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Recognizing "Plan Scape Organization" and "Construction Techniques" in the Body of Historical Buildings of Hozdar City in Sistan based on the Historical Sources and Archeological Studies

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ABSTRACT

Hozdar City located in the northern area of Sistan has many historical buildings, most of which have been damaged unfortunately due to being located on the river path. Protective measures have been taken only in a few remained buildings to prevent more destruction; therefore, preservation and revival of these monuments requires studying, investigating, and knowing them completely, which is a necessary issue. This study aims to recognize and examine the physical features of architecture in historical buildings of Hozdar City to document the works and revive the historical buildings located in this area. For this purpose, this study was done by using the descriptive-analytical method and historical-interpretive technique in another part of the research. The research literature section is done by reviewing authenticated documents and images and a field study or survey is done through direct observation of buildings, as well as interviews. The results indicated the following variables as the most outstanding patterns used in "plan space organization": observing geometric order, open, closed, and semi-open spatial arrangement, symmetry, deployment of the porch, presence of access hierarchy, and creation of visual continuity. Under the "construction technique in the body of buildings," clay and mud used in construction, combined doomed roofs with the pure volume of the building, high height on each floor of buildings, and frequent use of squinch can be mentioned. In terms of the distinction between buildings in Hozdar City and other Safavid cities, it is found the "plan space organization" is similar to Safavid architectural style in other cities, but "construction techniques" have been influenced by the Sassanid patterns in this area and other vernacular designs in surrounding villages.

Keywords: Sistan, Hozdar City, Machi Castle, Rostam Castle, Asbad.

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1. INTRODUCTION

Iran's area and climate zoning in its various districts provided the field for the advent of architectures with different features during historical periods in many areas, which is worth further studies. Unfortunately, these historical vernacular architecture patterns are devastating and disappearing in many areas of Iran due to erosion caused by natural and human factors. No attempt has been made to preserve and revive these monuments due to lack of any study and knowledge about these vernacular architectural patterns; therefore, study on this field and recognition of its patterns would considerably contribute to the perseveration and restoration of vernacular and historical architecture of these areas.

Safavid rule is one of the historical periods from which, many valuable architectural monuments have remained in various areas of Iran. "Architecture of the Safavid era had many ups and downs based on the attention and interest level of kings to the art and architecture, as well as the king's merit in governance. For instance, Shah Ismail I was interested in art and culture, and architects constructed new buildings by his order" (Pop 2009, 149). The architecture of this period presents a wide range of diversity in terms of scope and efficiency and is dynamically present in all dimensions of cultural, social, and economic life dimensions. Glorious mosques, large squares, numerous bridges and streets, huge bazaars, and many schools and caravanserais were built during that era (Javadi 2006, 6). The most significant monuments built during Shah Ismail I empire still exist in Isfahan (Honarfar 1992, 60). Hence, when it comes to the architecture of Safavid era, Isfahan and its historical monuments come in mind, while other cities especially those areas far away from their governance center are less considered. This point is also seen in the investigations and studies conducted by researchers who have paid more attention to some cities, such as Isfahan, Shiraz, Tabriz, Tehran, and Dezful because these cities have been at the center of attention during the Safavid era (Pakzad 2021, 380-420). Sistan Plain is one of the areas where many precious architecture and buildings from various historical periods exist, but many of them have been destroyed unfortunately due to a lack of attention and restoration. Hozdar City is one of the important areas in the Sistan Plain that experienced considerable glory during the Safavid era, and many monuments were built in this city at that time. Unfortunately, the displacement of the riverbed exposed this city to water washing that gradually led to the destruction of a considerable part of its historical architecture. However, a glance at its few historical monuments indicates that these buildings provide vernacular architectural values of this area, so worth further studies and investigations to preserve and restore these monuments. Therefore, the purpose of this study is to identify and examine the physical features of architecture in the historical monuments located in the Hozdar District, protect the cultural-historical values of this city, and reuse them in the contemporary architecture of this area.

1.1. Questions

• How are "plan space organization" and "construction techniques in the body" of historical buildings of Hozdar city?
• What are the differences between "plan space organization" and "physical construction techniques" in different uses of this city?
• What are the different features of "plan space organization" and "physical construction techniques" in the historical monuments located in the Hozdar area?

2. BACKGROUND

A review of studies on this subject indicates that few papers and reports are available despite the historical-cultural value of the Hozdar area. To investigate the research gap in the previous studies and find the necessity for doing this study, the available relevant studies are divided into three scopes. The first category of documentary studies includes travelogues and historical books related to the Sistan area: "A Glimpse Into the History and Archaeology of Sistan" by Malekzadeh (2011) and "Ehya Al-Moluk" (restoration of Buildings) by Shah Hossein (1965). Some of these references have examined or introduced the Sistan area in a general form, while some of them only mentioned Hozdar (or Howzdaar) city. Another category includes those studies that do not have architectural content and are done by archeologists. These studies include reports about the registry of the historical monument in Hozdar City, archeological assessments, and chronicles of this area. The first academic archeological step for Hozdar was titled "Systematic Archaeological Survey of Sistan" by Mosavi-Haji and Mehr Afarin (2008) to document and record the monuments and buildings of this city as a collection of archeological monuments of Sistan. There are other archeological studies conducted in this field: "Preliminary report for registry: Rostam Castel of Sistan" by Alaei Moghadam (2014), "Investigation and Speculation to Determine the Area and Propose the Boundaries of the Hoz Dar area of Hamon" report by Keykha (2019), and Ph.D. thesis by Saadatian titled "Chronology and Spatial Analysis of Islamic Era Settlements in the Hozdar District of Sistan with Emphasis on Rostam Castle." This category includes those studies that are published as academic research papers in journals; Karimian and Saadatian (2019) conducted a study titled "Analysis of Spatial and Architectural Structure of Ghale Rostam Based on Archaeological Excavations" to examine the physical connection between components of the castle and found some results about the history of buildings and their establishment time. In

another study titled "Investigating the Architectural Adaptation of the Kharkhaneh Chamber of Machi Castle (Safavid Period) with 120-Day Winds in the Ancient City of Howzdar Sistans," Behboodi and Oveisi (2019) studied the architectural adaptation of this space with average velocity of 120-day winds of Sistan, and confirmed the direction of air current and desirable air condition of Kharkhaneh Chamber in the building. In the study titled "Investigating the Mausoleums in the Safavid City of Howzdaar in Sistan" by Alaei Moghadam, these mausoleums are introduced, investigated, and classified based on the diverse structure of this kind of architecture. According to these reviews, the available studies are conducted on single buildings constructed in Hozdar City (Rostam Castle and Machi Castle), and the larger assessments are done on the typology of a kind of buildings (mausoleums). Overall, the mentioned three categories of studies indicate the research gap in examining the physical architectural features of historical buildings located in this city. Since this archeologic area has some architectural features that must be identified, the authors of this study investigated and identified some physical features of historical buildings in this area.

