DOI: 10.15415/cs.2013.11003

A Study of Conservation Interventions at Ram Bagh, the Summer Retreat of Maharaja Ranjit Singh at Amritsar

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Abstract

Heritage is our legacy from the past and a non-renewable resource which needs to be protected and sustained. Conservation refers to all measures taken to prolong the life of our heritage. This paper focuses on the study and analysis of the ongoing conservation work at Maharaja Ranjit Singh's Ram Bagh -- the foremost heritage site in Amritsar with its royal palaces and gardens, magnificent gates, watch towers and pavilions.

The aim of the study is to identify the causes of decay and deterioration of this historic property and also to understand the processes and techniques employed to conserve it. This has been achieved through a detailed visual examination of the complex, collection and compilation of theoretical data as well as information provided by officials of the Archaeological Survey of India and the Punjab Tourism Department. The study highlights that conservation approach for an architectural heritage should aim at protecting the cultural value of the historic fabric, and adopt interventions that help to preserve the authenticity of the original design, building materials, construction techniques, workmanship and aesthetics.

INTRODUCTION

Amritsar's Ram Bagh, built in 1818 AD, was designed as an exquisite summer retreat for Maharaja Ranjit Singh, the legendary king of Punjab. It was named Ram Bagh as a tribute to Guru Ram Das, the founder of the city. The complex is located in the north-east of the walled city of Amritsar. Spreading across an area of 84 acres, the complex contains a variety of historic structures in a garden setting similar to the Shalimar Bagh in Lahore.

Ram Bagh is a treasure house of the history, art and architecture of the Sikhs of the 18th and the 19th century. It is especially significant as being one of the few edifices created by Maharaja Ranjit Singh in Amritsar, most being located in Lahore, Pakistan. Ram Bagh Complex is cited by some writers as a unique example of the confluence of Persian principles with the Sikh architectural traditions. Others consider it as a blend of the Mughal, Rajput and European styles which, many profess, depicts the Maharaja's secular principles and his vision to synthesize pluralities from various cultures into a singular entity. Acclaimed as one of the finest historic ensembles of Punjab,

Creative Space
Vol. 1, No. 1
July 2013
pp. 39–61

Ram Bagh is also a masterpiece landscape design and a marvel of engineering exemplifying a scientific system of water management and unique horticultural practices.[1]

In consideration of its artistic, historic, cultural and architectural significance, the Ram Bagh Complex was declared as a protected monument by the Government of Punjab through a notification dated October 8, 1997. However, despite this exalted status, it continued to remain neglected and, thus, exposed to considerable damage by the changing city profile, misuse of built and open spaces and unauthorized building activities till recently. Matters were amended a few years ago when the Punjab Government's Department of Tourism launched an ambitious comprehensive project to conserve, develop and revitalize this complex, with a precise aim to recover the authenticity of the Sikh Era.

METHODOLOGY OF THE STUDY

One of the essential tasks required to be taken up as part of a project for conservation of built heritage, is a study and evaluation of the historical, cultural, architectural and other related attributes of the concerned property. Though built in its entirety during a single era, i.e., the Sikh Period of Indian history, both the gardens and the individual structures of the Ram Bagh Complex continued to be used for various purposes during the British as well as the post-independence, contemporary times. Thus, a number of historical layers and transformations can be seen in the context of its architecture as well as the undelying spatial configuration. Consequently, the first step in the study was to understand the historic evolution and layering of the property. Also, since the complex is to be conserved at two levels – that of the 'Garden Layout' and that of the 'Individual Monument' – the study of layering was organized accordingly.

EVALUATING THE GARDEN LAYOUT

As already mentioned, Ram Bagh was designed across an area of 84 acres, an area that was extended considerably over sunsequent years. In spite of the fact that the historical extent and the image of this royal garden has been severely diluted by layers of later developments, the place is still considered unique amongst the royal gardens of the Sikh kingdom and, continues

1 Ram Bagh comprises exotic lawns having rare trees planted by the Maharaja. An amazing 200 year-old earthen sanitation system was discovered during the digging operation undertaken for conservation.

to retain its original use as a recreational destination. Only the quality of experience has varied from 'royal' to 'imperial' to 'public'. The description below aims to trace this evolution over three distinct stages – the original Sikh Period, the British Period following the Anglo-Sikh Wars[2] and, the Post-Independence Period.

Layer One – The Original Design

Historically, Ram Bagh was designed on the concept of a Char Bagh (the Persian systems of historical gardens), square in shape and surrounded by a 14 ft. high *nanakshahi* brick masonry wall (Figure 1). This wall was further encircled by an outer mud wall, together with gun carrying ramparts. A moat, filled with water from the Hasli Canal, running all along this outer wall completed the system of fortification. Within the garden, buildings were laid on a *chaupar* pattern, the formal style of Mughal Gardens, with major and minor cross axes and structures placed at each of the terminal points of the numerous axes as well as their intersections. Kiosks or *burjis* were placed at the four corners of the enclosing wall. These *burji,* placed at strategic points, served as watch towers and sentry posts. The rear quarter of the garden was used as fruit orchards and the front as ornamental flower gardens.

