

Architectural Marvels of Sikh Empire: The Gobindgarh Military Fort in Northwestern India

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ABSTRACT

Also referred to as Bhangi Fort, Gobindgarh Fort was originally constructed in 1760 by Sardar Gujjar Singh, the chief of the Bhangi Misl. The fort is built using bricks, lime, and clay, reflecting the original construction methods of the 18th century. It was later renamed Gobindgarh Fort by Maharaja Ranjit Singh in honour of the tenth Sikh Guru, Guru Gobind Singh. Extensive renovations of the fort were carried out between 1805 and 1809 under the direction of Maharaja Ranjit Singh's two European military advisors, General Jean-Baptiste Allard and Jean-François Ventura. These modifications transformed the fort into both an artillery stronghold and the royal treasury—at one point maintaining the legendary Kohinoor diamond. The fort features a square layout, encompassing roughly 1,500 square meters, and is fortified with two massive iron-clad gates and four defensive towers at each corner. It has two main access points: the front entrance known as Nalwa Gate and the rear gate called Keller Gate. The primary entrance, also referred to as "Darwaza-e-Tope-e-Qila," included guard posts, and during Maharaja Ranjit Singh's reign, was defended by five artillery pieces. Drawing on archaeological findings, three-dimensional analysis, and historical sources, this study interprets Gobindgarh Fort as a military-architectural hybrid that represents the strategic difficulty and adaptive strength of the Sikh Empire. It offers critical insights into heritage defence and the evolution of early modern fortification systems in South Asia.

Keywords: Gobindgarh fort history, Architecture, rebuilding the structure, fortification system, zamzmma cannon.

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1. INTRODUCTION

Sikh architecture is a design style marked by innovation, elaborate detail, striking elegance, and harmonious, logical curves. Though rooted in Sikh religious architecture, this style has been embraced for various non-religious buildings because of its compelling visual appeal. The architectural use of marble during the Sikh Empire has emerged as one of its most admired and enduring legacies. Marble was not simply a building material but a statement of spiritual ideals, aesthetic innovation, and technical mastery, especially prominent in both religious and secular structures throughout the empire. The Golden Temple in Amritsar stands as the most iconic example, where marble serves as the base of the entire structure. The lower parts of the temple are made of pure white marble, which creates a sense of peace and spiritual purity. This marble was often sourced from Rajasthan and was chosen for its fine quality and lustrous appearance. The marble base anchors the temple structurally and symbolically, providing the perfect balance to the lavish gold plating that adorns the upper levels. This intricate craftsmanship involves the incorporation of semi-precious colored stones into marble slabs to create elaborate floral, geometric, and uniquely animal and human motifs. This distinguishes Sikh inlays from Mughal examples, which generally eschewed life-size sculptures. These panels go beyond decoration; they convey spiritual stories and Sikh heritage, adding deep meaning to the marble surfaces. Beyond the Golden Temple, other important religious structures such as Sri Keshgarh Sahib in Anandpur also feature extensive white marble. The gleaming marble domes and halls stand as expressions of Sikh spiritual ideals – purity, humility and unity – while their crisp lines and elegant forms exemplify the rationality and progressiveness characteristic of the Sikh architectural style. The employment of marble was not limited to

gurdwaras. It also found its way into the magnificent forts and palaces built during the reign of Maharaja Ranjit Singh. In structures like Gobindgarh Fort, marble is less dominant as a construction material but still features in decorative elements like stone screens and root work, which extend the values and artistry of Sikh temple architecture to civil and military buildings as well. With the rise of Maharaja Ranjit Singh in the early 19th century, Gobindgarh Fort gained even greater prominence. As Ranjit Singh expanded his influence over Punjab and consolidated the Sikh Empire, he recognized the strategic value of the fort, located outside the old walled city of Amritsar. He conquered it and rebuilt it extensively, investing significant resources in transforming it into a modern military stronghold. The fort was named Gobindgarh in honor of the tenth Sikh Guru, Guru Gobind Singh. Guided by Ranjit Singh's vision and the knowledge of French military experts assisting him, the fort was upgraded with advanced European defensive elements, including concentric walls, broad moats, and ravelins—sloped embankments designed to position cannons effectively. The fort's defenses were so powerful that it could withstand the artillery bombardment of the era.

