



Journal of Art, Architecture and Built Environment (JAABE)

Volume 4 Issue2, Fall 2021

ISSN: 2617-2690:(P) 2617-2704:(E)

Journal DOI: <https://doi.org/10.32350/jaabe>

Issue DOI: <https://doi.org/10.32350/jaabe.41>

Homepage: <https://journals.umt.edu.pk/index.php/JAABE>

Article:

Analytical Study of Decorative Techniques Used in Shīsh Maḥal, Lahore Fort, Pakistan

Author(s):

Khalifa Ahmed Muiz

Affiliation:

University of the Punjab, Lahore, Pakistan

Article DOI:

<https://doi.org/10.32350/jaabe.42.03>

Article
History:

Received: June 21, 2021

Revised: September 2nd, 2021

Accepted: September 28, 2021

Available Online: December 14, 2021

Citation:

Muiz, K. A. (2021). Analytical study of decorative techniques used in Shīsh Maḥal, Lahore Fort, Pakistan. *Journal of Art, Architecture and Built Environment*, 4(2), 33–58.

Copyright
Information:



This article is open access and is distributed under the terms of [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

Journal QR



Article QR



Indexing



A publication of the
School of Architecture and Planning
University of Management and Technology, Lahore, Pakistan

Analytical Study of Decorative Techniques Used in Shīsh Maḥal, Lahore Fort, Pakistan

Khalifa Ahmed Muiz*

University of the Punjab, Lahore, Pakistan

Abstract

Shīsh Maḥal, the magnificent and monumental creation of Mughals, still stands like a jewel after hundreds of years. This building characteristically excels in its decoration and is best known for its intricate detailing. The evolution and transformation of decorative arts reached its zenith during the reign of Shāh Jahan (1628 - 1658), which is known as the era of delicacy and pure light in white. The aim of this paper is to study the decorative arts that excelled during this golden era. In this regard, Shīsh Maḥal, situated at the Lahore Fort, is taken as a case study. Comprehensive documentation of these decorative arts including their design, material and technology developed the baseline inventory for their interpretation and appreciation. The study further explored the transformations and transitions during their refinement in addition to their description in the historical textual data.

Keywords: Decorative techniques, Pietra-dura, Shāh Jahan, Mumtaz

Introduction

The Lahore Fort emerged as a Mughals residential paradise along with its defensive characteristics. Therefore, they constructed different purpose buildings to accommodate their various functions accordingly. One of such marvelous addition is Shīsh Maḥal, which is translated as “Mirror Palace”, constructed by Shāh Jahan between 1631 and 1632. The concept of Mirror Palace is based on the dream of Mumtaz Mahal, the beloved queen of Shāh Jahan (Latif, [1994](#)).

Shīsh Maḥal is placed in the north western corner of the Lahore Fort. The finest quality mirror work reflects the minute detailing of the dream by the queen. The mirror work embedded precious stones further enhanced the overall ambiance of the space. Most of the original material is lost with the time but still it displays the glorious Mughal era of excellence.

*Corresponding Author: chairman.arch.cad@pu.edu.pk

Shīsh Maḥal front is decorated with a five-arched verandah before entering into the bedroom for Royals. The verandah mirror work is designed to capture all attraction by the glittering effects and the enriched sparkling experience. The bedroom decoration is very unique with star shaped mirrors along with the shining crystals that sparkles even in the dark depicting the dream of the queen (of the night view). The lavishly used invaluable stones include rubies, lapis lazuli, sapphires and emeralds that enriched the mirror work by adding colors to it. The original stones were stolen that's why the synthetic ones are placed during the restoration works.

The raised platform with fountain surrounded by the walkways presents stunning views in the full moon. The mathematics of space planning works on the principle of reflecting the moonlight on the mirrors that creates a wonderful and magnificent scene that envelope everyone in its spectacular aura. This was created to express the love of the emperor for his beloved queen (Munir, [2019](#)).

Decorative Techniques Used in Shīsh Maḥal

The salient features of the Shish Mahal are its varied decorations and ventilation systems. This research focused on exploring the aforementioned salient features of the Shīsh Maḥal. It also examines the various kinds of decoration techniques used in the construction of the Shīsh Maḥalsince they are considered its defining feature (Nazir, [1998](#)).

