CHAPTER-VII
ARCHITECTURAL FEATURES

Architecture is not mere art of building construction rather it converts the building in to fine piece of architecture when it is composed of elements which are systematically as well as aesthetically arranged. They not only serve a utilitarian purpose but in addition have an emotional appeal. The look of such building strikes deep and solemn chords in the human heart and gives enjoyment. Each great cultural movement has made its own particular contribution to the art of building so that the aspiration of the people and even their way of life stand revealed in substantial form for all to see. In India man’s ideals have found expression in numerous noble monuments showing that few countries possess a rich architectural heritage. From these productions it is possible to reconstruct much of the past and to visualize the social and political condition of the country. During the ancient period the outstanding quality of architecture of India is its spiritual content. It is evident that the fundamental purpose of the building art was to represent in concrete form the prevailing religious consciousness of the people.

The architecture for these building was of the trabeate order, as all the spaces were spanned by means of beam laid horizontally. With the advent of Mohammadans, the displacement of Indian architecture of the beam by the arch evolved. It was made possible by the introduction of mortar and masonry figuring. Unlike the architecture of the Hindus which was confined entirely to temples, Mohammadan architecture represented by many different types of buildings, religious as well secular. It had reached to the climax which after the death of Aurangzeb in 1707 had transferred from Delhi to the provincial centers. It was observed that even in Lucknow where there is a greater display of architecture, the buildings represents the style at that stage that the sources of information have ceased and stagnation have become. This stage of decadence may be due to the fact that the art appears to have reached that point at which all the essential problems of construction had been solved and the major elements of the style had been brought to perfection. It had not only reached the limits of its performance but had gone beyond it. In these circumstances the workmen found

that the only hope of advance lay in the direction of the elaboration and repetition to a larger scale of that which had already been brought to the highest degree of fulfillment.” To achieve this object, therefore, they discarded the use of stone or marble, the buildings materials hitherto, mainly employed, and reverted to brick and rubble foundation faced with stucco. By this means, they enabled to produce architectural projects of great size and imposing appearance, but at considerably less cost, efforts and time. It should be added that in the manipulation of these materials, the workmen showed exceptional technical skill, the finished execution of the ornamental details and moldings in plaster became the redeeming feature of this phase of style. In the nineteenth century, the elements from European sources began to be used. Thus a style of hybrid character flourished in which triangular pediments, Corinthian capital and Roman round arches were combined with fluted domes, ogee arcades and Arabesque foliations.4

At the same time the architectural style adopted by the Sikhs, was in appearance of Mughals extraction. With the elaborations, they presented a certain character of their own. They erected the buildings connected with their belief, which had to be so designed as to accord with its ritual and practice. Among its typical features are the multiplicity of chattris or kiosks which ornament the parapets, angles and every prominence or projections, fluted dome, the embowed or oriel windows and the enrichment of all arches by means of numerous foliations.5

In the remaining parts of India, at that time, a number of buildings were constructed by the British with the European styles of architecture. Those used in particular was the later Renaissance, Baroque Palladian and Neo Classical and the revival style including Gothic. These designs were influenced by the tropical climate helping to produce local hybridized styles, as did the use of oriental motifs, sometimes giving a unique flavour to individual buildings.6 Many buildings for the administrative purposes as well as ‘garden houses’ for the wealthy Indians were constructed with classical facades, spacious pillared porticos and elephant porches and gateways in a style of renaissance. Where stone was available this material was employed but in most instances the method of construction was brick or rubble

covered with stucco, in the handling of which the Indian masons under the British direction showed great aptitude.

During the second half of the nineteenth century, a movement began having as its object the utilization of the indigenous style of the country in preference to foreign styles. Several structures, which combined the features drawn from both Indian and European architectural sources, were begun to be built in this stage. Thus the movement suggests that a trend has emerged in the direction of reviving the styles of beauty and spirit of the old Indian architecture with the methods and ideals of the new age.7

In these phases of the architectural developments, the British had made their existence in the state of Punjab. The adoption of these architectural styles used by the British was natural as most parts of the state came in the political contact of the British as early as in the first decade of the nineteenth century. The principalities of the chiefs came to be known as the princely states. To the good luck of the rulers of these states, after the Revolt of 1857 the British put a stop to expansionist policies. They assured to all princely states of their protection. The states came indirectly under the British control. Under such political contacts the princely states willingly adopted the elements of new styles of architecture.

The factors of the existing styles had an effect on the architecture of the period but certain other factors were also not less important to determine the construction of buildings. The most important of these is the factor of geography that decides the climate of the region. In the state of Kapurthala the climate was characterized by dryness. The temperature began to rise during the latter half of March. The hot season reached its peak during the months of June. July, August and the first half of September constitute the south-west monsoon season. The period from mid-September to about the middle of November may be termed the post-monsoon or transitional period. From this month onward, the weather was cold reaching its maximum intensity during January and February.8 Still the dominant climate of the area is hot and dry. Therefore the protection from heat was needed more attention in the buildings of the region. To meet this demand of the climate, arcaded verandahs around the rooms and windows and ventilators with the projections were provided to combat the heat. The roofs of the buildings were kept on the double height and at

some instances the high pitched roofs are considered essential to throw off rain water.  

