

A Study of the Traditional Architectural Features of the Bai Dwellings in Dali

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Abstract: The dwelling architecture in different parts of China contains different regional characteristics, reflecting the local ethnic history and culture and the interaction between people and the regional and social environment. Dali is a Bai settlement, with many Bai villages. These villages have a long history and a deep cultural heritage, and have preserved a number of residential buildings with ethnic characteristics that have some artistic value. This study looks at the historical and cultural aspects of Dali, its natural environment and humanistic customs to understand the characteristics and uniqueness of the architectural art of Bai folk houses in Dali, and selects characteristic folk houses courtyards in Dali for study. The characteristics and problems of Bai folk architecture are analysed, and relevant research results and countermeasures are proposed to solve these problems.

Keywords: residential architecture, regional colour, architectural art, humanistic customs, the Bai nationality

1. Introduction

Traditional dwellings can represent the cultural identity of a region, and can also reflect a microcosm of human culture in a certain social period. Different regions have different traditional dwellings. These dwellings reflect the local ethnic colours and regional characteristics, and have a deep historical and cultural heritage. They are capable of displaying high artistic value. The Dali Bai Dwelling embodies the architectural style of traditional dwellings, while at the same time incorporating the local Bai culture of Dali. It is a very ethnic style building. This study explores the factors that influence the architectural style of the Bai people from the social, historical, cultural and natural backgrounds, analyses the architectural features of the local Bai dwellings in Dali through fieldwork, and points out the problems that exist in the conservation and inheritance of the Bai dwellings. The study of the traditional architectural features of the Bai dwellings in Dali can further enrich the theoretical system of traditional dwelling architecture, and can also play a role in the inheritance, protection and development of the dwellings.

2. Literature discussion

Some relevant studies have been conducted abroad on Bai traditional folk architecture. The main research results are summarized as follows: scholars point out in their relevant research that the art of Bai folk house architecture has attracted world attention^[1]. It leads the whole trend of architectural design. In the specific research process, it integrates several disciplines such as architecture, folklore and anthropology. Scholars in their related research argue that the design inspiration of Bai folk houses contains corresponding elements of architectural and religious culture and systematically analyses its artistic effects^[2] and other scholars pointed out in a related study that the design style and artistic effects of Bai folk architecture mainly stemmed from the advancement of building technology and the borrowing of the concept of architectural sophistication, which made Bai folk architecture distinctive and formed a very remarkable architectural art feature^[3]. Another scholar, in their study, argues that architecture is influenced by different regional folk cultures in the process of development, and that the unique artistic style of Bai folk house architecture should be re-analysed and re-examined from the perspective of aesthetics^[4]. They also synthesise the views of different schools of thought and use a large number of

relevant theories as the main basis for their research. Clearly, such a detailed and in-depth study is rare and has some research value.

In fact, our country was greatly affected by the war of aggression against China at the beginning of the last century^[5]. Liu Dunzhen, Liu Zhiping, Liang Sicheng and other famous design masters in China's architecture began to study and analyse the architecture of Kunming and Lijiang^[6]. As a result, ethnic minority dwellings, mainly in the southwestern frontier region, received great attention and importance, prompting more scholars to carry out relevant studies and achieve corresponding research results. In fact, relevant research on Bai dwellings in China is still in its infancy. Among them, scholar, in his relevant research, interpreted the cultural elements expressed in Bai dwellings from the perspective of anthropology and analysed the development and evolution of Bai dwellings from the perspective of culture^[7]. In a related study, scholar points out that he conducted a survey and research on the corresponding dwelling architecture in the ancient city of Lijiang as early as the end of the last century and obtained corresponding research results, opening the curtain on the investigation and analysis specifically for minority architecture^[8]. Subsequently, research into the architectural design style and aesthetic art of Bai folk dwellings continued to grow. Scholars Ge Shengnan, have analysed them from a number of perspectives, including historical, ethnographic, anthropological, and sociological, in relevant studies. After conducting large-scale surveys and analyses in several regions, they obtained more detailed papers and information, which led to more attention to the study of the architectural art of Bai folk houses and created a greater research effect^[9]. As we entered the 21st century, research on Bai folk architecture and Bai folk culture in China continued to increase, and this aspect became the focus of many scholars' studies. Elements of literature and art emerged in the studies related to Bai architecture at this stage, enabling Bai architectural culture to be passed on. Scholars used specific cases as objects of analysis in their relevant studies, and adopted a comparative analysis method to explore the artistic style of Bai folk architecture^[10]. In addition, Bai ethnographic theories have been incorporated into the artistic analysis of residential architecture in related studies. Relying on its own ethnic affinity, it has laid a good foundation for the emergence of a large number of relevant research results and formed a new research direction.

