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Analyzing the Infrastructures of Cultural Tourism in Heritage Sites with an Emphasis on Architectural Design Elements

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Abstract

Cultural tourism intends to provide an opportunity for everyone to visit heritage sites and raise the public awareness of heritage values and to satisfy tourists with respect to the heritage's authenticity and integrity. One of the most important areas affecting the environment, landscape and space of heritage sites is the tourism infrastructures. The international references discussed about principles for cultural tourism development and refereed to infrastructures with recommendations and guidelines. But the development of built-environment infrastructures requires different guidelines and solutions to design architectural elements.

Purpose: The purpose of this study is to investigate the cultural tourism infrastructures and analyze the criteria related to the built environment and the architectural elements. It aims to identify the features associated with the architectural design.

Method: This descriptive-analytical research firstly reviews the libraries resources and international references to identify the features related to development of infrastructures in world heritage sites. To this end, it focuses on the ICOMOS 1999 Cultural Tourism Charter specifically criteria related to the built environment and architectural design. It then reviews and evaluates thirty important national and world heritage sites in Iran to interpret the extracted attributes and analyze the properties associated with built experiences and long-term management.

Results: Analysis of the features extracted from principles two, three and six of the ICOMOS Cultural Tourism Charter, focuses on how to provide tourism services and the creation of new structures and added buildings such as service and information buildings, architectural elements such as signage and guarding, shells and installations such as temporary roofs, and furniture and equipment such as benches or lightning. The findings from field surveys indicate that the functional and service aspects of the infrastructures are essential and top priority. But the visual aspect of extensions and their impact on landscape integrity and in particular facilities and equipment require the presence of designers, careful implementers, and long-term monitoring-sensitive management. This feature in some of the surveyed sites require revision.

Conclusion: The development of tourism infrastructures requires principles such as reversibility, distinction from the setting, durability, and adaptability for long-term conservation of valuable cultural heritage sites.

Keywords: Cultural Tourism, Heritage Areas, Tourism Infrastructures, Artificial Environment, Architectural Elements.

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Introduction

Cultural tourism is associated with different concepts of culture and its manifestations. Cultural tourism covers all aspects of travel in a way that people learn another's way of life (Goeldner & Ritchie, 2009, 268). Thus, cultural tourism is a voyage for experience and sometimes directly participating in the disappearing lifestyle that is embedded in human memory (Ibid). The World Tourism Organization considers cultural tourism to include all activities and movements of individuals because it satisfies human needs for diversity and enhances cultural level of individuals and promotes new knowledge, experiences and meetings. (Richards, 2003, 5). ICOMOS introduces the cultural and natural heritage, and living cultures, as one of the most important cultural tourism attractions (ICOMOS, 1999). Heritage is a broad concept that covers the natural and cultural environment, including landscapes, historic sites, built environments, as well as biodiversity, collections and complexes, past and present cultural experiences, living experiences and knowledge and belong to all people. Mass tourism with a poorly managed situation can threaten the physical nature of heritage sites and damage their distinctive features and their originality and integrity (Ibid). The major foundation of the World Heritage Convention is the association of the world heritage to all people and the need to protect the heritage for the next generation (Pedersen, 2002, 3). Thus, the management of cultural tourism in relation to the heritage sites with its fragile and vulnerable nature is of great importance.

One of the most important domains for the development of cultural tourism in heritage sites is the tourism infrastructure. It facilitates tourism attendance in the heritage sites and meets the needs of tourism services; however, it affects the visual and physical appearance of the heritage environment. Many heritage sites are not used due to the lack of tourism services, and many important World Heritage Sites attract large numbers of tourists, although they do not have the proper infrastructure to handle large numbers of

visitors (Ibid) The purpose of this study is to analyze the factors influencing the development of tourism infrastructures in the field of built environment. It aims to recognize the elements of architectural design in heritage sites. This research has qualitative approach and descriptive-analytical method. Initially with the help of library studies, the tourism infrastructures were recognized after analyzing the worldwide resources and documents. Each extracted criterion was described carefully. In the analytical part, with the help of field surveys, architectural design criteria in more than 30 national and world heritage sites in Iran were analyzed and the strategies that can be modified in implementation and long-term management of extracted criteria were interpreted.

