



Construction Techniques and Material used in Subcontinent during British Era: A Case Study of Shikarpur Sindh

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Abstract: Shikarpur is one of the most historical place of Sindh, the history of this historical city begins from 1600 AD when Sindh was conquered by the Mughal Empires. The present city and its outskirts places were used as hunting fields known as Shikargah. Later on this historical place ruled by Daudpotas and Talpurs. In earlier 1800 British extended their trade to Central Asia through River Indus. In 1843 British conquered Sindh, Britishers given special attention towards Shikarpur due to its geographical location, an underground sewerage system was laid in 1890 AD, underground water supply were laid with a network of fire hydrants. as Shikarpur was the trade Hub of Central Asia and after getting special attention from Britisher, economically the city become more richer and Architecture of this city boast up people started built beautiful houses, community Havelis and other institutional Buildings by local Authorities. The workmanship and techniques of that era was very high, they were often to build two, three stories' buildings by using local techniques, Material and workmanship. The constructions were not only functionally, structurally and aesthetically sound but also environment friendly. Scope of this research to investigate the construction techniques and material used in Heritage of Shikarpur. The research was conducted through the surveys and detailed inspection of British Era Buildings in different areas of Shikarpur city.

Key words: Heritage, Construction Techniques, Architecture, Construction Material, Beautiful Houses

1. Introduction

The architecture of any era is the material evidence and true reflection of the building material in addition to the construction techniques embedded in that society. Legendary architect Frank Lloyd Wright also mentioned that the materials employed in the buildings according to the inherent nature enhance the quality of the building. He was also of the opinion that the beauty of the construction is dependent on the usage of material. So, for the good quality building the material selection plays a significant role. The study of British era buildings portrays the true excellence of the materials and workmanship at that time. Marcus Garvey said "a person without the knowledge of their past, origin & culture is like a tree without roots". Moreover, it's very necessary for restoration and preservation any building that one should know what types of material and techniques were used in building. The study area "Shikarpur" has more than one thousand historical buildings which were declared as cultural Heritage sites by UNESCO in 1998.

Shikarpur, a contested area in the 17th century, was later taken over by various rulers and became a monetary center. The British aimed to consolidate Sindh in the 1800s, constructing a modern town with Anglo-Mughal,

European, and French structures. Colonial Shikarpur was a hub of collaboration between wealthy elites and the British, known for its stunning architecture and functional facilities. However, after partition, Shikarpur's impact diminished, and Karachi became the dominant financial hub. The building materials and techniques play a decisive role in the behaviors of the structures they use. Historical agglomerations use different materials such as natural stone, brick, wood, mortar. Understanding the physical and mechanical properties of these materials is an indispensable part of the work to be done to evaluate historical structures [1].

1.1 Objectives of the Study

The overall goal of this research is to study the construction techniques and material used in subcontinent during British era.

1.2 Significance of the Study

The scope of this research is limited to study the material and construction techniques of British era buildings within the premises of Shikarpur city.

2. Research Methodology

Qualitative and quantitative both methods were used to conduct research. Case studies of different buildings were done to identify the material used in construction and surveys; interviews were conducted to identify the construction techniques which were used in construction of buildings.