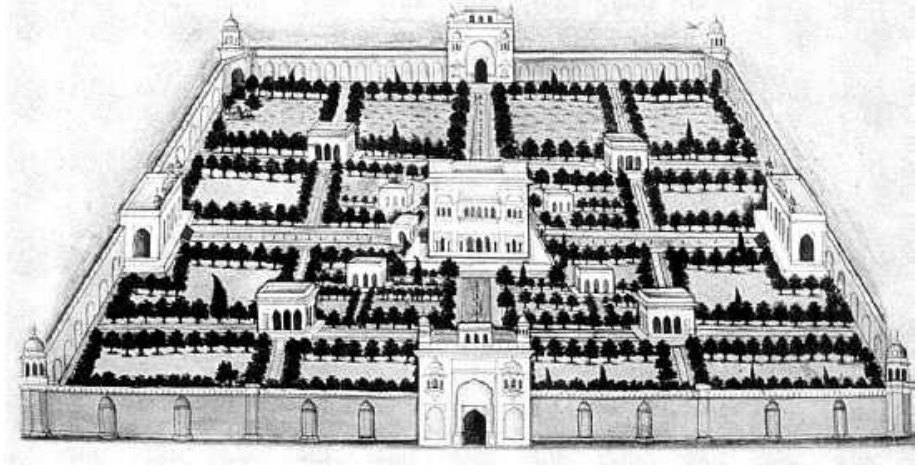


Figure 1: An artist's impression of the original layout of Ram Bagh. (Source: Gurmeet Rai, CRCI)

2 The Anglo–Sikh wars were a series of conflicts between the British East India Trading Company and the Sikh Empire. There have been two Anglo–Sikh wars: The First Anglo–Sikh War (1845–1846, and, the Second Anglo–Sikh War (1848–1849)

The centre of the composition was occupied by the principal building – the Summer Palace, which served as residence for Maharaja Ranjit Singh during his visits to Amritsar. Promenades, marking the two major north-south and east-west axes were lined with trees and rows of fountains. These connected the Palace to four secondary buildings, which were located at the terminal points of the axes, punctuating the middle of each side of the brick wall enclosing the garden. On the north and the south sides were placed the gateways to the garden known as '*Deorhis'* built in a lively blend of Mughal and Rajput architectural styles. The west and the east walls were punctured by the two *'Munshikhanas'*, the royal offices. A *'Hammam'* - bathing place for the ladies of the court – was located in the north-west quadrant of the layout. In the south-west quadrant was the pavilion called *'Baradari'* which was reserved for the leisure activities of royal guests. Four two-storeyed structures, presumably to lodge the trusted *sardars* of the Maharaja, were located along the two diagonal axes emanating from the main Palace, in a sense forming a protective ring around it.[3]

Layer Two – Transformations by the British

Following the Anglo-Sikh wars, Ram Bagh came into the possession of the British, who then made major transformations to the original use and the layout. Therefore, a distinct – though ill-considered – layer of colonial interventions can be witnessed in the complex.

In the beginning, the structures in the garden were used as offices and residences for the British officials. At a later stage, with the British gaining a greater foothold in the city, both the enclosing walls of Ram Bagh, i.e., the masonry boundary wall and the outer ring of mud wall, were demolished and the Summer Palace converted to the office of the Deputy Commissioner. In time, some more area was reclaimed around the historic garden and a circular road was built within the historic core, substantially altering the original Char Bagh layout of the garden. A few parts of the garden were later opened for public use as a recreational space, when the British converted the surrounding cluster of structures into clubs and libraries and the lawns into tennis courts. At this stage, 'Ram Bagh' became known as the 'Company Bagh', presumably after the East India Company.

Layer Three – Interventions during the Post-Independence Era

During the Post-independence period, the steep rise in the city's population, together with its growing recreational needs, was the major factor for the

3 These structures, however, do not exist any more.

drastic transformation of this historic garden. Contemporary structures were constructed on the northern and eastern side of the garden, the original landscape layout of a Char Bagh was demolished and new roads laid for convenient circulation around the city. Such were the measures, that the principal *Deohri*, was isolated into a traffic island for facilitating the traffic movement.

With the city having expanded much beyond its original wall, Ram Bagh now exists in the heart of the new Amritsar city and is approached through three major commercial roads of the town. New boundary walls and gateways on four sides of the garden have been constructed. These newer developments, in and around the garden, have negatively impacted the historic extent and value of the garden.

