectes de conservació, guiada per una comunitat, que preserven efectivament tant el patrimoni tangible com l'intangible. A través d'un estudi bibliogràfic s'han establert els aspectes positius i negatius d'un enfocament guiat per una comunitat, i s'han adreçat les prioritats i necessitats d'aquesta tipologia de projecte.

S'estableix una proposta d'intervenció, prenent a Taos Pueblo com a base, però adaptable a qualsevol comunitat amb característiques similars, per prioritzar tant el patrimoni tangible com l'intangible i el benestar comunitari.

Paraules Clau: Lideració Comunitària, Adobe, Patrimoni Tangible, Patrimoni Intangible, Taos Pueblo

ABSTRACT

Cultural heritage preservation can take many forms and approaches, some of which include the involvement of conservation professionals and others occur as a natural action of communities. The following dissertation explores the approach options to take during a conservation-restoration project regarding cultural heritage. The project draws inspiration from Taos Pueblo, USA, which serves as a valuable case study and example of community-led preservation efforts that have proven to be effective in safeguarding the tangible and intangible heritage of a specific community. Through an in-depth literary review, the positive and negative aspects of community-led approaches are established, as well as the priorities and needs of these kinds of projects.

An intervention proposal is presented, using Taos Pueblo as a base, but adaptable to any community with similar characteristics, to prioritize tangible and intangible heritage, as well as the wellbeing and preservation of the community.

Key Words: Community-Led, Adobe, Tangible Heritage, Intangible Heritage, Taos Pueblo

INDEX

1. Introduction

1.1 Motivation

The goal of this dissertation is to explore how a community's involvement, during the planning and execution of conservation efforts, can influence the long-term material heritage preservation, its cultural context, and the strengthening of the community itself. The conservation and restoration of cultural heritage is an important task that involves many professionals from different fields and can have many different end goals, usually related to the safeguarding and dissemination of cultural information, the strengthening of local and national tourism, and historical education. Conservation professionals are crucial to the preservation of the material. However, for a correct approach, their role must be malleable and capable of adapting and working with community members to preserve culture and tradition with as much attention as they give to the material. Culture is found not only in the tangible heritage of its community, but also in the community itself, its descendants, and the intangible heritage associated with the material and the people. Intangible heritage is a constant action performed by a community or group (UNESCO, 2003, p.4), and it can depend or not on material heritage. Moreover, what defines culture will be subjective to the individual or group in question (Watkins, 2021, p.108).

This dissertation examines the case of Taos Pueblo (New Mexico, USA), where the preservation of both tangible and intangible heritage is closely linked to community participation. Involving local residents in the preservation of their material heritage fosters social cohesion, enhances understanding of traditional building techniques, and helps to strengthen both community identity and cultural continuity. (Zamora, Judy, 2015)
Taos Pueblo is located in northern New Mexico, in the United States, and is one of the most significant and oldest continuously inhabited communities in the country. This case study aims to understand the role of community participation in the conservation and restoration of their heritage (mainly the historical adobe buildings). Before outlining the objectives, the following key concepts will be introduced, to contextualize the study:

- The material properties of adobe
- The conservation criteria specific to adobe structures and community projects
- The role of the community regarding tangible and intangible heritage
- A contextual overview of the adobe architecture and cultural significance of Taos Pueblo.

1.2 **Adobe**

1.2.1 **Material Properties**

An adobe is a brick or (usually rectangular) piece of earth made with a mold (COREMANS, 2017, p.54). Adobe is an earthen building material that is cured in the sun, unlike commercial baked bricks (Momĉilović-Petronijević *et al*., 2018, p.392). Colloquially, structures built with adobe bricks are also called adobes (e.g., an adobe house, an adobe). Adobe architecture is among the oldest forms of construction due to the simplicity and availability of the material (Momĉilović-Petronijević *et al*., 2018, p.389). Adobe structures have been dated back to 10.000 BC, with molded bricks dating back to the 6th century BCN in Mesopotamia (Costi de Castrillo *et al*., 2017, p. 437).
Adobe is available for production in any area with clay in the soil and a dry enough climate for the bricks to harden in the sun.

The composition and characteristics of the earth used to make adobe bricks depend on the geographic area where the construction takes place, as the material used is traditionally taken directly from the local soil. (COREMANS, 2017, p. 42). Essentially, adobe is made up of clay and sand, as well as smaller and bigger particles such as silt and gravel, and mixed with water. Clay will give the material its plastic properties and sand will avoid cracking and ensure cohesion. (For list of general proportions check Annex 1)
The proportions of materials used vary depending on the period, geographic area, and/or objectives of the construction. It is common to find other added materials such as plant fibers and other organic matter (dry manure, other vegetation) to modify the properties of the adobe. (Dominguez, 2011, p. 2) Traditional bricks tend to have straw added to the mix to prevent cracking (Smith, 1982, p. 23).

Adobe homes are usually built with sun-dried adobe bricks held together with mortar of the same composition. In many cases, the buildings are given an exterior and interior finish to help protect the material. (COREMANS, 2017, p)
The finish of the exterior and interior walls depends on the typology of the building and the composition of the adobes used, as well as the location and function of the specific wall. The surface is generally covered with a layer of clay with lime (COREMANS, 2017, p. 54).
The traditional bricks are long-lasting if properly preserved in arid climates, through initial construction with compatible materials and routine maintenance that includes reapplication of adobe and clay plasters.

The materials used to make adobe bricks are readily available in many places, but environmental conditions determine the possibility and difficulty of proper preservation of the material. The southwestern United States, especially the state of New Mexico, is the most recommended region for adobe construction because the climate is arid with minimal rainfall compared to other regions. (Smith, 1982, p.13-14; Hubble, 1943). New Mexico's Rio Grande clay is very suitable for adobe brick production (Smith, 1982 p.15), this river crosses New Mexico and specifically flows into the Taos Pueblo River, which cuts the Pueblo in half and is its main water source.
Adobe bricks can be made with or without a mold, and sizes vary by region and production method.

The adobe bricks typically used in Taos are 4 x 8 x 12 inches, 26 lbs; these dimensions are slightly smaller than the standard New Mexico adobe bricks (4 x 10 x 14 inches and 30 lbs) (Smith, 1982, p.14).
The curation process depends on regional and climatic characteristics, the size of the brick, and its composition. In general, the process will take no less than 2 weeks (Oates, 1990 p.388). To avoid a long process, the bricks should be cured during the driest months of the year. During construction, the bricks are glued together with a mortar made from the same paste (Oates, 1990, p.388).
In 1980, Taos Pueblo made traditional adobe bricks from clay, sand, and straw. The bricks were left to dry for 4-5 days before being turned and cured for weeks. (Smith, 1982, p.48).
The Taos Pueblo adobe buildings are mainly created with adobe, along with wooden vigas and latillas for roofing and wooden windows and doors. (Zamora, & Judy, 2015)

The most common degradations of adobe structures are the following(U.S Department of Interior, 1978):
- Cracking
- Bulging or sagging walls and roofs
- Loss of material
- Coving

The main agents of degradation of adobe structures are the following:
- Material incompatibility: adobe can have uneven ratios of sand, clay, and water which will affect its overall durability; adobe with correct proportions can also be incompatible with other materials in the building. Adobe in contact with wood, metal, stone, or cement can present cracking and separation, as its movement is greater and it will not bond correctly to these materials. (U.S Department of Interior, 1978, pp. 1,6)

- Water: Moisture is the main agent of degradation in adobe buildings. The moisture can be from rainfall, groundwater, or relative humidity. The degradation will be different based on the source of humidity.

1. Rainwater: rainfall will have an erosive effect on the material, if the relative humidity of the area is low, it will also create a fast saturation and drying cycle which can lead to cracks and deformities. The material will lose its cohesion and material when saturated with rainwater, leading to rounded corners. The accumulation of rainwater on ground level and the splash effect it may have can lead to coving, where the wall will lose material on ground level, creating a hollowed area. (U.S Department of Interior, 1978, P. 4)
2. Groundwater: groundwater is the humidity present in the soil at ground level, it will be absorbed into the structure through capillary action. The movement of the water will break the bond between the wall's clay particles. The water also carries soluble salts which will create deposits when it evaporates and can fill and destroy the material's pores if the cycle is repeated consistently, leading to loss of material from the lower levels upwards. Groundwater creates erosions, bulging, and coving, mainly on the lower levels of buildings. Coving is also a consequence of freeze-thaw cycles, which have a similar effect to the previously mentioned effect of salts during evaporation cycles. (U.S Department of Interior, 1978, P.4)

- Wind erosion: strong or constant wind will cause erosion as it carries solid particles such as sand. The degradation is similar to erosion caused by water, and wind erosion will be evident on the highest levels of buildings. (U.S Department of Interior, 1978, P.6)

- Vegetation and animals: vegetation and animals such as small rodents and insects may thrive in adobe walls, especially if the humidity levels sustain plant growth. Roots can cause cracking and loss of material, small animals can burrow in the material and create further loss, and termites can affect both any wooden structures within the building and the adobe itself, as they move through it in search of wood. (U.S Department of Interior, 1978, P.6)

1.2.2 **Conservation and Restoration Criteria for Vernacular and Intangible Heritage**

The main objective of conservation and restoration is the protection and stabilization of a material heritage, securing the original material, and avoiding future damage and/or loss.
When referring to vernacular and intangible heritage, The International Council of Monuments and Sites (ICOMOS) will be an important reference point. ICOMOS organizes the intervention criteria based on the typology of intangible or tangible heritage, some points of action will be shared in most cases, and others will be specific to the typology of heritage.
When dealing with a site such as Taos Pueblo, the criteria to follow will be related to architectural, archeological, and intangible heritage, ideally following a community-focused approach.

After the Second World War, heritage conservation became a more important and pressing issue, especially in Europe.
The International Charter for the Conservation and Restoration of Monuments and Sites (The Venice Charter) was created at the II International Congress of Architects and Technicians of Historic Monuments in Venice (May 31, 1964). The creation of ICOMOS was also proposed at the Congress and took place in 1965. (ICOMOS, 1964(2007))
This Charter is the foundation of the conservation of historic monuments and sites and has been referenced and built upon since its inception.
The Charter defines historic monuments and outlines, through 16 articles, the objectives, and criteria for their conservation, restoration, and dissemination. (ICOMOS, 1964(2007))

Based on this initial charter, international criteria have been and are being created to focus and best manage each tangible and intangible heritage group. For the purpose of this study, the criteria regarding vernacular and intangible heritage has been reviewd and organized into a table of relevant articles, which will be referenced throughout the study. (See Annex 2).

1.3. **The Role of Community in the Conservation of Cultural Heritage**

Cultural heritage can be tangible or intangible; the role of the community in its preservation will vary based on the typology of heritage, as well as the cultural context and resources available.

The conservation of material heritage is a complex process that may require the participation of professionals from diverse and specialized backgrounds; conservators and restorers, chemists, physicists, art historians, administrators (museums), artists, etc., depending on the needs and obstacles related to the project at hand (ICOMOS, 1990, p1). Furthermore, the community tends to be overlooked in the process of planning an intervention to the heritage, yet this group is extremely important, especially regarding archaeological and architectural sites (Higgins & Douglas, 2021, p.5). Any process of maintenance or study of built heritage will affect the community surrounding it, as the community will also have an important role in ensuring its respect, care, and historical contextualization.

A community can be defined as a group of people who share a common culture, belief system, customs, and, in many cases, geographic space. (By Getty; Tonnies, 2001, Wates, 2000).
As mentioned above, the opinion of a cultural community will carry more weight when dealing with heritage in an archaeological or architectural context, or heritage with a unique and significant historical relationship to the community. The community has an irreplaceable role when dealing with intangible heritage; language, folk music and dance, cultural and religious traditions, and symbolism associated with culture (UNESCO, 2011, p.4). Intangible heritage belongs to its culture and cannot exist without an active community, be it the original group or a community united by its appreciation for the heritage; the preservation of any material related to this intangible heritage is the right and responsibility of the community. (ICOMOS, Lausanne Charter, 1990, p2, Art.3). Because of its dependence on a community and present actions, intangible heritage can also be referred to as “living heritage”. (UNESCO, 2011, p.4)
For archeological heritage, community involvement in preservation is essential to maintain the material and its culture. (ICOMOS, 1990, p1).

It's important to note that, in some cases, intangible cultural heritage can exist only for a community or group of people. Whereas tangible heritage may be of more cultural significance to a specific group but perceivable to any person, some cases of intangible heritage, mainly heritage related to religious or mythical beliefs, can exist only for a specific group. Based on this concept, a tangible heritage site may be of cultural significance only to a specific community. (Watkins, 2021, p.108). In this case, the heritage and its existence depends on the community and may not be nationally or internationally prioritized when planning a conservation project, this fact should not eliminate its validity as cultural heritage .

The Nara Document on Authenticity (1994) was prepared at the Conference on Authenticity in Relation to the World Heritage Convention, held in Nara, Japan, November 1-6, 1993 (UNESCO, 2007). The document states that all cultures and societies have tangible and intangible heritage (UNESCO, 2007, point 7) and that even though the heritage belongs to the world as a whole, the responsibility and decision-making related to its preservation should involve the specific communities that have created and maintained each part of the cultural heritage.