3. METHOD

Regarding the topic nature, a part of a study that identified buildings and their historical background is done based on the historical-interpretative method, and that part of a study that includes field studies and analysis of information is done through the descriptive-analytical method. The data collection method in this study is done through documentary and historical methods and field assessments are done through surveys, presence in the place, observation, and interviews. In the documentary assessment phase, information related to natural geography, historical geography, archeological studies, and a review of the study background are used to identify and review the history of buildings located in Hozdar City. In the phase of field assessment, observations are recorded using a camera and the required data are inserted in the predesigned observational cards, and the interviews are done based on an open-ended method with architect experts and researchers, and archeologists who have carried out some studies in this area.

4. HOZDAR CITY IN HISTORICAL REFERENCES

Sistan and Baluchistan Province consists of two completely distinctive areas of Sistan and Baluchistan, which are different historically, location, socially, and culturally (Molanaei and Soleimani 2016, 60; Afshar Sistani 2004, 6). Sistan was originally a land with hills of flowing sands and sea sediments, which one part of it was located in the river path. The land area was increased and a large settlement area appeared after the river water was decreased (Malekzadeh 2001, 7). "Hozdar" area is located northeast of Hamun Lake and southwest of Shahr-e Sukhteh (Afshar Sistani 1990, 642). In his travelogue, Smith explains that one of the main wreckages in Sistan is located in Hozdar after Kondar, and is in its 4-mile distance. "Kondar and Hozdar ruins have many houses and walls made of clay," he expresses. In the case of the background of Hozdar, smith explains that Kondar's history goes back 90 years ago (90 years before the date of the travelogue date), and Hozdar is older than Kondar (Smith 2008, 137). He introduces Hozdar a place where Faramarz, son of Rostam, fought with his enemy Bahram, the son of Esfandyar. There is another collection of very old ruins called Shahr-e Sukhteh (another name for Hozdar City) about 10 miles from the eastern part of Hozdar, which was called the popular city of Rostam that is fired with oil spread over four corners of the city and destroyed (Smith 2008, 137). "Hozdar was populated in the past," Colonel Charles Edward Yate writes in Khurasan and Sistan Travelogue. There were some ruins called "Machi" within one-mile distance from its southeast part, and remnants of a city with doomed-roof buildings still exist (Yate 1986, 88). According to the available historical references, there is another castle in this area called Rostam assuming that it was built in 3rd and 4th centuries, reached glory and prosperity during Safavid era, and ruined in Qajar period (Karimian and Saadatian 2019, 96). This area experienced growth and development during 11th and 12th centuries, but became deserted after the Hirmand river path was changed, and now some remnants and ruins is seen in this location (Ebrahimzadeh 2010, 226).

5. HOZDAR CITY'S POSITION IN ARCHEOLOGICAL STUDIES

Despite many travelers and tourists having traveled to Sistan and Hozdar area, they have mentioned a few contents about this area in their books. There is no comprehensive archeological study on this area. However, the information and results of available studies are used in different parts of the paper. According to archeological studies and surveys, 200 structures have been recorded in the Hozdar area which covers about 36 km^2 (Keykha 2019, 85). According to the objects found in archeologic Hozdar City and studies conducted on them, it can be stated that this city is dated around 6th and 7th centuries (Arbab Bikas et al. 2009, 31). The mentioned studies showed that the buildings constructed in this area can be reviewed within four general categories. It should be noted that many details and event general design of many buildings were not considered and examined in this paper due to the excessive demolition of these monuments and their unknown structural shapes.

• **Castles:** there are two castles called Rostam and Machi, and each of them has many spaces. "As the largest establishment place of the Islamic era in Hamun County, Rostam Castle is located in historical Hozdar City and a flat and smooth plain[1]." According to the pottery samples found in the city, its history goes back to the late Islamic Era (Safavid to Qajar) (Mehrafarin and Seyed Sajadi 2005, 227). In the archeological studies on Sistan Plain, the history of its creation goes back to the 6th and 12th centuries (Mousavi-Haji and Mehr Afarin 2007, 12/748-798). "Rostam Castle[2] is a building made of adobe with an irregular heptagonal plan with 135m length along the north-south axis and 160m length along the east-west axis, which is confined with a defensive wall with 600m in length and 14 circular ramparts. The area of castle equals 22000m^2 and has various parts, such as fence, moat, entrance gate, royal room (Shah Neshin), icehouse, stables, and residential buildings" (Karimian and Saadatian 2019, 97). "There are entrance gates in the north and south of castle surrounded with a moat with 50-feet in width, and a large thatched building that was ruler seat was located in left side of northern gate" (Tate 1983, 154). "Machi Castle" or known as "Ghale Machi" is located within 60km distance from southwest of Zaboli County in Hozdar City, and an area between Shahr-e Sukhteh and Tasouki on the right side of Zabol-Zahedan Road (Khomae et al. 2001, 14). This castle and its associated buildings near it are located within 3km distance from southeast of "Hozdar" (Arbab Bikas et al. 2009, 31). In this building complex, one castle, one stable, one Asbad (windmills), several garden houses, water transmission channel, tomb or mausoleum, hill, cemetery, and several structures are identified and observable (Kheykha 2019, 85). A green garden exists in the north of Ghale machi building, which is now a desert, but performed as a windbreaker for building in past (Sanadgol 2005, 47). According to the superficial investigation and discovery of copper coin on which the phrase "Bandeh Shah Velayat Abbas" is endorsed, the history of this castle may grs back to Safavi Era (Kavosh 1998, 185). An inscription that remained from 1751 related to "Mir Jafar Khanoold Khan" has been discovered in this castle (Seyed Sajadi 2004, 32).

• **Asbads:** Asbads located in Sistan are known as the oldest windmills in the world and Iran. Asbads of Sistan are around the Zabol City in the path of 120-day winds, and are fabricated singly or in twin forms (Gholami et al. 2017, 4). The most not-destroyed Asbad among single Asbads of Sistan in Asbad No.2 Machi (Gholami et al. 2017, 8). "Wind always is blowing there and does not stop even for a second, so some windmills have been fabricated to grind corns with their wheels. There is a hot climate and the windmill has some wheels that wind would rotate them," Ghazvini, a geographer states about Sistan (Farshad 1997, 99).

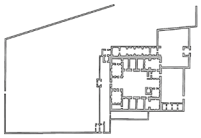
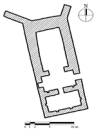
• **Mausoleums:** mausoleum buildings provide an aspect of the traditional architecture of Sistan from the late Islamic period. "Non-religious tombs are more known under the title of the mausoleum, which likely belonged to famous individuals and local Khans, so these tombs have different appearances and sizes based on the political and economic situation of that person. Most of these mausoleums are located at the center of the cemetery and tombs of ordinary people are made of clay and are graved upper the land surface" (Kheykha 2019 77). According to archeological assessments in Hozdar City, 15 small and large tombs were found (Alaei Moghadam 2020, 5) among which, few of them do not have any map or information due to excessive destruction and their ruined architecture and form. "We passed by an interesting archeologic cemetery near Hozdar in which, all tombs were upper the land surface and each tomb had a small shelter made of brick," Smith explains (Smith 2008, 137).