Fortification system of Gobindgarh fort

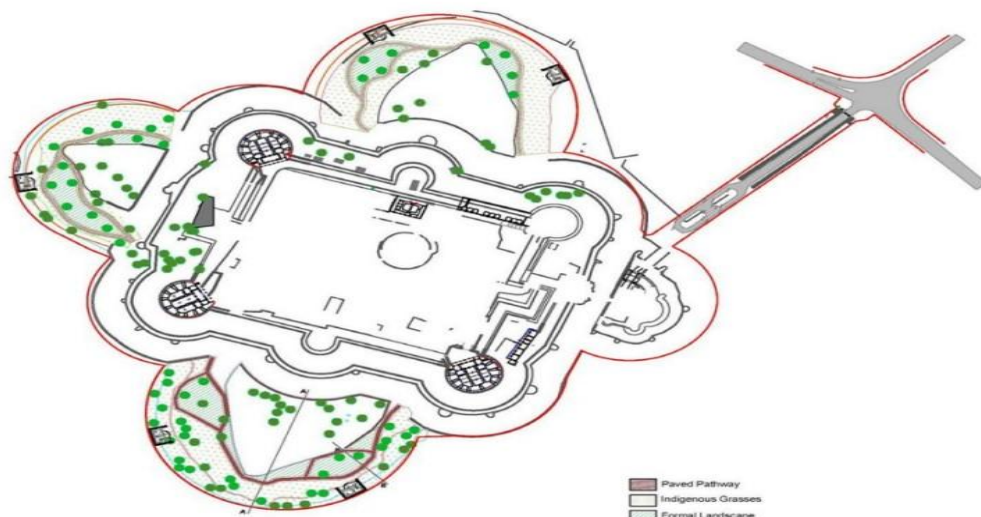
No clear distinction exists between the Bhangi era and the construction of the fort's walls and gates during Maharaja Ranjit Singh's reign, though the ravelin was specifically added under Ranjit Singh's rule. The fort featured a two-tiered system of defensive walls, and the ravelin was encircled by a moat approximately five meters deep. This double-layered fortification on two levels was designed to provide an effective defense mechanism. The fort's walls measured between 10 to 12 meters in thickness, with a core of mud securely enclosed by Nanakshahi bricks set in lime mortar on both sides. The thick mud core functioned as a shock absorber against artillery fire. Given the flat terrain and the advancement of European artillery technology, the fort faced significant challenges in maintaining its defense. By 1823, Maharaja Ranjit Singh, aided by French military advisors, established the Fuaz-e-Khas. These officers introduced contemporary French military strategies and fortification techniques, which the Maharaja implemented at Gobindgarh Fort to reinforce its earthen defenses.

Regarding the ravelin—an outward-leaning embankment positioned before the main fort walls—this structure provided defenders with an elevated platform to mount cannons and effectively cover a broad range of the battlefield below. Meanwhile, the attacking forces' artillery was disadvantaged by inferior positioning. Even when enemies managed to capture the ravelin, they became vulnerable targets for the fort's main cannons, making their hold precarious.

Map Gobindgarh Fort

"Source - Development of Gobindgarh Fort, Amritsar on Public Private Partnership Mode Draft Feasibility Report 2015"

Nalwa Gate- The "Nalwa Gate" of Gobindgarh Fort bears the name of Hari Singh Nalwa, who served as the Supreme Commander of the Khalsa Army. This legendary figure served as the Commander-in-Chief (1791–1837) of the Sikh Khalsa Army during the Sikh Empire era. This legendary figure served as the Commander-in-Chief (1791–1837) of the Sikh



Khalsa Army during the Sikh Empire era. Renowned for his valor and tactical acumen, he achieved remarkable victories in Kashmir, Peshawar, and Jamrud through his conquests.