The document defends that each community must treat its heritage based on its personal needs and priorities, within reason, and with respect for international criteria and the rights of other cultural communities. (UNESCO, 2007, point 8).
When dealing with the study and documentation of cultural heritage and its state of conservation and value, the document advises including its cultural context and being aware of the changing perspectives and priorities that each community will have in relation to its heritage; there can be no fixed criteria related to a specific type of heritage or material. (UNESCO, 2007, points 11, 12, 13).

Partially based on the Nara Document, the ICOMOS 2024 International Charter and Guidance on Sites with Intangible Cultural Heritage shows the direction conservation of cultural heritage is taking; the purpose of the document is to "advocate for the recognition of intangible cultural heritage as an integral part of site-based heritage and to support and guide ICOMOS members to a more integrated tangible heritage practice and to align their work with the 2003 Convention for Safeguarding of the Intangible Cultural Heritage" (ICOMOS, 2024, p.1: Preamble). This document lays out principles regarding the rights of communities, the relation between heritage sites and intangible heritage, and the role heritage professionals should aspire to take. Throughout the guidelines for practice, respect for material heritage, community members, and intangible heritage is maintained.

The 2022 ICOMOS International Charter for Cultural Heritage Tourism is a revision of the 1999 ICOMOS International Charter for Cultural Tourism, as a response to a growing tourism industry and new threats it brings to cultural heritage. The charter has the goal of advocating for the cultural heritage and the community its exploitation effects while creating a sustainable and studied approach to tourism. Principle 4 of the Charter focuses on the rights of communities, specifically indigenous peoples, and pushes for their involvement in tourism projects (ICOMOS, 2022, pp.1-11).

A clear example of community involvement in material heritage preservation is the case of the UNESCO World Heritage Site, the Old Towns of Djenné, Mali.
In Djenné, Mali, adobe is the main traditional building material. (Sacko, 2021, p. 3). The city has been successfully inhabited since 250 B.C. (Sacko, 2021, p. 2); the houses and the Great Mosque are all adobe, and the maintenance of these structures is part of the community's culture. The role of the masons (barey) is very important in the preservation of the houses; if a boy is born into a family of masons, he is educated and trained to ensure the survival of the profession (Sacko, 2021, p. 7). When large, externally led restoration projects have taken place, the community feels that the intangible heritage associated with their traditional restoration process is excluded from the objectives (Sacko, 2021, p.17).

1.4. **Context of Case Study: Taos Pueblo**

Based on the 2003 ICOMOS Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage (Art. 1.2) as well as the 1999 Charter on Build Vernacular Heritage (Principles of conservation: Art. 2), fixed criteria will not be effective for the proposal of an intervention plan; cultural contextualization and the recognition and respect for traditional and cultural values of vernacular architecture are essential to preserve the material and intangible heritage correctly.
To ensure the proper cultural contextualization of the material at hand, an initial study of its community and culture will be necessary.
Understanding the context of the Pueblo culture of New Mexico will be fundamental to the study of its material heritage and cultural dynamics. This preliminary step will help justify any interventions that deviate from international criteria, since in the case of living heritage, it is important to place the priorities of the living community at the same level as the criteria applied to archaeological heritage.

Taos Pueblo (N36 26 16.8 W105 32 45.6) is one of 13 properties (UNESCO, Taos Pueblo, 2025) in the United States of America considered a Cultural World Heritage Site by UNESCO (nominated in 1992),(UNESCO, Taos Pueblo, 2025).
Taos Pueblo is a Native American nation or pueblo in northern New Mexico, the Pueblo people of Taos are Northern Tiwa, who occupy Taos and Picuris (L.Trager, 1943, p.557). The Pueblos are communities native to the Southwest of North America. Currently, 60,000 Pueblo people live in 32 communities in NM and AZ and one in TX (Crow Canyon Archaeological Center, 2014). The Spaniards who arrived in the 1500s called the tribes of the region *pueblos*, as in “town”, and this word refers to the people, the physical village, and its architecture. (Van Dyke, 2017, p. 202)
Based on archeological evidence, the Pueblos originated in the Mesa Verde region about 1,400 years ago. The people who inhabited Mesa Verde from A.D. 550 to about 1200 were the Ancestral Puebloans. (National Park Service, *Ancestral Pueblo People and Their World*.)
100 miles south of the Mesa Verde region, Chaco Canyon became a very important cultural site for the Ancestral Puebloans (Crow Canyon Archaeological Center, 2014). Between 1000 and 1400 it was a central point of cultural and commercial exchange between tribes, and the architecture developed there would have a major influence on future Pueblo architecture, (mainly the multi-story massive units) (Van Dyke, 2017, p. 205).
Pueblo people began to migrate out of Chaco Canyon around the 13th century (Van Dyke, 2017, p. 209), with some returning to the Mesa Verde area and others expanding into different regions of New Mexico and Arizona (Crow Canyon Archaeological Center, 2014).

Pueblo people began reaching the northern Rio Grande valley around the 11th century, although the population of Taos was composed of different groups that arrived at different times in the early history of the town. (Boyer, 2008, p. 19)
Taos Pueblo is found in this valley, under the Sangre de Cristo Mountain range, at the southern end of the Rocky Mountains (UNESCO, Taos Pueblo) and is divided by Rio Pueblo, a tributary of the Rio Grande (World Monuments Fund, 2025).
The original site of the pueblo was established around 1325 A.D., but the original structures are currently a sacred ruin known as Cornfield Taos (National Park Service, 2020). Archaeological evidence suggests that around 1400 A.D. the inhabitants of the pueblo moved slightly west and established the current Taos Pueblo. (National Park Service, 2020)

Figure 1: Location of Taos Pueblo
Image 1: Google Images, 2025 accessed at… on …
Image 2: About Taos, 2025, accessed at… on 15/05/25

In the pre-colonial era, Taos was a central trading point between Pueblo nations and other tribes. (National Park Service, 2020)

Taos Pueblo is one of the most important Pueblos in the Southwest (Boyer, 2008, p. 19), as it is considered the oldest continuously inhabited site in the United States (about Taos Pueblo) and best preserved examples of Pueblo Architecture.
(*ABOUT–Taos Pueblo, 2025*). The Pueblo, like most Native American communities, is a sovereign state within the United States and has its own government consisting of the Tribal Council, Governor, and War Chief. (*ABOUT–Taos Pueblo,* 2025). Taos Pueblo has traditionally been preserved by the tribal members through yearly remudding before the San Geronimo Harvest Festival (Zamora, & Judy, 2015).
Taos Pueblo has a population of over 1900 people who live on Pueblo lands, 150 of whom live in the Pueblo permanently; in other cases, the houses are used for cultural gatherings, family events, and during religious or local celebrations (*ABOUT–Taos Pueblo, 2025*).

Taos Pueblo has traditionally been a strong cultural site, as the Pueblo Revolt of 1680, which pushed the Spaniards out of the entire New Mexico territory for 12 years, was initiated in Taos Pueblo (Lujan, 1993, p.108.) The pueblo has maintained its culture and been resistant to the Spanish and American influences and repression. 1970 was an important year for Taos Pueblo, when after decades of fighting for their land rights, the rights to the sacred Blue Lake where finally returned to the tribe by the U.S government. (Lujan, 1993, p.104)

Another example of the strength and resistance of culture in Taos Pueblo is the Taos Pueblo Pow Wow. A Pow Wow is a Native American celebration and dance and music competition, credited to the Plains tribes, with the goal of safeguarding native culture after settlers displaced most tribes and carried out a cultural genocide. The Taos Pueblo Pow Wow is an example of how a community can strengthen its own culture and that of other communities through the sharing of customs and traditions; Taos Pueblo has had a historical bond and exchange with the Plains tribes and has adopted their music and dances to create their pow wow, as have many other native communities throughout North America. In Taos, the Pow Wow has been celebrated every July since 1985. (Visit Taos New Mexico, 2025)

Figure 2: Details of Taos Pueblo,
Image: UNESCO (Taos Pueblo), accessed at … on 15/05/25

2. **Objectives**

The main objective of this dissertation is to study and understand the role of the local community in the conservation and restoration of its material heritage, using the case study of the adobes of Taos Pueblo in New Mexico, USA.

Three specific objectives have been created based on this general objective; they will be resolved through a scientific methodology based on in-depth literary research.

Specific Objectives:
1. To study and understand the construction methods and material properties of Taos Pueblo adobes and to locate documented preservation and restoration efforts. Interventions studied will include both small-scale community and homeowner-led efforts as well as large federally funded projects. Based on the information gathered from the literary review, a conclusion will be drawn and the positive and negative effects of community-led interventions will be compared. Finally, a list of current or conceivable conservation issues and threats will be made. This objective will set the base for the next two objectives to be resolved and will require the most research and objective listing of information.

2. To create a docuementation and intervention plan for community-led interventions. Based on the information gathered during the resolution of the first objective, the state of conservation of the Taos Pueblo adobes will be determined and the cultural context and needs of the specific community will be studied. The proposal will be curated to be suitable for implementation in this case study or a case with similar characteristics and objectives; to give priority to the community, to adapt the methods to the current resources, to prioritize the use of traditional materials and/or methods, and to prioritize the desired final use of the heritage.

3. To conclude how to adapt the role of conservation professionals to community-led approaches for intervention projects and discuss the cultural and practical relevance of this approach in the field of cultural heritage management .

3. **Methodology**

This dissertation will give a conclusion to the objectives proposed through an in-depth literary review. This method consists of the research and selection of bibliographic references, the understanding and summary, and finally, the transmission and relation of the information to the subject. Through this method, it is possible to give a true, referenced conclusion and answer to the hypothesis or question raised when presenting an objective.

The case of Taos Pueblo is used as an example of a site where community-led interventions have a history of success, are ongoing, and the possibilities for future projects are diverse. This case is also ideal because the community has a closed culture that is tightly held by tribal members, and the effects of participation in preservation projects are magnified.

Before the objectives, the basic context for the study has been established through an introduction to adobe and its general preservation criteria, the role of the community in preservation and restoration projects, and finally a summary of the historical context, development, and Native American culture of Taos Pueblo.
The information discussed in the introduction will be a constant theme throughout the study.

First Objective
To give a conclusion to the first objective, bibliographic research will be used as a means to find any information on the construction, restoration, problems and needs of the case study. The goal is to gain a clear understanding of what defines a community-led intervention by studying the case of Taos Pueblo, with its particularities as well as general characteristics that would apply to any community involved in cultural preservation.

Second Objective
This objective will have a conclusion in the form of a documentation proposal with a community focus in mind. The conclusions drawn from the first objective will form the proposal. The proposals will use the case of Taos Pueblo as an example of material heritage where the documentation and intervention should be community-centered; the proposal will include information related to the community and its needs and will be accessible and adaptable.

Third objective
The third objective will use the information obtained from the previous two objectives to conclude whether the community-led interventions are successful in preserving the culture and intangible heritage related to the material heritage being preserved.

Material Sources: A total of 54 documents have been consulted for this dissertation. The documents include books, journal articles, thesis, international charters and previous documented interviews. The documents were accessed through the following data bases:

- CRAI: Cercabib i més
- Google Scholar
- Google Chrome

4. Discussion and Results

4.1. The Taos Pueblo Foundation and Construction

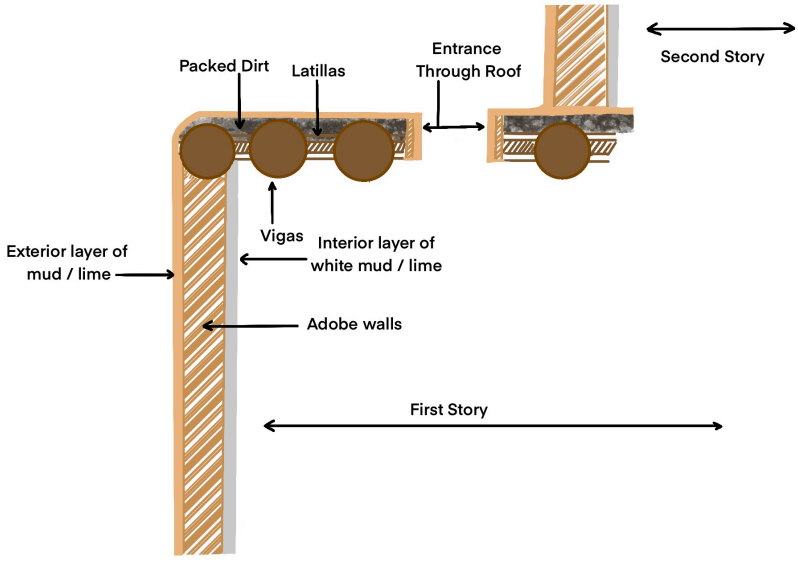
Taos Pueblo is characterized by its architecture; pre-Hispanic adobe buildings of up to 5 stories (UNESCO, Taos Pueblo). As mentioned in the introduction, the current Taos Pueblo has buildings dating back to 1400 A.D.

The physical structure of the Pueblo is based on two central buildings with groups of adjacent smaller units attached to each (UNESCO, Taos Pueblo). The walls of the buildings vary from 35 to 70 cm in width (National Park Service, 2020). The houses are organized in a tiered structure with small and minimal windows (National Park Service, 2020). Originally, the houses had no doors or windows except for entrances on the roof of each unit (*ABOUT–Taos Pueblo, 2025*) as a means of defense and protection from the elements (Zamora, & Judy, 2015, p.40). However, as the Pueblo developed, adjustments were made and wooden doors and windows were added (World Monuments Fund, 2025).

