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## “FORTIFIED LEGACY OF THE SIKH EMPIRE: THE ARCHITECTURAL AND MILITARY SIGNIFICANCE OF GOBINDGARH FORT”

Manwinder Singh<sup>1</sup>, Mohd Ashraf Dar<sup>2</sup>, Amita Gupta<sup>3</sup>

<sup>1</sup>Research Scholar, Department of History, Lovely Professional University, Phagwara

<sup>2</sup>Assistant Professor, Department of History, Lovely Professional University, Phagwara

<sup>3</sup>Assistant Professor, Center for Comparative Religion and Civilization (CCRC), Central University of Jammu, J&K

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Corresponding Author: Manwinder Singh  
(singhmanwinder94@gmail.com)

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### ABSTRACT

Constructed originally in 1760 by Sardar Gujjar Singh, the leader of the Bhangi Misl, the Gobindgarh Fort – then known as Bhangi Fort – stands as a remarkable relic of 18th century military architecture. The fort's structure, composed of brick, lime, and clay, reflects the indigenous building practices of its era. Maharaja Ranjit Singh later rechristened it Gobindgarh Fort in tribute to the tenth Sikh Guru, Guru Gobind Singh. Between 1805 and 1809, the fort underwent major restoration and expansion works under the supervision of Ranjit Singh's European generals, Jean Baptiste Allard and Jean François Ventura. These enhancements equipped the fortress as both a formidable artillery post and a secure royal treasury – once safeguarding the illustrious Kohinoor diamond. The fort's design follows a near square plan spanning about 1,500 square meters, featuring four bastions at each corner and two heavy iron reinforced gates. The main approach, Nalwa Gate, served as the principal entrance, while the secondary access, Keller Gate, offered an alternate route. The front gate – historically known as “Darwaza e Tope e Qila” – was heavily guarded and armed with five cannons during Maharaja Ranjit Singh's reign. Supported by archaeological evidence, 3D spatial assessments, and archival documents, this study views Gobindgarh Fort as a synthesis of martial strength and architectural ingenuity. It symbolizes the strategic adaptability of the Sikh Empire and yields significant understanding of South Asia's evolving fortification traditions.

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**KEYWORDS:** Gobindgarh Fort history, Sikh Empire architecture, Fortification system, Rebuilding the structure, Zamzamma cannon, Military heritage of Amritsar.

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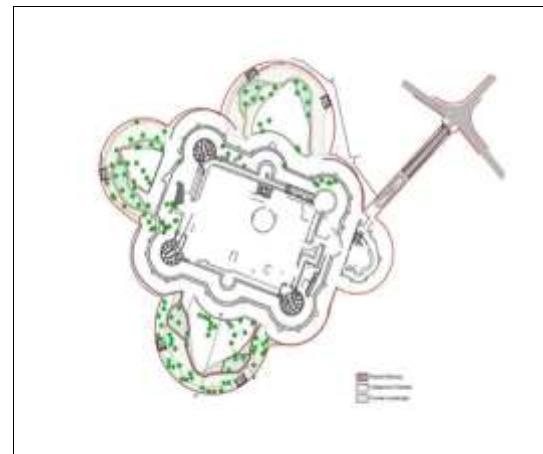
## 1. INTRODUCTION