Toshakhana (Coin Museum)- The building was initially built employing lime plaster. Commissioned by Maharaja Ranjit Singh, the Toshakhana stands prominently beneath the northern fort wall. Featuring a square design, the structure comprises two distinct chambers, with its walls reinforced by a decorative masonry tower. These buttresses consist of three-sided tapering columns topped with traditional capitals. Both chambers feature low vaulted ceilings, covered by a single

overarching vault, forming a double vault system. The walls and supporting masonry, measuring approximately 1.5 meters thick, are built from Nanakshahi bricks bound with lime mortar. There is no visible evidence of an actual floor surface. Along one side of the building's wall, living quarters were constructed for soldiers. On the southern side, remnants of a copper electrical transmission system were discovered. A replica of the famous Kohinoor diamond is also displayed here. It is said that no jeweler has ever accurately estimated the value of the Kohinoor. This diamond is perhaps the most renowned in the world, largely because it was housed here before the British removed it—this fact has added to the fort's mystique and has intrigued people across the nation. Visitors from diverse backgrounds come to see it, making Gobindgarh Fort one of India's premier tourist attractions. It is believed that Maharaja Ranjit Singh stored a treasury worth crores of rupees in the fort, including 30 lakh royal currency of that era, along with priceless jewels, gold, and silver, all guarded by a contingent of 2,000 soldiers.

The Bungalow (Ancient warfare repository)- At the center of the fort complex once stood a circular Sikh structure, which was demolished during or after the fort's occupation, leaving no remaining evidence of its presence. Interestingly, the British dismantled the lower portion beneath the plinth and repurposed those materials to construct the superstructure. The building's central location emphasizes its importance during the Sikh era. In 1864, a tall rectangular building housing four officers' quarters was built, although there is an unverified legend that it was originally a bungalow. A grand colonial-style staircase with intricate masonry was also added: a semi-enclosed staircase on the east side and a service staircase on the west, the precise date of the latter's construction remains unknown. The layout of the quarters featured individual entrances for each of the four units, all with verandas at the rear. Each quarter contained two to three small rooms. Historical records also mention a kitchen and eight servants' quarters, although their presence cannot be conclusively confirmed at the site today. According to documentation, the building was constructed using recycled Nanakshahi bricks set in mud mortar, with a cement concrete floor and a flat tile roof resembling traditional mud roofing.

Barracks- This building is situated very close to the south side of the bungalow. The original Sikh structure was likely modest in scale, designed not to obstruct the bungalow's round Sikh plinth. However, colonial modifications altered its size and proportions to such an extent that they now obscure the appreciation of the bungalow's circular Sikh plinth. The building was erected on the foundation of an earlier Sikh structure, as indicated by the thick walls on the north and south sides and the unique multi-foliated, orchid-like decorative shells. The central core rooms are believed to be of Sikh origin but were rebuilt in 1850 as a colonial edifice during British rule. This rectangular, east-west oriented building was subdivided into smaller rooms, with a veranda located on the western side. It was used as a mess hall and officers' quarters. The sturdy north-south walls from the Sikh period were constructed using Nanakshahi bricks bonded with lime mortar, whereas the walls added during the British period consist of ordinary bricks set in mud mortar. The original flooring of the barracks is unknown but was later replaced with cement concrete during British rule. The barracks' original masonry vaulted roof, characteristic of Sikh-era architecture, was substituted with a distinctive wooden truss system covered with tiles and mud.

Darbar Hall- The Darbar Hall is positioned at the eastern end, approximately at the midpoint of the north-south axis. It is accessed via the main road that passes through the inner gate. The hall is situated on the southern side of the fort and to the bungalow's east. The presence of plinth protection and wooden louvres indicates that the entrance was likely on the west side. According to historical records, it was constructed in 1850 as a six-bed hospital. The building exemplifies typical colonial architecture, featuring a rectangular two-story design with a colonnaded courtyard spanning both floors. The ground floor is divided into three rooms, with an additional two to three rooms above, all beneath a high ceiling. An impressive masonry staircase, accented with wooden railings, leads up to the upper floor. While the ground floor's layout suits hospital use, the upper floor—with its large hall and oval-shaped, ornately decorated ventilators—is not appropriate for such a function. The purpose and construction date of the upper floor remain unclear. This spacious public hall contains four fireplaces. The walls of the Darbar Hall are constructed from Nanakshahi bricks set in raw mortar; however, the columns feature bricks with finished coping edges, and the floor is made of cement concrete. The courtyard (veranda) is adorned with intricately designed wooden louvres and bracing rails, intended to alleviate the tropical heat. The roofing and intermediate floor are constructed using wooden beams decorated with finely carved cornices, supported by wooden brackets and purlins, and finished with clay tile roofing.