EFFORTS FOR REVIVAL OF THE GARDEN LAYOUT

The garden, over the years, had lost its original cohesive plan, and, was being perceived as a fragmented and disconnected experience of the past and the present. Hence in 2008, the Punjab Government's Department of Tourism, through a collaborative effort of the Archaeological Survey of India (ASI) and the Cultural Resource Conservation Initiative (CRCI), Project Consultant, proposed a plan for conservation and revitalization of the Ram Bagh complex as a part of integrated development of Amritsar as a 'Tourist Destination'. The project is still continuing, albeit with some hitches and glitches.

The project objective is to restore the Sikh legacy of Maharaja Ranjit Singh as embodied in this complex and, to change its present image from that of an anonymous public green space to a historic garden of immense cultural significance. The conservation approach agreed upon is two-pronged. On the one hand it aims to restore and conserve – both in spirit and content –the historic garden of the Sikh period and, on the other, make all efforts to continue and reinforce the present role of the garden as an active community space.

Proposed Interventions

Hence, the conservation plan would treat Ram Bagh as comprising of two prominent zones, namely a well protected 'Historic Zone' of nearly 30 acres with passive activities, and an active, outer surrounding 'Buffer Zone' of about 40 acres for accommodating the less 'quiet' activities. (Figure 2).

The 'Historic Zone' comprises the quadripartite garden of the Sikh Period. Its extents of would be marked by the four watch towers, the *chhatris,* denoting the area originally enclosed within the masonry boundary wall. This zone

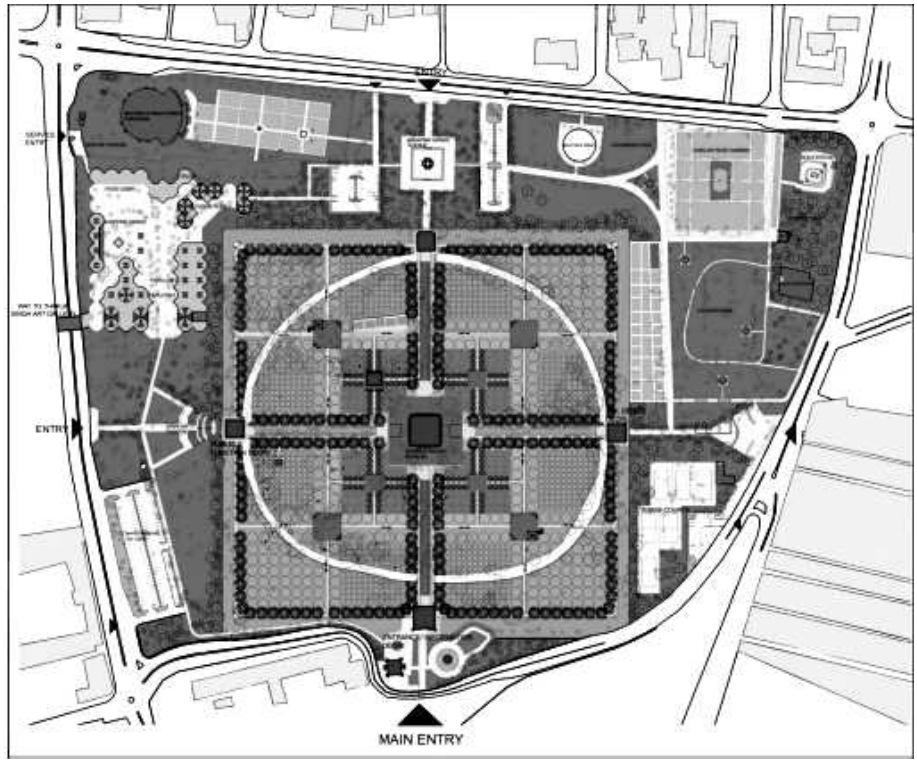


Figure 2: Proposed Conservation Development Plan (Source: Gurmeet Rai)

would be restored strictly on the basis of archaeological findings and research[4], and duly protected by law. Some of the means proposed to achieve this target, include the following actions:

- Restoring the original spatiality by removing the present circulation and retrieving the pathways that created the Char Bagh:
- Removing clubs and other similar uses from within historic structures and restoring these structures to their original 19th century architectural form;
- Adapting the Ram Bagh Palace to a museum;
- Removing the tennis courts and other active uses within the Historic Zone and re-locating them in the Buffer Zone;
- Restoration of the gardens and plant nurseries in the Buffer Zon

4 During excavations undertaken in 2007, revealed the original foundation of the boundary wall alongwith antique fountains and water channels of the quadripartite garden