Sikh architecture represents a distinctive design tradition characterized by creativity, intricate ornamentation, graceful aesthetics, and balanced symmetry. While it originated primarily in religious contexts, its visual sophistication soon inspired numerous secular constructions as well. Among the most enduring hallmarks of this architectural legacy is the masterful use of marble during the Sikh Empire. Far more than a mere construction material, marble embodied spiritual expression, artistic excellence, and technical refinement. Both sacred and civic buildings across the empire testify to this enduring material culture. The Golden Temple of Amritsar remains the most celebrated embodiment of this artistic ideal. Its lower structure, composed entirely of gleaming white marble, evokes tranquility and divine purity. Historically, the marble—renowned for its fine texture and natural sheen—was sourced from Rajasthan. Architecturally, the marble foundation serves both structural and symbolic purposes: it grounds the opulent gold-covered upper sections, creating a striking balance between material splendor and spiritual depth. The craftsmanship involved in this architecture includes the embedding of semi-precious stones into marble panels to form vivid floral, geometric, and occasionally human or animal motifs. This stylistic distinction sets Sikh inlay work apart from Mughal designs, which generally avoided life-like representations. These marble panels transcend ornamentation; they narrate stories of faith, valor, and cultural identity, enriching the sacred spaces with profound symbolic resonance. Other important gurdwaras, such as Sri Keshgarh Sahib in Anandpur, also make extensive use of pristine white marble. The shining domes and spacious halls stand as architectural reflections of Sikh virtues—purity, humility, and unity—while the clarity of their forms reveals the rational and progressive spirit that defines Sikh aesthetics. Marble's influence extended beyond places of worship. During the reign of Maharaja Ranjit Singh, the material appeared in military and civic architecture as well, blending spiritual artistry with imperial authority. Within Gobindgarh Fort, marble was used more sparingly—primarily for decorative screens, latticed stonework, and interior detailing—but its inclusion linked the fort's military might with the elegance of Sikh sacred design. With Maharaja Ranjit Singh's rise in the early 19th century, Gobindgarh Fort assumed exceptional strategic importance. Recognizing its defensive potential near the walled city of Amritsar, the Maharaja seized and completely reconstructed it. He renamed the

structure Gobindgarh, in homage to Guru Gobind Singh, the tenth Sikh Guru. Under the Maharaja's leadership and the guidance of French military engineers, the fort was remodeled with cutting-edge European defensive techniques, including layered walls, wide moats, and ravelins—angled earthworks that optimized cannon placement. These enhancements rendered Gobindgarh one of the most formidable fortifications of its time, capable of withstanding contemporary artillery assaults while reflecting the empire's union of strength, innovation, and artistry.

## 2. FORTIFICATION SYSTEM OF GOBINDGARH FORT

*Map View of Gobindgarh Fort.*



There is no definitive separation between the structural phases of the Bhangi period and the subsequent modifications undertaken during Maharaja Ranjit Singh's reign. However, the addition of the ravelin is distinctly attributed to Ranjit Singh's period of reconstruction. The fort was designed with a sophisticated two-tier defensive system, in which the ravelin was further protected by a moat measuring roughly five meters in depth. This dual-layer fortification created a strong, multi-level defense intended to resist sustained assault. The massive outer walls of the fort were estimated to be between ten and twelve meters thick. Their core consisted of compacted mud, encased on either side with Nanakshahi bricks bonded by lime mortar. This mud-filled interior acted as a cushion, effectively absorbing the impact of artillery bombardment. Due to the flat topography of the region and the growing dominance of European gunpowder weaponry, maintaining robust defenses presented increasing difficulties. By 1823, Maharaja Ranjit Singh—seeking to modernize his army—established the Fauj-i-Khas, an elite military corps trained and organized with assistance from French officers. These advisors

introduced advanced European principles of warfare and fortification, which were subsequently applied to Gobindgarh Fort, enhancing its structural resilience and strategic design. The ravelin, a forward-sloping embankment built before the fort's primary walls, played a crucial defensive role. It provided soldiers with an elevated artillery platform that allowed for a wide firing range across the battlefield. Enemy forces, positioned on lower ground, suffered a clear tactical disadvantage. Even in the rare event that attackers seized control of the ravelin, their position remained perilous, as they were directly exposed to the superior firepower of the fort's main batteries.

**Nalwa Gate** – The Nalwa Gate of Gobindgarh Fort is named in honor of Hari Singh Nalwa, the distinguished Commander-in-Chief of the Sikh Khalsa Army (1791–1837). Celebrated for his unmatched courage and military expertise, Nalwa led Sikh forces to decisive victories in regions such as Kashmir, Peshawar, and Jamrud, securing the northwestern frontiers of the Sikh Empire. His leadership and strategic brilliance made him one of the most formidable military figures of Maharaja Ranjit Singh's era, and the gate bearing his name stands as a tribute to his legacy.