As far as the ventilation system of the Shīsh Maḥal is concerned, the Mughals very astutely exploited the “climate-responsive architecture” and the “material science” of that era. Small windows supplemented by *jāli* work were constructed facing the river, which was also the windward side. The incoming air through the windows used to touch the surface of the river to become moist and cool before entering the building. Additionally, the *jāli* acted like a funnel and used to increase the velocity of the incoming air, making the whole building atmospheric and cool.

On the other hand, there was a large compound on the leeward side of the Shīsh Maḥal. There the floor is made up of marble, which has a tendency to store energy. The air, present in the compound, upon contact with the floor becomes hot and rises up. It leaves a vacuum behind, which was filled

by the air coming from the river side. In this way the ventilation cycle was completed, leaving the building well ventilated throughout the day*.

Previous literature suggests that the incoming air from the windows was also aromatic. This hypothesis is proven by the presence of troughs in front of the windward side windows. It is believed that these troughs were filled with fragrant flowers whose aroma mixed with the air that made the whole space aromatic (Shahzad, [2009](#)).

Various techniques of decorations were used to decorate the Shīsh Maḥal. These techniques are the chief characteristic of the Shīsh Maḥal. Through research, we found out that nine techniques were used to decorate the Shīsh Maḥal (Aijazuddin, [2003](#)). These techniques include:

1. Pietradura
2. Fresco painting
3. Stone carving in relief
4. Stone carving
5. Marble work
6. Stone fretwork
7. Wooden fretwork
8. Glass mosaic (Ā'īnakāri)
9. Mirror and gilded stucco tracery work (*Munābatkāri*)

Research Methodology

This research mainly focused on examining the ornamentation/decorative techniques employed during Mughal Emperor Shāh Jahan's reign. The data was collected through analysis of archival documentation, visual surveys, and historical textural references. The study further explored the precision and skill of decorative techniques used during the golden period of Mughal empire. It was determined that the techniques mainly employed the use of sparkling white marble. Thus, this study is a descriptive research that explored each decorative art used in Shīsh Maḥal architecture in detail. The data was obtained from all available resources and scrutinized to appreciate

*The phenomenon can be understood from the schematic conceptual plan of Shīsh Maḥal attached with the document as Annexure A.

the beauty of the ornamentation/decorative techniques employed by Mughal architecture.

Results and Discussions

Generally, Mughal buildings employed elements of Islamic architecture. Eye catching pure white, pale and red sand stone colour was used as contrast against the green vegetation in the background (Lal, [1884](#)). Thus, Mughal architecture needs to be examined in order to appreciate and understand their use of colours and compositions.

Following is the detailed description of various decoration techniques used in Shīsh Maḥal located in Lahore Fort.

Pietradura

Pietra dura is a stone carving inlay technique. It is said to originate from Florence, Italy. Pietra dura technique was used to describe sculptural details and to decorate furniture, cameos, vases and panels. Various stones were used for this purpose including malachite, jasper, and lapis lazuli. Pietra dura is an Italian phrase, which means “hard stone”. It is usually referred to a stone carving technique in which coloured stones are used to create intricate inlaid pictures.

The stones used for inlay work are silicates such as agates, amethyst, jasper, malachite, topaz, alabaster, jade, lapis lazuli and onyx. Originally the pietra dura art was referred to shaping stones to decorate objects like vases and small sculptures. In order to shape the stone, small saws, wires and other metal instruments were used. The art was revitalized during renaissance by Italian craftsmen. The first hard stone workshop was setup by Medici family in Florence in 1588. The pietra dura technique was not only used in Florence, but it was also practiced in Naples, Madrid, Prague, and Paris. From the late 16th century, pietra dura was used to inlay stones and create landscape and flower scenes. Unlike the pietra dura of Italy, Indian pietra dura is flatter rather than three dimensional. Mughals adapted the pietra dura with their own variations. The European birds were replaced by local birds like kingfisher, myna, and red breasted parakeet (Baqir, [1952](#)).

In the *Shīsh* Maḥal, pietra dura has been used at the base of the columns and at the inner side spandrels of the multi-foil arches at the entrance hall. Various floral patterns have also been created through the use of this technique.