The two main structures are Hlauuma (north) and Hlaukwima (south), which are separated by the river and seem to have been built during the same period. (*ABOUT–Taos Pueblo, 2025*). This distribution of clusters of homes creates a community effort in preservation, as the homes are in contact with one another and need collaboration to be maintained as a whole.

The Taos Pueblo adobe homes were initially built using poured or puddled adobe, as well as hand-made adobe slabs, this method is characteristic of the Pueblo IV period. (To check the Pueblo architectural evolution see Annex 3)

In this case, the local earth is mixed with straw (*ABOUT–Taos Pueblo, 2025*). The roofs are held up by vigas of wood, also native to the area, with smaller timbers in between (pine or aspen latillas). Externally, the roofs are covered with packed earth. The interior and exterior walls are covered with thin layers or washes of adobe and white clay for the interior (*ABOUT–Taos Pueblo, 2025*).



Graph 1: Stratigraphic drawing of adobe structure (author's creation)

The Taos Pueblo is comprised of the mentioned homes, as well as seven kivas; Kivas are religious circular underground rooms, particular to the Pueblo nations, used for ceremonies and rituals. In pueblos such as Taos Pueblo, each clan (original family) has a specific kiva. They are extremely sacred and closed off to any outsider (*ABOUT–Taos Pueblo, 2025*). Additionally, the Catholic San Geronimo Church (originally built in the 17th century) is also a central part of the Pueblo life, as most tribal members are Catholic, while still practicing the Pueblo religion (*ABOUT–Taos Pueblo, 2025*). Finally, the center is surrounded by two historic walls. (Trujillo, 2019, p.8)

The pueblo does not have electricity or running water, to respect its tradition and material authenticity, but most members live full-time in modern homes and use their pueblo homes for cultural and ceremonial gatherings and celebrations. (*ABOUT–Taos Pueblo, 2025*).
The adobe homes of Taos Pueblo are an ideal example of Pueblo Vernacular architecture. This style has been present from before 1598 to the present. (State of New Mexico Department of Cultural Affairs Historic Preservation Division, 2013, p. 3) .

The following list encompasses features that define the Pueblo Vernacular Style (State of New Mexico Department of Cultural Affairs Historic Preservation Division, 2013, pp 3-4) and can be identified in the Taos Pueblo Adobe architecture:
- Massive room blocks organized around a common public plaza space
- Single room family units
- First floor, storage with no doors until after 1880
- Second floor / first floor roof terrace food processing and extended family space
- Upper floor and terraces
- Flat earth roofs supported by wood logs, covered with slip wood latillas or reed matting with compacted earth
- Vigas protruding through the wall plane
- Limited fenestration
- Small window opening (originally with mica glazing)
- Low door openings
- Stepped back second story terraces
- Wood ladders made from logs

The following list encompasses all construction materials found in the Pueblo Vernacular Style (State of New Mexico Department of Cultural Affairs Historic Preservation Division, 2013, p4) and that can be identified in the Taos Pueblo Adobe architecture:
- Adobe
- Logs
- Mud plaster
- Mica glazing
- Twig and thatching
- Slit wood decking

The following mapping shows the characteristics directly indicated on the structures:

Graph 2: Mapping of Taos Pueblo Adobes (author's creation)
Red: Single room family units
Yellow: Limited fenestration and small window openings
Orange: Vigas protruding through the wall plane
Brown: Flat earth roofs

4.2. Spanish Influences

The first documented contact between Spanish colonizers and the Taos Pueblo area and its inhabitants was in 1540. (Jenkins, 1966, p. 85). The relationship between the Pueblo and the Spaniards was tense as the colonizers attempted to impose Christianity on the native communities.

The town of Taos was founded in 1615 after Pueblo leaders asked the Spaniards to leave Pueblo to avoid intermarriage and the extinction of their culture. (Lujan, 1993, p.108)
Vernacular architecture in the town of Taos is varied, but the traditional adobe homes and businesses best fit the New Mexico Vernacular Style, which was prevalent between 1870 and 1940 and takes direct influence from both the Pueblo Vernacular Style and Spanish influences. (State of New Mexico Department of Cultural Affairs Historic Preservation Division, 2013, p. 9)

Spaniards introduced the use of molds to make adobe bricks, which were previously hand-made 5cm thick slabs. (Mutal, S.,2003, p.14) Additionally, they introduced metal tools for wood carving to create wood ornaments and doors and windows.(State of New Mexico Department of Cultural Affairs Historic Preservation Division,2013, p 7).

This Spanish adaptation (1620-1900) of New Mexico Pueblo and Mexican styles was applied primarily to mission churches (State of New Mexico Department of Cultural Affairs Historic Preservation Division,2013, p 7) built in conquered territories to impose Christianity. The European styles were adapted to the limitations of location and building materials; the Baroque transept dome was altered to a transept window. (State of New Mexico Department of Cultural Affairs Historic Preservation Division,2013, p 7). Building orientations were also adjusted based on European standards; facades would face south/southeast to provide good lighting for morning mass while respecting the sacred southeast orientation in Pueblo culture (State of New Mexico Department of Cultural Affairs Historic Preservation Division,2013, p 7).
Spanish town included central plazas with a church and modular houses around it. They were inspired by the original Pueblo architecture and layout, adding what they could from European styles. (State of New Mexico Department of Cultural Affairs Historic Preservation Division,2013, p 7)

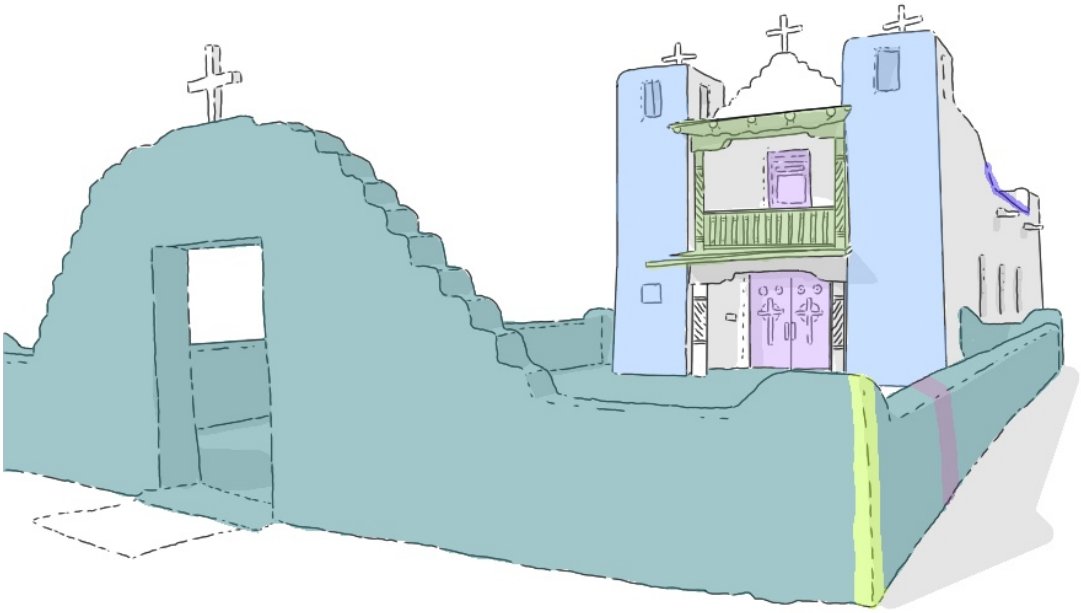
The Taos Pueblo Geronimo Church (originally built in 1619) is an example of Spanish-Mexican Vernacular Style. This style existed between 1620 and 1900 and is also known as Spanish Pueblo, Spanish Colonial, or Mexican Baroque. This style is found primarily in churches. (State of New Mexico Department of Cultural Affairs Historic Preservation Division, 2013, p. 7)
This church has been built three separate times; originally built in 1619, a second time after the 1680 Pueblo Revolt, and finally, it was completely reconstructed in 1850 after being targeted and destroyed in 1847 by the U.S Army during the American-Mexican war (*ABOUT–Taos Pueblo, 2025*). The 1850 version is the current church and the original bell tower is still standing in the Pueblo (National Park Service. Taos Pueblo: World Heritage Site.)

The following list encompasses all features that define the Spanish-Mexican Vernacular Style Buildings (State of New Mexico Department of Cultural Affairs Historic Preservation Division, 2013, p 7-8). and can be identified in the Taos Pueblo San Geronimo Church:

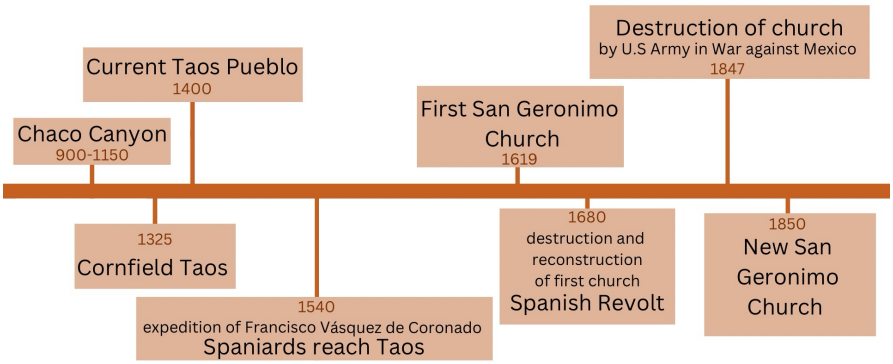
- Flat roofed single nave and cruciform churches
- Single nave often with side sacristy
- Towers connected by wood balconies
- Rounded parapets and walls
- One-story; low pitched or flat roof
- Thick adobe walls covered with mud plaster or cement stucco
- Multiple external doorways and few small window openings
- Iron hinges and fixtures
- Rarely, a zaguan entrance to a courtyard, or placita, surrounded by single story rooms

The following list encompasses all construction materials found in the Spanish-Mexican Vernacular Style Buildings (State of New Mexico Department of Cultural Affairs Historic Preservation Division, 2013, p 8) and that can be identified in the Taos Pueblo San Geronimo Church:

- Adobe
- Vertical logs and jacal
- Mud plaster
- Wood vigas, corbels and zapatas
- Milled wood
- Rough sawn wood
- One over and double hung wood windows
- Stain glass windows



Graph 3: Mapping of Taos Pueblo San Geronimo Church (author's creation)
Light Blue: Single nave often with side sacristy
Light green: Towers connected by wood balconies
Lime Green: Rounded paraphernalia and walls
Dark Purple: Thick adobe walls covered with mud plaster or cement stucco
Dark Blue: Flat roofed single nave and cruciform churches
Teal: Rarely, a zaguan entrance to a courtyard, or placita, surrounded by single story rooms
Light Purple: Multiple external doorways and few small window openings



Graph 4: Timeline of the Construction of Taos Pueblo, (author's creation)

4.3. Taos Pueblo as Cultural Heritage

Taos Pueblo was inscribed on the UNESCO World Heritage List in 1992. It's one of 13 properties in the United States listed for their cultural value.
For a site to be inscribed on the list, it must be of outstanding universal value and meet the criteria. UNESCO's criteria for selection has 10 points, each site must meet at least one of them. The criteria for inscription of Taos Pueblo to the World Heritage List is Criterion IV:
To be an outstanding example of a type of building, architectural or technological ensemble, or landscape that illustrates (a) significant stage(s) in human history.
New Mexico's architecture is based primarily on the use of adobe, and its traditional styles are inspired by Native American Pueblos, Taos Pueblo being the most important example, and Spanish influences (Spanish Pueblo Revival style) (State of New Mexico Department of Cultural Affairs Historic Preservation Division,2013).
Of the 13 cultural heritage sites in the United States on the Unesco World Heritage List, 6 are precolonial architecture; of these, Taos Pueblo and Chaco Culture are both in New Mexico.