Basic backgrounds and definitions

• Review of management of cultural tourism in the world references

The background studies and important guidelines on tourism management in heritage sites refer to those published by UNESCO, the World Tourism Organization or ICOMOS. For example, the book "Sustainable tourism in protected areas, guidelines for planning and management" was written by Dr. Paul Eagles from the World Commission on Protected Landscapes with the help of various international experts. It tries to address the challenges of site visits and negotiation with activists of tourism industry for conservation of protected areas (Eagles, 2002). Also, a World Heritage Manual (No.1) by Pederson titled "Heritage Management in World Heritage Sites: A Practical Manual for World Heritage Managers", while reviewing the World Heritage Convention, focuses on types of cultural tourism and new trends. It proposes activities to analyze the tourism structure of the site and determine the desire tourism. It later discusses the negative impacts of tourism and visitor's use on sites, communities and cultures. Then it explains management plans to work in concept with interested parties and public participation. Policy goals

and management objectives, and offering multiple activities are also discussed (Pedersen, 2002). Another important reference is related to ICOMOS, in the book “Cultural Tourism, Tourism at world heritage cultural sites: the site manager’s handbook”. It establishes the philosophy of management and describes the process of planning the management of the site (ICOMOS, 1993). After this important reference, at the 12th General Assembly of ICOMOS in Mexico in 1999, this committee proposed an important charter titled “International Cultural Tourism Charter, managing tourism at places of heritage significance” (ICOMOS, 1999).

The principles of the ICOMOS Cultural Tourism Charter emphasize the dynamic and mutual relationship between cultural heritage and tourism and ideas for sustainable development. Article 3 states: “Conservation and planning of heritage sites should guarantee a satisfying, valuable and enjoyable experience for visitors.” However, Article 2 of the Charter states: “It is important to preserve the authenticity of heritage sites. Authenticity is an essential element of the cultural significance and validity of the heritage that is identified with physical materials, collective memory, and non-tangible traditions and remains of the past. Programs and plans should present and explain heritage authenticity to increase the understanding and respect for cultural heritage”. Various features can be extracted from international references for tourism management, development planning with the help of tourism industry owners, planning to attract public participation, and to distribute economic benefits between local communities, etc. Contemporary tourism activities include economic, business, administrative and planning programs as well as the development of tourism infrastructures. Among different aspects of development of cultural tourism, this research focuses on tourism infrastructures. After the review of basic definitions, this research seeks to describe the architectural and design-related features of the built environment. It then tries to identify the

components needed to develop tourism infrastructures by referring to one of the most important international documents, ICOMOS 1999 Cultural Tourism Charter.

• Tourism Infrastructures

A practical tourism operation in heritage sites with proper management is based on four basic needs of visitors:

- Accommodation
- food and drink
- transportation
- information

Accessible tourism destinations, including infrastructures, facilities, information and services, enable the public to participate and enjoy the tourism experience (Darcy, 2010). Products and services including travel-related information, places of residence, dining, and tourist attractions must serve sites to make them accessible to everyone without restrictions such as disability, gender or age. Tourism infrastructures consist of the primary tools, buildings, facilities and institutions that the tourism industry needs to operate (Panasiuk, 2007, 4–6). In the area of built environments and architecture, there are service facilities and architectural elements and furniture to support visitor’s four basic needs. Residences and hotels, restaurants and dining spaces, transportation, information centers, and museums are examples of these service facilities. Information infrastructures such as information centers, souvenir or handicraft shops and retails increase the popularity of the site (Khirfan, 2007). The development of infrastructures according to the capabilities and capacities of the destination area offers different solutions and is divided into:

- Physical infrastructures including facilities that create built environments, such as hotels, residences, restaurants, coffee shops and cafes, stations or terminals, information centers or resorts, information elements and guides, guiding or barrier elements, commuter routes, museums and exhibitions, handicraft and souvenir shops, cultural products and more
- Social infrastructures including human resources and

related activities such as travel agencies, tour guides and managers, transportation staff, etc. (Panasiuk, 2007).