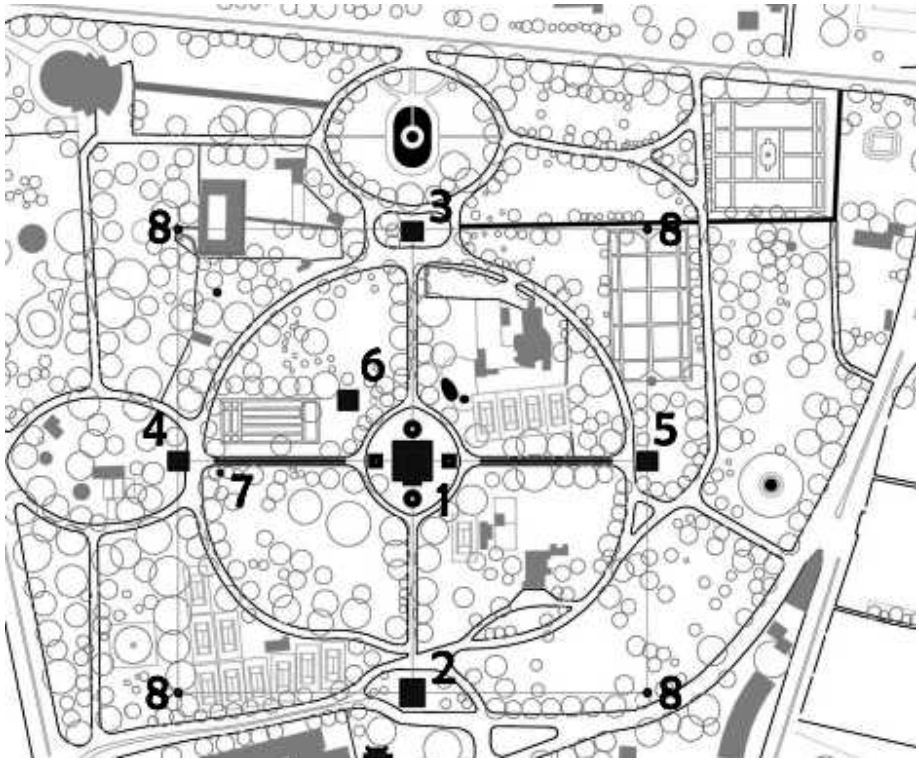


Figure 3: Extant Monuments of Ram Bagh (Source: Gurmeet Rai)

EVALUATING INDIVIDUAL STRUCTURES

The structures that are extant and are being conserved include the (1) Summer Palace, (2) Ram Bagh Gate or the main *'Deorhi'*, (3) Inner Gate or the 'Service Club', (4) western *Munshikhana* or the 'Civil Defence Building', (5) eastern *Munshikhana* or the 'Reading Room', (6) *Hammam,* (7) *Chhoti Baradari*, and, (8) Watch Towers or *Burjis* demarcating the original boundaries (Figure 3).

The project envisages a scientific restoration and, at times, an adaptive re-use of these structures. Some of the work has already commenced, while the rest is in the pipeline. Given below is an account of the surviving structures in the Complex, tracing their original design, changes made over time, and the present state of conservation.

The Summer Palace

The Original Design -- The Maharaja's Summer Palace was designed as a luxurious country house in the Early Indo-Sarcenic Style. Spread over an area

of 678.18 kanals[5], it is a large double-storyed structure, square in plan with rooms and passages arranged symmetrically around a central, double-height Durbar Hall. The 21 feet thick walls of the basement were punctured with funnel-like windows to channelize air movement and allow diffused light inside to create cool comfort conditions (Figures 4 & 5). The palace was built with Nanakshahi bricks set in lime mortar,[6] with roofs of timber joists and rafters, and was richly ornamented, both inside as well as outside.

Distinctive features of the building are various types of pillars, pilasters, multifoil cusped arches, sandstone bracket, eaves, *jaalis* and *jharokhas*. The internal and external walls had low-relief stucco work. The presence of frescoes on the terrace of Palace indicate a strong possibility of similar painting on other walls also (Figure 6). Every inch of the wooden ceiling was richly ornamented with *Khatamband* technique,[7] remains of which can be seen on the stair ceiling and the outer chamber on the first floor (Figures 7). Richly carved wooden doors and varied patterns of marble flooring were used..

Transformations over Time & Current Condition – The building underwent several changes when converted as the office of the British Raj Deputy Commissioner. Additional rooms were created by closing open arcades of the Durbar Hall, and projected balconies were covered with wooden doors. New windows ad fire places introduced. At places the original marble flooring was replaced by cement tiles. During the Second World War the Palace was occupied by the Civil Defense Organization. In the 1970s it was used by the local Municipal Corporation, and then converted into a museum in November 1977. While no preventive maintenance was undertaken during this entire period, several incongruous additions were made, interior walls were white washed obsuring original artwork. Many of the original timber roofs had deteriorated due to seepage and termites in the absence of proper maintenance. Almost all of these were inadvisably replaced with RCC construction, just as of cement-based plaster and mortar was used for repairing masonry.