Along with the factor of climate, the interests of the patrons of the buildings who constructed these buildings and the people who were employed for the purpose also determined the structures of the buildings. It was after the annexation of Punjab to the British Indian Empire in 1849 that a properly organized department for carrying out public works was organized in the province by the British which had been placed under the charge of Civil Engineer and then Chief Engineer. Emulating the example of the Punjab Province, Raja Randhir Singh set up Public Works Department in the State in 1860. This department worked under the charge of State Engineer. The other staff members included the sub-engineer, overseer, accountant, clerks, mistris and others. The department looked after the construction of buildings and roads and the machinery of the State. Later on all of its branches were separated. The earliest chief engineer of the state came was Dallimore who had many qualities which fitted him for his position here, and rendered the state excellent service in various capacities for about eighteen years. He had initiated and executed several works which were of great benefit for the State. A large number of buildings were raised under his guidance but at most of his time the ruling authority was the British Residency which was to run the administration of Kapurthala State during the ‘mental derangement’ of Raja Kharak Singh and minority of Maharaja Jagatjit Singh. These buildings included Randhir Hospital, dispensary of Sultanpur, Jalandhar House, stables at Kapurthala, tehsil buildings at Kapurthala, Phagwara and Bhulath, civil guest house of Kapurthala, Rest Houses at Phagwara, Bhunga and Sultanpur. The construction of famous Darbar Hall and Mausoleum of Kharak Singh was also started under his supervision but the death stopped him. After his death, C.S. Rundle took over the charge as the Chief Engineer of the state. He worked here upto 1912. On the other hand after attaining the majority in 1890, Raja Jagatjit Singh was invested with full ruling powers and the office of superintendent ceased to exist. Villa Kothi, Jagatjit Club, Clock Tower were the important buildings under his able stewardship but the most important was the

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9. *Archaeological sites of the buildings in the state.*
completion of Darbar Hall and public buildings for the central offices, the mausoleum of Raja Kharak Singh and the smadhi of Raja Randhir Singh.\textsuperscript{11}

Maharaja Jagatjit Singh was the most illustrious ruler and wide travelled person, wherever he went he appreciated the building art of the country and not only adopted the outwardly features of their buildings but he built the whole buildings in such designs. A few examples of these were the Jagatjit Palace, Villa Kothi and Moorish Mosque though in the other buildings the European features of the architecture were also adopted. Even for the construction of these buildings he hired the engineers and designers from other countries. At home Lala Kanshi Ram remained the Chief Engineer of the State for about twenty five years from 1912 to 1937. After his retirement Lala Lekh Raj worked on this post. The main buildings of Randhir College, State School buildings, Hospitals at Kapurthala, Phagwara and Sultanpur, Town Hall, Jubilee Hall, State Gurudwara, etc. were designed by Lala Kanshi Ram. Sardar Lekh Raj supervised the construction of the state industries of Phagwara, Hamira and Kapurthala. The additional buildings in the hospitals, new schools for girls at Phagwara and the smadhis for the Maharani were also constructed under his supervision. In the construction of these buildings the impression of the British impact is directly noted.\textsuperscript{12}

Some of the monuments of the state had been constructed by the people of the state, mostly of the religious nature. Among these the most prominent were the Temple of Bhadrakali at Sheikhpur, Lahori Gate Mosque, Jami Mosque, Mosque of Darveshpind, Gurudwara Bawain, Akali Gurudwara and Dera Ravidas. In these buildings the effect of the belief waw's reflected. The other monuments include the additional buildings in the Phagwara dispensary, Smadhi of Chuhar Mal, Smadhi of Diwan Mathura Das’s wife, Janjghar Sultanpur etc.\textsuperscript{13}

Architectural material is another factor responsible for the style of the buildings. The availability of building stone was crucial in the region and the architect relied upon brick and chunam which prevailed here in sufficient quantity. The architecture of the region was mainly of brickwork of fine quality. As in the region as

\textsuperscript{11} Report on the Administration of Kapurthala State, 1911-12, p. 74, Anju Arora, Princely States, p.272.
\textsuperscript{12} Anju Arora, Princely States, p.272-73, Archaeological sites of the buildings.
\textsuperscript{13} Archaeological sites of the buildings.
a rule the building material was not prepared on the site of the structure but in the quarry itself often some considerable distance away.\textsuperscript{14}

The main material used in the buildings of the state was the bricks. The bricks were usually prepared of well puddle clay with their beds so smoothed that they fitted very accurately. The skilled handling of much of this brick work denotes that it was a method of building which had been in practice for a very long period. Its great antiquity has been proved by the advanced stage building in brick had attained as early as 3000 BC in the cities of Indus civilization. The use of such small elements adds to the difficulties of bridging spaces, as in the case of roofs, doorways, and all openings. The Indian builders overcame it by resorting to very large bricks but they soon realized that even by employing exceptionally large bricks spaces could not be readily spanned. So it became the practice to introduce beams of wood over the openings. Gradually the method developed to span a void by means of over sailing the courses of brick until they met.

They followed the method of header and stretcher, care being taken that no two joints came over one another. Between the joints a mixture of clay was interposed as an adherent but only very thin layers as the bricks were brought into close contract. The beds of the bricks were grooved to hold the mixture well. This brickwork if properly prepared and other things being equal has durable qualities little inferior to those of stone masonry. Besides it also has the advantage of being composed of small units the flexibility of which gives greater constructional possibilities.\textsuperscript{15}