The Steel Bell- This bell is placed outside the outer gate of the fort. This bell was manufactured in 1863 by Naylor Vickers & co in Sheffield, a city in the United Kingdom.

Zamzama Cannon- The Zamzama Cannon was started during the reign of Ahmad Shah Durrani and was completed in the year 1765 AD. The cannon was made of copper and brass, the only cannon made of such metal during that time. The length of the gun is 14 feet 4.5 inches, with an aperture of 9.5 inches. Zamzama is currently in the Ranjit Singh Museum in Lahore, Pakistan. Maharaja Ranjit Singh Ji acquired this cannon from the Bhangi ruler Mai Sukhan and it is believed that for a short time Zamzama was kept at Gobindgarh Fort, Amritsar.

The cannon has two Persian inscriptions. It adds: "By order of the emperor [Ahmad Shah], Duri Duran, Shah Wali Khan Wazir made a gun called the Zamzama, or guardian of forts." And in the long canonical inscription, it is written: "Destroyer even of the strongholds of heaven." In 1762 the Bhangi chief Hari Singh attacked Lahore and captured the artillery. Then

it came to be known as Bhangian top. Upon capturing Amritsar in 1802, Maharaja Ranjit Singh acquired the cannon and utilized it in his campaigns across Daska, Kasur, Sujanpur, Wazirabad, and Multan. In the 1810 fort siege, it was moved to Multan using a custom-built vehicle but did not leave.

2. MATERIALS AND METHODS

The resources found show that the main reason for building this fort was to protect Sri Harmandir Sahib and the city of Amritsar from the invaders who made serial attacks on the holy place till the 18th century.

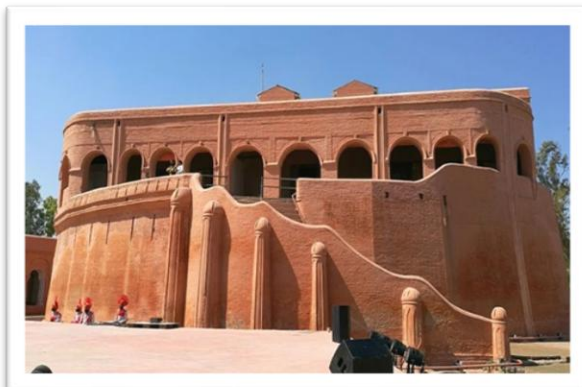
Based on research at Gobindgarh Fort built and modified by Maharaja Ranjit Singh in Punjab. For this purpose not only traditional techniques were applied but also modern techniques and computer software were used.

As stated in the Draft Feasibility Report of 2015, “Gobindgarh Fort is situated outside the walled city, adjacent to the military station on the northwest side. The fort lies on the northern side of the GT Road fort and spans a total area of 171,000 square meters (42.26 acres).”

Based on evidence from old photographs and research on Gobindgarh Fort, there is no clear differentiation in the construction of the fort’s walls and gates during Ranjit Singh’s era. However, the ravelin was an addition made during Maharaja Ranjit Singh’s reign between 1805 and 1809.

The fort featured a two-tiered system of ramparts, with the ravelin encircled by a moat approximately five meters deep. This dual-layer of fort walls, arranged on two levels, safeguarded an effective defensive arrangement. The walls of the fort were 10–12 meters thick, consisting of a mud-packed core encased on both sides by Nanakshahi bricks set in lime mortar. The thick mud core acted as a shock absorber against artillery strikes. The flat landscape and advances in European artillery posed significant threats and challenges to the fort’s defense. By 1823, Maharaja Ranjit Singh, assisted by French military officers, established the Fauz-e-Khas. These officers introduced not only French military tactics but also modern French fortification techniques, which the Maharaja incorporated at Gobindgarh Fort to reinforce the earthen defenses.