Based on criterion (iv), Taos Pueblo is a clear example of an important stage in human history, although this criterion does not refer to its important cultural ties to its community and other living Native American communities in the Southwest, or to interaction between the pueblo and its natural landscape. Both criteration iii and v could be applied to this case as they refer to sites of similar value; criteration iii is applied both to Chaco culture and Mesa Verde National Park (UNESCO. (n.d.). United States of America).
UNESCO justifies the use of criterion (iv) concerning Taos Pueblo with the following statement:
"Taos Pueblo is a remarkable example of a traditional type of architectural ensemble from the pre-Hispanic period of the Americas that is unique to this region and that, because of the living culture of its community, has successfully retained most of its traditional forms to the present day." (UNESCO, Taos Pueblo, 2025)

4.4. The Protection of Taos Pueblo

4.4.1 Chronological Actions

The Taos Pueblo adobes have been successfully preserved by the community since their initial construction, as they were the primary housing structures for tribal members until 1970.
The United States destroyed the San Geronimo Church during the Mexican-American War (1847) because the territory of New Mexico was part of Mexico at the time. To end the war, the Treaty of Guadalupe Hidalgo was signed in 1848, and New Mexico became an American territory, and the 47th state in 1912. (Library of Congress: Territories to Statehood, the Southwest: Topics in Chronicling America)

Once New Mexico became a state, the recognition and preservation of Taos Pueblo's material heritage became more dependent on the United States, although in the United States preservation laws only apply to projects that receive federal funding. (Watkins, J.,2021, P. 107).
The following list is a succession of actions taken regarding to the preservation and protection of Taos Pueblo:

- 1960: Taos Pueblo recognized as a Historic Landmark of the United States (UNESCO, Taos Pueblo)
- 1966: Taos Pueblo recognized as a Historic District of the United States (Zamora, & Judy, 2015)
- 1966: National Historic Preservation Act (NHPA). This act decides what property is representative and entitled to federal protection. Criteria have a Western perspective and priorities (Watkins, J.,2021,p. 107)
- 1970: Return of Blue Lake (Lujan, 1993, p.104)
- 1970: HUD housing built outside the historic walls of Taos Pueblo to give tribal members comfortable housing with plumbing and electricity while remaining on tribal land and not altering the original infrastructure and authenticity. (Zamora, & Judy, 2015)
- 1980s: Concerns relating to the expansion of the Taos Regional Airport, which would threaten the Taos Pueblo lands (UNESCO, Taos Pueblo)
- 1981: First preservation plan is established (Zamora, & Judy, 2015)
- 1992: Amendments to the NHPA make it possible for First Nations to assume responsibility for the preservation of their lands and heritage (Watkins, J. ,2021,p. 107).
- 1992: UNESCO Inscribes Taos Pueblo on the World Heritage List (UNESCO, Taos Pueblo)
- 2006: UNESCO adds the pueblo to the World Heritage Sites in Danger list. (Zamora, & Judy, 2015)
- 2009: Federal grant to create the Taos Pueblo Preservation Program in response to growing threats. (Zamora, & Judy, 2015)
- 2010: WMF and CyArk collaborate to scan and document the condition of the historic adobes. (WMF)
- 2011: Taos Pueblo Preservation Program receives 800,000$ federal grant. (WMF)

As of 2019, 194 tribes participate in the National Historic Preservation Program through Tribal Historic Preservation Offices (THPOs). (Watkins, J.,2021, P. 107). But what is currently their natural and cultural heritage to preserve is a small percentage of what was their original property (Watkins, J.,2021,p. 108).

4.4.2. Taos Pueblo Preservation Program

The Taos Pueblo Preservation Program was established in 2009 with a federal grant from the American Reinvestment and Recovery Act. (Zamora, & Judy, 2015, p. 41). The tribal members claim to have initiated the project in 2007, when they began efforts to receive funding for the renovation of the adobe buildings. (Trujillo, 2019, p.8: George). The goal of the program was to train the younger generation in traditional preservation methods to be applied to the historic adobes, both to ensure their preservation and to give participants new skills to apply in the workforce. (Zamora, & Judy, 2015, P. 41)
The program consisted of a director, two supervisors, a training coordinator, and eight trainees. More than 80 people applied for the trainee positions (Zamora, & Judy, 2015, p. 41); this information indicates that in 2009, community members wanted to be involved in conservation projects and gain skills related to traditional material conservation methods. The information and knowledge passed on to the trainees was provided by the director and supervisors based on oral and practical experience, not by studying documented interventions, as there were none. (Zamora, & Judy, 2015, P. 41)

The phases were planned in the following order: (Zamora, & Judy, 2015, pp. 41-44)
1. (2009) Classroom instruction: site safety, reading and preparing construction documents, construction basics (carpentry, electrical wiring, plumbing, operation of heavy equipment). Theory followed by a hands-on construction workshop at the Red Willow Education Center Complex. A decommissioned cement mixer was adapted to mix mud and straw to make adobe bricks for the workshop. (Zamora, & Judy, 2015, P.41)

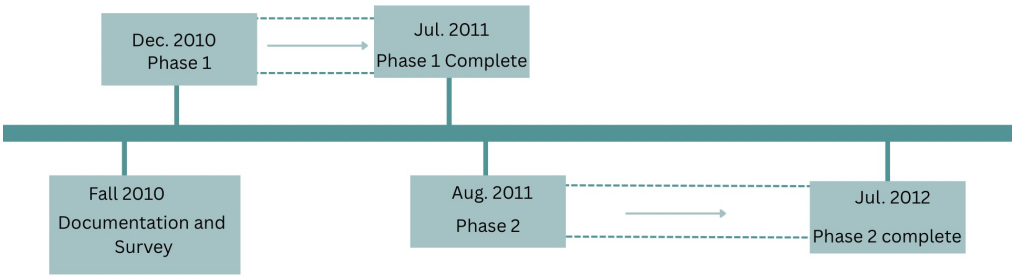
2. (2009) Historical training: knowledge of how to identify and collect natural materials from tribal lands for use in traditional construction (Zamora, & Judy, 2015, p.41), education on historic adobe architecture, preservation issues, and how to organize information for site surveys. (Zamora, & Judy, 2015, P.41)

3. Documentation and Survey Phase (completed November 2010): Creation of survey documents "Assessment Overview Form" and "Home Assessment Form" and digital scanning (CyArk) to document the historic center. (Zamora, & Judy, 2015, P. 41)

4. Subhouse 2 selected for intervention project: Model Restoration Project "to demonstrate traditional construction methods combined with modernized labor skills" (Zamora, & Judy, 2015, p. 42) Creation of a two-phase restoration plan.

5. Phase 1 Restoration: Critical Areas and Structural Work. Between December 2010 and July 2011. Fire Damage and Adjacent Areas (Zamora, & Judy, 2015, p. 42). (To view the steps of phase one see Annex 4)

6. Restoration Phase 2: Exterior and interior finishes, roofing, and site work (Zamora, & Judy, 2015, p.42). Between August 2011 and July 2012 (Zamora, & Judy, 2015, p. 44). Southeast units were prioritized (visitor entry point). In the second phase, inappropriate materials (concrete plaster, exposed granular cap sheet roofing) from previous interventions were removed. (Zamora, & Judy, 2015, P. 44)



Graph 5: Timeline of Taos Pueblo Preservation Program, (author's creation)

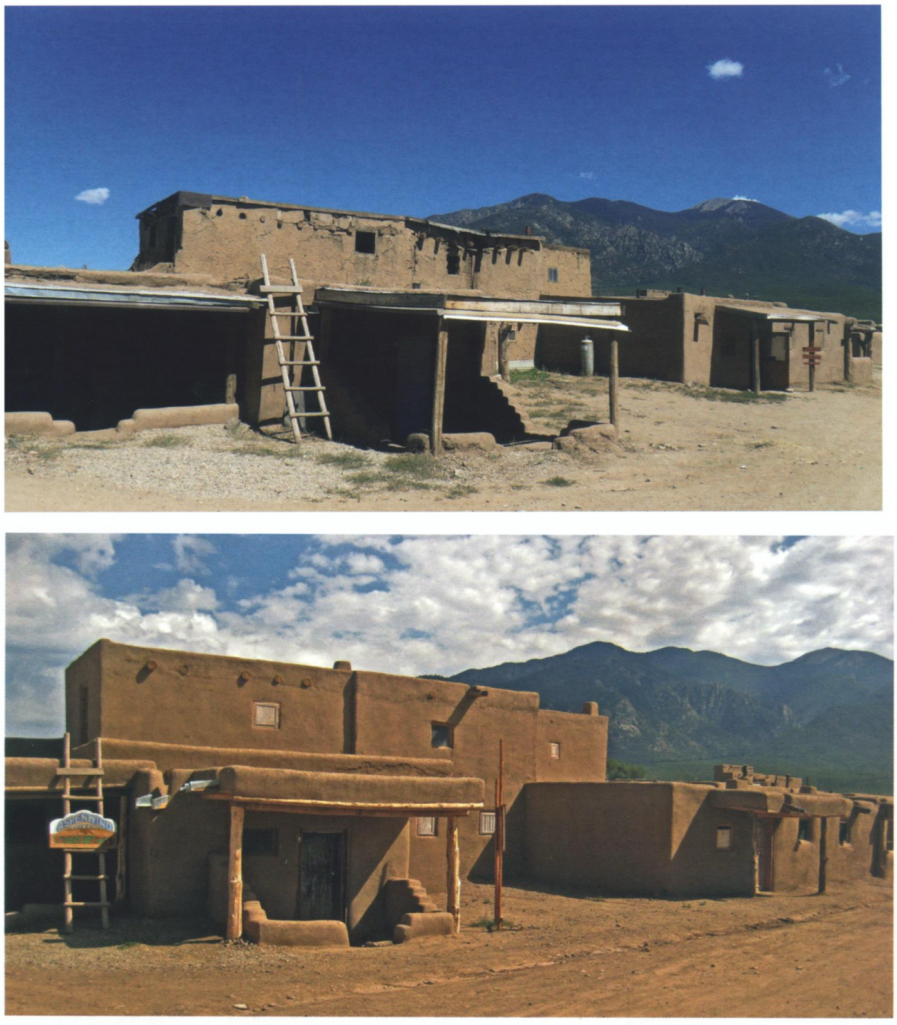


Figure 3: Before and After intervention images of Sub House 2, Image: Zamora, & Judy, 2015,

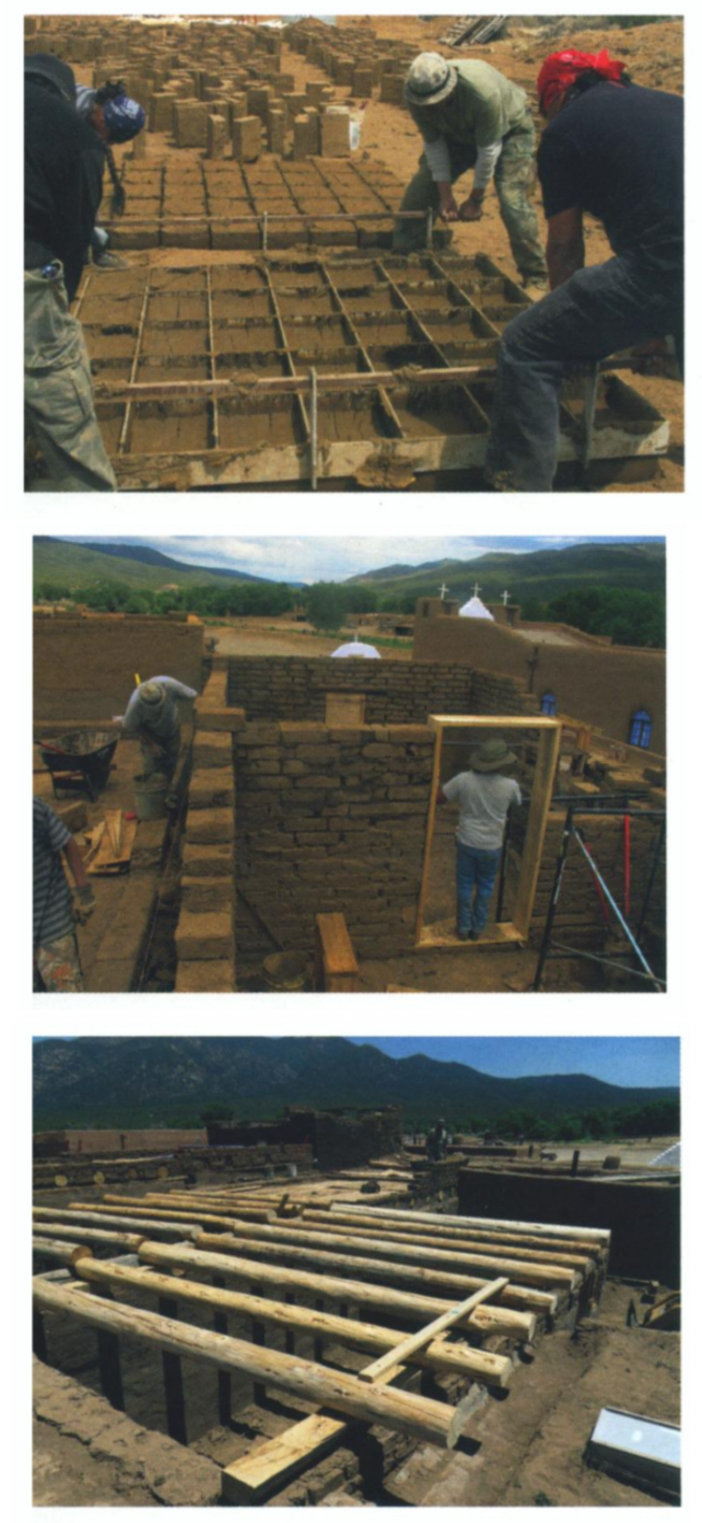


Figure 4: Process images of Taos Pueblo Preservation Program, Images: Zamora, & Judy, 2015,

4.4.3. Other Documented Interventions and Traditional Methods

The Taos Pueblo Preservation Program's 2010-1012 intervention is an example of a restoration intervention that uses intensive and invasive methods to address active or destructive degradation. Not all preservation projects will be invasive or have the goal of solving an active conservation issue; non-invasive, preventative projects are grouped as preventive preservation or maintenance. This method is recommended and ideal for avoiding long-term (Jigyasu, R. 2021, p.171), more destructive and costly degradation, but these projects may be unattractive to stakeholders because they require more documentation and long-term monitoring, rather than a one-time project with a fixed budget. When considering community-led interventions, this non-invasive, routine method seems natural because it integrates conservation efforts into the daily lives and traditions of community members.