The state of Kapurthala was a part of the alluvial plain. The alluvial soil can be easily moulded into fine bricks and sufficient wood was available for firing them. Hence the brick architecture, where the good clay was easily obtainable, was expected and the state of Kapurthala was not an exception. The persistent clay used for making hard burn bricks is still met with between the depth range of 160m and 175m in this area.\textsuperscript{16} The fired bricks made of this clay are the chief building material used in the monuments but the size of bricks varied from small Nanakshahi or Lahori bricks to standard sized bricks. Sometimes these are of extra-ordinary size. Most of the buildings constructed before Maharaja Jagatjit Singh’s rule were built with small sized Nanakshahi bricks but the lateral constructions are erected with the standard

\begin{itemize}
  \item \textsuperscript{14} Percy Brown, \textit{Indian Architecture}, Vol.1, p.66
  \item \textsuperscript{15} \textit{Ibid}, pp.40,45.
  \item \textsuperscript{16} \textit{District Gazetteer, Kapurthala}, 1984, p.9.
\end{itemize}
sized bricks. The smaller size brick measures 6.75 x 4.0 x 1.4 inch, though the standard size measures about 9 x 4 x 2 inch. The bricks of other shapes than the standard ones are also found in the buildings. These are of round shaped used in the pillars and pilasters.\(^\text{17}\) The Imam at the Phagwara Jami Mosque told that the family, who donated money and land for the mosque was of brick-kiln. They also made the round shaped bricks which had been used in the mosque.\(^\text{18}\)

The mortar for joining and plastering these bricks was the mixture of lime, \textit{kankar} and \textit{surkhi}\(^\text{19}\) as told by the employees of P.W.D. of Kapurthala.\(^\text{20}\) \textit{Kankar} is the local name of calcareous concrete. Found in beds generally at a slight depth below the surface, whence it was excavated and cost into blocks for use. Sometimes \textit{gur} and finely chopped hemp and \textit{dals} were also mixed with the mortar. Since the mid 1930’s, the cement and mud materials also began to be used for the plastering and joining the bricks. Sand for mixing in the cement was found from west of Sutlej around the confluence of Sutlej and Beas.\(^\text{21}\) In some of the construction like Jagatjit Hospital, Phagwara the use of mud to join the bricks is found. The bricks were not left exposed normally and these were covered with a layer of plaster almost with the same mortar but the walls of the Darbar Hall and Court Complex were plastered with a fine type of material and the local residents are of the opinion that \textit{gur} and \textit{dal} were mixed in it to make it so smooth.\(^\text{22}\)

Wooden beams and plaques were used in the roof and over the door and window openings. Even the wooden roofs were never kept uncovered. Mortar and bricks were used to cover these roofs. Again in the buildings constructed in the 20\textsuperscript{th} century there was the use of iron girders and bricks in the roofs. The wood remained the main material for doors, windows and at many projections over them. The projected balconies were also made with the wood at the Military Headquarter, Kapurthala, and Jami Mosque, Phagwara. Fine quality of wood used here can be judged form the fact that even after passing of more than hundred years, many of the doors and windows are found in good conditions in spite of the humid weather and sufficient rains.\(^\text{23}\)

\(^{17}\) \textit{Archaeological sites of the buildings.}\n
\(^{18}\) \textit{Interview with the Imam Ovais-ul-Rehman.}\n
\(^{19}\) \textit{Surkhi} is the powdered brick\n
\(^{20}\) \textit{Interview with the employee, named Mr. Ram Kishan at P.W.D., Kapurthala.}\n
\(^{21}\) \textit{District Gazetteer Kapurthala, 1984, p.9.}\n
\(^{22}\) \textit{Archaeological site of the buildings.}\n
\(^{23}\) \textit{Archaeological sites of the buildings.}\n
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In the words of Percy Brown “the theory of the availability of materials should not be pressed too far. Much depends on the human elements and the preference of people under certain conditions for the particular type of building which would best suit their purpose.” True in the state of Kapurthala where the stone and marble was not found easily but was used freely for paving the floors on the domes and even for the construction of the buildings. The building of baradari and royal smadhis were built with the red stone brought from Delhi. White marble for the dome of state Gurudwara, Kapurthala was brought from Maqrana, Rajasthan. White and black marble and red sand stone were used in the palaces, Moorish Mosque, Gurudwara Ber Sahib had been brought from outside the state. Some of the marble used in these buildings brought even from other countries. The stone for the construction of Panj Mandir was brought from Dehli. As it is also used in the other temples built in the state territory, it might have been imported from outside of the state.

Iron and steel began to be used for the building purposes in Europe at the end of the eighteenth century. According to W. R. Dalzell, iron was developed largely in order to find a fireproof material which was to be used in the buildings and the mills required for the industrial revolution. With the coming of the British this material also came into use both for constructional and decorative purposes. Iron girders and corrugated iron sheets revolutionized the prevailing roofing techniques. Besides being light in weight corrugated iron sheets were decorative too when placed in a sloping manner. The parallel ridges and grooves imparted a texture to the roof which continuously changed with the angle of the Sun. Here it is important to mention that while the use of iron had been common in the construction up to the period when the Moorish Mosque was built but it is not used in the masonry construction as it was to be built in the same architecture and style as that of the mosque of Marrakesh.

Iron gates were fixed in the outside boundaries in the buildings like Jagatjit Palace, Moorish Mosque, Court Complex and eastern side gate of State Gurudwara. There were the wooden gates fixed in the tehsil buildings, Gurudwara Bawain, Sanatan Dharam Sabha, Radha Krishna Temple all at Kapurthala and Dera Ravidas, Phagwara. Many of the other buildings had no gates and even many of them did not

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25. Archaeological sites of the buildings.
27. Archaeological site of the Moorish Mosque, Kapurthala.
have the boundary walls. Besides the gateways fencing, decorative fountains and the finials of the domes were built with this material.28

The use of glass was also found in these monuments. It was used in the doors, windowpanes and the ventilators where it acts as a barrier for dust and rain. The glass must have been painted with colours as some references are found so but now only at the buildings of the grain market of Sultanpur Lodhi the painted glasses with yellow, green, red and blue colours are found.29

Terracotta is the other material that is used for enclosing the parapet. It is made of different styles. These different parapet designs are prepared on the potter’s wheel. The terracotta tiles are also used for the decoration purpose.30