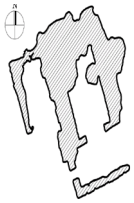
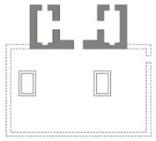
• **Budlings with uncertain uses:** there are three buildings in the east of Hozdar and the outdoor area south of Ghale Machi, Their use is not clear due to over-destruction, so no map is prepared for them. The geometry of the plan and indoor spatial proportions of one of them (elongated rectangle with niches in the wall) are similar to stable. Another building had two porches (north and south) two rooms (east and west), and one protruded space in its west front. The third building has a rectangular shape with two porches and two large rooms on two sides. Unfortunately, no more information is available about these three buildings. Hence, they were not considered in the investigation process in some parts of the research.

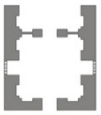
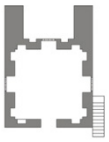
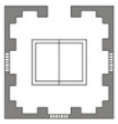
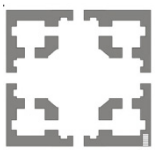
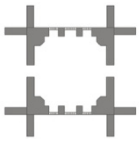
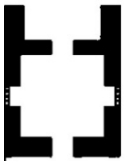
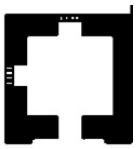
Fig. 1. Location of Hozdar City in Sistan and Hamun County (Left), Location of some Studied Buildings in Hozdar City (Right)

(https://www.chht-sb.ir/)

Table 1. Introduction to Studied Buildings in Hozdar City

Castles					
Name of Building	Location	Function	Plan (all Images are Redrawn)	Image	Source of Images
Ghale Rostam	65km distance from south of Zabol City in west of Hozdar	Shah Neshin, Stable, Residence, and Icehouse			Redraw by the author based on (Karmian and Saadatian 2019, 98)
Ghale Machi	60 km distance from southeast towards the right side of the road from Zabol to Zahedan and northeast of Shahr-e Sukhteh	Shah Neshin and Stable			Redraw by the author based on (Archives of the Cultural Heritage, Handicrafts and Tourism Organization of Zahedan 1996)
Asbad of Ghale Machi (Sattari)	Northeast of Ghale Machi	Flour and Grain Mill and Warehouse			Redraw by the author based on (Archives of the Cultural Heritage, Handicrafts and Tourism Organization of Zahedan 2009)
Asbad (2)	In the historical area of Hozdar and the southeast side of Ghale Machi	Flour and Grain Mill and Warehouse			

Castles					
Name of Building	Location	Function	Plan (all Images are Redrawn)	Image	Source of Images
Twin Asbads (3 & 4)	In the historical area of Hozdar and west of Ghale Rostam	Flour and Grain Mill and Ware-house			
Asbad of Ghale Rostam (5)	In the historical area of Hozdar and the southwest side of Ghale Rostam	Flour and Grain Mill and Ware-house			Redraw by the author based on (Archives of the Cultural Heritage, Handicrafts and Tourism Organization of Zahedan 2009)
Asbad (6)	In the historical area of Hozdar and on the south side of Ghale Machi	Flour and Grain Mill and Ware-house			
Mauso-leum (1)	In the northern front of the Hozdar area	Location of One or more Tombs			
Mauso-leum (2)	In the northern front of the Hozdar area	Location of One or More Tombs			
Mauso-leum (3)	In the northern front of the Hozdar area	Location of One or more Tombs			Redraw by the author based on (Alaei Moghadam 2020, 6-12)
Mauso-leum (4)	In the north front of the cemetery and northern front of Hozdar City	Location of One or more Tombs			
Mauso-leum (5)	In the northern front of the Hozdar area	Location of One or more Tombs			

Castles					
Name of Building	Location	Function	Plan (all Images are Redrawn)	Image	Source of Images
Mauso-leum (6)	In the eastern front of the Hozdar area	Location of One or more Tombs			
Mauso-leum (8)	In the southern cemetery of Hozdar City	Location of One or more Tombs			
Mauso-leum (9)	In the southern front of Hozdar City	Location of One or more Tombs			Redraw by the author based on (Alaei Moghadam 2020, 6-12)
Mau-soleum (10)	In the east of Hozdar City	Location of One or more Tombs			
Mau-soleum (11)	In the eastern front of Hozdar City	Location of One or more Tombs			
Mau-soleum (12)	In the eastern front of Hozdar City	Location of One or more Tombs			(Alaei Moghadam 2020, 9)
Mau-soleum (13)	In the eastern front of Hozdar City	Location of One or more Tombs			
Building Complex Next to Ghale Machi	South of Ghale Machi	Three Entrance Gates on two Sides and two Porches on the North	-		-

6. ARCHITECTURAL FEATURES AND DETAILS IN THE BODY OF HISTORICAL BUILDINGS IN HOZDAR CITY

Regarding the physical features of historical buildings in Hozdar City, the information obtained from documents, images, archeological documents, and field observation emphasizes two general components of "plan space organization" and "construction techniques in the body" of these historical buildings. Some subsections are examined in each section based on the content. These components were chosen among all physical architectural features for some reasons: firstly, only those components were examined based on the available documents due to the huge damage

to buildings and the absence of monuments, recorded documents, and evidence. Since archeologists and architects have prerecorded plans of buildings, a part of assessments is done on the plan that includes privacy, hierarchy, introversion, transparency, visual continuity, etc. that are presented titled "spatial organization." On the other hand, remnants of buildings and their roofs indicated the materials and techniques used in their construction. Therefore, these features were examined under the title of "construction techniques in the body of the building." It should be noted that despite the importance of architectural features, including circulation, coating type, and so forth, a definite explanation cannot be given for some parts of the building due to the non-transparent body of the building. Therefore, the unclear features have been eliminated in this study. Another important point in the examination of these buildings is that they have lost their original shape and patterns or have changed due to the restoration of these buildings. Therefore, these buildings are considered based on the available images and documents from the time before the restoration and renovation of these buildings. On the other hand, some buildings have been removed due to excessive destruction and lack of visual information before their destruction, as well as too much vagueness (Asbad 5, one of 15 available mausoleums, residential buildings around the Ghale Rostam).

6.1. Plan Space Organization

This part of the study examines geometry, arrangement of space towards each other, their areas, the number of each space, and mass-to-space percentage under the title of "plan space organization". Moreover, the deployment of spaces in connection with each other, hierarchy of open, semi-open, and closed spaces, type of physical and visual access to each space, and introversion and or extroversion aspect of each space are considered under the title of "movement organization and access hierarchy."

6.1.1. Spatial Organization

Symmetry is one of the aesthetical principles of Islamic Architecture (Peyvastehgar 2017, 5), which is widely used in the architecture Safavid era. The spatial organization of the plan and façade of all buildings (except for the plan of Asbads considering their different functions) is symmetric in Hozdar City. However, the symmetry of the plan and façade has disappeared in some parts especially in the castle because these spaces have been settled by various tribes and individuals over time who added some spaces to it based on their needs. "Vernacular architecture of Sistan is along with east-west orientation because of available northern wind and sunlight. In terms of space, this area includes closed, semi-closed, and open spaces" (Sargazi 2012, 66). There is a general classification in the spatial organization of the buildings located in Hozdar:

• **Open spaces:** open spaces in the historical buildings of Hozdar include courtyards, routes, empty spaces, and squares among which, only courtyards of the castles are examinable. The construction mass percentage of buildings that have courtyards almost equals 1.2, which indicates the importance of courtyard space in this climate. The geometry of courtyards is rectangle-shaped, which is probably designed for creating spaces for summers and winters. Outside of some of the mausoleums in the historical city of Hozdar, a staircase is combined with the building connected to the roof surface of the upper floor and creates the only open space of these buildings.