The Taos Pueblo community has traditionally maintained its adobe vernacular structures through an annual remudding of the exterior walls in the fall, before the San Geronimo harvest festival (Mountain Zamora, Kay Judy, 2015, p. 40). In this intervention, the owner of each unit applies a layer of mud plaster to the exterior wall. The new coat is applied to repair initial stages of cracking and/or erosion due to weathering. In this case, the final product will mimic the original condition of the wall and the new material will replace any damaged preexisting coating. (U.S. Department of the Interior National Park Service Cultural Resources, p. 7)
The annual maintenance of the adobe surface is part of the cultural heritage and is not officially documented. The process is a tradition passed down through generations, originally performed by women and currently performed by mainly men (Trujillo, 2019, p.9: Benjamin).
Using local materials when restoring an adobe structure ensures compatibility, and issues may arise when new or alternative materials are added.
Material compatibility is a major concern in the restoration of any material heritage because the use of the wrong materials can cause further deterioration in the long run (Garrison,1990,p.55); the intervention will cause more damage than repair.

In the 2019, a member of the community stated that Taos Pueblo had a crew prepared for intervention in the case of heavy snow. Other actions of maintenance and preventative conservation, other than yearly plastering, are draining efforts and raising the grade of the homes. (Trujillo, 2019, p.8: George)

Because Taos Pueblo is a living heritage site, its traditional preservation has always been tied to the daily lives of its residents. When a repair was made to one of the adobe houses, it improved the living conditions of the owner as well as preserving a piece of cultural heritage.
When tribal members began to move out of the historic boundaries of Taos Pueblo in the 1970s (Mountain Zamora, Kay Judy, 2015, p. 40), any preservation and/or restoration would have to be a conscious act that was no longer tied to the quality of life in the community.

4.5. Active Conservation Threats

The following issues mentioned are threats to the conservation of the tangible and intangible heritage of Taos Pueblo.

Since the inscription of Taos Pueblo on the UNESCO World Heritage List in 1992, the main international concern related to the preservation of the site has been the Taos Regional Airport and its plans to expand the runways to accommodate more air traffic. This concern was noted in 4 annual reports by UNESCO between 1993 and 1996 (UNESCO, Taos Pueblo). Taos Pueblo expressed concerns about how more air traffic would increase noise pollution and affect the aesthetic characteristics and authenticity of the World Heritage Site (Memorandum of Agreement, 2012, p. 5). In 2012, a Memorandum of Agreement was signed by the Federal Aviation Administration, the Advisory Council on Historic Preservation, the New Mexico Department of Cultural Affairs, Taos Pueblo, the Town of Taos, the National Park Service, and the New Mexico Department of Transportation to ensure the safety and protection of Taos Pueblo and its lands while allowing the airport to expand (Memorandum of Agreement, 2012, p. 1). Regarding the Taos Pueblo World Heritage Site, a voluntary minimum flight altitude of 5,000 feet above ground level was presented to avoid noise pollution and interference with the area, and a minimum flight altitude of 3,000 ft AGL was established over the Blue Lake Wilderness Area (Memorandum of Agreement, 2012, p. 8).

The planes landing at the Taos airport tend to be small, non-commercial aircrafts, but the threats they pose to the preservation of Taos Pueblo are:
- Crash landings
- Pollution
- Vibrations

With the aforementioned limits, the threat level is minimal, but it is important to understand the vulnerability of adobe buildings to vibration. Viga roofs, such as the roofs of the historic houses at Taos Pueblo, can amplify airplane-induced vibrations by a factor of 12 (King, 1991; 1996, p. 1). Vibrations can cause cracks and micro-fissures in adobe walls, which can lead to a higher risk of water damage (King, 1996, p. 2-10).
In the 2019 interviews conducted by Trujillo in Taos Pueblo, members of the community showed concern regarding the planes and vibrations, believing they would lead to the eventual collapse of the adobe structures. (Trujillo, 2019, p.7: Diego)

The airport and air traffic also pose an intrusion into the land and lives of the tribal people, as any aircraft accidents or other problems related to the airport on their land would mean more outside personnel, such as U.S. law enforcement and government agencies, coming onto tribal lands to deal with the problem. This issue was addressed in the Memorandum of Agreement to avoid unnecessary actions and reduce the number of U.S. officials on the land in hypothetical situations. (Memorandum of Agreement, 2012 p. 6-16)
Development projects, such as the expansion of the airport, and the push for urban expansion are a constant threat and legislation must be strict with the development designs, to ensure minimum issues (ICOMOS, Lausanne Charter, 1990, p3, Art.3). The community and conservation professional must be aware of development projects as a constant issue to revise.

The town of Taos has experienced an increase in tourists, rental housing, and second homes since the 2020 pandemic (Situation Analysis Report, 2023, p. 10).

Taos Pueblo may be included in these increased numbers, as tourists arriving in the town of Taos will most likely consider Taos Pueblo an ideal cultural site to visit.
Before the pandemic, Taos Pueblo received over 100,000 annual visitors (Situation Analysis Report, 2023, p. 59), although the Pueblo closed its access to tourists during the pandemic and did not reopen until 2022. Many community members preferred not to reopen because they were unhappy with the behavior of visitors (Situation Analysis Report, 2023, p. 111).

While respectful and open-minded tourists provide an important source of income for the Taos Pueblo community, the behavior of outsiders is not the only potential threat to the adobe.
Adobe as a material shows good relative humidity regulation because of its hygroscopic properties. Adobe also provides good thermal insulation. The characteristics of a specific building will vary based on the composition and proportions of the actual adobe bricks and the added materials such as wood and metal, as well as the size of the windows and doors and the thickness of the walls. (Soto, *et al*. , 2022, p. 13)
Adobe is capable of storing heat from daily exposure; the whole of an adobe room will remain at a lower temperature than the outside during the day, and the walls will emit heat during the cool night. (Parra-Saldivar & Batty, 2005, p. 1892)
The characteristics of traditional Pueblo adobe homes, such as those at Taos Pueblo, adapt to the context of their construction; small windows and entrances served both as defensive systems and to enhance the thermal regulation provided by the adobe walls.

Potential changes to the architecture of these structures, such as the incorporation of new materials, larger windows, and new doors, can affect the adobes in a variety of ways. The culture and context of the buildings will be affected if the changes are driven by pressure to modernize the pueblo or adapt to the needs of tourists, but the physical stability of the material will also be vulnerable to damage. In addition, the use of certain buildings for activities related to tourism, such as educational centers, exhibition rooms, or shops, could lead to chemical degradation related to spikes in temperature, relative and absolute humidity, and CO2 from the concentration of many visitors in a small space not created or prepared for that kind of capacity. (J. Paul Getty Trust. *Our Lord in the Attic: A Case Study, 2025*)
As the adobe adapts to these changes in the internal microclimate of visited structures, the possibility of cracking and disintegration will increase. Possible condensation can affect the wood of the vigas and doors as well.
Therefore, the increase in tourism can hypothetically cause both physical and chemical degradation in the material, as well as damage to the intangible heritage and culture associated with the adobe houses exposed to tourists.

Documented degradation caused by environmental emergencies and/or accidents include fire damage resulting from house fires (Zamora, & Judy, 2015) and erosion caused by torrential rains (Zamora, & Judy, 2015). Snow accumulation is common in the high desert climate of Taos Pueblo during the winter months and can also damage the material if not controlled.
Erosion from rain and snow is very common in adobe structures and can result in the complete collapse of a structure (National Park Service, 2023). The damage associated with these agents usually affects the superficial exterior of the building, and with proper maintenance and routine reapplication of materials, as was done at Taos Pueblo, it should not affect the structural stability of the building. Torrential rains or snowstorms threaten buildings, especially if they were previously vulnerable, because they are unpredictable and difficult to prepare for. In addition, the effects of climate change will increase climate-related degradation, with more events and greater impacts. (Jigyasu, R., 2021, P. 169)

The maintenance of the buildings in Taos Pueblo partially depends on the owners, who also determine if the process is done properly and what materials are used. No generalizations should be made regarding the preservation of the buildings, as they are treated differently and can have varying degrees of preservation, but some aspects are common to all unique structures.

A decrease in annual and routine maintenance of the pre-1970 adobe houses has been noted (Zamora, & Judy, 2015) as members of the community have moved into the housing created by HUD in 1970. A decrease in maintenance may lead to cumulative deterioration and the building may reach a point of collapse similar to the collapse of Sub House 2, which was restored between 2010 and 2012 (Zamora, & Judy, 2015).

4.6. Pros and Cons of Community-led Conservation Projects

In the process of preserving material heritage, certain steps are followed to ensure maximum respect and the use of the scientific method to identify, diagnose, and resolve any problems it may suffer. The process will vary depending on the goals, type of material, and resources available, but the following list includes the logical steps that are followed in most cases:

1. Study/contextualization of the heritage
2. Visual examination and initial documentation
3. Physicochemical examination if needed
4. Diagnosis of conservation issues and intervention proposal
5. Cleaning
6. Stabilization and consolidation
7. Volumetric reintegration
8. Chromatic reintegration
9. Final documentation
10. Preventative conservation recommendations

When the conservation of a site is led by a community (or a large group of researchers and professionals from different fields), the approach will be different and more complex than when a restoration project is led by an individual or a small team of people trained in a specific field.
Since the context of the material heritage and its community should be prioritized, trying to follow a strict system while intervening may cause specific problems not found in other cases. (ICOMOS, 2003, art. 1.2)
When possible, it will be necessary to adapt the plan to the community's resources, goals and limitations. The following is a list of key issues possibly present in a case such as Taos Pueblo, not as common in closed projects:

- Timing: time management must adapt to the needs of the community and its own daily priorities, studies may need to be faster and certain steps may be rushed or postponed due to other daily activities of the members.

- Overlap: In a case similar to Taos Pueblo, the heritage in question is the entire historical village, and the creator, owner, and restorer are all the same entity; the community as a whole. As with most large-scale projects, there will be overlapping of steps during the intervention, but if properly organized, this should not detract from the final product.

- Added material: Taos Pueblo is a living community, the heritage is contemporary in the same way it's historic. Evolution, added materials and structures and functional changes may occur and if performed by the creators, the community, should not be considered a threat to the authenticity of the heritage. As the community is also the conservator, an adapted documentation system could facilitate the knowledge on any new materials and how they must be treated. In this specific case, the use of traditional and local materials is a cultural priority of the community, this fact is also beneficial to the material preservation and international goals for sustainability.

- Cultural Priorities: An outside conservator on any project must know the material they're working with, as well as the context of the cultural property. The information used as a reference is objective and has little or no personal relationship to the professional. When a

community intervenes and leads a conservation project, priorities may differ between members, these may be objective or based on their personal connection to the heritage and/ or ideals (Gould, P. G., 2021, p. 131). In these cases, not only the objective justifications for actions should be considered, but also the cultural and personal ones, even if they contradict the criteria applied to similar heritage in other communities. To establish the correct criteria to apply, meetings and discussions within the community to decide what the members want to consider a correct course of action may be necessary and must be taken into account and respected as part of the project proposal.

- Financial resources: To fund specific projects, a community may rely on external funding, whether federal or private. To access these funds, the community will lose some freedom and will have to adapt to the objectives of the sponsor; this phenomenon also affects communities that intend to promote tourism. The involvement of visitors will mean adapting daily life and customs to become more inclusive of non-members. (Gould, P. G., 2021, p. 130) In both cases, a balance must be struck between the community and stakeholders, but the community must not feel a need to lose their beliefs or true goals to become a tourist attraction; in a case where the heritage is nationally and internationally recognized, funding should be tied to a general goal of preservation, regardless of economic return and tourism possibilities. (Higgins, V., & Douglas, D., 2021, p.6).

- Previous training: Depending on the goal of the intervention, training may be needed to prepare community members (Gould, P. G., 2021, p.131). Training will be a positive activity, not only for the specific projects but also to create a stronger community bond and give participants new skills to use in future projects and jobs. The negative aspect of prior training is the need to set aside time and funding for it, in this sense it must be included in the initial budget as an immovable step and priority.

Although community-led conservation may have unique problems, the positive must be considered and held in esteem.
When the community is considered as the primary user, owner, and in many cases creator or descendant of the creator, the methods and criteria used to preserve and maintain its heritage will be more appropriate to its needs. If a community is properly involved, it will also become the primary conservator. (Higgins, V., & Douglas, D., 2021, p. 6 ?)
Involving the community in the conservation process can increase education about tangible and intangible heritage, it can help educate youth in areas relevant to the project, and it can culturally unite a group and create new relationships. The benefits are not only for the community; if the researcher, archaeologist, conservator, or historian involved steps out of the comfort of their preconceived notions and asks the community for information about the materials, methods of creation, and context, it is probable that important concepts can be extracted to help create a safer intervention proposal for the heritage and its culture.