With the influence of all such factors architectural elements were arranged by the architects in such a manner that they existed up to the day with their glory. In fact the building is composed of architectural elements just as a literary composition is made of words.31 ‘Persons’ declared Vitruvius, a Roman architect as well as a theorist, ‘can justly claim to be architects only if they have from boyhood mounted by the steps their studies and being trained generally in the knowledge of arts and science have reached the temple of architecture at the top. He demanded an architect should be a man of letters a skillful draftsman, a mathematician familiar with scientific though a diligent student of philosophy, acquainted with music, not ignorant of medicine, knowledgeable about the opinions of jurists and familiar with as with astronomy and the theory of heavens.’32 Such architects can be able to arrange properly all the elements of the buildings according to the necessities and purposes of the buildings. The elements include the pillars, piers, columns and pilasters, arches and vaults, roofs, domes and shikharas, verandahs and porticos, platforms and plinths, etc. The features of these architectural elements found in the historical movements of Kapurthala state are analyzed after studying its buildings.

The major feature of these building was the presence of pillars and pilasters. A pillar is a free standing upright member which need not be cylindrical or with any specific order. Usually it is a weight carrying member.33 Basically these pillars or

28. Archaeological sites of the buildings.
29. Archaeological sites of the grain market, Sultanpur Lodhi.
30. Archaeological sites of the buildings of the state territory.
31. Subhash Parihar, Architectural Heritage of a Sikh State, Faridkot, p.34.
piers are designed to carry the weight of an arch, rafter or the roof overhead.\textsuperscript{34} The prominence and the number of these supports had produced such intricacy and beauty in the architecture that the state buildings of the period can be identified from them.

The pillars are found in different shapes like round or octagonal and in many instances the plain rectangular or square. These were used, both decoratively as well as structurally, to support the galleries, arches, rafters or roofs. Whatever be the shape, these pillars as usual were divided into three parts: base - the bottom parts, shaft - the middle part and capital - the top part. In most of the buildings standing in the state of Kapurthala, the bases were built on square platforms which rose from a few inches to about two feet high. Simple mouldings were provided for the designs under the shafts which were plain. Sometimes these shafts were plastered but at some places these were built with naked bricks. The capitals were built with the inverted bases. Such simple pillars were constructed in the public secular buildings like tehsil complexes, educational buildings, hospital buildings, etc. found in the cities of Kapurthala, Sultanpur and Phagwara.\textsuperscript{35}

The other style of pillars was made in the Jagatjit Club. The beauty of this building lied in its beautiful Greek style columns. Here the Attic base was provided in which upper torus and lower torus were separated by Scotia.\textsuperscript{36} The base carried the circular shaft with flutes. It rose up to the inverted base like capital and supported the wooden rafts provided under the wooden girders supporting the roof. The columns of this order of fluted shafts were also provided at the gates of Shalimar garden, Sanatan Dharam Sabha Bhavan and Gurudwara Bawain but in these buildings double pillars were built on a single raised platform. The building of clock tower also had such columns but here the single torus of the base was kept under which a square platform was built. Inside the great Darbar Hall at court complex beautiful leaflet designs were also made on the capitals and bases of the fluted shafts.

The third type of pillars is found in the temples. The Panj Mandir, Radha Krishna Temple and the temple attached to Sanatan Dharam Sabha Bhavan, all were constructed in the Kapurthala city, the temple attached to Khurrampur sarai, and the temples of Dhiran Mohalla, Sultanpur and Shiva temple of Bhunga. For these pillars,

\begin{itemize}
\item \textsuperscript{34} Pardeep Singh Arshi, \textit{Sikh Architecture in the Punjab}, p.120.
\item \textsuperscript{35} \textit{Archaeological sites of the buildings}.
\item \textsuperscript{36} G.K.Hiraskar, \textit{The great ages of World Architecture}, p.233. The Torus is the moulded disc. The Scotia is a concave moulding lying between upper and lower torus. This moulded base was brought to this perfect form in Attica and hence it came to be known as Attic base and used in Greek Lonic order.
\end{itemize}
bulbous bases were built over a square pedestal. A tapering fluted shaft was constructed over which sometimes bell like capital was built. Leaflet designed decoration was given on the bases. These pillars were as wide as the walls of these temples but were less thick. The pillars like these temples were built in the War Memorial and Gurudwara building at Kapurthala and Gurudwara at Palahi.\textsuperscript{37}

Double pillars with plain shafts were built at Villa Kothi, Kamra Palace and Jagatjit Palace terrace and Rest House buildings at Phagwara, Sultanpur and Bhunga. However at the gates and boundary wall and on the exterior of the main building gateways of Jagatjit palace the decorative giant pillars had been built. The carved red stone pillars with round shaped shafts at royal smadhas had the bulbous double pot with lotus designed bases. The same design was repeated on the capitals. Almost the same designed masonry pillars were constructed at the mazaar of Mian Nasir Ahmad. The pillars of Moorish Mosque had mouldings over square pedestal for the bases and the round shaped shafts carried the beautiful capitals, though the pillar capitals of the liwan hall and gateway had the calligraphic designs. The pillars of the outside boundary and the gateway of this mosque had octagonal bases. Round shaped pillars with square base but beautifully designed capitals were found in the Jami Mosque Phagwara where double pillars on a single platform and round shaped pillars with double bulbous kalash encircled by lotus leaf designs were provided in the verandah and gateway respectively.\textsuperscript{38}

One more style, the octagonal was also used at the Gurudwara Ber Sahib, Sultanpur Lodhi. From octagonal bases the same style shafts arose. These pillars had beautiful capitals with brackets to support. For the gate of Idgah Kapurthala big octagonal pillars were used with the same base and capital.\textsuperscript{39}

The term pilaster normally is referred to a pillar which is embedded into a wall of the structure but a major part of its body projecting out of it. In other words a pilaster is used in a structure more to add to its decorative intent and on few occasions to add to the strength of the fabric of the walls. Thus a pilaster as its functional ride implies is more in the nature of a decorative motif of the architecture of the wall of the structure both exterior and interior.\textsuperscript{40} The pilaster seems an invariable item in the state monument just like the presence of the pillars on the outside of these buildings.