• **Semi-open spaces:** semi-open spaces existing in historical buildings of Hozdar City include porches, porticoes, Mardgard (covered or open corridors around the building), and front entrances. The presence of a porch is one of the important aspects in the spatial organization of these buildings, so that one porch is seen in almost all buildings and several porches may exist in more important buildings[3]. Mardgard and Portico are usually seen in the buildings where the ruler or king settled in the castle[4].

• **Close spaces:** villages in Sistan have dense fabrics. The form of the plan must be compacted in the hot and dry climate, so fewer surfaces are exposed to sunlight (Khodabakhshi and Mofidi 2001, 608). The height of most walls is high and rooms have no pores in Hozdar. The construction mass in some buildings is central, and there is a central courtyard in other ones and geometry of most buildings is squared-shaped, rectangular, and Chalipa inspired by the Sassanid architecture. Kharkhaneh's room exists between closed spaces. Kharkhaneh is one of the specific closed spaces in Sistan, which was constructed in important buildings. Kharkhaneh (thorn room) had a cooling function; therefore, builders designed the windows of the room facing the prevailing 120-day winds of Sistan and put thorns in front of a window to direct cool wind into the building. The walls' pillars are thick to provide building strength and thermal comfort during different seasons of the year. This thickness is lower and more useful space exists in the service and mausoleum spaces in which, cooling and heating are less important. Like other Asbads in the area, the organization of Asbad spaces in Hozdar consists of three main spaces: As Khaneh (long rectangular room), Por Khaneh, and warehouse. In Asbads, the height of buildings reaches two floors Por Khaneh is located on the second floor like other Asbads in the area. "This part of the building not only covers the As Khaneh because wind wheel exists in it, but also plays a vital role in structure Asbad, which connection with this part is created through stairs created based on the location between several windmills." (Khezri and Imani 2009, 118).

Table 2. Spatial Organization in Historical Buildings of Hozdar City

Open Space			
Space	Examined Feature		
	Geometry	Number	Courtyard-to-Building Percentage
Ruler's courtyard of Ghale Rostam	Rectangle	3	49%: 2790.8m^2 courtyard, 2878.8m^2 mass
Ruler's courtyard of Ghale Machi	Rectangle, elongated rectangle	4 courtyards, 1 backyard	48%: 1636m^2 courtyard, 3423m^2 mass
Staircase and roof of mausoleum 4	Rectangle-shaped staircase and roof	1	No courtyard, (open space on the roof)
Staircase and roof of mausoleum 8	Rectangle-shaped staircase and roof	1	No courtyard, (open space on the roof)
Staircase and roof of Mausoleum 10	Rectangle-shaped staircase and squared-shaped roof	1	No courtyard, (open space on the roof)

Closed Space				
Space	Examined Feature			
	Geometry of General Plan	Partial Geometry	Net-to-Gross Area	Arrangements relative to the Courtyard
Ruler's seat of Ghale Rostam (accommodation and vestibule)	Symmetric and organized	Squared and rectangular	54%: 1310.3m^2 walls' pillars, 1568.5m^2 useful area	O-shaped on four sides of the central courtyard
Battlement and rampart of Ghale Rostam (one rampart)	Symmetric and organized	4, a part of the circle	49%: 18.75m^2 walls' pillars, 18m^2 useful area	Like a fence around the building
Stable of Ghale Rostam	Symmetric and organized	Elongated rectangle	67%: 58.16m^2 walls' pillars, 119.64m^2 useful area	Inside and outside the courtyard
Ruler's seat of Ghale Machi (Khar Khaneh, Accommodation, Vestibule, etc.)	Symmetric and organized	Squared, rectangle	57%: 649m^2 walls' pillars, 865m^2 useful area	O-shaped on four sides of the central courtyard
Stable of Ghale Machi	Symmetric and organized	Elongated rectangle	57%: 139m^2 walls' pillars, 176m^2 useful area	Parallelly is one side of the service courtyard
Asbad 1	Symmetric and organized	Elongated rectangle	49.5%	Outdoor space near the Ghale Machi
Asbad 2	Symmetric and organized	Squared, rectangle	44%	Outdoor space near the Ghale Machi
Asbads 3 and 4	Symmetric and organized	Three-rectangle combination	-	Outdoor area of Ghale Rostam
Asbad 6	Symmetric and organized	Rectangle-circle combination	-	Outdoor space near the Ghale Machi
Mausoleum 1	Symmetric and organized	Squared	66%: 7.28m^2 walls' pillars, 14.14m^2 useful area	Northeast area of Hozdar
Mausoleum 2	Symmetric and organized	Rectangle	61%: 51.6m^2 walls' pillars, 82.3m^2 useful area	Northeast area of Hozdar
Mausoleum 3	Symmetric and organized	Squared	58%: 14.7m^2 walls' pillars, 20m^2 useful area	Northeast area of Hozdar
Mausoleum 4	Symmetric and organized	Rectangle	56%: 60.6m^2 walls' pillars, 75.6m^2 useful area	Northeast area of Hozdar
Mausoleum 5	Symmetric and organized	Rectangle	62%: 28.21m^2 walls' pillars, 22.7m^2 useful area	Northeast area of Hozdar
Mausoleum 6	Symmetric and organized	Rectangle	64%: 22.19m^2 walls' pillars, 39.69m^2 useful area	North area of Hozdar
Mausoleum 8	Symmetric and organized	Rectangle	67%: 27.7m^2 walls' pillars, 55.7m^2 useful area	Southeast area of Hozdar
Mausoleum 9	Symmetric and organized	Rectangle	74%: 9.5m^2 walls' pillars, 27m^2 useful area	Southeast area of Hozdar
Mausoleum 10	Symmetric and organized	Overall square and center Chalipa	66%: 63m^2 walls' pillars, 123.3m^2 useful area	East area of Hozdar
Mausoleum 11	Symmetric and organized	Rectangle	58%: 30m^2 walls' pillars, 41.2m^2 useful area	East area of Hozdar

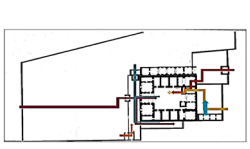
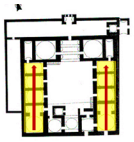
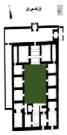
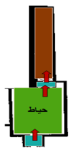
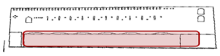
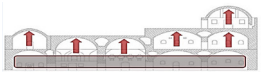
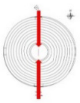
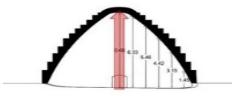
Closed Space				
Space	Examined Feature			
	Geometry of General Plan	Partial Geometry	Net-to-Gross Area	Arrangements relative to the Courtyard
Mausoleum 12	Symmetric and organized	Rectangle	61%: 15.1m^2 walls' pillars, 23.5m^2 useful area	East area of Hozdar
Mausoleum 13	Symmetric and organized	Squared	51%: 10m^2 walls' pillars, 10.2m^2 useful area	East area of Hozdar
Icehouse	Symmetric and organized	Circle	64%: 66.18m^2 walls' pillars, 116m^2 useful area	North of Ghale Rostam