3. Architectural features of Bai folk dwellings

3.1 Background to the formation of the architectural features of Bai dwellings

Firstly, there is the history and culture of the Bai people. Some scholars point out that the "ancient Erhai people" are an important part of the origin of the Bai. The Bai emerged during the pre-Qin period, when the Qiang were the main ethnic group, and over the course of several thousand years, various ethnic groups continued to integrate, with the Bai also incorporating the Hui, Han and Mongolian minorities. Influenced by the diversity of cultures, the Bai have a unique cultural identity.

The second is the natural environment, with the Bai mainly concentrated in Dali, Yunnan. Dali is located at the junction of the Yunnan-Guizhou plateau. The four seasons are like spring, with beautiful scenery and a suitable climate. The eaves of the back wall are built in the form of a 'banded building'.

The Bai have a diverse cultural system and a rich belief system. The scholar Zhang Shuhui has divided the hierarchical features of the Bai belief system into three parts: firstly, the primitive religion of the roots, secondly, the core ancestor and local worship, and thirdly, the foreign religion of dependence. In the era of primitive society, people believed that all things were spiritual and worshipped nature. The Dazheng tree in Zhoucheng, Dali, was regarded by the Bai as a 'feng shui tree' and rituals were held beside it. Bai ancestor and native worship is a belief practice unique to the Bai people. There are many major Bai temples dedicated to historical figures and heroic figures who helped people. These major temples are closely associated with the beliefs of the Bai people. The main foreign religion of the Bai is Buddhism, which is a foreign religion, but with the integration and development of cultures, Buddhism has taken an important place in the Bai belief system. Similarly the Bai have a strict clan system. Each surname clan has strict clan rules and the clan leaders are experienced and of high social status. For example, in Dali Xizhou, couples visit the elderly while raising their children, but when the children grow up, they divide the family property and live separately. Also, the system of not intermarrying with people of the same surname was followed^[11].

3.2 Factors influencing the architectural style of Bai folk houses

3.2.1 Nature worship

The ancients worshipped nature and believed that all things have a spirit. The Bai also worshipped nature. The elements of Bai nature worship include heaven and earth, animals and plants. These elements of nature worship have also influenced the construction of buildings. For example, the Bai see the swallow as a bird of prey and believe that swallows bring good luck, so they put wooden boards under the eaves of their houses for swallows to build their nests. Another example is that the Bai would include peonies and lotus flowers in their architectural carvings and decorations, and would paint sunflowers, fish, cranes and other flora and fauna in their tile designs. All of these reflect the Bai people's reverence for nature^[12].

3.2.2 Totem worship

Totem worship has also influenced the construction of Bai houses. In ancient times, due to the effects of natural disasters, people developed a fear of nature, which led to the creation of a variety of totem worship. At the same time, totems were also a reflection of social organisation. The totem worship element of the Bai folk houses is mainly reflected in several aspects such as the tiger totem, the chicken totem, the dragon totem and the melon totem. The tiger totem and the chicken totem are the more common totems among the Bai^[13]. The Bai revere the colour white and consider the white tiger to be a symbol of the Bai protector god. In terms of the tile structure of the Bai architectural style, there are mostly lions, tigers and cats printed on them. Representing the tiger, it serves to ward off evil spirits and evil spirits. In addition, chicken totems, dragon totems and melon totems are also widely used in architectural decoration.

3.2.3 The feng shui concept

The Bai houses were built with the concept of feng shui in mind, building houses to store wind and gather air, reflecting feng shui ideas in the layout of the space and the orientation of the roof. The Bai are influenced by Chinese culture and attach great importance to the idea of the unity of heaven and man. When building a house, they would incorporate feng shui knowledge into the construction of the house. Bai dwellings generally have their backs to the mountains and face the water, which means that they are low in the front and high in the back, reflecting the feng shui concept of the left green dragon and the right white tiger. Bai doors do not face the main hall and are built in the northeast corner, which is thought to be conducive to storing wind and gathering qi. This is evident from the fact that the Dali Erhai Dam is high in the east and low in the west, and the topography of the mountain and the water. Bai houses are built facing west and east to get plenty of sunlight and to avoid the south-west wind. Doors generally face north-east^[14]. Wells are generally located in the southwest, and the concept of feng shui is reflected everywhere.

3.3 Architectural features of Bai dwellings

The Bai culture has been influenced by the Han and other ethnic groups in the course of its development, and has interacted with the cultures of other ethnic groups

The Bai culture has been influenced by the Han and other ethnic groups and has interacted with other ethnic groups to form a diverse ethnic culture. In the Ming dynasty, Li Yuanyang wrote in the Yunnan Tongzhi that 'the houses were all four-sided tiled houses' and that the Bai built quadrangular houses during the Ming dynasty. During the Nanzhao period, the Bai absorbed the merits of courtyard and terraced architecture from Han culture and adapted and innovated them to suit the Bai's regional environment and social customs^[15]. The most important decorative elements of Bai houses are the gatehouse, the shade wall, the doors and windows, etc. The most representative of these are the 'three houses with a shade wall' and the 'four houses with five patios'. After thousands of years of development, the Bai dwellings have developed into a mature and complete architectural system.