\textsuperscript{37} Pillars at the archaeological sites of the buildings.
\textsuperscript{38} Ibid.
\textsuperscript{39} Pillars at the archaeological sites of the buildings.
\textsuperscript{40} Pardeep Singh Arshi, Sikh Architecture in Punjab, p.121.
These were present at the four angles of walls, on the both sides of doors, windows and ventilators. The pilaster can also be divided into three basic components like the pillars. These are the same; the base the shaft and the capital.

The first category included the pilasters with square shafts rise from the square base on which a simple moulding was given. The capital was given under the roof. These were plain in both exterior and interior. In the same category the other type of pilasters had some decorative designs in the interior and in certain cases at the exterior also. The category of plain pilasters was noticed in the educational buildings, hospitals, Tehsil complexes at Kapurthala, Phagwara and Sultanpur. Idgah Wall Kapurthala and Parvat Math Hall of Phagwara also had the same type of pilasters. The decorated pilasters were built in the buildings like Court Complex, Jagatjit Club, Jubilee Hall, rooms built near the swimming pool at Shalimar Garden, the State Gurudwara, the Lahorigate Mosque, Peerowali Mosque, Mansurwal Mosque all situated at Kapurthala, Ahlakar’s Sarai Sheikhpur, Grain Market, Sultanpur, and Mosque and baoli at Hadiabad Phagwara. Some of the places like Hadiabad Mosque and baoli, Lahorigate Mosque, Peerowali Mosque, Mansoorwal Mosque, etc. had only a few traces of such designs.

The second category of pilasters belonged to those which had rectangular bases, shafts and capitals. These were found in the temples of Kapurthala, Bhunga and Khurrampur and the War Memorial Kapurthala. The other category with round shaped shafts included doubles and even some triples which were erected in the exterior walls of Kamra Palace, Kapurthala, while in the interior here the square decorated shafts were used. Single round shaped shafts with bulbous pots with lotus leaf designed bases and capitals were present in the mazaar of Mian Nasir’s tomb, Mansurwal Kapurthala, Jami Mosque Phagwara and Janjghar Sultanpur.

The pilasters of most of the state buildings show that these were embedded to add the strength of the walls which also served the purpose of decoration in addition. The long walls of the buildings had doors and windows alternately with ventilators above in almost all the walls where these must have been needed. The interior of the halls like those of court complex Jagatjit Club, Jubilee Hall Kapurthala, Town Hall, Parvat Math Hall, Phagwara and even all mosques had the pillars to support the
arches and over the arches these pillars were joined for the pilasters around the spandrels which needed the strength to support the roof.\textsuperscript{41}

Both arcuate and trabeate systems were followed in the state buildings to bridge the spans. The trabeate order of architecture in India was the indigenous one used by the Hindus from the ancient period. In this procedure the spaces were spanned by means of beams laid horizontally. This system has been adopted in the Hindu Temples. The door entrances of the temples are carried with it. Though some other important buildings like the terraces of important buildings like the terraces of the Jagatjit Palace, the verandahs of Jagatjit Club, Jagatjit Diamond Jubilee School, Phagwara and the portion of Jagatjit Hospital Kapurthala and Phagwara also built with this system.\textsuperscript{42}

The accurate system was most prominent in the state monuments. The arches are the curved structures used to bridge spans and to support the weight of upper parts of the building.\textsuperscript{43} It is constructed in such a way that the downward thrust of the weight above is converted to an outward movement which is resisted by any suitable means, usually a solid mass of masonry.\textsuperscript{44} The arches were built at the door entrances, doorways, verandahs, galleries and porticos, even in the niches and recesses for both functional as well as decorative purposes. Various shapes of arches are found in these buildings. The commonest type of arch was the round shaped British style of arch. Most of the buildings constructed during Maharaja Jagatjit Singh’s time had such arches as many of the buildings constructed earlier have been demolished. This form of arch is seen in the buildings like Randhir School and College buildings, Clock Tower, Elysee Palace, Jagatjit Jubilee Hall, Paramjit High School, Sultanpur, Jagatjit High School, Phagwara, in the hospital buildings constructed at the earlier stages, Tehsil complexes at Kapurthala and Sultanpur and Town Hall Phagwara.\textsuperscript{45}

Another type of arch adopted at the same period was the pointed arch which is the important feature of Muslim architecture. The pointed arch is the architectural symbol of hands joined in prayer pointing towards heaven indicating that all the things in the universe meet in only one the Allah. The types of such arches are two centered arch four centered arch, ogee arch and multicentre arch which was originated

