

# Present Condition and Causes of Decay of Tomb of Jahangir at Shahdara, Lahore

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## Abstract

*All the materials used in the construction of historical buildings undergo deterioration when exposed to aggressive environments. The rate and symptoms of such a process is influenced by a number of factors, including the properties of material itself, the natural factors and human-actions. These factors either act separately or in various combinations. Conservation refers to systematic measures taken to keep the monument in good condition.*

*The monument of Jahangir's tomb is about 370 years old. Several times, since its construction, it has gone through various repairs and restoration work, though never under a comprehensive conservation plan. The nature of restoration work included the restoration/repair of cenotaph, stone pavements and some facades of main building.*

*This paper is focused on the study and analysis of the present condition of structure of building of this very important historic monument, the 'Tomb of Jahangir', situated at Shahdara, Lahore.*

*The aim of the paper is to identify the causes of decay and deterioration of the building through a detailed visual examination carried out by authors of the paper during the year 2004.*

*An examination of the building has shown that there is no single cause responsible for the deterioration and decay of Jahangir's tomb. It has been found that there are number of intrinsic (internal) as well as extrinsic (external) causes responsible for decay of the building. Thus this paper is an attempt to facilitate the work of conservator/conservation-architect by providing necessary information required for the conservation/restoration of a historic monument.*

**Keywords:** Monument; Mughal architecture; Cultural heritage; Archaeology; decay; deterioration conservation; creation; destruction; restoration; neglect; maintenance; facade; construction techniques

## 1. Introduction

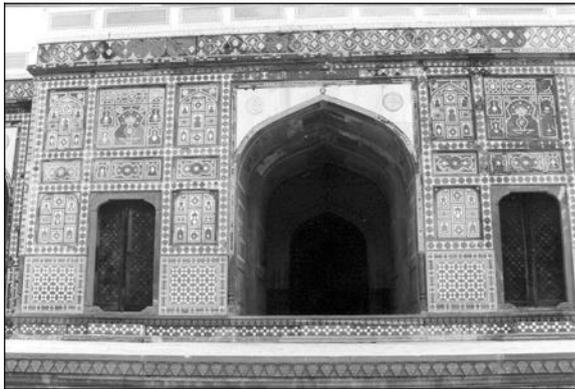
The tomb of Mughal Emperor, Jahangir, is one the most significant historic buildings of the Mughal period. Emperor Jahangir was son of Mughal Emperor Akbar the Great. Jahangir died in 1627 AD and according to his last wish he was buried at Shahdara, Lahore in the garden of "Dilkusha" situated on the north-western bank of the River Ravi. Now the area of whole Shahdara complex (Jahangir's tomb, Akbari Serai and Asif Jah's tomb) is 100 Acres, out of which area of Jahangir tomb is 59 Acres. The Jahangir' tomb is approached through a spacious Serai, called Akbari Serai, which is a rectangular enclosure. Its interior court is surrounded on all sides by raised walkways and small room/cells. The Jahangir's tomb is situated to the east of this Serai. The tomb is single storey square building and

is set in a luxuriant square garden of "Chaharbagh" style. Each corner of the building is surmounted by an octagonal minaret which is structurally attached with main building. Jahangir was succeeded by his son Emperor Shahjahan who started construction of his father's tomb in 1627 and completed in 1637.

As restoration of this monument has continuously been done after its first construction and lastly in year 2004, western facade of main building was restored by the Department of Archaeology and Museums, Pakistan, as shown in Figure 1.

As the building is one of the masterpieces of the Mughal architecture, it was considered appropriate to find out major causes of its decay. The causes of decay relate to various factors which have been discussed in the following sequence:

1. Causes, related to geographical location of building, such as thermal movement, rain and moisture and natural disasters
2. Causes related to nature of ground.
3. Causes related to materials and techniques used in original construction.
4. Man-made causes which include willful destruction, neglect, atmospheric pollution, vibration, wear and tear by visitors and use of poor conservation techniques.
5. Biological and Micro-biological causes.



**Figure 1:** Western facade after restoration .The floor of main building has slightly curved downward due to settlement.

## 2. Causes Related to Geographical Location of Building

These mostly concern with climatic condition to which the building is subjected all the time, such as solar radiation, temperature, humidity, rain, wind speed, floods, earthquake etc. These are now discussed in detail in the following section.

### 2.1 Thermal Movement

Lahore falls within the zone of extreme climate. During summer the temperature rises up to 48°C and during winter it falls down to 0°C. [1] The exposed parts of building expand more due to solar radiation, where as internal and shaded parts of building stay relatively cool. Thermal movements create stress in building material and components, which results in cracks in the material and structure. Different materials and even the same material of different colors have different thermal expansion, due to which cracks, between the joints of masonry, are developed.

The building of Jahangir's tomb has massive

masonry structure. The upward thermal expansion is controlled by compressive forces of dead load, but the horizontal movement has created vertical cracks on the upper portion of building. The roof, which is decorated with different colored stones, has also developed cracks between joints at roof; through these cracks, the rainwater percolates and causes damage to the interior of building, having fresco painting and mosaic tile work.

### 2.2 Rain and Moisture

In the city of Lahore, the average rainfall is 20 inches annually [1]. Rain damages the masonry above the ground and penetration of rainwater through capillary action causes decay of structure internally. The rainwater picks up soluble materials along its path and destructive crystallization process occurs when water evaporates. Salt crystallization results in powdering of surface, cracking in material and sometimes even complete disintegration of stone masonry. Contour scaling also occurs due to repeated wetting and drying cycles of stone masonry.

The facade of Jahangir's tomb is of red sandstone, which is a porous material. Cavernous decay can be witnessed on the facade, where the cavities have developed and marble inlay has either corroded or fallen down. Scaling and contour scaling on stone surface has also taken place due to repeated wetting and drying cycle. At some places, salt crystallization has resulted in a form of powdering and fragmentation of surface as it exerts pressure on the pores of material.

### 2.3 Natural Disaster

Jahangir's tomb, one of the Shahdara monuments, is situated at a distance of about 1/2 km from the river Ravi, which always remains a source of serious threat to the monument at the time of flood. The Shahdara monuments were damaged during the floods of 1938, 1955, 1973 and 1988. The flood water remained standing at Jahangir's tomb for five days during the flood of 1988 and its level varied in height from 6 feet to 10 feet [2] (Figures 2 & 3). This natural disaster has prolonged action and reaction on the monument. The flood has affected the north-west minaret of building. The lower portion of this minaret has bulged outward and its veneering has mostly disintegrated (Figures 4 & 5). Its shaft and walls also have major cracks (Figure 6). The earth shaking shocks induce dynamic movement in all three dimensions of building. Although, Lahore is not in serious seismic zone, even then cracks have developed at the corner of walls, around openings and arches at Jahangir's tomb; which shows that the structure might have weakened due to long life span.

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