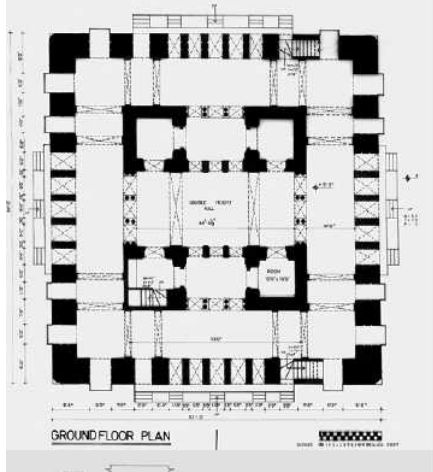
Conservation Action – With the overall objective of restoring the complex to its original form of the Sikh Period, the first major action is to remove all superimposed work of subsequent periods. The original form, features and

5 1 Kanal is equal to 5445 square feet.

6 Nankshahi bricks are typical of Punaj region and are small, thin, multi-hued, sturdy, frost and weather-resistant,

7 Khatamband is an art of making ceiling, by fitting small pieces of wood (preferably walnut or deodar wood) into each other in geometrical patterns.

Figure 4: The Summer Palace before restoration (Source: ASI)



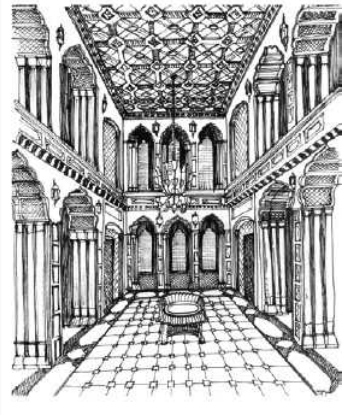


Figure 5:

Top & Bottom Left: The Ground Plan & Section of the Summer Palace (Top Right: Artist's impression of the Darbar Hall.)

Figure 6:

Extant Wall Frescoes in the Summer Palace

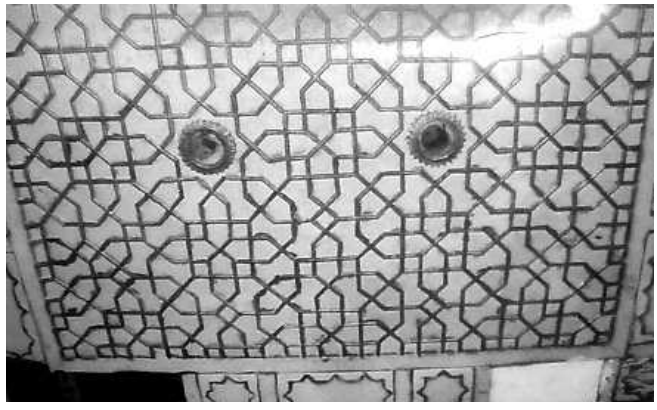


Figure 7: :

Decorative Ceilings, constructed using the Kahtamban technique.

Figure 8:

The Summer Palace during restoration, layers of plaster were peeled off to reveal original details.

Figure 9:

Restoring the Khatamband ceiling

materials are being recovered. Multiple layers of cement plaster and paint were removed to access original materials, features and details (Figure 8). The original flooring, wherever found, is being preserved and consolidated, with cracks being filled with lime concrete. Removal of the later cement-based flooring on the first floor has revealed the original *nankshahi* brick flooring. The RCC roof has been removed and a new 'combination' roof has been built of traditional wooden battens and steel joists. The second aspect of conservation concerns reconstruction and reproduction and of missing artwork and details. This entials removal of old decayed timber rafters and joists and reconstruction of traditional wooden roof as well as repairing and replacing the damaged *Khatamband* ceiling tiles (Figure 9).

The Ram Bagh Gate or the Deorhi

The Original Design – Situated in the southern wall of the garden, the *Deorhi* is the main entrance gateway to the Ram Bagh Complex, and the beginning of the ceremonial processional route of Maharaja Ranjit Singh from the Palace to the city. It is almost square in plan and consists of a central covered passage flanked symmetrically by two-storeyed wings with guard-rooms staircases on each side. Each room is a square-shaped with recessed niches in the middle of its side walls The Deorhi is considered to be a blend of both Mughal and Rajput Architecture. The northern and southern façade have a huge central archway, flanked by a rectangular bay on each side containing an ornamental *jharokha.* The exterior as well as interior of the *Deorhi* is decorated with floral and geometrical designs (Figure 10). The roof terrace is animated with a centrally

Figure 10: An old photograph of the Deorhi. (Source: ASI)

placed red sandstone *Baradari* and square or octagonal *chhatris* at each of the four corners. Exquisite inlay work of Baradari is a distinctive feature of this Deorhi and the jaalis on the parapet of Baradari show finest examples of cut work. Nanakshai bricks have been used for masonry whereas sandstone has been employed for the *chhatries* and the *Baradari* on the terrace.