\begin{itemize}
\item \textit{Pilasters in the archaeological sites of the buildings.}
\item \textit{Archaeological Sites of the state buildings.}
\item \textit{D.K. Ultimate Visual Dictionary, p.484}
\item \textit{Gary Robinson, Illustrated Dictionary of Architecture, p.13}
\item \textit{Archaeological Sites of the buildings.}
\end{itemize}
in Mughal style.\textsuperscript{46} Though its sources are found in the traditional Indian culture planted in Indian soil by Aryan philosophy, which reached its highest artistic expression before the Mughal rule was established, and influenced the greatest works of the Mohammedan period as much as any other. It is noticed that the pointed arch was by no means unfamiliar to Indian craftsmen before the Mohammedan invasion, though structurally they had used it very sparingly and on a small scale. All the forms of pointed arch which characterize Saracenic buildings in the West are found in the niches of the temples of various Brahmanical sects in India which inherited the early Buddhist traditions. If the images and the sculptured ornament of the niches are removed, all types of Arab arches are found. The process of adaptation by which Indian arches were converted into the Saracenic, begun by the Arabs in Western Asia in the first centuries, were continued in the successive centuries by all the Mohammedan invaders of India- Arab, Afghan, Turk and the Mongol. Even the religious significance for the pointed arch was only acquired from India which eventually led the Saracenic builders to adopt it as their own, through the contact of the Arabs with the Buddhists of Western Asia; and thus the very feature by which all Western writers have distinguished Saracenic architecture from the indigenous architecture of India was originally Indian.\textsuperscript{47} By the period of this study this architectural feature has came to be known of the feature of Mohammedan architecture.

Among the pointed arches the multi-foiled style of arch is found in the State Gurudwara Kapurthala though at most instances the Gurudwara building has been renovated yet it is seen at the old pictures of the Gurudwara that this type of arch was used here. The arches of this type, found in original shape, are at the Court Complex, Shahi Smadhis, Tomb of Mian Nasir Ahmad, Mansurwal Mosque, War Memorial, Radha Krishna Temple of Maharani Sahiba, Shiva Temple of Bhunga, Panj Mandir, Kapurthala and Shiva Temple of Khurrampur Sarai.

The building of State Guest House in the Kamra Garden had the two centered pointed arches used in the whole building. The other places where ogee type of arch was used are Rest Houses of Phagwara, Sultanpur and Bhunga, Tehsil Complex of Phagwara, the gateways of Gurudwara Bawain, Sanatan Dharam Sabha Bahwan,

\textsuperscript{46} G.K. Hirasakar, \textit{The Great Ages of World Architecture}, P. 290
\textsuperscript{47} E.B.Havell, \textit{Indian Architecture Its Psychology, Structure and History from the First Mohammedan Invasion to the Present Day}, London, 1913, pp.4, 6, 79.
Radha Krishna Temple, Tehsil complex of Kapurthala, Dera Guru Ravidas Phagwara, Mosque buildings of Peerowali, Lahorigate Kapurthala, Hadiabad and Darveshpind. The Villa Kothi, Kapurthala had three foiled arch system that constructed in the Mosque Kaaba at Meeca. The Moorish Mosque was carrying Moorish arch that is deep semi-circular and found in the Spanish Cardoba Mosque. The arch which is broader and seems rather stunted is found at Kamra palace, Kapurthala. This type of arch was the characteristic feature of Aurangzeb’s period in which the arch with curved shoulders and a long straight horizontal top is found.\textsuperscript{49}

The styles of the roofs of these monuments are to be seen both externally and internally. Prominent among the style was the vaulted roof style. The vaults were generally semi-circular. It was constructed by dividing the large spaces into small bays with the help of girders. Then the small bays were spanned with the bricks joined with the mortal of lime, \textit{kankar} and \textit{surkhi}. This type of roof was found on the galleries and verandahs of the buildings like Jagatjit Palace, Rest Houses, Karma Palace, Jagatjit Jubilee Hall, Jagatjit Club, Military Headquarter, State Gurudwara, War Memorial, Moorish Mosque, Lahorigate Mosque, Peerowali Mosque, Ahalkar Sarais of Sheikhupur and Khurnampur, schools and college buildings, hospitals and the rooms built at Shalamar Garden near the swimming pool, all had the vaulted roofs with flat surface over the whole buildings.\textsuperscript{50}

The second type of roof was the flat roof that had been built both in masonry and wooden material. The roofs built in the earlier period before Maharaja Jagatjit Singh’s rule like the Kamra Palace, State Guest House had the timber roofs which still remain at many places but at some places these are renovated with vaulted ones. There are traces of wooden roof on the demolished structure of Military Headquarter but the two remaining rooms still has fine wooden roofs which were built with the wooden girders. Even the wooden girders are also found on the roof of Jagatjit Club. The masonry flat roofs were covering the roof of the buildings such as Gurudwara Ber Sahib, at hospital blocks named Amarjit Memorial Maternity ward, Phagwara. One of these buildings that was erected earlier for the Shahi Smadhi building had the flat roof but its four sides above the wall were rounded off. The same roof is depicted at the

\begin{itemize}
  \item \textsuperscript{48} Arches at the Archaeological Sites of the state buildings.
  \item \textsuperscript{49} Subhash Chander, A Study of Mughal Architecture in the Punjab, p.13
  \item \textsuperscript{50} Roof Style of the state monuments.
\end{itemize}
mazaar of Mian Nasir Ahmad at Kapurthala and the mazaar of Panj Pir at Sultanpur.\footnote{51}

The central portion of Jagatjit Jubilee Hall still has flat wooden ceiling in its interior but not in a good condition though the ceiling of the Jagatjit Club is not found now. The Darbar Hall of Court Complex had the wooden ceiling thus covering with flat roofs from the interior and the surface above the roof while the other halls had triangular roofs over them. The Satsang Hall at Parvat Math, Phagwara had triangular tin roof and it had no ceiling in its interior.\footnote{52}

Some of the buildings in the state have the domes over the roof. The domes were introduced in India by the Mohammadans. A dome is a convex roof. Not only have the Mohammadans, the domes seemed to be so distinctive characteristic of Saracenic architecture. There are the examples of all types of domes constructed by the Mohammadans that are of indigenous origin and are of early Buddhist prototype.\footnote{53}