Figure 1

Pietra-Dura at the Inside of Spandrel of Arch



Figure 2

Pietra-Dura at the Base of Column



Figure 3

Pietra-Dura Line Drawing of a Motif



Figure 4

Pietra-Dura Line Drawing of a Motif

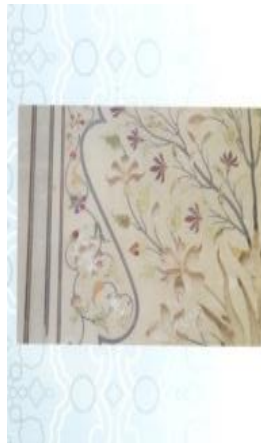


Figure 5*Pietra-Dura Line Drawing of a Motif***Figure 6***Pietra-Dura Line Drawing of a Motif***Figure 7***Pietra-Dura Line Drawing of a Motif***Figure 8***Pietra-Dura Line Drawing of a Motif*

Various patterns were adopted as shown in (Figure 1 to Figure 8). It can be seen that finesse and sophistication of the highest level was achieved through the use of this technique. This finesse can be seen in the construction of petals that were made up of two tones to show light and dark shades (UNESCO, [2006](#)).

During the construction of the Shīsh Maḥal, various stones from all over India were imported and then carved to perfection to create unmatched patterns using the pietra dura technique. The stones used in Shīsh Maḥal's pietra dura work are shown in Table 1 (Feilden, [1982](#), [1989](#)).

Table 1*Stones used in Pietra Dura Work at the ShīshMaḥal, Lahore Fort*

Sr. No.	Stone	Stone (English)	Query
1	Chitorrorsang-iMūsa	Black Marble	Dholpūr, India
2	Sang-iKhattu	Turquoise	Judhapūr or Dholpūr, India
3	Sang-iZaharmura	Turquoise	PākistānSwāt
4	Sang-iLājward	Lapis lazuli	Qandhār, Afghānistān
5	Sang-iAqīq	Carnelian	Irān + Jaipūr, India

If we look at the pietra dura work done at the base of columns and at the inside spandrel of arches located at the entrance hall, one difference is very obvious. The pietra dura work at the bases of the columns has been done on a miniature scale, which is the essence of pietradura; whereas, the work done on the spandrel is on a large (stone inlay) scale.

With the passage of time, the pietra dura work has deteriorated. If we look at the pietra dura work at the above mention two sites, then we could see that the work done at the bases of the columns has deteriorated more than the work done at a site which is out of the humanman’s reach. There are various causes behind the deterioration. These causes include:

1. Chemistry of the stone (bonding of stone particles)
2. Exposure to sun
3. Acid rains
4. Vandalism
5. Mortar quality

Everything tends to decay with time and so is the case withthe stones used for various decorations in the Shīsh Maḥal. This is evident when we look at the stones used in Shīsh Maḥal’spietra dura work. This deterioration varies stone to stone, it mainly depends on their nature, chemistry and physiology. If we look at the stones of different physiology, we shall come to know that stones with coarse grains deteriorate more rapidly than the stones that have fine grains. For example, “turquoise” (local name: sang-ikhattu) deteriorates more rapidly than “agate”.

The characteristics of stones depends upon multiple factors such as change in the position of the sun and exposure to rain. The stones exposed to sun face harsh climate and expand and contract rapidly. Due to this reason, the stones exposed to sun light deteriorate more rapidly than the stones used indoors where there is a controlled environment. Similarly, the stones exposed to rain deteriorate more quickly due to the chemical effect of acid rain. The acid is formed in the rain water due to the presence of air pollutants.

Deterioration of pietra dura stones is due to “acid rain” and not due to rain. Rain with a pH value less than 5.6 is termed as acid rain. The rain in Semi-arid regions can be termed as low intensity acid rain as it has pH value ranging from 5.0 to 5.5. The description of acids produced due to pollutants is shown in Table 2.

Table 2

Types of Acids Produced due to Pollutants

Pollutants	Combinations	Products
SO ₂	SO ₂ + H ₂ O	H ₂ SO ₃
	SO ₃ + H ₂ O	H ₂ SO ₄
	SO ₂ + O ₂	SO ₃
	SO ₃ + H ₂ O	H ₂ SO ₄
NO ₂	NO ₂ + H ₂ O	HNO ₂ /HNO ₃
	HNO ₂ + H ₂ O	HNO ₃
CO ₂	CO ₂ + H ₂ O	H ₂ CO ₃
HYDROGEN FLOURIDE	HF + H ₂ O	HFO ₃

Due to these rains, stones become porous and discolored and peeling of stones. For example, stones such as turquoise (Sang-iKhattu) become rough when exposed to acid rain.