Transformations over Time & Current Condition – After the Anglo-Sikh wars, the British are reported to have carried out some repairs including insertion of steel girder below the roof of the central passage as an additional support for consolidation of the structure. Following the expansion of the city after Independence, the Deorhi was segregated from the main Ram Bagh Complex and surrounded by vehicular roads on all four sides. It was used as a museum till it was declared protected as monument of National Importance in 2006. When the ASI took up its conservation, the building was in a poor condition due to neglect and damage due to climatic factors. The original timber roof of the Baradari had collapsed and had been replaced with an RCC roof by the Municipal Corporation. Despite this, ingress of water continued to be problem, the reinforcements corroded and, the roof collapsed again. The sandstone chhatries on the four corners of the terrace had also deteriorated due to rainwater penetration. The façades had blackened due to atmospheric

Figure 11: The *Baradari* after completion of conservation. (Source: ASI)

pollution aggravated by active vehicular movements in close vicinity, and rising damp had caused unsightly efflorescence in most part of the building.

Conservation Action – The missing features from the restoration period have been replaced, based on documentary and physical evidence, using traditional materials or compatible substitute materials. The *Baradari* roof was restored using the original construction technique, i.e, timber joists. For this, the whole structure was dismantled, assigning identification numbers to each dismantled piece, and was then re-erected using the original material. Missing red sandstone parapet *jaalis* were recreated as per the original design. Restoration work of the *chhatries* included filling of gaps, joints, repair of cracks, underpinning of brick masonry in domes, edging, pointing and re-plastering. Also, the roof terracing of the *Deorhi* where pointing of tiles had been done in cement was redone in lime-surkhi. (Figure 11)

The Inner Gate or the 'Services Club'

The Original Design – The 'Inner Gate', the northern gateway of the garden is also a double-storeyed structure and is quite similar to the *Deorhi* in its planning as well as architectural character, but smaller in size. The façade contains a large rectangular doorway with centrally placed decorative balcony,

Figure 12: A recent picture of the Inner Gate or the 'Service Club'

Figure 13: Damage to the 'Service Club' due to neglect, misuse and abuse.

the entrance arch being flanked by sandstone balconies. The front façade comprises two massive square pilasters at the corners. This structure too is constructed of Nanakshahi brick masonry, with sandstone balconies supported on stone brackets.

Transformations over Time & Current Condition – There is no evidence of British interventions. But, after independence, the structure was given for use as the 'Service Club'. Today, the building is in a dilapidated condition due to lack of maintenance and incongruous additions, besides the deleterious impact of climatic factors. The interior has been changed totally and the traditional timber roof replaced by an RCC one. Damage due to dampness is apparent in most parts of the building. The façade too has blackened due to atmospheric pollution aggravated by vehicular movements (Figure 12).

Multiple layers of cement-based plaster and coats of paint have been used to 'repair' the building marring the original aesthetics. External sandstone features have been lost under multiple coats of limewash. Original balconies and openings have either been closed or doors/ windows have been added. Addition of toilets on the upper floor necessitated installation of sewerage pipes, which are the main cause of seepage and dampness, resulting in plaster deterioration, vegetal growth, damage to masonry and development of cracks. The new plumbing and rain water pipes, the overhead cables for electrical supply and air conditioning units affixed to exterior walls are insensitive interventions that create visual clutter and ravage the authenticity of the historic structure. No conservation action has yet been started (Figure 13).

The Western *Munshikhana* or the 'Civil Defence'

The Original Design – This *Munshikhana* lies on the western end of the E-W axis and was originally used as an office by Maharaja Ranjit Singh's courtiers. Square in plan and built on a low plinth, this structure has a flat roof and an open rectangular pavilion at the front. The front elevation of the building is a symmetrical composition of five arched openings framed by sleek and slender columns. The end bays of the lower story are treated with a composition of rectangular panels. The rear, western wall is pierced by a gateway. The side elevation, with projected balconies and cusped arches within rectangular frames, is a fine example of an asymmetric composition of a variety of elements brought together. Walls throughout the building are decorated with vertical and horizontal stripes in low relief and flanked on their extreme ends by fluted plasters, with decorative *ghata* shaped bases. *Nanakshahi* bricks have been used for the masonry whereas the pavilion arches, eaves and brackets are in red sandstone. (Figure 14)

Figure 14: The western Munshikhana used for 'Civil Defence'.

Figure 15: Front pavilion of the western Munshikhana after restoration

Transformations over Time & Current Condition – During the British period, the building was used as an office, and doors, windows and partitions were added to the original structure. The flooring was completely changed from a traditional brick floor to cement concrete tiles. After independence, the building was handed over to Civil Defence authorities, and lime-washed repeatedly. Cracks developed in the arches due to ground subsidence, while vegetation growth and leakage from the roof terrace caused multiple problems.