Viewed as a cycle, a group that receives fair benefits and respectful treatment from the tourism industry will be more proactive in preserving the cultural heritage that brings tourism, which in turn will create a better preserved and more authentic site/cultural experience that is more attractive to tourists. (Gould, P. G., 2021, p. 127) In this sense, community-led interventions should be attractive to stakeholders and sponsors, but members of the community need to receive real, tangible benefits to remain active and welcoming. (Gould, P. G., 2021, P. 132)

Another positive aspect of community-led projects is the sense of closeness and security that is created when members participate in emergency interventions. (Tandon, A., 2021, P. 183)
In cases of emergency, such as natural disasters, cultural heritage is not the first priority for emergency teams or the international humanitarian aid (Tandon, A. , 2021, p. 185). This fact will have negative impacts on the material preservation of the heritage, but communities with a close relationship to their heritage, and who have been involved in preservation projects, will be more prepared and need less external assistance. (Tandon, A., 2021, P.184)

4.7. State of Conservation

The state of conservation of the site has been documented by UNESCO and the World Monument Fund between 1993 and 2010.
According to UNESCO's State of Conservation Reports between 1993 and 1996, the main conservation concern for Taos Pueblo was the proposed expansion of the Taos Airport. (UNESCO, Taos Pueblo)
In 2006, Taos Pueblo was placed on the UNESCO List of World Heritage Sites in Danger. Before the listing, severe weather and torrential rains were reported to have severely damaged the adobes. The damaged buildings were repaired with incompatible materials. Berms on the banks of the Taos Pueblo River were also damaging.
These issues and causes were addressed and the site was delisted. (Zamora & Judy, 2015, p. 40)
In 2010, the World Monument Fund placed Taos Pueblo on the World Monument Watch.
Sub-House 2 was the building restored by the Taos Pueblo Preservation Program with support from the World Monument Fund between 2010 and 2012. It is located on the north side of Taos Pueblo. Dating from the early 19th century, this building consists of 17 family units. Its state of preservation required intervention, as the second floor of the building had been severely damaged by a fire in the 1990s. (Zamora & Judy, 2015, p. 42)
No reports on the state of conservation have been published since the intervention on Sub-House 2, and the pueblo is open to tourists.

4.8. Cultural Context

Before proposing a conservation and restoration project, a thorough study of the material and its contexts is necessary (ICOMOS, 2003, ART. 1.2, 1.7, 2.3). This process may have several levels of intensity based on what the situation requires; a superficial, visual study of the material and a brief search for previous documentation may provide the essential information for a particular intervention, but in other cases, the physicochemical study of samples and extensive contextualization may be required. When dealing with archaeological or vernacular heritage, a cultural study of the context and perspective of the community to which it belongs is as important as any of the above (ICOMOS, 2003, Art. 2.5 & 1999, principles of conservation: Art. 2). As with other studies, this cultural contextualization may be more or less thorough, but it will not only ensure the proper conservation of the material, it will also be an essential component in the justification of any procedures. Material heritage and archaeological or architectural sites are part of a landscape that holds a community and its culture, therefore the steps taken in its conservation should have a well-documented study of the culture and needs to which it must adapt, as well as its natural landscape.

When presenting the proposal for the preservation of cultural heritage deeply related to a specific community and culture, to receive federal funding it will be necessary to follow federal and state preservation criteria and laws, but to preserve the culture it will also be necessary to follow the criteria of the community. A balance must be struck to ensure maximum preservation of both tangible and intangible heritage.
In the Taos Pueblo case, the heritage site belongs to and is part of an active, living community. The conservation of the material must not interfere with the development of activities in the life of the members of the community or damage the cultural values of the community while protecting the material characteristics that define it as a piece of heritage.

The cultural context to be respected when dealing with cultural property will vary depending on its location and the traditions of the community to which it belongs. In the case of Taos Pueblo, the following points must be considered:

- A close relationship between the community and the environment and Pueblo lands (UNESCO, Taos Pueblo). This fact makes it necessary to consider the material heritage as part of the natural heritage and to treat it as such, this criteria is present in recommendations for the conservation of architectural heritage (ICOMOS, Lausanne Charter, 1990, p2, Art.2) but especially relevant in this case. In the case of emergency interventions, it may be necessary to give priority to the natural elements of the site or not to intervene in any way that would affect its natural environment. In conservation, the use of materials that pose a risk to humans or the environment is discouraged, but in cases such as this, where the material heritage is fully integrated into its environment, it should be a main priority to avoid them.

- A closed community. Taos Pueblo is a Native American community, where the residents are tribal members and their families, different to towns or cities where any person can be a member of the cultural community if they live or interact with the area. When dealing with heritage that belongs to a closed community, the priorities will be different from those for heritage that belongs to an open community where anyone can choose to be a part of the community and participate in cultural activities. In the case of Taos Pueblo and all sovereign First Nations, training community members to perform preservation tasks such as documentation and emergency response should be a priority to ensure independence and

avoid unnecessary outside influence on the physical heritage. (ICOMOS, Lausanne Charter, 1990, p2, Art 2). Related to the idea of a closed community is the information extracted by the 2019 interviews Trujillo conducted in Taos Pueblo; one member of the community states that "we are a very secretive tribe… so sometimes if I catch myself going a little too far I will stop myself and then rephrase it because we are trying to protect [our culture] as much as we can." (Trujillo, 2019, p.7: Diego). This statement shows a different perspective to conservation; where in many cases dissemination of information regarding conservation practices is ideal to educate the public and help preserve cultural heritage, in small communities vulnerable to globalization, keeping the culture within the group is prioritized.

- Traditional Materials. Related to the previous points is the fact that the adobe used in the restoration of the houses is very similar, if not identical, in composition to the original adobe used in the construction process around 1400 AD. In this case, the restoration material must be both physically and culturally compatible, since the sourcing and use of adobe is part of the intangible heritage of this community (Zamora & Judy, 2015). The incorporation of new materials must be acceptable from a conservation standpoint and culturally beneficial or at least not detrimental to the cultural integrity of the site.

- A different understanding of authenticity (Tandon, A., 2021, p. 189). The adobe structures of Taos Pueblo are a community home first and a cultural heritage site second. In situations of this nature, the criteria of authenticity usually applied to monuments and architectural heritage (ICOMOS, Lausanne Charter, 1990, p5, Art.7) must be contextualized; the creation of new structures, aesthetic alterations, and the addition of material should not imply damage to the authenticity of the site, since these actions are taken by the same community responsible for the creation and maintenance of the site.

The conservation principles will have to take into account international criteria as well as local priorities. In the case of the 2010-2012 Taos Pueblo Preservation Program project, the main goal was to salvage and reuse as much original material as possible (Zamora & Judy, 2015, p 42). This principle will adapt to an international goal of sustainability but is embraced by the community for a different reason; "The guiding philosophy was that the materials that came from tribal land should not be wasted and that they embody the energy of their ancestors' labor"(Zamora & Judy, 2015, p 42).
In this case, the community created goals based on their cultural beliefs and standards; these goals also fell into the budget for the project.

Examples of the application of this criteria are the following:
- Reshaping rotting vigas by eliminating the ends and using the healthy wood for a smaller roof.
- Crushing and remixing damaged adobe bricks
- Recycling of mud plaster from exterior walls

Although the criteria are beneficial both economically and culturally for the community, the reuse of material may not completely comply with international standards for the conservation of monuments (UNESCO, VENICE CHARTER, Art.9). This action may be perceived as a manipulation of the authenticity of the site or a use of incompatible material, as the reused material can be at a higher risk of degradation (possible added salts in the adobe, interior damage to the wood).
The field of conservation needs professionals to be highly innovative when proposing solutions for each conservation issue, this entails the use of new materials and methods. The behavior of

said materials and methods may not be completely known to the professional, hence, documentation is essential to be able to track the long-term effects of his or her actions. In this case i propose the application of the same criteria; reused material will have specific properties based on the environment is has initially existed in, its use should not be discouraged, but documentation and tracking should be principal.

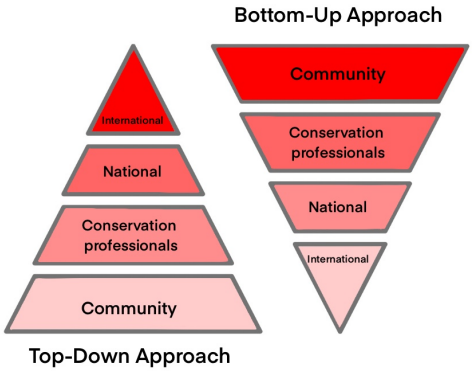
4.9. Intervention Proposal: Adapting a Project to a Community

4.9.1. Conservation Approaches

In empowering communities and training their members to preserve their material heritage, the goal should be self-sufficiency and more rights for the people and their culture, not a more attractive tourist site. (Higgins, V., & Douglas, D., 2021, P.6), Especially for indigenous groups. (ICOMOS, Lausanne Charter, 1990, p4, Art.6)
In this case, conservation is the main focus of the community; the yearly maintenance is the preservation effort closest to the members and most ingrained in the Pueblo's tradition.
Standards documentation forms have not been published, as the information relating to the conservation of the adobes has been passed on verbally for centuries, but the documentation of interventions can be used as a tool for training young generations and/or documenting emergency or abnormal actions.

When dealing with cultural heritage, various approaches can be taken. Traditionally the method applied to plan a conservation-restoration project consisted of a top-down approach, where the value of the heritage and criteria for its preservation are determined by an international or national authority, such as UNESCO (Zhang, 2022, pp. 44-46). This approach facilitates the organization of heritage and criteria but creates a need to choose and decide if heritage is universally valuable enough to be preserved by the bodies of authority responsible for funding and legislations (Zhang, 2022, p.45). In this approach, the value of the heritage must be significant to the biggest group, leaving its respective community last in line to voice their opinions and make decisions; furthermore, the community will receive the ability to make decisions only with the international and national pre-established limits and rules already in place. (Zhang, 2022, Pp. 45-46)

Currently, the issues relating to the top-down approach have pushed researchers and conservation professionals to change their perspective on the goals of conservation of cultural heritage. The bottom-up approach views cultural heritage as a living part of a culture, where the material heritage exists always within a context and is tied to intangible heritage which evolves and adapts to its environment (Zhang, 2022, p. 46). This idea calls for a continuous process of study and conservation of the heritage (Zhang, 2022, p. 46), in this approach preventative conservation and routine maintenance thrive over invasive projects of restoration to solve specific issues based on fixed criteria. A bottom-up approach means a community will make the initial decisions regarding their heritage, the criteria will be set by their context, and if national and international agencies are involved, they will be the ones to adapt to a set of rules established by the community.(Zhang, 2022, p.47) This approach questions traditional criteria and sets the community and present use of the heritage over the preservation of the material for future generations. (Zhang, 2022, Pp. 46-47)



Graph 6: Representation of reduction of freedom to make decisions relating to preservation of heritage in both approaches. (Author's creation)
Bright red: Maximum freedom; no limits are imposed
Lightest Red: Minimum freedom; limitations imposed by multiple previous bodies

Graph 6 is a representation of the dynamics present in each approach, in the case of community centered conservation projects. In a top-down approach, the community will be able to make decisions within a context limited by the decisions and criteria previously set by international and national standards, and carried out by external experts. In a bottom-up approach the community proposes the project and sets priorities and needs that any conservation professionals and national and international agents, if included, will have to take into account when deciding what criteria and methods to follow. This is a very simplified version of a complex concept with many other variants, but it creates a clear image of the direction each approach takes and how it shapes a conservation-restoration project.

A Community-Based Participatory Research approach is where research is initiated and led by the community, the steps taken are adapted to the needs and priorities of the community, and the goal is to extract information relevant to the community. This approach is used in different fields such as healthcare or social development, but can be very relevant and useful for community-led cultural heritage preservation projects. (Watkins, J., 2021, P.110). (To view Watkins' trajectory of a successful CBPR see Annex 5.)

4.9.2 Documentation Proposal

A key factor in the proper conservation of the tangible heritage is the documentation of all interventions. Documenting the intervention process is how knowledge of the history, context, conservation issues, material properties, added materials, and studies conducted on the heritage can be passed on to future generations to ensure maximum respect for the heritage and educational material.

When a community is involved in the restoration and continued creation of its heritage, as in the case of Taos Pueblo, the criteria and information regarding interventions are passed down verbally (cite) and become part of the community's traditions.

Verbal information should not be disregarded, as it is part of the intangible heritage that is tied to the material heritage in question, but documentation of any added materials, changes in conservation status, or emergency interventions is fundamental to keeping a record of materials and/or procedures that deviate from traditional methods of intervention that are rooted in the culture; documenting the priorities and criteria of the community will also help the intervention group protect their rights and justify their actions to potential stakeholders.

The following documentation plan proposal (Table 2) is based on the Taos Pueblo case study, but intended to be adaptable to similar small communities that prioritize member involvement in the preservation of their tangible heritage; it is simplified to primarily include information relevant to a general community, for a bottom-up approach.