Photographs Gobindgarh Fort Building



The Bungalow (Ancient warfare repository)



Nalwa Gate



Toshakhana





Darbar Hall



Barrack



The Steel Bell



Zamzma Cannon

3. RESULT AND DISCUSSION

Historical value

Gobindgarh Fort holds great historical importance due to its role in the military history of Amritsar and the greater Punjab region, closely tied to Maharaja Ranjit Singh. The fort was initially constructed to protect the holy city of Amritsar and the esteemed Sri Harmandir Sahib. Maharaja Ranjit Singh named the fort after Guru Gobind Singh, the tenth Sikh Guru and founder of the Khalsa. The fort reflected the Maharaja's commitment to social and religious inclusivity, as its administration

and army comprised Hindus, Sikhs, Muslims, and Europeans alike. Under his leadership, the Khalsa army established and defended the frontiers of Punjab.

Initially constructed in the 18th century by Gujjar Singh Bhangi, the fort was known as the Fort of the Bhangis. It was later taken over and expanded by Maharaja Ranjit Singh in the early 1800s, who renamed it Gobindgarh Fort to honor Guru Gobind Singh. The fort also served as the venue for the grand wedding of Maharaja Ranjit Singh's grandson, Prince Naunihal Singh, in 1837. To better protect the holy shrine and the city, Maharaja Ranjit Singh enhanced the fort's defenses, implementing design plans heavily influenced by French military architecture, with assistance from a French architect. Additionally, a 50-meter tall water tower, completed in 1874, stood on the premises but was dismantled by the Indian Army following independence.

4. ARCHITECTURAL AND ENGINEERING

Gobindgarh Fort stands as an outstanding example of military architecture and engineering, highlighting its architectural importance. The fort's design was influenced by French castle-building traditions, featuring multiple layers of fortifications, including landscape elements such as moats and ravines. Within the fort, facilities included a treasury (toshakhana), a foundry, and a well-developed system for managing water supply and drainage. The British made alterations to the fort's original structure after taking control following the Anglo-Sikh Wars in 1846, and later, further changes were implemented by the Indian Army, which held the fort from independence until 2006.

Constructed primarily from lime and brick, this impressive fortification is protected by 25 cannons and four bastions. The main eastern entrance, known as Nalwa Gate, honors the famed warrior Hari Singh Nalwa. Near this gate stands Darwaza-e-Ali, a beautifully crafted wooden doorway serving as the main entrance, adorned with intricate workmanship. A notable feature of the fort includes an underground tunnel said to connect with Lohgarh Fort in Lahore. The fort's surrounding moats, spanning approximately 100 meters in circumference, reflect the influence of French military architectural styles. Additionally, artillery was manufactured onsite alongside a minting facility, which has now been transformed into a museum.

5. CONCLUSION

Gobindgarh Fort stands as a prominent emblem of Punjab's extensive military, architectural, and cultural heritage from the era of the Sikh Empire. Originally built in the 18th century and extensively fortified under Maharaja Ranjit Singh's leadership with European military expertise, the fort exemplifies a blend of indigenous and foreign architectural influences. Its strategic design, robust fortifications, and essential facilities like the treasury and foundry highlight its critical role in protecting Amritsar and the revered Harmandir Sahib. The fort's history mirrors the changing phases of authority—from Sikh governance to British occupation, and subsequently Indian Army administration—each phase imprinting unique architectural and functional marks. Its recent restoration and opening to the public have transformed Gobindgarh Fort into a vibrant heritage site that celebrates Punjab's resilience, cultural diversity, and historical significance. Functioning as both a distinguished heritage site and a dynamic museum, Gobindgarh Fort continues to inspire and enlighten visitors while preserving a crucial element of the region's cultural legacy for future generations.

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