Conservation Action – Doors, windows, coats of paint and plaster added later have been removed to reveal the original features and materials. Brick masonry has been consolidated by pointing, edging, stitching and filling gaps. Timber joists have been replaced with steel girders (Figure 15).

The Eastern Munshikhana or the 'Reading Hall'

The Original Design – This too is a square, double-storeyed structure divided into three sections by archways. The facade is almost bare, except for the twin imposing quadrangular blocks, at the two sides, which are flanked on their extreme ends by fluted plasters, with decorative *ghata* shaped bases. The upper pavilion on the eastern front is comparatively more ornamental than the western front and comprises six pillars, with hexagonal shafts standing on *ghata* shaped bases, interspersed with *jaalis*. The interiors are simple except for some engrailed arch recesses. The upper floor comprises a single rectangular hall, with a balconies projecting from northern and southern ends. The parapet wall is made of *jaalis*.

Transformations over Time & Current Condition – The building was used as a library during the British era. Alterations include layer of cement tiles on floors, closing openings and adding partitions. In 1977, the building was converted to an aquarium and has since then retained the name of "Machhi Ghar". When the officials of ASI inspected the building in 2008, the walls were severely damaged due to seepage and inappropriate repairs. The masonry had deteriorated in the absence of regular maintenance. Negligence had caused extensive vegetation growth over the roofs. The wooden doors and windows were badly decayed (Figure 16).

Conservation Action – The building is under restoration. Growth of vegetation on the roof has been removed, the decayed roof has been reconstructed as per the original details and internal walls have been treated with lime plaster

Figure 16: Damaged interiors of the Eastern Munshikhana

Figure 17: The Hammam

The Hammam

The Original Design – The *Hammam* lies towards the north-west of the Summer Palace, located on a diagonal axes. It is a square-shaped, single-storeyed building, within which is an 8'-6" deep L-shaped tank, and a square room. The southern front wall of the building is divided into three recesses, the central one being its main entrance. Side recesses are decorated with numerous rows of small niches used for placing lighted lamps. There are round pilasters at the four angles of the exterior wall, surmounted by square parapets of *jaalis*. Walls terminate into projected eaves with a *guldasta* above (Figure 17).

Transformations over Time & Current Condition – The historic structure was badly damaged when it was converted into a modern swimming pool by the Municipal Committee in the mid 20th century.

Conservation Action – Wall cracks were repaired by stitching and filling up gaps. Broken eaves and parapets were repaired and the enormous growth of vegetation on the roofs was removed. Seepage of water from roof top was arrested by filling the gaps and joints of the stone. Peeled plaster was raked out and re-applied. The original decorations were restored.

The Chhoti Baradari

The Original Design – Situated on the western side of the palace, the *Chhoti Baradari* is a square pavilion with 12 arched openings, three on each side. It was built in marble and supported on fluted columns with lotus shaped bases and capitals. The façade terminates into projected eaves supported on brackets, crowned with small *burjis* on the four corners and surmounted by a marble parapet. The raised plinth, eaves, brackets and pilasters are of red sandstone.

Figure 18: Chhoti Baradari, during and after reconstruction

The Current Condition – The roof and parapet of the *Baradari* collapsed due to seepage, vegetal growth and termite attack. Moreover the roots of a tree in close proximity had posed a great threat to its foundations. With the passage of time and due to negligence, the original flooring – laid in a specific pattern with black and white marble – was completely damaged.

Conservation Action – This *Baradari* too had to be completely dismantled and reconstructed. It was brought down piece by piece, with all the members being carefully numbered. Then these members were placed back to their original position. The roof has been restored using the original construction technique, i.e., timber joists and rafters. Flooring has been laid in white marble tiles, though in a simple pattern, and not as per the original one. Later on, after the *Baradari* had been restored, an apron almost 2.0 m wide was provided and enclosed by a railing to protect it from further damage (Figure 18).

The Watch Towers or the *Burjis*

The Original Design – The Burjis, located at each of the four corners of the boundary wall, though small in size, are elegant piece of architecture. These were raised octagonal structures, approached by a flight of steps, the ground floor serving as a Guard Room. Each side has a central cusped arch framed by sleek columns at corners of the polygon. The structure is covered by a fluted dome with a sandstone base, eaves supported on brackets and, surmounted by a *kalasa*. The dome is decorated with patterns of lotus petals and floral motifs.

Transformations over Time & Current Condition – Just as all other buildings, the *Burjis* were also in a dilapidated condition due to negligence, lack of maintenance, dampness and inappropriate repair works. The original *Nanakshahi* brick masonry had decayed due to dampness and absence of regular preventive repair, and had been replaced by modern bricks laid in mud mortar. The octagonal stone eaves had also deteriorated due to rain while roots of nearby trees posed further threat.