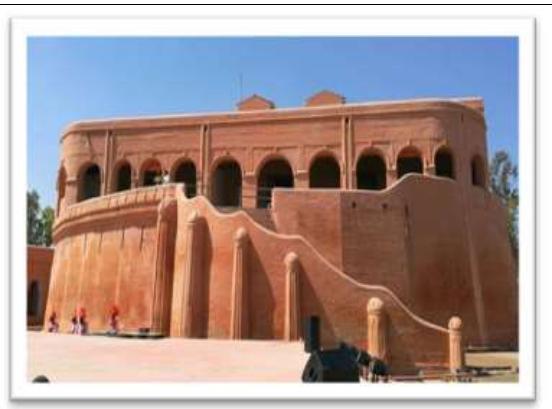
**Toshakhana (Coin Museum)** – The Toshakhana, originally constructed under the orders of Maharaja Ranjit Singh, occupies a prominent position beneath the fort's northern wall. Built using lime plaster, the square-shaped building contains two interconnected chambers, reinforced by a decorative masonry tower. The tower's buttresses feature three-sided, tapering columns topped with stylized capitals. Each chamber has a low vaulted ceiling, while the upper layer forms a larger overarching vault, resulting in a distinctive double-vaulted system. The walls, approximately 1.5 meters thick, were built of Nanakshahi bricks bonded with lime mortar. There is no conclusive evidence of

the original flooring, although remnants suggest adjacent living quarters for soldiers along one side. On the southern wall, traces of a copper-based electrical system have also been identified. The Toshakhana today houses a replica of the renowned Kohinoor diamond, which once formed part of Maharaja Ranjit Singh's treasury. The diamond's true value was never conclusively assessed, adding to its mystery and fame. Before being seized by the British, the Kohinoor was reportedly kept within this very fort, enhancing Gobindgarh's aura of imperial wealth and power. Historical accounts indicate that Ranjit Singh's treasury stored treasures worth crores of rupees here, including royal currency, gold, silver, and precious jewels guarded by an elite force of about 2,000 soldiers. Today, the building serves as a museum, attracting visitors from across India and abroad.



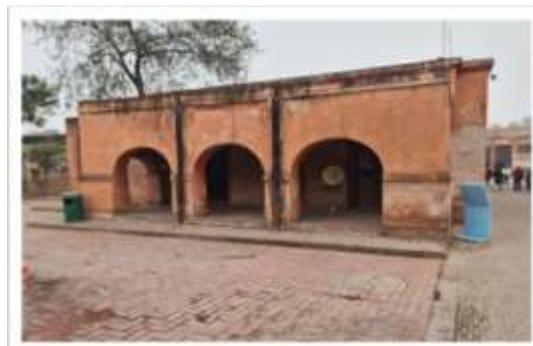
**The Bungalow (Ancient Warfare Repository)** – At the heart of the fort once stood a circular Sikh-era structure, now lost due to demolition during or after the British occupation. The British reportedly dismantled the base of the original building and reused the materials for new construction,

underscoring the site's continued military importance. Around 1864, a rectangular colonial building with four officer's quarters was built on the same site. A grand staircase of colonial design was introduced—semi-enclosed on the eastern side, with a service staircase on the west. Each quarter had a separate entrance and a rear veranda, consisting of two to three small chambers. Historical documents also note the presence of a kitchen and eight servant quarters, though physical evidence of these features no longer survives. The building was constructed from recycled Nanakshahi bricks set in mud mortar, featuring a flat tiled roof reminiscent of traditional mud structures and a cement concrete floor.