Thus, climate conditions of a region play an important role in the deterioration of stones. In a harsh climatic zone, such as Pakistan, stone expand and contract due to rising temperatures during the day and cooling temperatures at night, respectively. Due to this rapid expansion and contraction, the bonding within the stone gets loose and the stone attains a rough texture. Another factor associated with deterioration of stones is the

co-efficient of expansion and contraction of the stone. Stones with high co-efficient of expansion and contraction deteriorate more rapidly as compared to the stones with relatively low co-efficient of expansion and contraction.

Fresco Painting

Fresco paintings are also found at the back wall of the entrance hall in the form of panels and on the side chamber's walls. The fresco paintings were created during Sikh rule (Haq, [2018](#)).

Figure 9

Probable Wedding Ceremony of Karishna Offering Garland to Bride with Attendants Holding Umbrella



Figure 10

Meeting of Two Hindu Rajas



Figure 11

*Shiva with His Disciple.
Background Showing Mughal*



Figure 12

Hunting Scene



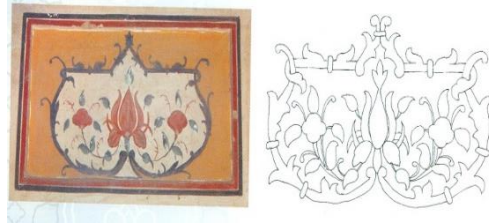
Figure 13

Karishna and Radha. Sheep is also Seen



Figure 14

Line Drawing of a Fresco Painting



The paintings that depict Sikh period are located in the main entrance hall. Additionally, floral patterns have been created using fresco painting in the flanking rooms. Just like pietradura, delicacy in fresco paintings was also observed. Shading was used to create floral patterns since gives the paintings two-dimensional look.

Figure 15

Line Drawing of a Fresco Painting



Figure 16

Line Drawing of a Fresco Painting

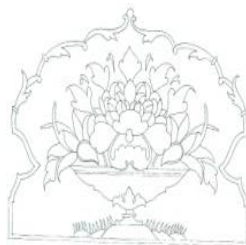


Figure 17

Line Drawing of a Fresco Painting



Figure 18

Line Drawing of a Fresco Painting



The ceiling of the flanking rooms is also decorated with fresco painting. It has a beautiful and delicate floral pattern. Blue, green, orange, red and white colour has been used to create beautiful harmony, contrast, and balance. The painting is two dimensional, it still uses light and dark tones for shading.

Figure 19

Fresco Painting at the Ceiling of Flanking Room

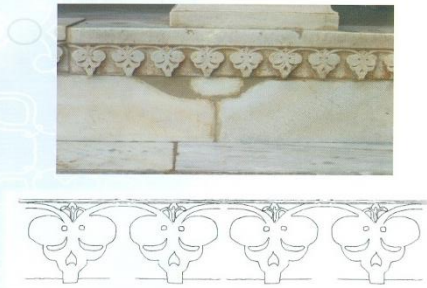


Stone Carving In-Relief

It is used at the front façade of the entrance hall beneath the base of the columns. In stone carving in-relief, the actual motif has been carved out of the stone. This work has been done on white marble (Sang-iMarmar).

Figure 20

Line Drawing of Stone Carving In-Relief

**Figure 21**

Stone Carving In-Relief at the Front of Padestal



Stone Carving

This technique has been used at the capital of the double columns that are located in the entrance main hall. It has also been done on marble. The capitals of du-decagonal columns have been beautifully carved out in the form of arches in three stepped layers.

Figure 22

Stone Carving at the Capital of Columns

**Figure 23**

Blow Up Detail of Figure 22



Arch is considered the most stable structural element in architecture. Any load that is present at the center of the arch is comfortably shifted to the vertical structural element such as the shaft of the column. Thus, carved arches also have another role to play as they are used as a technique to

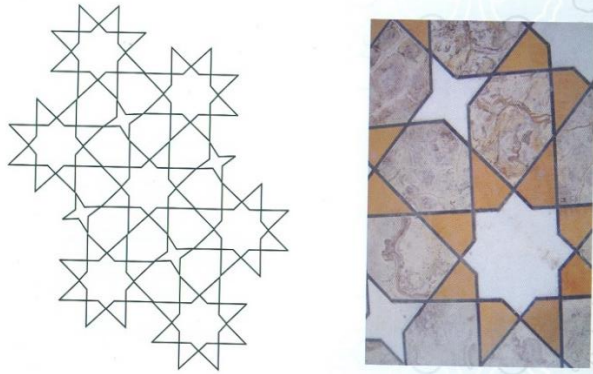
transfer the load of the heavy super structure to the base through columns. The staggered arches shift the load to the shaft of the column and ultimately to the base (Kipling & Thornton, [2002](#)).