Intervention Informative Document

Community Focused Approach

Before Intervention

Context			
Register number / address	Sub House 2 (TPPP)	**Traditional materials**	Materials initially used
Owner		**Added materials**	Only materials different to the traditional ones
Documentation by:		**Type of structure**	Residential, religious
Date oldest material	Known date of initial building	**Current function**	Touristic, commercial, residential (full or part time)
Date newest material	Of last added material	**Observations**	

Images	
Before intervention	
After Intervention	

Conservation State	Yes	No	Observations
Degradation to base			
Surface / coating degradation			
Deep cracks / leaning walls			
Interior coating degradation			
Degradation of windows, doors, chimneys			
Degradation of added materials (previous interventions)			
Images			

Intervention Proposal	
Steps (by priority)	
Utility changes, unrelated to conservation	
Materials needed	

After intervention

Intervention			
Steps performed	List steps		
Persons involved	Names, role		
Materials used per step			
Future intervention proposal	If new issues arose, if steps were left unfinished		
Images	Degradation	Intervention	Mappings

Preventative conservation	
Materials to avoid	
Preferred materials	
Next intervention date	
Vulnerable areas	
Cultural context	Information on restrictions unrelated to the material limits

Table 2: Intervention Informative Document (author's creation)
Red areas indicate examples

4.9.3 Emergency Action Plan

An Emergency Action Plan is a very important documented list of priorities and key actions needed to ensure the proper protection of the physical heritage in the event of an emergency. When creating a plan of this type, it is very important to keep in mind the priorities of the community, as the criteria will vary. What may be a priority for protection to an outside party may be considered a minor concern to community members, and vice versa.

In an emergency situation, the persons responsible for the protection of the material heritage would need a plan with a precise method of intervention, as well as a clear idea of what defines the heritage, since its removal - as a method of protection - may pull it from its context and thus deprive it of its cultural significance.
In the event of an emergency, the plan should be able to clearly define what is worth protecting, and how to do so, and what needs to remain in its original context.
To adequately present a community-led emergency intervention plan for material heritage, the priorities of the community must be placed first. These priorities will consider the economical, cultural, and material context.
Although emergency situations are the most complicated to involve the community in, as they can be dangerous for untrained professionals and material heritage, they are also situations where a community's bond and unity around its culture and heritage can be extremely beneficial (Tandon, A., 2021).

In order to best involve the community and ensure that their priorities are respected when emergency responders are involved, preventive measures are more important than recovery plans (Jigyasu, R., 2021, p.171); training community members to identify indicators of degradation or threats may prevent the disaster altogether and eliminate the need for external intervention. The knowledge of threats to materials tends to be rooted in the traditional knowledge of communities that have created their heritage, such as Taos Pueblo; in these cases, training would be conducted by members of the community and targeted at younger generations or new members.
In cases where a top-down approach is used to intervene in emergency restoration cases, the community has less or no involvement and is placed in a more vulnerable position with respect to future similar situations. (Tandon, A., 2021, P. 184)
In this sense, a community that participates and is trained in the conservation of its material heritage can create a stronger cultural tie, which will passively preserve the intangible heritage.

4.10. The Role of the Conservation Professional

Although conservation professionals have traditionally been trained in the top-down approach - where they apply international and national criteria to heritage, regardless of who it belongs to - this approach is not sustainable when intending to maintain intangible heritage, traditional customs, and a sense of community.

Community-led interventions and conservation projects should not pose a threat to conservation professionals or the technical and methodical field of material heritage conservation and restoration. Ideally, a community centered approach should be highly beneficial for the professionals involved, as it can create a greater general understanding of the field of conservation and allow the trained professional to become a figure of reference and education, not just a skilled technician. In projects that involve federal or private budget plans and external stakeholders, the expert should be a point of connection between the community and these agencies (Higgins & Douglas, 2021, p.6), as the expert holds technical knowledge essential to the creation of a specific plan and budget. In community-led interventions the expert must maintain an open and flexible approach, as his or her knowledge and technical training should not intend to overshadow the knowledge held by the community members. (Watkins, J., 2021, p.112) The knowledge extracted from traditional, closed communities, is niche and very specific to local materials, phenomena, customs, and methods and can be extremely useful to fully understand any material heritage.

In conclusion, any conservation professional interested in participating in community centered conservation and restoration projects should take on the role of an advisor and, in many cases, student, not an imposer of a rigid set of rules to follow. (ICOMOS, Lausanne Charter, 1990, p5, Art.8)

5. Conclusions

To conclude the research, the Taos Pueblo preservation methods encompass a shared goal to maintain the tangible and intangible heritage with a focus on the preservation of culture and identity. The methods used stray from the top-down approach known to conservation professionals like myself, where the goal of any project is to meet a fixed list of criteria through a series of common steps, with exceptions based on material properties. The literary review has resulted in various sources for information relating to the construction, conservation and culture of Taos Pueblo. All sources confirm and support each other, creating a reliable base of information.

Understanding the different kind of conservation approaches and their characteristics is essential for conservation professionals, as an understanding of the best approach options will contribute to the correct justification of a project plan, as well as aid in the conservation of the tangible and intangible heritage and the strengthening of any possible communities involved. Additionally, through this dissertation it has been possible to prove that documentation and intervention plans can be prepared and adapted to best fit the needs of the heritage, which previous contextualization regarding the material and its culture.

Finally, the need of strong communities is on the rise, with the evolution of climate change, natural disasters are increasing and will continue to become more damaging. Using community-led preservation projects can allow for a more secure preservation of material heritage during natural disasters and other emergencies, as well as create a sense of community and mutual support when dealing with the trauma of any big scale catastrophe. Conservation professionals can benefit greatly from the understanding and application of community-focused intervention approaches and should thrive to adapt criteria and study solutions relating to this concept.

6. Annexes

1. ANNEX 1: Proportions of earth particles in Adobe

Generally, the paste contains clay (5-25%), silt(?) (10-30%), sand (40-50%), and occasionally gravel (0-15%). (COREMANS, 2017, pp. 42-43). The particle size of the material used determines its properties and quality;
The approximate particle sizes of each component are (NYSDEC Environmental Education):
Clay: <0.002 mm
Silt: 0.002-0.05 mm
Sand: 0.05-2 mm
Gravel: >2 mm
According to the New Mexico State Code, the following percentages are required to make sun-dried bricks: (Smith, 1982, p.15)
55-75% sand
25-45% finer materials; silt and clay
The New Mexico State Code percentages show sand as the biggest particle; in the case of the Coremans indications, sand and gravel are in different categories, if counted together the percentage is between 40 and 70%, comparable to the New Mexico State Code requirement of 55 to 75% sand. The Coremans indications also separate clay from silt (together they make up 15 to 55% of the adobe mix), where the New Mexico State Code calls for 25 to 45% silt and clay.

2. ANNEX 2: Table of Charters and Criteria relevant to Case Study (based on table by Sandu, I., & Spiridon, pp 2-3)

Normative	Year	Context	Goals	Articles Relevant to Case Study
Venice Charter	1964	2nd International Congress of Architects and Technicians of Historic Monuments, Venice, Italy	To define historic monuments and create 16 articles with the criteration to apply for the conservation, restoration, historic sites, excavations and publications related to them. (ICOMOS)	- Article 4: Maintain a permanent basis for conservation - Article 5: Use monuments for socially useful purposes - Article 6: Maintain traditional environment - Article 7: Move the monument only for preservation (extreme case) - Article 8: Remove attachments only to ensure conservation - Article 9: Maximum respect for original materials and authentic documents. Added material must be distinguishable from original material. Restoration must be accompanied by historical study of the monument. - Article 10: Consolidation can be achieved through modern techniques supported by studies. - Article 11: Epochs of the building must be respected. The removal of layers must be justified. - Article 12: Replacements must be harmonious with the original, but distinguishable. - Article 13: Additions should be avoided. - Article 14: Sites of monuments shall also be protected.
Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage	2003	14th ICOMOS General Assembly, Victoria Falls, Zimbabwe	Recommendations related to conservation and restoration of architectural heritage. (ICOMOS)	1. General criteria 1.1. Multi-disciplinary approach 1.2. Cultural contextualization of heritage: no fixed criteria 1.4. Any change in use or function must consider conservation requirements 1.7. No actions without previous studies, except emergency interventions (these should still avoid irreversible changes or damage) 2.Researches and diagnosis 2.1. Prioritization of multidisciplinary team 2.3. A full understanding of structural and material characteristics before intervention 2.4. Stabilization should not compromise buildings concept form and use. 2.5. Diagnosis base on historical, qualitative and quantitative approaches. 2.6. Determine cause of damage and safety level of structure before intervention. 2.7. Use of qualitative and quantitative analysis to determine safety level (last step of diagnosis). 2.9. Create explanatory report 3.Remedial measures and controls 3.1. Address root causes 3.2. Prioritize preventative maintenance 3.4. Justify that actions are necessary. 3.5. Prioritize minimum intervention 3.6. Design of intervention based on previous study/contextualization 3.7. Priorization of minimum invasion and maximum compatibility as well as case context when choosing between traditional and innovative techniques. 3.8. Observational method: interventions from less to most invasive, depending on evolution of situation 3.9. Prioritize reversibility 3.10. Study compatibility and reversibility of materials used. 3.11. Do not destroy distinguishing qualities of structure and environment 3.12. Leave evidence of intervention and respect concepts, techniques, and historical value. 3.14. Avoid removal or alteration of historic material. 3.15. Reparation over replacement 3.16. If safe, maintain imperfections and alterations relevant to historical context 3.21. Checks and monitoring during and after intervention
Charter on Built Vernacular Heritage	1999	12th ICOMOS General Assembly, Mexico City (?), Mexico	Protect built vernacular heritage from specific threats related to the homogenization of culture and global socio-economic changes. (ICOMOS)	General issues 1. Recognition of vernacular structures 2. Importance of the involvement and supports of the community 3. Call to recognize the right of all communities to maintain their living traditions Principles of conservation - 1. Importance of multidisciplinary expertise and respect the cultural identity of the community involved - 2. Importance of respecting cultural values and traditional character of vernacular building during intervention - 4. Treatment of vernacular structures as part of the cultural landscape - 5. Incorporation of intangible heritage within the vernacular whole Guidelines in practice 1. Research and documentation: publicly documented and accessible analysis of form and structure 2. Maintain the integrity the siting, relationship to the physical and cultural landscape, and of one structure to another 3. Retain, record and pass on traditional building systems to future generations 4. Added contemporary materials must maintain a consistency of expression, appearance, texture and form 5. Respect integrity when adapting and reusing vernacular structures, while maintaining compatibility with use demand: code of ethics within the community. 6. Recognize changes and period restoration as part of the structure. 7. Prioritize education and training for communities and young generations.
Lausanne Charter	1990	9th ICOMOS General Assembly, Lausanne, Switzerland	Encourage local community involvement in cultural development (Sandu). Lay down the principles relating to different aspects of archeological heritage management; specifically participation criteria, legislations and economical priorities to apply in order to ensure humanities rights and responsibilities relating to architectural heritage are taken into account. (ICOMOS)	- Article 2: importance of policies for the protection of archeological heritage and participation of the general public. - Article 3: Protection of archeological heritage as a moral obligation of humanity, relevance of legislation and federal and international funding. Control of development projects (major threat) - Article 5: Minimum intervention criteria - Article 6: Importance of community involvement in conservation efforts, specifically of indigenous peoples and local cultural groups. - Article 7: Criteria for reconstruction - Article 8: Importance of adequate training for conservation professionals.

3. Annex 3: Pueblo Vernacular Evolution

The Pueblo architectural history is organized in the following chronological order: (National Park Service U.S. Department of Interior, & Mesa Verde National Park.)

- Basketmaker period (450-700 AD): The first permanent homes were created; pithouses. These structures were partially underground and had roofs and walls made of vegetation fibers and wood.
- Pueblo I (750-900 AD): Pithouses were still used but above ground homes began to appear (Pueblos). The structures were made with wooden beams with fiber woven through to make walls which were covered in mud to protect the exterior (jacal). The use of sandstone began.
- Pueblo II (900-1150 AD): Jacal was substituted for sandstone blocs. Pithouses were still included but evolved to become kivas, completely underground ceremonial chambers.
- Pueblo III (1150-1300 AD): The Classic Pueblo Period. Culture and architecture thrived and continued to evolve. Chaco Canyon is a clear example (*Ancestral Pueblo Architecture : New Mexico Museum of Art*., 2024)
- Pueblo IV (post 1300 AD): Pueblo people migration leads to the use of puddled adobe. Mud was laid in horizontal layers as the wall was built up. The use of stone and sod block was also included. Pueblos were multi-storied, arranged around a large plaza and continued to use traditional underground kivas. Taos Pueblo is a clear example of the pueblo IV style. (*Ancestral Pueblo Architecture : New Mexico Museum of Art,* 2024)

4. ANNEX 4: Steps of phase one of the 20120 Taos Pueblo Preservation Program Intervention (Zamora & Judy, 2015)

5.1. December 2010 (p. 43): Measure and confirm dimensions, fabricate new windows, doors and shutters.
5.2. January 2011 (p.43): Prepare structure for construction. Protection, security, public signage, staging equipment, reinforcement of the first floor.
5.3. February 2011 (p.43): Debris removal, demolition of damaged areas, preparation of vigas and latillas for installation.
5.4. March 2011 (p.43): Reinforcement of the foundation.
5.5. Spring 2011: (p.44) Making adobe bricks.
5.6. April and March 2011(p.44): Restoration of ground floor walls and floor, start of restoration of second floor walls. Preparation of vigas and latillas for second floor roofs.
5.7. June 2011 (p. 44): Completion of the restoration of the walls and roofs of the second floor.
5.8. July 2011 (p.44): Complete exterior adobe plastering (lime plaster, interior lime finishes, and adobe floors) and begin site drainage improvements.