Various studies have examined the tourism infrastructures. Using the SWOT model, Jahedpour and Jafari have addressed the sustainable management and development of tourism infrastructure and emphasized the role of national and regional planning (Vahedpour & Jafari, 2011). In the field of architecture and built environment, few case studies have focused on analyzing built elements. For example, with the help of quantitative analysis, Yousefi Shahir and others have identified pedestrian rings that have historical value to improve access networks in Tabriz and increase tourist satisfaction in historic areas. A review of the state of the art and field studies in the country reveals the need for comprehensive research on architectural design related infrastructures.

• **Interpretation of the Principles of the ICOMOS Cultural Tourism Charter related to architectural design elements of infrastructures**

This study has carefully studied the objectives, principles, and details of the ICOMOS 1999 Cultural Tourism Charter and has extracted the articles that directly or indirectly recommend the development of tourism infrastructures in the context of built environment, architectural functions and elements. Principles 2, 3, and 6 of the Charter, with its 16 recommended sub-paragraphs are interpreted by this research into 3 main criteria, 9 subsections and about 30 detailed characteristics as follows:

1. Providing a dynamic and sustainable relationship between heritage sites and tourism demands (principle 2)
 - 1.1. Preserving the originality of the heritage sites after developing architectural infrastructures
 - 1.1.1. Correctly locating various necessary service buildings, without overshadowing the integrity and beauty of the landscape of sites
 - 1.1.2. Using local materials and implementing durable material

- 1.1.3. Designing new buildings with respect to local architecture, traditional material, geometry and spatial organization of site's relics and architectural remains, natural elements, landscape skyline, and significant point

- 1.1.4. Choosing the right furniture with the long-term durability of the material and equipment to guide the paths and facilitate the walkability of tourists in the site while respecting the visual characteristics of the landscape

- 1.1.5. Using nature-friendly material and equipment to reduce costs, environmental damage and poor visual influence

- 1.1.6. Protection of sensitive and vulnerable elements and walls of the heritage with the help of partitions or panels, protective walls, barriers, temporary floors, etc.

- 1.2. Enhancing the accessibility of heritage sites with public or private transportation, bicycles, sidewalks, etc.

- 1.2.1. Conveniently locating terminals and stations for public transport with respect to the privacy of historic context and convenient access

- 1.2.2. Building adequate parking lots for vehicles or bicycles with up-to-date equipment in the proper places with minimum disturbance for local traffic

- 1.2.3. Promoting the use of electric vehicles for transportation in large areas

- 1.3. Long-term maintenance of infrastructure and permanent repairs and periodic survey and monitoring of the impact of tourists' use of existing facilities and equipment

2. To provide a satisfying and enjoyable experience for visitors of heritage sites (principle 3)

- 2.1. Providing reliable information to visitors and increase their knowledge from the history and culture of the site

- 2.1.1. Guiding the visitors toward the site using signage boards and information panels starting from the region to the local neighborhood

- 2.1.2. Presenting adequate information about the history and characteristics of the heritage buildings and

their importance from reliable references by furnishing the site with information panels by a coherent and consistent design

2.1.3. Using new Information and Communication Technologies to equip the site with digital information panels, display monitors, new virtual presentation tools including audio-visual interactive devices, etc.

2.1.4. Locate enough signs and signposts to guide visitors to every allowed corner

2.1.5. Design of information centers and first aid facilities

2.1.6. Establishing museums and exhibitions or virtual amphitheaters, especially near the archaeological sites that have limited remains on the earth.

2.2. Directing visitors to heritage sites, especially large areas or areas with vulnerable sections

2.2.1. Cleaning and clearing the circulation path on the site, making temporary floors over vulnerable remains, use of durable and visually proper flooring to separate paths from the ground, facilitating walking on steep grounds with steps or ramps, handrails, etc.