Marble Work

The floor has been decorated with geometric pattern created through marble work. The geometric work looks complex but it is constructed simply by two overlapping squares that overlap each other a

Figure 24

Line Drawing of Marble Work Done at the Floor



Through observation, it was found that different types of stones have been used in the floor, such as Sang-iMarmar, Sang-ikhattu, and Sang-iMusa. Sang-iMusa's been delicately cut to mark the outline of the pattern. The walls of the flanking rooms used Sang-iMarmar having dado finish.

Figure 25

Marble Work Done on Walls in the form of Panels



Similar stones such as Sang-iMarmar, Sang-iKhattu, and Sang-iMusa have been used to create the floor pattern of flanking rooms. The stones have been delicately cut to form a floor pattern. Sang-i Musa has been used to form the outline. At the center and side of the flanking room's floor pattern, Sang-i Musa forms an overlapping square pattern.

Stone Fretwork

Fret work in Sang-iMarmar is found in all rooms facing the old river Ravi, which used to flow at the North and North-West side of the Shīsh Maḥal. The delicate fret work has been done extensively in the back of the central chamber. All of the three chamber openings are fully filled with beautiful fret work carved in Sang-iMarmar. The central opening has floral and geometric pattern, whereas the flanking openings only have geometric pattern.

Figure 26

Central Opening Marble Fretwork



Figure 27

Floral Marble Fretwork



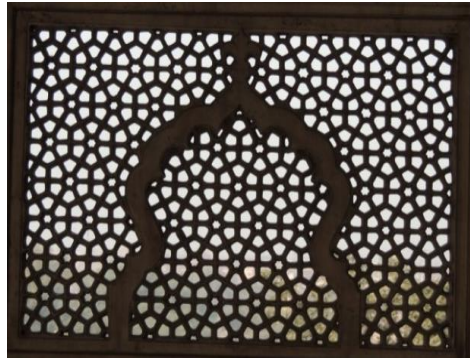
Figure 28

Marble Fretwork of Central and Flanking Opening



Figure 29

Geometric Pattern of Marble Fretwork



The openings in the flanking rooms have fret work in stone to the height of eighteen inches. The stones act as a parapet. These openings have geometric patterns (Goulding, [2006](#)).

Figure 30

Marble Fretwork in Flanking Room



Figure 31

Geometric Pattern of Marble Fretwork



As the openings are located at the windward side, the fret work in the openings act as a funnel and increase the velocity of the wind that ventilates the space. Even today, one can feel a strong wind current upon entering from the windward side (i.e., Minār-i Pakistan side).

Wooden Fretwork

This type of work is found on the roof of the main entrance hall and the chamber behind it. The fret work has been done on bamboo. Bamboo was used since it is flexible material and can be molded into various geometric patterns. Furthermore, bamboo is resistant against termite attack and is tough against wear and tear caused by extreme weather. The fret work has been covered with lime plaster in such a way that the pattern in fret work stands out against the plaster. Mirror work has been applied over the lime plaster.

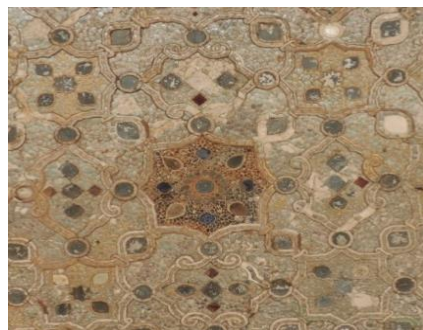
Figure 32

Wooden Fretwork at the Ceiling



Figure 33

Blow Up Detail of Figure 32



Glass Mosaic (ĀĪNAKĀRI)

Glass and mirror work is the main decorative techniques used in the Shīsh Maḥal. It has been most extensively used. Shish Mahal is named after the technique employed in the glass and mirror work. Glass mosaic has been used in the form of panels at the entrance main hall and behind the chambers. Various floral patterns and bird patterns have been used for decoration. Floral motifs dominate all other shapes. Coloured glass has been used to create different patterns. The glass has been pressed over wet lime plaster so that it fits delicately in its place. The plaster that comes out of the width between two glasses holds the glass (stucco work) in place. This fine layer of plaster was then gilded with gold.