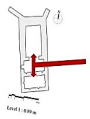
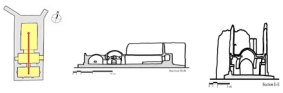
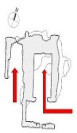
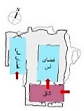
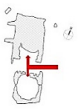
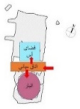
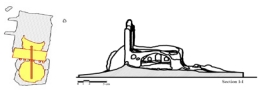
Semi-Open and Semi-Closed Space				
Space	Examined Feature			
	Geometry		Number	Location
Ruler seat of Ghale Rostam (balcony and porch)	Rectangular balcony, porch and corridor		1 balcony, 2 porches, 1 corridor	Balcony: on the second floor Porch: in the north and south
Ruler seat of Ghale Machi	Porch	Square, rectangle	2	North, south
	Fron entrance of vestibule	Rectangle	1	Southeast
	Mardgard (portico)	Elongated rectangle	1	Rooms on the west side
Front entrance of stable in Ghale Machi	Rectangle		1	Entrance gate
Porch of mausoleum 1	Square		1	North
Porch of mausoleum 2	Square		1	North
Porch of mausoleum 4	Square		1	North
Porch of mausoleum 8	Rectangle		1	-
Porch of mausoleum 11	Rectangle		4	Four main sides
Porch of mausoleum 12	Rectangle		1	-
Porch of mausoleum 13	Rectangle		1	-
Buildings in south of Ghale Machi	Unknown		Unknown	North, south

6.1.2. Movement Organization and Access Hierarchy

Movement organization is examined based on two visual and physical aspects. Visual continuity is a principle that can be called organization of view or transparency. "Continuity occurs when elements appear consecutively" (Estremadoyro 2003, 7). Under the continuity principle, human eyes tend to follow the counters existing in a visual structure until the motifs remain unchanged and no barrier appears (Gholami Rostami et al. 2015, 69). Visual continuity in historical buildings of Hozdar City can be searched through two aspects: scope of vision in horizon dimension and increase spatial connection and continuity in the vertical dimension. Domes and arches are frequently seen in all types of buildings so such deconstruction and dematerialization create a kind of visual continuity in the vertical dimension. On the other hand, the depth of view has been expanded in the horizon dimension by reducing the walls' pillars and creating niches. Another strategy for the creation of visual sequence and continuity includes odd numbers used in the repetition of pores and arches; in this case, odd numbers create a kind of symmetry that leads to movement of the vision axis towards symmetry. "Sequence means the following of an event after another in a logical order and at a different time" (Estremadoyro 2003, 7). From another perspective, the organization of movement can be related to the physical movement in the space, which is figure can be seen in the access hierarchy and sequence of spaces, type of movement axis, etc. A kind of introversion appears followed by the spatial sequence preventing a direct view of buildings' inside by using a break in the entrance axis. This feature is seen in those unknown castles and buildings that probably had residential use. In most Asbad and mausoleum buildings, the entrance gate was direct, and the view towards indoor space was less considered because individuals were not present there permanently and these spaces were not residential. The access hierarchy features (movement axis, spatial sequence, visual continuity, introversion, vertical access) are separately examined in different parts of Table 3.

Table 3. Investigation of "Organization of Movement" and Access Hierarchy in the Historical Buildings of Hozdar City

	Access Hierarchy					
Building	Move-ment Axis	Number of En-trance Gates	Sequences of Spaces	Visual Continuity	Introversion and Extroversion	Vertical Access
Ruler seat of Chale Machi	Bronek, spiral	3	Complicated spatial hierarchy (front entrance, vestibule, height difference, rotation, courtyard)	- in vertical dimension: 1. Arches and domes, 2. Classification of niches on three floors. -in horizon dimension (visual continuity is less in the horizon dimension): 1. Rooms in south-facing front, 2. North-facing and south-facing porches, 3. Arches in east-facing façade, 4. Mardgard on the second floor, 5. Using odd arrangements and creating symmetry in niches, as well as internal and external arches	Central courtyard, tall walls with small pores	Two one-way direct staircases
Image						
Ruler seat stable of Chale Machi	Almost direct	1	Short hierarchy: front entrance, courtyard, front entrance, stable	- in vertical dimension: dome - in horizon dimension: niche, continuity of arch	Introverted entrance courtyard	-
Image						
Ruler seat of Ghale Rostam	Broken, spiral	1	Complicated spatial hierarchy (front entrance, vestibule, height difference, rotation, courtyard)	- in vertical dimension: 1. Arches and domes, 2. Classification of niches on three floors. -in horizon dimension: 1. Rooms in south-facing front, 2. North-facing porch, 3. Arches in east-facing façade, 4. Latticed parapet, 5. Using odd arrangements and creating symmetry in niches, as well as internal and external arches	Through the courtyard, tall walls with small pores	Four one-way direct staircases and two diagonal staircases
Image	-	-			-	
Stable of Ghale Rostam	L-Shaped and direct		No gate (direct entrance)	- In vertical dimension: cradle arch - In horizon dimension: no	Tall external wall without pores	Does not have
Image				-	-	-
Battlement and rampart of Ghale Rostam	Spiral	3	-	- In vertical dimension: conical form of ramparts - In horizon dimension: crenelate of walls	Tall walls with very small pores, tall walls	Spiral staircase
Icehouse	Direct	2	Does not have (direct entrance)	- In vertical dimension: sugarloaf-shaped dome	Without external pore	Does not have
Image						

Access hierarchy						
Building	Move-ment Axis	Number of En-trance Gates	Sequences of Spaces	Visual Continuity	Introversion and Extroversion	Vertical Access
Asbad 1	Broken, T-shaped		Limited number	- In vertical dimension: with arch, niches in two height levels - In horizon discussion: with niche, arch, and internal openness	Small pores	Two staircases, low height different
Image						
Asbad 2	Direct		Does not have (direct entrance)	- In vertical dimension: cradle arch - In horizon dimension: openness between two spaces	Without pore	Does not have
Image						
Asbads 3 & 4	L-shapes		Limited numbers	- In vertical dimension: cradle arch and niche in the height - In horizon dimension: niche and openness between spaces	Without pore	Does not have
Image						
Asbad 6	Broken, T-shaped		Does have, limited numbers	- In vertical dimension: cradle arch and niche in height - In horizon dimension: niche and openness	Without pore	Does not have
Image						
Mausoleum 1	Direct		Does not have (direct entrance)	- In vertical dimension: arch and niche in height - In horizon dimension: niche and porch	Without pore	Does not have
Image						
Mausoleum 2	Direct		Limited form (by porch)	- In vertical dimension: dome - In horizontal dimension: niche	Latticed windows and front entrance	Does not have
Image						
Mausoleum 4	Direct		Limited form (through the porch and front entrance)	- In vertical dimension: arch and niche in height - In horizon dimension: openness, porch, and niche	Latticed windows and front entrance	Direct and one-way staircase
Image						