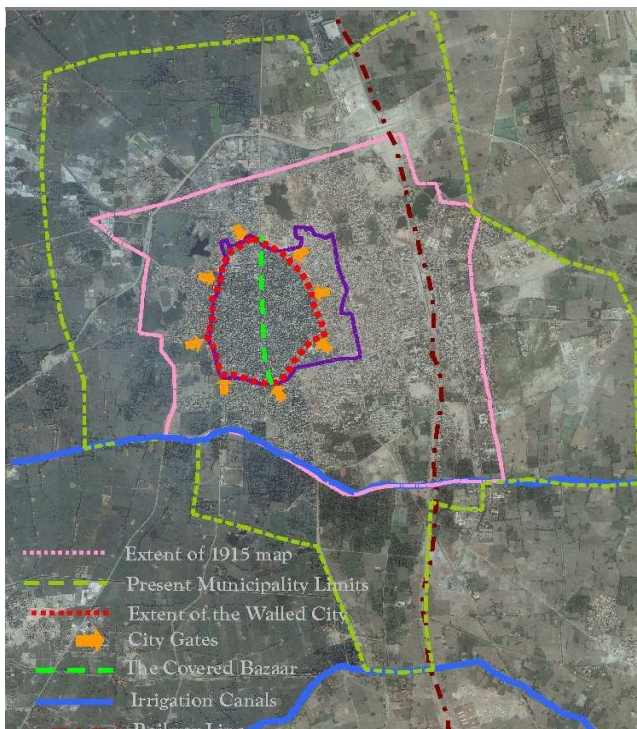


Figure 1: Satellite image Shikarpur showing details of areas developed with passage of time. Source: “Shikarpur heritage committee”

3. Results and Discussions

3.1 Construction Material for Foundation

In most of the buildings backed bricks (12x8x3-4) inches used in foundation. The minimum width of foundation was twice of the wall and in some buildings its three times to thickness of walls in stepped footing. Lime mortars were commonly used for construction. The quicklime was made by burning the limestone or chalk which was afterwards slaked with water. The quicklime and water mixture were than mixed with the fine aggregates to form mortars. It takes time in settling with the help of carbonation process.

Some limes have a hydraulic set (a bit like a weak cement). This could be induced by adding pozzolans which contain silica. Another option was to use a lime which naturally contains silica (usually a proportion of clay). A hydraulic 'set'

is quicker and stronger than carbonation. Some of the very strong hydraulic limes are not dissimilar to modern cement; made of course, from chalk and clay.

3.2 Construction Material for Walls

Backed and kachi (dry) bricks were used in construction of all types of walls. the thickness of walls vary between 1'-6" to 2'-6" depending on over all load of building, as almost all the structures of British era were load bearing, mud and lime mortar used as binding material. The thickness of walls at upper floor (1st,2nd) were reduced but to strengthen the walls wooden framework introduced in masonry which reinforced the wall to brick masonry, this wooden framework is invisible and due to the plaster (mud or/and lime).



Figure 2: shows the wooden frame reinforcement in brick masonry.



Figure 3: shows the wooden frame reinforcement in of same house covered with plaster.

To provide more strength they often laid bricks at 45° and 60° after certain numbers of bars, especially after lintel level and before roof level by using this technique they were able to distribute the load equally on throughout the wall.