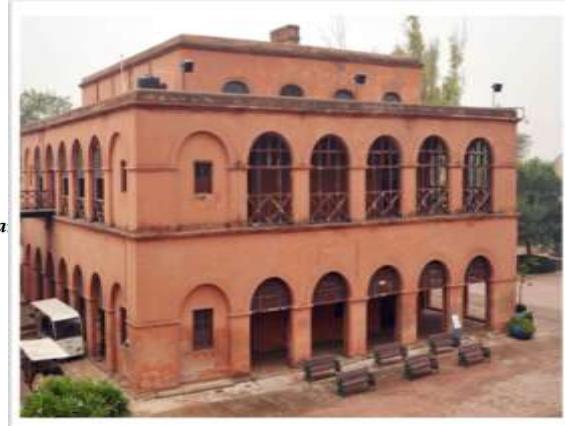


**The Bungalow (Ancient warfare repository)**

**Barracks** – Located near the southern flank of the bungalow, the barracks were originally a modest Sikh-period structure. Later colonial alterations enlarged the building, obscuring the view of the original circular plinth beneath. The thick north and south walls, as well as the distinctive multi-foliated shell-like motifs, suggest early Sikh workmanship. However, the structure was substantially rebuilt in 1850 to serve as a British officers' mess and living quarters. The rectangular, east-west oriented building was subdivided into smaller rooms, with a veranda on the west. Sikh-period walls were made from Nanakshahi bricks set in lime mortar, whereas British additions used ordinary bricks bound with mud mortar. The original vaulted roof—a hallmark of Sikh construction—was replaced with a wooden truss roof covered with mud and tiles. The original flooring remains uncertain but was later resurfaced with cement during British rule.



**Darbar Hall** – The Darbar Hall occupies a strategic position at the fort's eastern end, approximately midway along its north-south axis. Accessible through the main internal road, the building lies south of the fort and east of the bungalow. Historical documentation suggests it was repurposed in 1850 as a six-bed hospital under British administration. This rectangular, two-story structure exemplifies colonial architectural style, featuring a central colonnaded courtyard that spans both levels. The ground floor comprises three rooms, while the upper level includes two to three additional chambers beneath high ceilings. A masonry staircase with wooden railings connects the floors. The ground layout is suitable for hospital use, but the upper level—with its expansive hall, oval-shaped ventilators, and decorative detailing—indicates a later addition of uncertain date. The hall's four fireplaces suggest adaptation for residential or ceremonial purposes rather than medical functions. The walls, built from Nanakshahi bricks joined with raw mortar, feature columns with neatly finished brick coping. The cement floor and wooden-louvred verandas provided ventilation to mitigate the regional heat. The intermediate floor and roof incorporate carved wooden beams, cornices, and brackets supporting a traditional clay-tiled roof, reflecting a blend of Sikh craftsmanship and colonial formality.

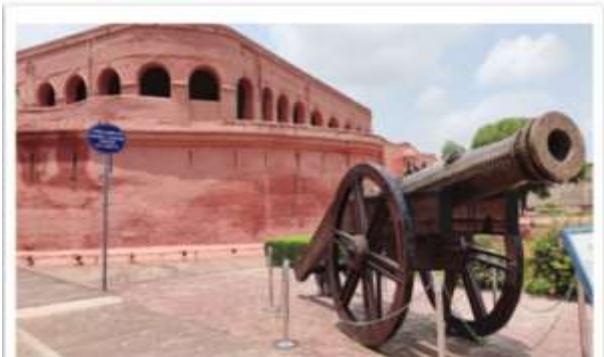


*Darba*

The Steel Bell – Positioned outside the outer gate, the steel bell bears the inscription of its manufacturer, Naylor Vickers & Co., Sheffield (1863). It represents one of the few surviving industrial-era additions to the fort, symbolizing the technological transition of the period.