	Access hierarchy					
Building	Move-ment Axis	Number of En-trance Gates	Sequences of Spaces	Visual Continuity	Introversion and Extroversion	Vertical Access
Mausoleum 5	Two entrance gates, direct, L-shaped		Limited (entrance with porch)	- In vertical dimension: arch or dome - In horizon dimension: niche and porch	Without pores, with a courtyard	Two floors (unknown location of staircase)
Image						
Mausoleum 6	Two direct entrance gates		Limited (entrance with porch)	- In vertical dimension: dome - In horizon dimension: niche, porch, and openness between two spaces	Few and latticed pores, having a front entrance of the porch	Does not have
Image						
Mausoleum 8	Direct		Does not have (direct entrance)	- In vertical dimension: niche and dome - In horizon dimension: porch, niche, and openness	Few and latticed pores in high-height	One-way and direct staircase
Image						
Mausoleum 9	Direct		Does not have (direct entrance)	- In vertical dimension: dome, niches in different heights - In horizon dimension: niche, openness	Latticed windows	Does not have
Image						
Mausoleum 10	4 direct entrance gates		Limited (pre-space)	- In vertical dimension: niche at height, central dome, and vault - In horizon dimension: niche and Chalipa form	Introverted without pore	Direct and one-way staircase
Image						
Mausoleum 11	Two direct entrance gates		Limited (pre-space)	- In vertical dimension: niche at arch and dome - In horizon dimension: niche	Introverted with latticed windows and front-entrance	Does not have
Image						
Mausoleum 12	Direct entrance gates		Limited (porch)	- In vertical dimension: dome and niche at height - In horizon dimension: niche and porch	Introverted with latticed windows and front-entrance	Does not have
Mausoleum 13	Direct entrance gates		Limited (with front entrance)	- In vertical dimension: dome - In horizon dimension: niche	Introverted with latticed windows	Does not have
Image						

6.2. Construction Techniques in the Body of Buildings

This section examines the materials used in the construction and ornaments of various parts of the buildings and the fabrication method for physical components of buildings titled "materials used in

the construction and decorations." Moreover, the fabrication of various components of buildings especially ceilings that have a greater diversity, and the techniques used in their fabrication are explained under the title of "construction technique."

6.2.1. Materials used in the Construction and Decorations

The specific potential of Sistan includes an abundance of clay soil as the raw material for brick during full-water times of Hamun and available straws, which are permanent indigenous possibilities emphasized in the architecture of this area. The materials used in external bodies mainly consist of clay, mud, and sometimes brick. However, brick has been sporadically used in walls and construction of the arch and ceilings of buildings (Mosavei Haji 2010, 82). In addition to strength, design is one of the important features of the architectural technique of the Safavid era. Light, color, and surfaces (particularly the tiled surfaces) combination in the buildings constructed at that time create abstract and spiritual landscapes (Blair and Bloom 2002, 475). In contrast to buildings of the Safavid era in other cities of Iran (Isfahan, Shiraz, Tabriz, etc.) that used diverse materials, such a variety of materials is not used in buildings located in Hozdar. The considerable point is why various materials such as tilework, wood, and or color are not seen in the decorations of these buildings while diverse colorful clays and objects have been discovered in the Hozdar area. No study has been done on the variety of materials used in Hozdar City and no information has been obtained, but the remnants of the buildings indicate the abundant use of two dominant types of materials which are clay and mud, and brick in some areas. The decorations available in these buildings have been done by using clay and mud, without a variety of materials and colors, and by using various geometries. Archeologists have discovered some patterned clays with different colors especially blue and green blue, and brown and red in other cases with flower, animal, and other motifs in some buildings, particularly in mausoleum buildings, which indicates the importance of ornaments in this area (Fig. 2); this case highlights a probability based on this idea that building is one of the most important physical figures of human life. This probability indicates that since colorful decorations with different motifs and materials are seen in the dishes discovered in this area, such a possibility exists in the buildings too (Fig. 3). Another point that increases the probability of colorful decorations with various motifs and materials is the discovery of colorful decorations with different motifs and materials at the same time in areas in the vicinity of Hozdar City and even from previous times (Khajeh Mountain, Dahaneh Gholaman, etc.). Therefore, various decorations and materials might have existed in the buildings at that time, but washed out through the river path or buried under the debris resulting from the destruction of those buildings. Another feature is the use of latticed windows and parapets in the façade of the historical buildings of Hozdar. These elements are seen in almost all buildings. In addition to climate function, these windows were used to decorate the buildings[5].

Fig. 2. Some Engraved and Patterned Clays were discovered from the Historical Buildings in Hozdar City (Kheykha 2019, 157-170)

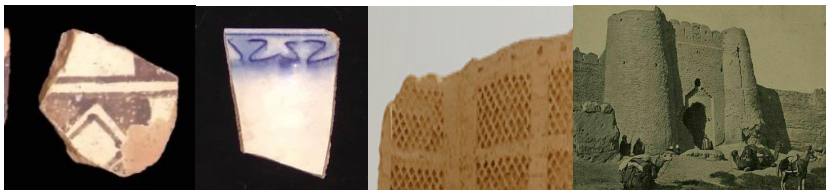


Fig. 3. The Motif of one Dish patterned with Latticed Windows Crenelates similar to the Crenelates of Battlements and Ramparts (Left Side) (Kheykha 2019, 157-170)**; Latticed Decorations existing on Asbad, Crenelates of Battlement, and Ramparts of Ghale Rostam (Right Side)** (Vaibhav 2017)

6.2.2. Construction Technique

Tall walls and dome-shaped roofs of houses are among the prominent architectural features in villages of Sistan (Sargazi 2012, 66). The domes designed in Sistan have a specific type with a special potential, which is its implementation on the

rectangle plan. Various types of domes, arches, and Kolanboo are seen in most parts of the historical buildings of Hozdar City, which are created by using "Squinch" on a body with square and rectangle plans. Arches and cradles have been used in other spaces to cover the large and rectangular openings. These construction patterns have been adopted from the Sassanid architecture of this area, especially in the buildings located in "Khajeh Mountain" which are implemented similarly in all buildings. The climate-related function of the dome in hot and dry climates is creating natural vertical ventilation or air conditioning in the room based on the valves designed under the dome. The height of rooms in the castles constructed in hot and dry climates is designed high in a way to direct heat upwards and cool the lower space of the room. However, this height is taller in the mausoleum buildings not for climate reasons but to create transparency and increase the sense of spirituality in the building. Another climate strategy was the application of semi-open covered spaces and routes to provide shading during summer, especially in castles (table 4). Regarding the construction of Asbads, windmills are not usually constructed singly but all windmills of one village are constructed in a single place next to each other with the same length, height, and system[6] (Khezri and Imani 2009, 115). All Asbads constructed in Hozdar except one case are designed singly and separately. In Asbads, the roof of As Khaneh is dome-shaped leading to a cradle-shaped arch; this feature is seen in other Asbads located in this area.