2.2.2. Creating ramps and slopes to provide access for the disabled people

2.2.3. Providing enough parapets and protective walls for increasing safely of visit from a height

2.2.4. Providing suitable equipment to manage queues during peak times such as national holidays

2.2.5. Restrict access to vulnerable sections of the building with the help of signage, fences, etc.

2.2.6. Equipping the remote places with CCTV to control movements with proper signage

2.3. Providing basic services to visitors

2.3.1. Design of restaurants, cafeterias, teahouses and other food services on sites including new buildings or remodeling existing buildings with adaptive reuse methods

2.3.2. Designing sufficient restrooms in areas where installations such as water supply, ventilation, and sewage disposal do not damage the heritage sites

2.3.3. Providing adequate signage to inform the

location of services

2.3.4. Equipping heritage sites with disaster response systems such as fire alarm and fire extinguisher and test of systems periodically

3. Conservation and improvement of cultural heritage features through tourism promotion programs (principle 6)

3.1. Manage large number of visitors

3.1.1. Arranging entrance gate, ticket office, waiting room and secondary entrance with proper size and scale

3.1.2. Providing resting places in the form of shaded benches, parks and children's playgrounds, next to the main gate for scattering visitors and helping rush hours waiting times.

3.1.3. Providing proper queuing equipment during rush hours to manage long queue and large number of visitors

3.1.4. Strategically locating new buildings such as museums and restaurants to distribute visitors properly around the site

3.2. Reducing the pressure of tourists on very popular heritage sites

3.2.1. Restoring, renovating and promoting less known and less attractive places adjacent to popular and crowded locations to encourage tourists to disperse in the area

3.2.2. Defining the tourism paths and promoting the use of a chain of heritage attractions including important and less important sites (by promoting chain tickets, package tours, etc.)

3.2.3. Creating new attractions such as museums, information centers, permanent and periodic exhibitions, shopping centers, theme parks, and other architectural attractions

3.3. Promoting local and indigenous cultures and traditions

3.3.1. organizing permanent and temporary bazaars to present local products and traditional goods

3.3.2. Locating handicrafts, souvenir shops and book stores with original products and reasonable

prices with proper access and design

3.3.3. Organizing events of local traditional ceremonies or festivals in amphitheater or open spaces which are designed inside or adjacent to the popular attractions

The above-mentioned items extracted from principles of ICOMOS 1999 Cultural Tourism Charter provide the designer a comprehensive list of suggestions for tourism infrastructures in heritage sites. These criteria can also reveal the deficiencies and shortcomings of tourism service facilities and equipment, and assist heritage site managers in planning and managing architectural infrastructures.

Results

Interpretation of architectural design solutions for development of infrastructures in heritage sites in Iran. The extracted articles to recognize tourism infrastructures in heritage sites using ICOMOS 1999 Charter needs interpretation and adjustment considering the limitation of infield construction capacities and management capabilities in the country. For this purpose, this study selected more than 30 heritage sites and did an academic survey activity. Students of master of restoration of historical buildings and urban areas (of University of Tehran, Faculty of Architecture) were given the extracted articles and were asked to interpret the selected sites under our supervision.

The selected heritage sites were from different regions and with different functions as follows: Parse-Pasargadae world heritage site, Bisotun world heritage site, Alamut Fortress, Safavid Government Building, Jame Mosque, and Saad al-Saltaneh Collection in Qazvin, Dolatabad Garden of Yazd and Pahlavan Pour Garden of Mehriz, Jame and Imam Mosque, Naghsh-e-Jahan Square, Monarjanaban, Wang Church and HashtBehesht Mansion in Isfahan, Niavaran Palace, Saadabad Palace and Golestan Palace in Tehran, Kandovan Village, Kaboud Mosque and Alishah Arg in Tabriz, Gonbad-e-Qabus in Gorgan, Hegmataneh

Archaeological sites, Takht-e Soleiman, and Soltanieh Dome in Zanjan, Chaleshtor fortress in Chahar Mahal & Bakhtiari, Karimkhani Citadel of Shiraz, Fin Garden and Ameri House in Kashan, Fahadan historic neighborhood of Yazd and the city of Meybod. A summary of the findings related to architectural design features obtained from the executive experience and management situation of the sites during a decade of survey (2009-2019) are presented here. The summary is provided in [table 1](#) and four heritage sites whose locations are analyzed in [Fig. 1](#).