Zamzama Cannon – The Zamzama Cannon, commissioned by Ahmad Shah Durrani and completed in 1765 CE, was cast from copper and brass—an unusual combination for artillery of its time. The cannon measures 14 feet 4.5 inches in length with a bore diameter of 9.5 inches. It carries two Persian inscriptions: one records its commissioning by Durrani and Shah Wali Khan, while the other proclaims it the "Destroyer of the strongholds of heaven." After the Bhangi chief Hari Singh captured Lahore in 1762, the cannon became known as Bhangian Top. Maharaja Ranjit Singh acquired it in 1802, temporarily housing it at Gobindgarh Fort before employing it in military campaigns at Daska, Kasur, Sujanpur, Wazirabad, and Multan. During the 1810 siege of Multan, the cannon was transported on a specially built vehicle but remained in the city thereafter. Today, the Zamzama is preserved at the Ranjit Singh Museum in Lahore, continuing to symbolize the martial legacy of the Sikh Empire.



### 3. MATERIALS AND METHODS

Historical evidence indicates that Gobindgarh Fort was originally constructed to safeguard Sri Harmandir Sahib and the surrounding city of Amritsar from continuous invasions that repeatedly targeted the sacred shrine until the late eighteenth century. The fort thus emerged as a defensive bastion, symbolizing both the religious and strategic resilience of the Sikh community.

Subsequent studies reveal that Maharaja Ranjit Singh not only restored but also extensively modified the fort, integrating it into the broader defensive network of Punjab. The analysis of the fort's structure combines traditional architectural documentation with modern methods, including digital modeling and computer-based analysis, allowing researchers to understand its layered evolution over time.

According to the Draft Feasibility Report (2015) prepared for conservation planning, "Gobindgarh Fort stands beyond the walled city of Amritsar, adjacent to the military cantonment on its northwestern periphery. The fort occupies a total area of approximately 171,000 square meters (around 42.26 acres) and lies along the northern side of the Grand Trunk Road."

Archival photographs and archaeological investigations suggest that distinguishing between the Bhangi Misli construction phase and the later modifications made during Ranjit Singh's reign remains difficult. However, the addition of the ravelin—a defensive outwork situated before the main rampart—is known to have been introduced between 1805 and 1809 under Ranjit Singh's supervision.

The fort was designed with a two-tiered defensive system, featuring a ravelin surrounded by a moat roughly five meters deep. This dual arrangement of ramparts created a robust and multi-layered fortification strategy. The outer walls, measuring approximately 10 to 12 meters in thickness, contained a central mud-filled core encased by Nanakshahi bricks bound with lime mortar on both sides. This internal mud mass effectively absorbed the impact of artillery bombardments, acting as a natural cushion.

Because of the region's level terrain and the rapid advancement of European artillery technology, maintaining strong fortifications required significant innovation. By 1823, Maharaja Ranjit Singh had established the elite regiment known as the Fauj-i-Khas, trained under French officers who introduced contemporary European military strategies. These experts also imparted knowledge of modern fortification principles, which Ranjit Singh subsequently applied at Gobindgarh Fort—

strengthening its earthen ramparts and enhancing its defensive architecture to withstand modern warfare.

#### 4. RESULT AND DISCUSSION

Gobindgarh Fort stands as a significant landmark in the military and political history of Amritsar and the wider Punjab region. Its strategic and symbolic role is deeply connected to the reign of Maharaja Ranjit Singh. Originally built to safeguard the sacred city of Amritsar and the revered Sri Harmandir Sahib from repeated invasions, the fort later became a cornerstone of the Sikh Empire's defensive network. Maharaja Ranjit Singh renamed it in honor of Guru Gobind Singh, the tenth Sikh Guru and founder of the Khalsa order. The fort also embodied the Maharaja's inclusive vision of governance—its administration and army reflected a pluralistic composition of Sikhs, Hindus, Muslims, and European officers who served together under the Khalsa banner to defend Punjab's frontiers. The fort's origins trace back to the late 18th century when it was established by Gujjar Singh Bhangi, the chief of the Bhangi Misl, and was then known as the "Fort of the Bhangis." In the early 19th century, Maharaja Ranjit Singh seized and expanded the structure, renaming it Gobindgarh Fort in reverence to Guru Gobind Singh. The site gained further distinction in 1837 as the venue for the lavish wedding of the Maharaja's grandson, Prince Naunihal Singh. To strengthen the city's defenses, Ranjit Singh fortified the structure using design principles influenced by contemporary French military engineering, drawing assistance from European officers and architects. Later, in 1874, a 50-meter-high water tower was added to the complex, which remained until its removal by the Indian Army after independence.