The domed roofs are found in the monuments of Kapurthala State like Radha Krishna Temple, and Idgah Minars of Kapurthala, Dera Ravidas and Smadhi of Chuhar Mal both found in Phagwara, Shiva Temple and Smadhi of the unknown person at Bhunga, Asha Rani Temple, Smadhi of Diwan Mathura Das’s wife and Mazaars of Sultanpur and Shiva Temple of Khurrampur. Though the smadhis were constructed with octagonal plan, the Dera was square externally but octagon in the interior. Thus the domical roofs had octagon bases which were converted to polygonal construction for round base of the dome. The central portion of the tomb of Mian Nasir Ahmad, double storey building of Shahi Smadhi, Peerowali Mosque, Lahorigate Mosque, State Gurudwara and Gurudwara Ber Sahib all had domical roofs on its central portion which were constructed in square shape. Some of the secular buildings also carried beautiful domes of different styles over them. Jagatjit Palace Kapurthala had a renaissance style dome over the central Darbar Hall. The Darbar Hall of Court Complex had the iron dome which was set to reduce the weight of the masonry dome. Three domes were built over the front turrets of the Jagatjit Jubilee Hall. Fine domes were also found on roof of the Town Hall.\footnote{54}

The art of placing domes over the structure was always a basic problem for the builders at all ages. The Romans placed the domes on circular ground plans and the

\begin{flushright}
\footnote{51} Ibid.  
\footnote{52} Ibid.  
\footnote{54} \textit{Domes at the Archaeological Sites of the state buildings.}
\end{flushright}
Byzantines placed them on spherical pendentives, i.e., the triangular curved overhanging surface formed between the adjacent arches. The Muslim builders overcame this difficulty by employing an indigenous method of transition form square place below to the circular above by super imposing the angles with pointed pendentives, squinch arch and stalactites. The squinch is a device which consists of a series of arches placed at angles to convert the square base to octagon. In practice the dome does not rest on octagon directly. So in the next phase of transition with the help of pendentives a sixteen sided base is obtained which again is converted into thirty two sided base and so on thus finally provided almost a circular base for the dome above. The method also helped to present a beautiful ornament at the corners.\textsuperscript{55} This system of Muslim builders was adopted to place the domes in the buildings of this state. The pendentives were sometimes kept on inside and on the other at the outside.

The Hindu temples of the state had \textit{shikharas} which carry the finials. Such architectural feature figures in all the types of temple design in the country. An early phase of the \textit{shikhara} (tower) consisted of a series of mouldings or courses of masonry of a very simple order diminishing as they ascend thus taking the shape of stepped pyramid truncated above and crowned by a ribbed stone. Later on instead of being curved in outline it almost straight sided like an elongated pyramid but inclined inward at the apex to support the finial.\textsuperscript{56} Ultimately the triangular slabs came to be used to bridge across the corners successively creating a diminishing pattern of nested square.\textsuperscript{57}

This developed pattern to create the \textit{shikhara} in all the Hindu temples are found in the State of Kapurthala. However, the \textit{shikhara} at the temples of Kapurthala city were pyramidal with triangular cuts in the Panj Mandir, curved at the edges in the Radha Krishna Temple of Maharani Sahiba. The replica of \textit{shikhara} was built for the designs on the \textit{shikhara} of Shiva Temple attached with sarai of Khurampur. The old remaining structures of the temple at Chaurah Kuh, Mansa Devi Temple had the diminishing slabs without the triangular ones at the corners, kept to raise the

\textsuperscript{57.} Banister Fletcher, \textit{A History of Architecture}, p.761.
pyramidical shikhara over the shrines. All of these were covered with the finials of Kalash.58

Under the European forms of architecture, the buildings have been set in its own garden compound with the rooms protected by the deep verandahs and porticos. The setting of buildings in their own compounds or garden areas was as much a reflection of good planning, to promote a cool flow of air and to reduce the risk of the disease as from any desire for exaggerated individual splendour. The porticos in the entrances of the houses are set so that the carriages could wait protected from the fierce heat of the sun.59 The verandahs screen the sun rays and allowed the cool air to penetrate. James Johnson, a British traveler enumerates the qualities of verandahs that these afford a pleasing shade from the Sun and keep the inner apartments cool and refreshed by the draught of air under them. According to another observer a verandah keeps off the too great glare of the Sun, and affords a dry walk during the rainy season. Moreover, the arches of the verandahs articulated the facades of the buildings in a decorative way.

These elements of architecture existed in mostly secular type of buildings of the State of this study. It is kept in mind that if the building is aesthetically good and also decorated beautifully from inside, yet if its surroundings outside area is rubbish, then the beauty of the building will be considered reduced. As such the building must have a beautiful surrounding which can be achieved by landscaping and gardening. It was considered as an art in the 16th century in Italy, in the 17th century in France and in the 18th century in England. In India, the Mughal rulers were the lovers of buildings and the gardens.60

Keeping in view the landscaping, the buildings were almost set in a vast compound with shady trees which were planned as an integral part of the buildings and enhanced the cheerfulness of the surroundings. The porticos are found at the entrances front of the buildings which led to the verandahs with lower roof than the roofs of the rooms inside. The main buildings those carried the porticos in front of the verandah were Jagatjit Palace, Villa Kothi, Court Complex, State Guest House, Kapurthala, rest houses at Phagwara, Sultanpur and Bhunga, Randhir Jagatjit Hospital Kapurthala, Amarjit Memorial Block in Jagatjit Hospital, Phagwara and Ahlakar’s