5. ANNEX 5: Trajectory for successful CBPR (Watkins, J., 2021, p.110)

1. Early involvement of the community
2. Ongoing (transparent) communication
3. Open, public meeting to explain the proposed project, proposed timelines, and proposed issues as previously identified
4. Consultation with the community to identify community areas of concern
5. Involvement of professionals and subject matter experts in identify in areas of heritage resource concerns (either in conjunction with the community or parallel to community consultation)
6. Development of protocols regarding possible undocumented or unexpected discoveries

7. A mechanism for hearing grievances or concerns

6. ANNEX 6:

Alignment of the Dissertation with United Nations Sustainable Development Goals (SDGs).

This dissertation aligns with goal 8: Decent Work and Economic Growth. The inclusion of communities in cultural heritage conservation plans promotes the training and inclusion of community members in preservation efforts and helps prepare young generations to manage material heritage.

This dissertation aligns with goal 10: Reduced Inequalities. Community-led cultural heritage preservation projects strengthen the ties within the community and its culture, when a community is strong it will be more capable of advocating for the member's rights.

This dissertation aligns with goal 11: Sustainable Cities and Communities. Community-led cultural heritage preservation projects call for a hands-on approach where feedback from community members must be taken into account. In cases where the cultural heritage involves vernacular architecture, this approach allows for the community to work based on its cultural and living quality priorities.

This dissertation aligns with goal 12: Responsible consumption and production. Community-led conservation, such as the case studied in this dissertation, prioritize the use of local materials and traditional intervention methods. This approaches protects the culture, promotes the knowledge and use of simple, local construction materials, and promotes the reuse of materials through low-energy, low-waste actions.

This dissertation aligns with goal 13: Climate action. Conservation of cultural heritage can involve the use of chemicals and energy that can have negative impacts on the climate. As previously mentioned, a community-led approach can be an ideal situation to promote the reuse of materials and knowledge on local and environmentally respectful materials.

7. Bibliography

ABOUT – Taos Pueblo. (2025). Taospueblo.com. https://taospueblo.com/about/#top

Ancestral Pueblo Architecture : New Mexico Museum of Art. (2024). Nmartmuseum.org. https://humanities.nmartmuseum.org/curriculum/ancestral-pueblo-architecture/

Boyer, J. (2008). *NORTH PEOPLE AND SOUTH PEOPLE: ETHNOHISTORICAL AND ARCHAEOLOGICAL EVIDENCE FOR THE ORIGINS AND ORGANIZATION OF TAOS PUEBLO* (pp. 19–35).

Centre, U. W. H. (n.d.). *Taos Pueblo*. UNESCO World Heritage Centre. https://whc.unesco.org/en/list/492

Costi de Castrillo, M., Philokyprou, M., & Ioannou, I. (2017). Comparison of adobes from pre-history to-date. *Journal of Archaeological Science: Reports*, *12*, 437–448. https://doi.org/10.1016/j.jasrep.2017.02.009

Crow Canyon Archaeological Center. (n.d.). *Peoples of Mesa Verde* https://crowcanyon.org/EducationProducts/peoples_mesa_verde/basketmaker_II_overview.php

Dominguez, T. (2011). *ABCs of Making Adobe Bricks Guide G-521*. *https://pubs.nmsu.edu/_g/G521/index.html*

V. T. N. M. (2025). *Taos Pueblo Pow Wow*. https://taos.org/events/annual-event/taos-pueblo-pow-wow/

Garrison, J. W. (1990, October 19). *The Evolution of Adobe Construction Systems in the Southwest (USA) and Related Conservation Issues.* 6th International Conference on the Conservation of Earthen Architecture. *https://www.getty.edu/conservation/publications_resources/pdf_publications/adobe90.html*

Gould, P. G. (2021). Realities and requisites in community-based heritage management. In *Communities and Cultural Heritage, global issues, local values* (pp. 127–138). Routledge.

Higgins, V., & Douglas, D. (2021). Introduction. In *Communities and Cultural Heritage, global issues, local values* (pp. 1–11). Routledge.

ICOMOS. (n.d.). *INTERNATIONAL CHARTER FOR THE CONSERVATION AND RESTORATION OF MONUMENTS AND SITES (THE VENICE CHARTER 1964)*. *https://admin.icomos.org/wp-content/uploads/2025/03/Venice_Charter_EN.pdf*

ICOMOS. (1990). *CHARTER FOR THE PROTECTION AND MANAGEMENT OF THE ARCHAEOLOGICAL HERITAGE (1990) Prepared by the International Committee for the Management of Archaeological Heritage (ICAHM) an approved by the 9th General Assembly in Lausanne in 1990*. *https://admin.icomos.org/wp-content/uploads/2023/01/arch_e.pdf*

ICOMOS. (1999). *Charter on the Built Vernacular Heritage, Ratifiet by the ICOMOS 12th General Assembly, in Mexico, October 1999*.
https://admin.icomos.org/wp-content/uploads/2023/01/vernacular_e.pdf

ICOMOS. (2003). *ICOMOS CHARTER-PRINCIPLES FOR THE ANALYSIS, CONSERVATION AND STRUCTURAL RESTORATION OF ARCHITECTURAL HERITAGE (2003)*.
https://admin.icomos.org/wp-content/uploads/2023/01/structures_e.pdf

ICOMOS Annual General Assembly. (2022). *ICOMOS International Charter for Cultural Heritage Tourism (2022): Reinforcing cultural heritage protection and community resilience through responsible and sustainable tourism management Adopted by the ICOMOS Annual General Assembly (Bangkok, Thailand) in November 2022*.
https://admin.icomos.org/wp-content/uploads/2023/01/eng-franc_ICHTCharter.pdf

ICOMOS, & Greece. (2018). *ICOMOS THEOPHILOS ISC CONFERENCE* .
https://theophilos.icomos.org

International Institute of Tourism Studies, The George Washington University, & Center for Responsible Travel. (2023). *Taos Destination Stewardship Plan, Situation Analysis Report, 2023* (pp. 1–278).

Jenkins, M. E. (1966). Taos Pueblo and Its Neighbors, 1540-1847. *New Mexico Historical Review*, *41*(2), 85–114.
https://doi.org/10.2307/40120921

J. Paul Getty Trust. (n.d.). *Our Lord in the Attic: A Case Study*. Www.getty.edu. Retrieved June 1, 2025
https://www.getty.edu/conservation/publications_resources/teaching/case/olita/climate/current_vis_imp.html

Jigyasu, R. (2021). Disaster risk management of cultural heritage through community engagement. In *Communities and Cultural Heritage, global issues, local values* (pp. 168–179). Routledge.

King, K. (1996). *INVESTIGATION OF HELICOPTER INDUCED VIBRATIONS AT BALCONY HOUSE, MESA VERDE*.
https://geohazards.earth.utah.edu/images/King_1996_MEVE.pdf

Lamaire, R., & Stovel, H. (2007). *THE NARA DOCUMENT ON AUTHENTICITY Preamble*.

Library of Congress. (n.d.). *Territories to Statehood, the Southwest: Topics in Chronicling America*.
https://guides.loc.gov/chronicling-america-southwest-territories

Lujan, C. C. (1993). *UCLA American Indian Culture and Research Journal Title A Sociological View of Tourism in an American Indian Community: Maintaining Cultural Integrity at Taos Pueblo Publication Date*.
https://escholarship.org/content/qt3q5273wz/qt3q5273wz.pdf

Ministerio de Educación, Cultura y Deporte. (2017). *The COREMANS Project: Intervention Criteria for Earthen Architecture*.
https://doi.org/10.4438/030-17-184-9

Momcilovic-Petronijevic, A., Toplicic-Curcic, G., & Curcic, A. (2018). Architecture and ceramic materials, development through time: Adobe and brick. *Facta Universitatis - Series: Architecture and Civil Engineering*, *16*(3), 387–400.
https://doi.org/10.2298/fuace180521016m

Mutal, S. (2003). Adobe Architecture: Past and Present. *World Heritage Review*, 4–21.

National Park Service. (n.d.). *Taos Pueblo: World Heritage Site*.
https://www.nps.gov/articles/000/taos-pueblo-world-heritage-site.htm#:~:text=Taos is the best preserved,traditional Native American living culture.

National Park Service. (2023). *Measuring The Effects of Rainstorm Intensity on Adobe Walls in the National Parks, Tumacácori National Historical Park*.
https://www.nps.gov/tuma/

National Park Service U.S. Department of Interior, & Mesa Verde National Park. (n.d.). *Ancestral Pueblo People and Their World*.
https://www.nps.gov/meve/learn/historyculture/upload/ancestral_pueblo_people_2018_508_01-24-18-2.pdf

Oates, D. (1990). Innovations in mud-brick: decorative and structural techniques in ancient Mesopotamia. *World Archaeology*, *21*(3), 388–406.
https://knowledgebasedsociety.com/wp-content/uploads/2021/12/124837.pdf

Parra-Saldivar, M. L., & Batty, W. (2006). Thermal behaviour of adobe constructions. *Building and Environment*, *41*(12), 1892–1904.
https://doi.org/10.1016/j.buildenv.2005.07.021

Pueblo, T. (2023, June 9). *Taos Pueblo Pow Wow*. Taos.org.
https://taos.org/events/annual-event/taos-pueblo-pow-wow/

Sacko, O. (2021). The involvement of local communities in the conservation process of earthen architecture in the Sahel-Sahara region – the case of Djenné, Mali. *Built Heritage*, *5*(1).
https://doi.org/10.1186/s43238-021-00040-y

Sandu, I., & Spiridon, P. (n.d.). *Conservation of cultural heritage: from participation to collaboration* (pp. 1–11).

Sapu, S. (2009). *Conserving Heritage In East Asian Cities: Planning For Continuity and Change Community Participation in Heritage Conservation*. J. Paul Getty Trust.

Smith, E. W. (1982). *Adobe bricks in New Mexico* (pp. 1–89). New Mexico Bureau of Mines & Mineral Resources.
https://geoinfo.nmt.edu/publications/monographs/circulars/downloads/188/Circular-188.pdf

Soto, F., Bueno, J., Ramos, M., Manzano-Ramírez, M., Chavela, A., & López. (2022). Hydrothermal Evaluation of Vernacular Housing: Comparing Case Studies of Waste PET Bottles, Stone, and Adobe Houses. *Buildings*. https://doi.org/10.3390/buildings12081162

State of New Mexico Department of Cultural Affairs Historic Preservation Division. (2013). *Architectural Classification: Style and Type to be used with the Historic Cultural Property Inventory (HCPI) Form*. *https://www.nmhistoricpreservation.org/assets/files/arms/HCPIArchitecturalStyles20131115.pdf*

Tandon, A. (2021). Cultural heritage in disasters: people-centred responses for building resilience. In *Communities and Cultural Heritage, global issues, local values* (pp. 180–193). Routledge.

Memorandum of Agreement, (2011-2012). Taos Airport https://nmelc.org/wp-content/uploads/2017/12/120229_Taos_Airport_Memorandum_of_Agreement-3.pdf

TRAGER, G. L. (1943). THE KINSHIP AND STATUS TERMS OF THE TIWA LANGUAGES. *American Anthropologist*, *45*(4), 557–571. https://doi.org/10.1525/aa.1943.45.4.02a00060

Trujillo, A. (2019). Exploring Living Heritage Conservation: An Ethnography of Taos Pueblo, New Mexico. *Ursidae: The Undergraduate Research Journal at the University of Northern Colorado*, *6*(2), 11. https://digscholarship.unco.edu/cgi/viewcontent.cgi?article=1230&context=urj

U.S Department of the Interior, National Park Service, Cultural Resources, Heritage Preservation Services. (1978). *5 Preservation Briefs: Preservation of Historic Adobe Buildings*. https://www.nps.gov/orgs/1739/upload/preservation-brief-05-adobe.pdf

UNESCO. (n.d.). *United States of America*.

UNESCO. (2003). *The Convention for the Safeguarding of the Intangible Cultural Heritage*

UNESCO. (2011). *Sixth session of the Intergovernmental Committee for the Safeguarding of the Intangible Cultural Heritage*.

United Nations. (2023). *Sustainable Development Goals*. United Nations Sustainable Development; United Nations. https://www.un.org/sustainabledevelopment/sustainable-development-goals/

Van Dyke, R. (2017). *Chaco Canyon: A Contested Memory Anchor in the North American Southwest*.

Watkins, J. (2021). Heritage preservation and Indigenous communities in the United States: a case for community-based participatory research. In *Communities and Cultural Heritage, global issues, local values* (pp. 106–115). Routledge.

World Monuments Fund. (2025). *Taos Pueblo*. Taos Pueblo. https://www.wmf.org/projects/taos-pueblo

Zamora, L. M., & Judy, M. K. (2015). Taos Pueblo Preservation Program. *APT Bulletin: The Journal of Preservation Technology*, *46*(4), 38–45. https://www.jstor.org/stable/43659962

Zhang, L. (2022). Towards a Better Approach: A Critical Analysis of Heritage Preservation Practices. *Open Journal of Social Sciences*, *10*(05), 43–54. https://doi.org/10.4236/jss.2022.105005

Aquest Treball Final de Grau segueix els crtieris establerts en el Llibre d'estil de la Universitat de Barcelona.