Conservation Action – The modern bricks used in the lower masonry were removed and the structure reconstructed with original bricks laid in lime mortar. For further consolidation, underpinning of the foundation walls was done to prevent seepage into the structure. Cement plaster was replaced by lime plaster and the rotten door of the guard room was replaced with new door constructed as per the original material. Brick tile flooring of the watch towers was preserved in its original condition. The tree that posed a threat for the structure was removed (Figure 19).

Figure 19: One of the *Burjis* – before and after conservation

CONCLUSIVE ANALYSIS

The study allowed one to draw conclusions firstly regarding the causes of decay and damage of the Ram Bagh, and secondly regarding the nature and appropriateness of the Conservation Action adopted.

The Causes of Decay and Damage

During its heyday, the Ram Bagh Complex was indeed a place of splendor and beauty. However, by 2007, when conservation was taken up, the buildings were in an advanced state of decay and deterioration due to the combined action of a number of intrinsic as well as extrinsic factors. In addition to the damage caused by normal wear and tear and the natural climatic factors, the two major causes which could have been prevented are categorized as under:

1. *Damage due to sheer negligence and lack of maintenance*: The study has shown that all parts of Ram Bagh were devoid of basic preventive maintenance, so that over the years minor defects snowballed into major problems. Negligence had allowed unchecked vegetative growth over all roofs, leading to cracks in terracing, ingress and stagnation of rainwater, breeding of fungi and termites, and so on. Similar is the story of vegetative growth on the ground, causing water retention in the soil and several consequential problems. Dampness caused by lack of preventive maintenance led to disintegration of masonry joints, deterioration of bricks and plaster due to capillary action, efflorescence, fungal rot, termite

infestation and harmful vegetation growth. The roots of trees were a major threat to most of the structures especially the watchtowers, the Chhoti Baradari and the Service Club. Accumulated bird droppings, which contain salts and organic acids and react with the building materials, have also been instrumental in inducing decay as have excreta of stray animals that have free access to the complex. Huuman visitors too have also indulged in mild vandalism. All this could have been prevented through a simple periodic maintenance routine and protective measures.

2. *Damage due to ill-considered and inappropriate alterations, additions or repairs*: Most monuments of Ram Bagh have been subjected to inappropriate transformations, insensitive and unethical usage as offices or for recreational purposes. Repairs undertaken prior to the coming in of ASI were done inexpertly, using unsuitable materials, which reacted unfavorably with the original material, aggravating the very damage they were supposed to make good. For instance, layers of cement-based plaster had been used to 'repair' the building. The use of cement is harmful as it is too strong in compression, adhesion and tension and, thus lacks elasticity and plasticity in comparison to the original lime-based material. Cement also produces soluble salts on setting, which may dissolve and damage the original porous material. Multiple coats of limewash and whitewash had been applied both on exterior and interiors of the buildings, obscuring the original materials and rich ornamental details.

Analysing the Conservation Action

Conservation action at Ram Bagh involved making interventions at various scales and levels of intensity which were determined by the physical condition, causes of deterioration, the anticipated future environment of this cultural property, and, above all, the desire to honour and recreate the legacy of the Sikh period of Indian history. Various 'Degrees of Intervention' can be identified and, at times, several have been used simultaneously.

For instance, original materials discovered during the excavations or during scraping off superimposed layers, are being 'preserved' just as several original internal elements like the floors, doors, etc. have been preserved in their original state. In order to ensure the continued durability or structural integrity of the buildings, 'consolidation' of the existing material and structure is being resorted to wherever needed. Edging, pointing and re-plastering of the brick masonry, underpinning of the masonry walls and provision of additional supporting steel girders below the original roof to strengthen the roof and prevent sagging (e.g., in the main *Deorhi*) are among the few such measures

taken. The original form, features and materials of the historical buildings were recovered after the removal of later interventions. In few structures, such as the *Munshikhana* (the Civil Defence Building), the later additions of doors, windows, coats of paint and plaster have been removed to 'restore' the original glory of the Sikh era. During restoration of this complex, measures were taken to replace the broken or missing features with 'reproductions' of original designs based on authentic knowledge resources. While the missing features replaced, with 'reproductions' there are also cases where parts of the structures (such as the roofs) or even entire structures had to be 'reconstructed'.

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One of the primary lesson learnt through the study is that a correct conservation approach for architectural heritage can only emerge from a holistic understanding of its historic and architectural and art significance, as well as the peculiar materials and techniques employed for its construction. A comprehensive understanding of the factors causing deterioration and transformation in the building and its setting is needed to evolve the basis for all conservation intervention. The main aim of conservation processes should be retention of authenticity, minimal intervention and minimal loss of historic fabric and associated values. Above all it must be recognized and emphasized that regular maintenance of historic resources and, framing and enforcement of proper legislative measures minimizes the need for such interventions.

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