58. Shikharas at the Archaeological Sites of the state buildings.
Sarai Sheikhpur. The Jagatjit Palace had two porticos leading to the main building. One of these led to the Darbar Hall and other might have been built for the general use of the family members. In the court complex both wings on the front and back side had the porticos. All these porticos were built with arched openings in all the sides but the Amarjit Memorial Block portico was built in trabeate system. Among the religious type of structures the only Gurudwara Ber Sahib, Maharani Sahiba Temple Kapurthala, Radha Krishna Temple Sultanpur, Shiva Temples of Bhunga and Khurrampur were entered through a portico. Some of the buildings had arched verandahs without porticos. These are school and college buildings which had neither porticos nor a gateway. A few buildings had the gateways but did not have the porticos. Such buildings were tehsil complex Kapurthala, Shalamar Garden, Sanatan Dharam Bhavan, Gurudwara Bawain, Dera Ravidas, Baggi Khana, and Jagatjit Diamond Jubilee Girls School.61

Almost all the existing buildings of the state are kept higher on the ground and on the entrances the platforms are built. Some of these are as lower as to reach with one or two steps but some are having more than even ten steps to reach them and about 4’.0” high. The State Guest House was reached with only one step platform though the Moorish Mosque, Jagatjit Club, Court Complex, all at Kapurthala, Gurudwara Ber Sahib, Radha Krishna Temple at Sultanpur, Shrine of Dera Ravidas and Town Hall at Phagwara, Smadhi and Shiva Temple of Bhunga, Shiva Temple of Khurrampur had much higher platforms. There were a few steps for the schools and college buildings, State Gurudwara, Elysee Palace, Tehsil Complex, and Jagatjit Jubilee Hall. Jagatjit Palace and Kamra Palace were built with the basement storey kept as the platform. These platforms were built with the bricks which were not almost plastered, though at Shahi Smadhi and Moorish Mosque these were covered with red sand stone. These platforms were surrounded with masonry parapet at some places like school and college buildings, Town Hall and Court Complex. The steps raised to reach above the ground basement at Jagatjit Palace were surrounded with beautiful parapet where the small statues of human beings were kept at the equal distances and flower bases were provided above.

A Jharokha or overhanging balcony typically used in the Rajasthan architecture is traced at the buildings of Military Headquarters of the Maharaja,

61. *Verandahs and the porticos in the archaeological sites of the state buildings.*
Sanatan Dharam Sabha Bhavan and Gurudwara Bawain at Kapurthala. It is said that there was such balcony in the old palace called Jalaokhana but it is extinct now. Such balconies are also found at the shops of grain market Sultanpur Lodhi.

The projecting eave called *chhajja* usually supported on the brackets was an element adopted over the doors, windows and ventilators in the state monuments. These eaves were the integral part of the architecture of Punjab, Gujrat and Uttar Pradesh. More than providing shade, the *chhajja* also acts as heat sinks for the buildings in particularly hot regions. These *chhajjas* also work as the protector for the openings from the rain included with the sunlight. Sometimes these are covered with tiles. While many of these are built with bricks, some of these are of cast iron and other wooden ones, all built with the support of brackets.\(^{62}\)

The grand towers with various shapes were set on the cardinal sides of the buildings. Some of these carried the stairs to reach on one or more floors for which the doors had been provided at each level. The others were built for beautification. One of such tower of Villa Kothi had stairs to reach up to the top of the roof. There were four octagonal towers built on cardinal sides of the buildings of Civil Guest House in Kamra Garden but these towers did not have the stairs. One side tower of Jagatjit Club had the small stairs to reach the balconies and to the roof. There were four towers set in the Jagatjit Jubilee Hall but three of these had the stairs. One of the four towers of Town Hall Phagwara had a set of stairs inside it. Both the towers of *Idgah* Kapurthala had the stairs. Here the windows and niches were kept at the blind storeys. In the Moorish Mosque, a separate tower called minaret was built with false storeys for carrying stairs. At the false storeys here the windows were kept. The War Memorial had the side towers but the stairs had not been provided in these. The octagonal towers at Radha Krishna Temple did not have stairs while the temple with such structure at Sultanpur had the stairs in one of its tower. Usually the small surmounting turrets were placed on towers that were already kept higher than the walls which gave extra command of the roof top.

The other buildings had open stairs to reach the roof but in the certain buildings like the War Memorial of Kapurthala, Dera Guru Ravidas Phagwara, Temple Mansa Devi, etc., where the stairs were not provided. The big structures of the buildings of schools and college had the small stairs of about only 3’0” wide.

\(^{62}\) *Chhajjas at the Archaeological Sites of the state buildings.*
though the others had slightly wider set of stairs but not the grand ones. In the grain market, Sultanpur, the stairs are found after the two shops but these are only 2.0 feet wide.\textsuperscript{63}

The tradition to set the four small staircases in each corner of the main block instead of any grand staircase was in practice before the arrival of the British, though it met with a great criticism when the satirist Sir Charles D’oely found it at Calcutta.\textsuperscript{64} In the buildings of Kapurthala State this old tradition was followed. Even the buildings erected by Maharaja Jagatjit Singh, who was in great touch with the European style, the buildings, other than his Jagatjit Palace, also carried the small stairs in the corners.

On the whole these monuments architecturally as well as materialistically were constructed so excellently adopted to the climate and environment that some of these survive even after passing about more than one and a half century with only little renovations. Those buildings, which were constructed in the last century, are stood intact even without renovations though they need the attention for their existence in the future. This long life of these mortal structures is only because of the material and the proper setting of all the elements in these buildings. Though the elements of the foreign architectural styles were used freely in these but the needs and environment of the state was also kept in mind while the construction of their structures, which made these constructions to live long and beautiful.

\textsuperscript{63} Turrets and the stairs at the Archeological Sites of the State Buildings.
\textsuperscript{64} Philip Devies, Splendours of the Raj, p.65.