Table 4. Construction Technique in Historical Buildings of Hozdar City

Building	Common Patterns in the Ceiling							Body	Surface and Height Difference of Building	Specific Cases and Explanations
	Domed	Kolanboo	Vault (Body)	Flat (Vaulted)	Cradle	Squinch	Staircase	Simple Crescent Arch		
Ruler seat of Ghale Machi	✓	✓	✓	✓	✓	✓	-	✓	Two-story staircase in the corner of the courtyard	Decreased mass of pillars using shelves in internal walls and façade
Stable of Ghale Machi	✓	-	✓	-	-	✓	-	-	-	Some ventilators installed beneath the roof
Ruler seat of Ghale Rostam	✓	✓	✓	✓	✓	✓	-	✓	Three-story with internal and external staircase	-
Stable of Ghale Rostam	✓	-	✓	-	✓	✓	-	✓	Single-story with a height of two floors	Some ventilators installed beneath the roof
Battlement and rampart of Ghale Rostam	-	-	✓	✓	-	-	-	-	Three-story with an internal staircase	Decreased mass of pillars using shelves in internal walls and façade, water storage house and channeling to direct and store water, Consecutive buttress behind the external wall
Icehouse	✓	-	-	-	-	-	✓	✓	Single-story with tall height	The volume outside the icehouse has become a staircase in the renovation phase
Asbad 1	✓	-	✓	-	✓	✓	-	✓	Two-story with an internal staircase	-
Asbad 2	-	-	-	✓	✓	-	-	✓	-	-
Asbads 3 & 4	✓	Unknown	✓	✓	✓	✓	-	✓	Two-story with tall height	-
Asbad 6	✓	Unknown	✓	Unknown	✓	✓	-	Pediment	Two-story with an external staircase (probably)	-
Mausoleum 1	✓	-	✓	-	-	✓	-	✓	-	-
Mausoleum 2	✓	-	✓	-	-	✓	-	-	-	-

Building	Common Patterns in the Ceiling							Body	Surface and Height Difference of Building	Specific Cases and Explanations
	Domed	Kolanboo	Vault (Body)	Flat (Vaulted)	Cradle	Squinch	Staircase	Simple Crescent Arch		
Mausoleum 4	✓	-	✓	-	-	✓	-	Pediment	Single-story with external staircase towards roof	-
Mausoleum 5	-	-	✓	✓	✓	-	-	✓	Two-story and unknown staircase	-
Mausoleum 6	✓	-	✓	-	-	✓	-	✓	-	-
Mausoleum 8	✓	-	✓	-	-	✓	-	✓	Single-story with external staircase towards roof	-
Mausoleum 9	✓	-	✓	-	-	✓	-	✓	-	-
Mausoleum 10	✓	-	-	-	✓	✓	-	✓	Single-story with external staircase towards roof	-
Mausoleum 11	✓	-	✓	-	-	✓	-	✓	-	-
Mausoleum 12	✓	-	-	-	-	✓	-	✓	-	-
Mausoleum 13	✓	-	-	-	-	✓	-	✓	-	-
Unknown collection of Ghale Machi ۱	✓	✓	✓	Unknown	-	✓	-	✓	-	-
۲	✓	Unknown	✓	Unknown	-	✓	-	✓	-	-
۳	Unknown	-	✓	-	✓	-	-	✓	-	-

7. FINDINGS

According to the research components assessed in previous sections of the study, there are common aspects regarding architectural physical features between the studied buildings in Hozdar and other cities of the Safavid period. However, the studied buildings have used the local and Sassanid patterns of Sistan, which its reason may be rooted in more attention paid to Sistan during the Sassanid Era, the construction of different and valuable buildings at that time, being far from the capital of the Safavid Dynasty, and low attention to this area during Safavid period. The common points are seen between the building of this area and with architecture of the Safavid era in other cities: plan space organization, organization of movement and access hierarchy, geometric order, use of open, semi-open, and closed spaces, and symmetry. The dominant pattern shared with other Safavid buildings in other cities within the spatial organization includes semi-open space of porches and four-porch buildings used in some mausoleums. The closed spaces also indicate the same plan pattern and symmetric façade seen in the general architectural patterns of the Safavid era, and these patterns are common in different construction functions of Hozdar City, and plans have geometric and organized forms. According to assessments of movement organization and access hierarchy. Spatial hierarchy has been matched with the building use and function importance in all historical buildings of Hozdar City. The hierarchy and sequence of spaces are more in the castles. Moreover, movement routes in the studied buildings show that not only do castles have log access routes to their insides but also had rotation and fracture through the path to prevent any disturbing view towards the indoor space of the building. Introversion and access hierarchy exist in Abads and mausoleums; however, the length of the access route has been reduced and rotational entrance route has been minimized, and the entrance path has been defined by creating a front entrance due to public use of the building.

The building of all mausoleums is introverted with latticed windows and dome-shaped roofs to create a sense of spirituality in the space. Asbads have numerous ornaments designed on the external façades, which indicate their extroversion aspect and public use. Visual continuity in the horizon and vertical dimensions is one of the architectural features seen in all buildings in this area. Like dematerialization and construction lightness (deconstruction), as well as the transparency principle that was widely used during the Safavid era, this principle has been observed in all historical buildings of Hozdar City by designing niches within several height rows, creating domes in

the vertical dimension, consecutive arches, and porch. The outstanding features used in buildings of this historical city include diverse vaulted arches, curved or crescent-shaped arches, cradle form, Kolanbo, etc. that are seen almost in all buildings even in those buildings with low-important use, which indicates mastery of the architects of that time over structural and technical issues of implementing dome and arch. There are some ambiguities in the examination of materials and decorations, which its reason may be rooted in the lack of comprehensive archeological studies in this area or numerous destructions caused by the location of buildings in the river path. The discovered remnants of pottery dishes indicate the diverse colorful decorations, while various materials or colors are not seen in the buildings located in Hozdar City. Most of the remained materials in the buildings include clay and mud, and also various geometric decorative designs are seen among which, the most common include lattice design in the facade and windows and the presence of special geometric design in the walls of castles' rooms. In general, the greatest difference in the body of buildings located in Hozdar is seen in materials and decorations, as well as the construction technique of buildings. These features have followed the indigenous patterns of the area and Sassanid architecture in some nearby and surrounding areas, such as Khajeh Mountain. Table 5 summarizes the prominent features of the historical buildings in Hozdar City based on the components examined in this study.