• New buildings or existing reused buildings

–Museums

The most important museums of archeology or history of the city as a well-designed monument attract many visitors when located next to a heritage site, such as Qazvin Museum with Early Modern design next to Chehelston. Reconstruction of part of the site as a museum adds diversity of functions to the site; it is critical to attracting visitors to archaeological sites that have few significant relics on the ground, such as Persepolis Museum, which is reconstruction of harem building ([Fig. 2](#)).

• Hotels, apartments and rural residences

New hotel buildings with good access to parking and pedestrian areas with a design that respect to the local material and architecture can attract many tourists, such as the Rocky Lale Hotel in Kandovan Village. Reuse of proper historic buildings strengthens the revitalization process in the area, as in the Bisotun caravanserai Hotel ([Fig. 3](#)). Encouraging rural eco-tourism residences encourages local entrepreneurs to participate in community service activities, such as village residences of Gazorkhan Alamut fortress ([Fig. 1](#), bottom, right).

• Heritage offices, research centers, information centers, tourism service offices

Office buildings or research centers representing a governmental place can show a compatible and respectful design to the site and promote research and study about the site among researchers, such as

Table 1. Architecture Design Solutions for Tourism Infrastructure in Selected Heritage Sites. Source: author.

Name of the site	Persepolis world heritage site	Bisotun world heritage site	Pasargadae world heritage site	Alamut (survey in 2012 and 2014)
New buildings or reused buildings	Service buildings between 1 st and main entrance Museum at the Harem Office of cultural heritage behind museum Bathroom at the southeast end	Office of cultural heritage Hotel in Bisotun caravanserai Tea house in exiting 19 th century building abandoned well designed kiosks restroom near a shrine	Souvenir shops near entrance gate office of cultural heritage near the entrance	Office of cultural heritage in footstep west of fortress Vernacular residences in the village houses Store and tea house in a room at top of the fortress with wooden furniture
Furniture	Guides and introductory boards made of glass panels on which the inscriptions are printed with a stone base	Route guide and boards with historical descriptions	Signage and guide boards similar to Persepolis scattered beside every monument	Temporary structures including temporary roofs made from scaffolding
Architectural elements	Temporary flooring made from wooden panels over original stone steps and floors Glass panel on the original inscribed stone walls which can be touched	Walking paths making every point accessible on the very vast site Steel staircase reaching the Bisotun Achaemenid inscription 40 m above the floor A few numbers of garbage boxes	Glass barrier around Cyrus tomb Paved paths reaching to scattered monuments in a vast site	Temporary handrails, parapets, steps, made from scaffolding Few numbers of signage, information board and garbage boxes
Transportation and parking	Near entrance square 450 meters away from Persepolis main gate	Near Bisotun caravanserai which is changed into hotel, 720 meters away from Bisotun inscription	Outside entrance gate 280 meters away from Cyrus Tomb	Near office of cultural heritage at footstep of mountain

Bisotun world heritage sites (Fig. 4). Information offices including information boards, brochures, and tour guides raise public awareness about the historical values of the site but need to be supported by site managers due to lack of economic benefits, such as kiosks of Bisotun (Fig. 5).

• **Handicraft shops, coffee shop, tea house, restaurant, food and beverage store**

If these spaces are not created with the supervision of the site managers and provided by the contractors, they might create an eclectic space without respect to the surrounding texture. Handicrafts are a source of empowerment for local products and native

entrepreneurship, and their presence diversifies functions in heritage sites (such as handcrafted shops in front of Kashan Fin Garden).

• **Amphitheater, permanent and temporary exhibitions, indoor or outdoor**

The variety of functions, the use of remote and unused areas, the enhancement of nightlife, the strengthening of local crafts and the motivation to return to the site are the results of the creation of amphitheaters, seasonal and temporary exhibitions in heritage sites. Like Persepolis 'amphitheater, the nomads' Black Tents near Persepolis (Fig. 6) and the temporary exhibition of old cars at Niavaran Palace (Fig. 7).