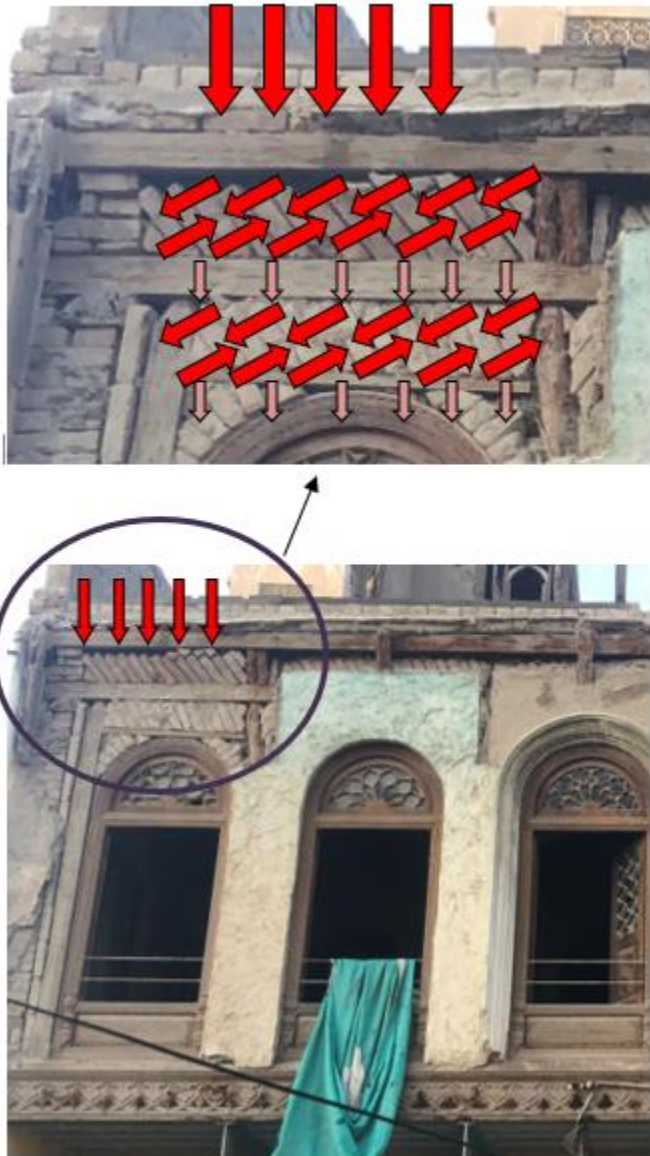


Figure4: shows the load distribution and interlocking technique of brick masonry achieved by laying bricks at certain angle.

3.3 Construction of Roof

Basically, three types of material were used in construction of roof namely Timber/wood, iron and burn bricks. Roofs of some houses were built by using timber beams and planks, some built by using timber beam rafter and burn bricks while some of the roofs were built by iron I beam (guarder), T iron and burn bricks with slope up to 10° for proper drain of rain water. the treatment done in layers, 3to 4-inch-thick layer of earthen mixture of sand, clay, and sometimes straw or other organic materials were used for insulation.



Figure5: shows the roof built by rafter and burn bricks. (a house built in 1930 at Awan Muhala)



Figure6: shows the roof built by I beam, T iron and burn bricks. (a house built in 1930 at Awan Muhala)



Figure7: shows the roof built by timber beam, rafter and wooden sleepers (a house built in 1940 at Hathi Dar).

3.4 Building Facade

Building's facades in Shikarpur were impressively decorated by imaginative artisans and brilliant craftsman. The local craftsmen of that time were excellent in wood carving, glass paintings, metal art and stucco work.

The facade and Balconies were richly decorated with wooden carving and metal art. Even the drain pipes of most of the houses were decorated through metal art.



Figure8: shows the Islamic calligraphy by metal art on window of mosque (at Awan Muhalla).



Figure9: shows the wooden craft work under projected I beam (Guarder). (at Awan Muhalla).



Figure10: shows the metal Art on parapet wall of house.

3.5 Floor Finishing

Backed brick in zig zag bond, mosaic ceramics and terrazzo most commonly used as floor finishing material



Figure11: backed brick floor



Figure12: Terrazzo floor



Figure13: mosaic ceramic floor

3.6 Conclusions and Recommendations

In the light of Case study of Historical city, it is concluded that the city Shikarpur have very rich architectural history. The city has prominent historic identity of its own. Techniques of construction, material and workmanship were amazing. But unfortunately, local residents of city and authorities are neglecting the historical importance of their city they start demolishing old houses and even in some cases they tried to preserve the heritage buildings but due to unawareness of original techniques and material they used alternative material and techniques due to which, the original beauty and attraction of British era buildings seems to be disappeared with passage of time. It is the duty of every citizen and authorities, not to forget reflecting heritage of buildings because the people who do not care about their past tend to be reckless with their present and future.

References

- Mangi, N.N. Shikarpur–Hik Ibhyas [Sindhi]. Kandiaro, Sindh: Roshni Publications, 2004;
- Naseem, Mughal. Shikarpur Heritage. An Illustrated Journey Through History. Karachi: Sindh Archives, 2012;
- Dhakku, N.A. (2016). "The Forgotten Dak Bungalows from the British Era." Dawn, December 11, 2016.
- Board of Revenue. District Shikarpur base map [map]. Government of Sindh, Board of Revenue, Heritage committee presentation (2012). "Shikarpur Historical City, Sindh Pakistan.
- Naeem A. 2012. Shikarpur: Experiences of a City under Shadows of a Glorious Past. In P Vandal (ed.), Life in Small Towns: 3rd THAAP Conference: 123–136. Trust for History, Art and Architecture, Lahore