Various floral patterns that are used in Shīsh Maḥal are as follows:

Figure 34

Pattern of Glass Mosaic



Figure 35

Pattern of Glass Mosaic



Figure 36

Pattern of Glass Mosaic



Figure 37

Pattern of Glass Mosaic



Figure 38

Pattern of Glass Mosaic



Figure 39

Pattern of Glass Mosaic



Figure 40

Pattern of Glass Mosaic



Figure 41

Pattern of Glass Mosaic



Figure 42

Pattern of Glass Mosaic



The glass mosaic shown above has sharp colours that stand out against the white surrounding. Another feature of the glass mosaic is that each mosaic is beautifully framed by a border of glass mosaic. Following are some line drawings of various glass mosaic patterns present in Shīsh Maḥal.

Figure 43

Line Drawing of Glass Mosaic

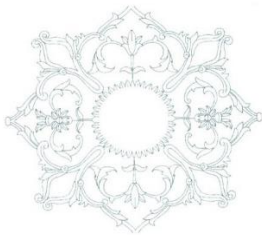


Figure 44

Line Drawing of Glass Mosaic



Figure 45

Line Drawing of Glass Mosaic

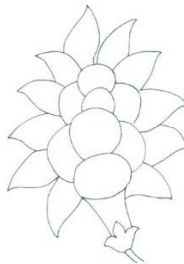


Figure 46

Line Drawing of Glass Mosaic



Figure 47

Line Drawing of Glass Mosaic



Figure 48

Line Drawing of Glass Mosaic

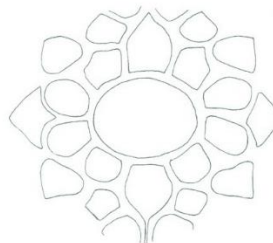


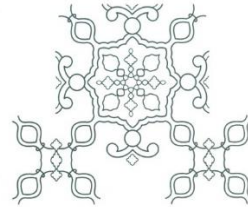
Figure 49

Line Drawing of Glass Mosaic



Figure 50

Line Drawing of Glass Mosaic



Mirror and Gilded Stucco Tracery Work

Stucco tracery is different from stucco work, both of which are techniques used in the construction of Shīsh Maḥal. In order to appreciate the work done in Shīsh Maḥal, it is therefore important to know the difference between them.

In stucco work, wet lime plaster comes out of the gap between two mosaic components. This wet lime plaster holds the components in place.

In stucco tracery work, when the wet lime plaster comes out of the gap between the two mosaic components, it is molded to make beautiful floral patterns.

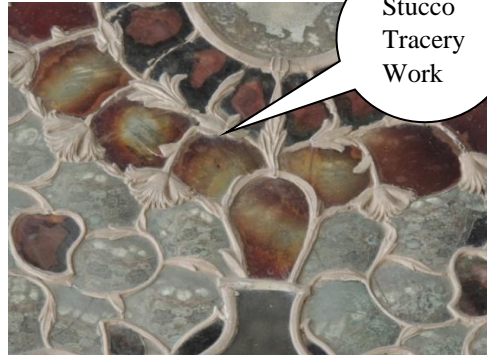
Figure 51

Stucco Work



Figure 52

Stucco Tracery Work



In Shīsh Maḥal, beautiful examples of stucco gilded tracery work can be seen. This decorative technique is used in the main entrance hall and the

chamber behind the main entrance hall. This work is found at a height that is out of a human man's reach. Beneath gilded stucco tracery work, simple stucco work can be seen. It is believed that gilded stucco tracery work was done in all areas of the Shīsh Maḥal, but with time, it degraded and was unrecognizable. The simple stucco work that we see today is the maintenance carried out by Pakistan's Department of Archaeology in 1970s.