Architecturally, Gobindgarh Fort exemplifies the fusion of Sikh and European military design traditions. It features multiple defensive layers, including moats, ramparts, and bastions, integrated with functional structures such as a treasury (toshakhana), a foundry, and sophisticated water-management systems. The British made significant structural changes after annexing Punjab in 1846, and further modifications were carried out during the period of Indian Army occupation, which lasted until 2006. Constructed primarily of lime mortar and brick, the fortification was originally armed with 25 cannons and secured by four massive bastions. Its eastern gateway, known as Nalwa Gate, commemorates the celebrated Sikh general Hari Singh Nalwa, while the main entrance, Darwaza-e-Ali, features elaborate wooden craftsmanship typical of early nineteenth-century Punjab. Local accounts

also refer to a subterranean passage believed to link the site with Lohgarh Fort in Lahore. Surrounding the fort is a broad moat—approximately 100 meters in circumference—reflecting the defensive influence of French military architecture. Within its complex, artillery production facilities and a royal mint once operated; today, these structures have been repurposed into a museum that preserves and interprets the fort's remarkable legacy.

#### CONCLUSION

Gobindgarh Fort embodies the grandeur, strategic wisdom, and cultural synthesis of the Sikh Empire, standing as a remarkable example of Punjab's military and architectural heritage. Its evolution from a defensive fortress to a cultural landmark mirrors the changing tides of history in northern India. Constructed with the primary aim of safeguarding the holy city of Amritsar and the revered Sri Harmandir Sahib from repeated invasions, the fort became a cornerstone of Maharaja Ranjit Singh's vision of a strong, united, and secure Punjab. The fort's design and engineering reflect a sophisticated understanding of both indigenous and European military traditions. Maharaja Ranjit Singh's engagement of French officers and architects introduced advanced defensive techniques, such as multi-layered ramparts, moats, and bastions that merged with traditional Sikh architectural aesthetics. This integration of foreign expertise with local craftsmanship demonstrates the Maharaja's pragmatic approach to governance—an openness to innovation while maintaining cultural authenticity. Beyond its military significance, Gobindgarh Fort represents the inclusive administrative ethos of the Sikh Empire. Within its walls once coexisted soldiers, artisans, and officials from diverse religious and cultural backgrounds—Hindus, Sikhs, Muslims, and Europeans—embodying the spirit of communal harmony that characterized Ranjit Singh's rule. The fort's Toshakhana, Darbar Hall, barracks, and foundry each tell stories of organization, discipline, and self-reliance, highlighting how the empire sustained both defense and prosperity through effective infrastructure. Following the British annexation of Punjab in 1849, the fort underwent numerous alterations that reshaped its original form but could not erase its historic essence. Even after independence, when it remained under military control until the early 21st century, Gobindgarh Fort retained its identity as a symbol of resilience and national pride. The recent conservation and restoration initiatives have transformed it into a heritage site that bridges the past with the present,

offering valuable insights into the military history, architectural excellence, and socio-political fabric of the Sikh Empire. In essence, Gobindgarh Fort is not merely a structure of brick and lime—it is a living chronicle of Punjab's valor, innovation, and pluralism. Its preservation is a reminder of how history, when carefully restored and interpreted,

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continues to inspire a sense of identity and continuity for future generations. As a site of collective memory and cultural revival, the fort stands as both a monument to the achievements of the past and a beacon guiding the heritage consciousness of modern India