• Restrooms, security and prayer room

Restrooms are essential and require a proper location, always clean, and with easy access and proper disposal of sewage. The guard rooms next to the entrance gate need to be designed to avoid the use of improper kiosks available in the market. The prayer room or mosque can add to the site's attraction and can be a special theme for design. This item needed revision

in most sites

• Green spaces, children's play area, and parks

Enhancing and using the natural attractions of the site is a key strategy, such as the landscape design of Bisotun with beautiful spring and its old plane trees (Fig. 8). The green areas combined with the resting places next to the entrance gate of the most popular sites are essential, specifically in the most crowded



Fig. 1. Analysis of location of infrastructures in four heritage sites in Iran: Persepolis (top, left), Bisotun (Top, right), Pasargadae (Bottom, left), Alamut Fortress (Bottom, right). Source: Google earth.



Fig. 2. (Left) Persepolis Museum in Nowruz. Photo: Parisa Ganjabadi's survey, Spring 2011.

Fig. 3. (Right) Bisotun Caravanserai that has changed into hotel. Photo: Elham Androodi, Fall 2019.



Fig. 4. Researcher's office. Photo: Mona Ebrahimi, 2009.



Fig. 5. The Bisotun information Kiosk. Photo: Mona Ebrahimi, 2019.



Fig. 6. Temporary Exhibition in nomad's Black Tent. Photo: Parisa Ganjabadi, 2011.



Fig. 7. Old Car Exhibition at Niavaran Palace in Nowruz 2011. Photo: Nasim Zand, 2011.

time; such as the green sidewalks and benches next to the entrance of the Ameriha House in Kashan (Fig. 9). Children need play spaces to be amused. A play ground that can be a charming rooftop of a historic bathroom with vaulted surface like the Ameriha House in Kashan. Safety measures must be taken.

Temporary shelters, canopies and roofs

Walking in vast areas such as Alamut Fortress resting places with temporary shelter or canopies, which can add attraction to the site's view. The scaffolding is not suitable for temporary roofs covering archaeological sites, such as the Alamut Fortress and the remains of the castle walls.

• Ticket and ticket booth

An entrance is where tourists first meet the site. A visitor prefers to see a well-designed atmosphere to have an orderly image rather than a sloppy one. The entrance gate materials must be durable and firm enough to withstand large number of visitors during peak times, such as Nowruz, as with the glass panels of Persepolis (Fig. 10). Intentional damage is likely if the waiting time is long (Fig. 11).

Furniture

• Informational pages, guides and signs

The diverse information boards and signage, each



Fig. 8. Landscape around the Bisotun, World Heritage Site, the old plane trees. Photo: Elham Andaroodi, 2019.

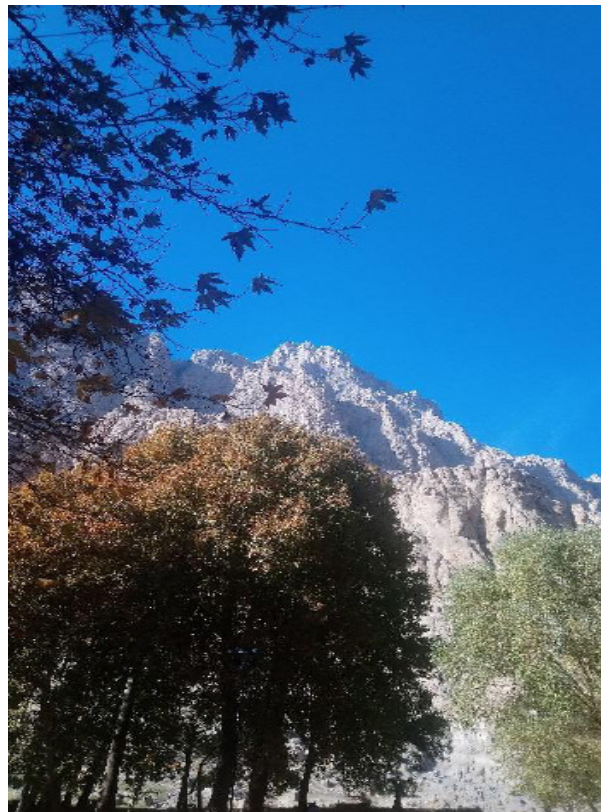


Fig. 9. Public sitting area at the entrance of Kashan Ameriha House. Photo: Elham Andarodi, 2018.

with a different form, damages the integrity of the landscape. Unified design enhances the readability of the site. Durable and visible materials are highly desirable; however, they should not block the view. Good examples are Persepolis (Fig. 12), Bistoon, Pasargadae, and Chehelston Palace (Fig. 13 & 14).