Table 5. Physical Features of Historical Buildings in Hozdar City

Features		Type of Building	Castles	Asbads	Mausoleums	Buildings with Unknown Function
Spatial Organization	Open	Geometry	Rectangle-shaped	-	-	-
		Courtyard-to-whole percentage	Almost 1.2 in all buildings	-	Open space on the roof	-
	Closed	Geometry	Rectangle and square	Rectangle and square	Square	Rectangle and square
		Pure-to-gross area	Almost equal to 1.2 (creating thermal comfort)	1.2 and less (thick pillar to cool space for storing flour and wheat and increase height)	Almost equals 2.3 (except for one case) (gross area and lower pillar of walls due to less importance of thermal comfort in this function)	-
		Arrange-ment	O-shaped and four sides of courtyard	Central mass without courtyard	Central mass without courtyard	Central mass without courtyard
	Semi-Open and Semi-Closed	Geometry	Rectangle and elongated rectangle	Rectangle	Rectangle	Rectangle
		Number	10 and greater	1-2 in each Asbad	1-2 in each mausoleum	2 and 3
		Deployment location	North, south	North, south	North, south	North, south
Access Hierarchy	Movement axis		Spiral and broken	Direct or L-shaped	Direct	Direct or L-shaped
	Sequence of spaces		Consecutive multiple spaces	Having front-entrance	Having front-entrance	Having front-entrance, spatial sequence with moderate numbers
	Visual continuity		Considerable and eye-catching in the horizon and vertical dimensions	Considerable and eye-catching in the horizon and vertical dimensions	Considerable and eye-catching in the horizon and vertical dimensions	Considerable and eye-catching in the horizon and vertical dimensions
	Introversion and extroversion		High introversion	Moderate introversion	Moderate introversion	Relatively high introversion
	Vertical access		Does have	Some of them have	Some of them have	-

Features	Type of Building	Castles	Asbads	Mausoleums	Buildings with Unknown Function
Materials and Decorations	Materials	Clay, mud, and brick	Clay, mud, and brick	Clay and mud	Clay and mud
	Design	Decorations with specific geometric motifs on the walls of rooms, latticed windows in all internal and external walls, and the balcony	Girih tiles designed on the façade	Latticed windows	Shelves and framing
Construction Technique	Roof patterns	Arch, Kolanboo, cradle, and squinch (adopted from Sassani architecture)	Arch, Kolanboo, cradle, and squinch (adopted from Sassani architecture)	Arch, Kolanboo, cradle, and squinch (adopted from Sassani architecture)	Arch, Kolanboo, cradle, and squinch (adopted from Sassani architecture)
	Surface and height difference of building	2- and 3-story human height, direct and spiral staircase	Single-story with tall height, direct staircase	Single-story with tall height, direct staircase	-

8. CONCLUSION

Hozdar City is one of the areas with historical value in Sistan, various settlements have existed in it during different centuries but a large part of it was constructed and developed during the Safavid era. The authors of previous studies focused on the landmarks and prominent buildings of this area (Ghale Machi and Ghale Rostam), as well as the quantitative climate study on the cooling spaces of these monuments. The present study aims to identify and examine the physical architectural features of buildings located in Hozdar City during the Safavid period, and these assessments are done to find the most important features. Most of the patterns used in the construction of buildings in Hozdar have been influenced by the Sassanid architecture in this area, and novelties and innovations are more seen in decorative designs. One important point was found according to the investigations based on the available studies conducted on the classification of buildings based on their uses and function by the architects and archeologists in this area. Unlike other cities of the Safavid era, no evidence is seen in Hozdar to show the presence of religious spaces, such as mosques or churches, as well as temporary accommodation spaces such as caravanserais. This is a challenging issue because the lack of religious space in a mosque in this area seems weird due to the importance of religion at that time. Hence, this issue can open a new window for future studies in this area. On the other hand, archeological studies of this area are gradually completed. Accordingly, it is recommended that future studies consider other topics such as decorations in the buildings of this historical city, find why there is a difference between decorations and other buildings in Safavid cities of Iran, and find the reason for the lack of various materials in these buildings.

The following results were obtained under the examinations conducted to answer the research questions:

• The most prominent patterns used in “plan space organization” include following geometric order, open, closed, and semi-open spatial organization, symmetry, use of one or more porches, access hierarchy, privacy, and creation of visual continuity. Use of clay and mud in construction, a combination of dome ceilings with the net mass of construction, tall height on each floor of buildings, and abundant use of squinch.

• According to the assessment of distinctions between various uses in Hozdar City, similar patterns are used in the “plan space organization” of all buildings. The only difference is seen in the increased access hierarchy or privacy regarding the importance of building function due to the use of route change and the longer route of movement in the castle. Construction techniques are similar in all buildings in terms of materials and construction methods, but decorations are considerably used outside of Asbad buildings.

• According to evidence and studies on the distinction between buildings of Hozdar City, “plan space organization” is similar to the Safavid architectural style, but the “construction techniques” are more adopted from the Sassanid patterns and indigenous designs of surrounding villages, so various arches with different dimensions and openings are used in these buildings. The most different and outstanding architectural feature of Hozdar compared to other Safavid cities is the non-use of colorful materials such as tile, pottery, wood, and plaster inside the buildings despite the availability of these materials. In general, it seems that the historical buildings of Hozdar are similar to other cities of the Safavid Era in terms of the physical features and patterns that create the concept and meaning in the architecture (for instance, these similarities are seen in the spatial sequence and hierarchy that create the concept of privacy and visual

continuity that leads to the organization of view and transparency). However, the aspect that is related to the construction technique and implementation of various components and provides a physical aspect more than other dimensions is adopted from the vernacular architecture of Sistan, which is different from Safavid architecture in other cities

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CONFLICT OF INTEREST

There is no claim of conflict.

MORAL APPROVAL

The authors commit to observe all the ethical principles of the publication of the scientific work based on the ethical principles of COPE. In case of any violation of the ethical principles, even after the publication of the article, they give the journal the right to delete the article and follow up on the matter.

PARTICIPATION PERCENTAGE

The authors state that they have directly participated in the stages of conducting research and writing the article.

ENDNOTE

1. According to this description, it seems that this area was located in the connection route between Sistan and Kerman during the Safavid Era. This route possibly connected Hozdar and Kondar to Nosrat Abad and then to Bam and Kerman. The water required for Hozdar City and subsequently for Rostam Castle through a main channel branched from the Biaban River that had had many different names during various periods (Sistani 2004, 144).
2. This area is a place where, Faramarz-son of Rostan- fought with Bahram-son of Esfandiar- and killed him with spear. There are gates in the north and south of the area surrounded by a moat 15m in width (Arbab Bikas et al. 2009, 29). The glory of this castle has given a mythological-historical aspect to this area, so it has been named Rostam after the most famous character of Sistan during Ferdowsi's heroic era, while no information is available about its constructors and users (Oveisi and Kavosh 2015, 2). Mohammad Azam Sistani assumes that Rostam Castle and its surrounding monuments belong to Raeesi Tribe, which head of Sarabandi Tribe captured it and killed most of the inhabitants of the castle (Sistani 1988, 2/359).
3. Buildings of this period have four porches; however, the construction of large porches with large dimensions has been considered (Javadi 2006, 6).
4. "Ghale Machi building is a two-porch building with a north-south direction, 38m length and 39m width. Symmetry has been observed as much as possible. This building consists of a central courtyard and two porches in north and south with large and small halls around the courtyard, which is continued in its second floor too" (Kavosh 1998, 161).
5. "One of the form features in the vernacular architecture of Sistan is seen in lattice shelters designed on the roof of houses. These shelters protected the roof and also created airflow and coolness on the roof. Moreover, these shelters or parapets created a beautiful view and landscape while providing a suitable place for sleep at night" (Tavasoli 2002, 119).
6. First, to prevent strong winds from destroying them, and second, to give centrality to the building because the location of Asbads is a place where farmers gather together after product harvesting and create a small community for exchange and sell wheat and flour (Khezri and Imani 2009, 115).

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