Mirror and gilded stucco tracery work is seen in the main entrance hall. It blends beautifully with the glass mosaic work. Some examples of this work are as follows:

Figure 53

Mirror and Gilded Stucco Tracery Work



Figure 54

Blow Up Detail of Figure 53



Figure 55

Mirror and Gilded Stucco Tracery Work



Figure 56

Blow Up Detail of Figure 55



Figure 57

Mirror and Gilded Stucco Tracery Work



Figure 58

Blow Up Detail of Figure 57



Mirror and gilded stucco tracery work is also used at the ceiling of the main entrance hall.

Figure 59

Gilded Stucco Tracery Work at the Ceiling



Figure 60

Gilded Stucco Tracery Work at the Soffit of the Arch



It is also used at the soffit of the arch that is located behind the entrance hall, this arch is built as a cased opening between entrance hall and the central chamber. The original work was carried out in the reign of Shahjahan.

Figure 61*Blowup Detail of Figure 60***Figure 62***Glass Mosaic, Mirror and Gilded Stucco Tracery Work At the Soffit of the Arch*

If we try to go to the flanking rooms from the central chamber, we see that the roof is a half dome. In this half dome we find geometric patterned glass mosaic blended with gilded stucco tracery work.

Figure 63*Glass Mosaic, Mirror and Gilded Stucco Tracery Work at the Half Dome***Figure 64***Geometric Patterns at the Half Dome*

Figure 65

Details of Glass Mosaic, Mirror and Gilded Stucco Tracery Work at the Half Dome



Figure 66

Details of Glass Mosaic, Mirror and Gilded Stucco Tracery Work at the Half Dome



Figure 67

Details of Glass Mosaic, Mirror and Gilded Stucco Tracery Work at the Half Dome



Conclusion

Shīsh Maḥal was constructed by ShāhJahān in 1631-32. The royal grandeur and magnanimity of the architecture of that time is well depicted in the Shīsh Maḥal. The delicacy of the decorative work done in Shīsh Maḥal is matchless. The fineness of gilded stucco tracery work is enchanting and gives a glimpse of the Mughal's taste in architecture. The colours and contrast have been delicately used in glass mosaic work. The

petals of flowers have been painted in double tone to show shade and shadow. Pietra dura has been lavishly used in Shīsh Maḥal at the base of the columns and at the inside spandrel of the entrance arches. The stones have been delicately cut to perfection to form beautiful floral patterns. The stones were skillfully cut to show different shades and shadows in the flower patterns. Additionally, it was found that the fresco paintings were painted during the Sikh period. The precision and skill that is the trade mark of Mughal aesthetics is absent in the fresco painting found in the Shīsh Maḥal. For example, the sheep and lamb shown in one of the paintings with Karishna and Rādhaare crudely drawn. The detailed analysis of the decorative techniques used in Shīsh Maḥal shows us that there is a deep affiliation between the decorative aesthetics of the building and the Mughals of that era.

References

- Aijazuddin, F. S. (2003). *Lahore recollected: An album*. Sang-e-Meel.
- Baqir, M. (1952). *Lahore, Past and Present: Being an Account of Lahore Compiled from Original Sources* (No. 34). Panjab University Press.
- Feilden, B. B. M. (1989). *Guidelines for conservation: A technical Manual*. The Indian National Trust for Art and Cultural Heritage.
- Feilden, B. M. (1982). *Conservation of Historic buildings*. Butterworth & co. Publisher.
- Goulding, C. (2006). *Old Lahore*. Sang-e-Meel Publications.
- Kipling, J. L., & Thornton, T. H. (2002). *Lahore as it was: Travelogue, 1860*. National College of Arts.
- Lal, K. (1884). *Tareekh-e-Lahore*. Sang e Meel Publications.
- Latif, S. M. (1994). *Lahore: Its history, archeological remains and Antiquities*. Sang-e-Meel Publications.
- Munir, S. (2019). *The lady behind the Sheesh Maḥal*. The News on Sunday. <https://www.thenews.com.pk/tns/detail/568004-101283>
- Nazir, A. (1998). *A short history of Lahore*. Sang-e-Meel Publications.

Shazad, G. (2009). Lahore ghar, galliyan, darwaze. Sang e Meel Publications.

UNESCO. (2006). *Motifs and Designs a selection*. <https://whc.unesco.org/en/list/171/>

SaleemulHaq. (2018). Project Lahore Fort conservation ShāhBurj documentation key plan level 1 [Interview]. Department of Archaeology Northern circle ShāhiQila, Lahore.