- **Queue management equipment, temporary stairs, parapet and guardrail**

Tourists need to walk safely around the site and access every location in an orderly manner. This furniture needs to be provided permanently or temporarily and need to be made of durable materials. Scaffolding is not a proper solution, as in Alamut Castle .

- **Benches, chairs, trash bins, flowerboxes**

This furniture is often provided by the operators using available products in the market. Good brands with products suitable for historic contexts need to be promoted. Furniture with foundation that does not need

digging the ground is necessary for archaeological sites, such as Pasargadae and Persepolis.

- **Barriers, panels and protective walls**

Protecting valuable surfaces that people can touch is essential with a temporary enclosure. Like the glass shields that protect original walls with painting in Chehelsotun Palace in Isfahan and Persepolis bas reliefs (Fig. 15 & 16). During peak times, access to important areas can be restricted, such as fencing around the Gate of Nations in Persepolis in Nowruz and closing the passage below it due to a very large number of visitors.

- **Indoor and outdoor lighting**

The nightlife of the heritage sites is valuable, and it is necessary to facilitate movements of tourists safely in dark areas. Lighting can be set in a way that light sources are not visible and the main forms of the building are clear and legible, such as the Kashan



Fig. 10. Persepolis entrance in Nowruz 2011.
Photo: Parisa Ganj Abadi, 2011.



Fig. 13. Chehelston Palace information panels.
Source: Marzieh Ebrahimian, 2010.



Fig. 11. Glass Information panel in Persepolis without visual barrier.
Photo: Parisa Ganj Abadi, 2011.



Fig. 14. Scaffolding in Alamut castle.
Photo: Betol Sahrakaran, 2009.



Fig. 12. Chehelston Palace information panels.
Source: Marzieh Ebrahimian, 2010.



Fig. 15. Protective glass panels of Chehelston Palace wall paintings.
Photo: Marzieh Ebrahimian, 2010.

Ameriha house and the iwan and courtyard lighting (Fig. 17). Light sources and wiring should be kept away from visitor's paths and be installed in separate installation's shafts, and the use of original physical elements of the heritage sites is not recommended for new installations such as Persepolis canals.

Architectural elements

• Temporary floors

Temporary floors provide walking path over sensitive surfaces or floors of the heritage sites, such as the temporary floor on the roof of Ameriha inner courtyard. Protective installed parapets ensure child safety (Fig. 18). The use of durable materials is essential because of the high erosion of the floors, such as stairs and temporary wooden panels over the steps and floors of Persepolis (Fig. 19). These elements require permanent maintenance and replacement of

deteriorated or broken parts.

• Doors, windows and store advertising boards

In heritage sites that are connected to urban spaces, it is necessary to renovate store facades, clean the facades from wires, canals and additions of installations, and unify signages and advertisement pannels. A good case is clearing and refurbishing the facades of the Tehran Enqelab axis.

• Installations including water pipes, electricity, telephone, gas and heating, and cooling facilities

Installations such as air conditioners and coolers canals, split units, plumbing and wiring and additions require design and long-term maintenance. It depends on the desire and decision of the site manager to provide a good design with proper built, long term maintenance and periodical revision.

• Transportation space and parking

Parking is one of the major problems of heritage sites,



Fig. 16. Protective glass panels of Persepolis bas relief. Photo: Parisa Ganj Abadi, 2011.

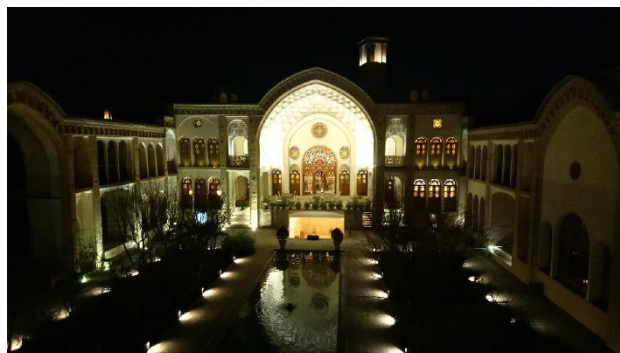


Fig. 17. Night lighting in the outer courtyard of the Ameriha House which illuminates the Iwan, Baadgir and courtyard. Photo: Andarodi, 2019.



Fig. 18. Temporary floor on the roof of Ameriha inner courtyard. Protective installed parapets ensure child safety. Photo: Elham Andarodi, 2019.

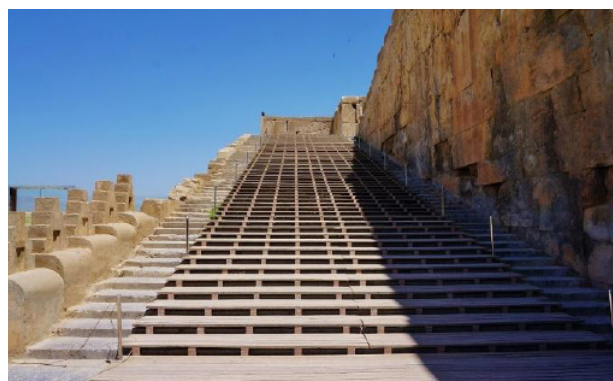


Fig. 19. Temporary floor of Persepolis's stairway prevents the erosion of original stairs. Source: <http://www.travelswithdiesel.com/paes/Per2017->

especially in urban and rural contexts. Providing adequate parking and encouraging tourists to walk in the neighborhoods can reduce the visual damage of the parking lot, for example, the parking lot next to the entrance of the historic houses of Kashan (Ameriha House); (Fig. 20).

Discussion and Conclusion

Tourism infrastructure plays a key role in the development of cultural tourism in heritage sites. Infrastructure balances the needs of tourists (such as security, services, information, accessibility and satisfaction), and the needs of heritage sites (such as preserving values, integrity and authenticity of the site and long-term safeguarding of the buildings). Architectural elements and additions have an important visual influence on the heritage site. Designing and managing built infrastructures and architectural service structures require national and global guidelines to minimize damage to the heritage site and provide the most tourist satisfaction. Some important principles to maintain the integrity and authenticity of the heritage site are as follows:

- Adaptability: compatibility of materials, form and technology of structures, and additions with the historic site
- Durability: durable material with resistance against long-term use and environmental erosion
- Reversibility: the possibility of removing interventions, without damaging the historic site
- Distinctiveness: the ability to distinguish new structures, extensions, and interventions from the original body

This research extracted tourism infrastructures after reviewing global resources and documents with the help of ICOMOS Cultural Tourism Charter. Then, during an academic, The research surveyed more than 30 heritage sites with the help of graduate students of restoration and interpreted criteria related to architectural design, executive experiences and management situation in Iran.



Fig. 20. Parking lot on the street adjacent to the Ameriha House.
Photo: Mona Ebrahimi, 2009.

The findings show that the need for functional services such as restaurants, restrooms and information centers or furniture is well understood by site managers and users, and in most surveyed areas, the supporting infrastructure is available. In particular, information related to the history of the buildings plays an important role in raising public awareness and is often provided to visitors through visual guides or audiovisuals or new digital tools. But the proper design of additions and interventions, particularly service facilities, installations and equipment such as heating and cooling facilities, sanitation and installation facilities including plumbing and cabling, requires careful planning, investment, and built directly or indirectly under the desire of site managers and local authorities. Despite the remarkable and valuable sensitivities used to develop services and installations in surveyed cases, especially in World Heritage Sites, these criteria need to be revised in many cases.

During a decade of survey and observation done by this research, from 2009 to 2019, furniture and architectural elements have significantly improved in quality of materials and types, and designers have taken advantage of the more appropriate variables available in the market in flooring and lighting solutions. The new tendency toward renovation and adaptive reuse of existing buildings has given

a new life to heritage sites and increased the site's attractions. The sensitivity of site management and maintenance to design elements and details has also increased dramatically. Finally, the findings of the study indicate that heritage site management plays a key role in balancing economic needs, architectural design, tourism infrastructure requirements, long-term maintenance and safeguarding of the building.

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