3.3.1 Spatial layout and combination of forms

The "Three Workshops and a Shining Wall" is the most characteristic spatial layout of the Bai architecture in Dali. The layout is of the right size, and the layout is exquisite and elegant. The architectural structure of the "Three Workshops and a Shining Wall" better reflects the cultural and economic functions of the people. A courtyard is composed of three places and a shade wall. One side of the courtyard is covered by the wall, one side by the main house, and the other side by the wing. The courtyard will be planted with some vegetation to reflect humanistic elegance. The form of this courtyard

was influenced by Han Chinese culture. The courtyard is about three rooms in size, and the length of the wall is also three rooms long. The three rooms are divided into compartments and main rooms, with subtle differences in openings and depths. In each room, the upstairs was used for living or for storing food. Downstairs, in the middle, is the main room, which is used to receive guests, while the family gathers here for activities. The two houses to the left and right are the bedrooms. On the opposite wall of the main room is the illuminated wall. Directly in front of the wall is the wing, with a corridor connecting the main room to the wing for added convenience(Figure 1). Between the two adjoining 'squares' and the wall, there are side rooms and a corner patio with a water leak. The patio contains a side room, often used as a kitchen^[16].

"The 'Three Square and One Shade Wall' is a very distinctive architectural structure in Dali. The courtyard building is transformed into a shade wall to reduce the feeling of oppression and bring a sense of openness. It also reflects the characteristics of the Bai culture. It reflects the harmonious coexistence of architecture and nature.

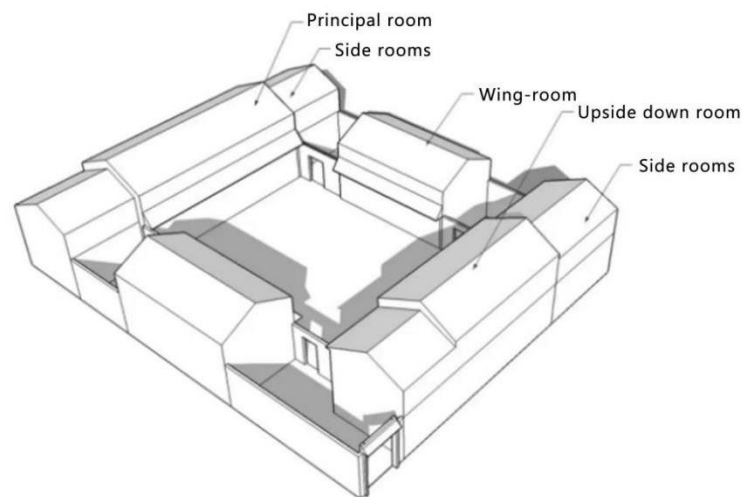


Figure 1: Axonometric view of the Three Square and One Shining Wall (Photo credit: repainted by the author)

3.4 Internal construction

3.4.1 Beam and Column Framing

The Bai dwelling is supported by a wooden beam and pillar framework, supplemented by other materials, which is largely the same as traditional Chinese architecture, except for slightly different uses and names. The beam and pillar structure of Bai dwellings consists of four huge pillars erected on the ground. Above the pillars, horizontal beams are used to build the houses. The main beams and girders of Bai dwellings bear the weight. The wall part of the building cannot be used for heavy objects. The walls serve as partitions. No wall of any type or material has this weight. This is why the Bai dwelling is said to have "walls that do not fall down". When setting up doors and windows in Bai houses, there is no need to consider the load-bearing function of the wall, and any part of the wall can be decorated.

3.4.2 The arch structure

The arch structure is also one of the most distinctive components of the Bai dwelling. It is an important support, usually placed at the joints of beams and columns. The bucket is a rectangular block of wood and the arch is a bow-shaped block of wood, with the bucket arch located at the junction of the arch and the arch. The "bucket" symbolises the top of the Big Dipper and the "arch" symbolises the "plough" of the farming period. In the Dali Bai houses, the Bai have enriched the form of the arch structure, bringing more beauty to it. However, the construction of the arch is very time-consuming and consumable, so it is also an element that reflects the level of architecture.

3.5 External form

3.5.1 The roof

The differences in architecture between ethnic groups can also be seen in the roofs. The roofs of the

Bai dwellings in Dali are large curved surfaces with a high curved end, forming a curved roof with flying eaves and angles, which embodies the unique artistic characteristics of the Bai people. The flying eaves and sloping roofs are cleverly adapted to the local climate. In the rainy season, rainwater can slide further away, which better protects the wooden structure of the house. At the same time, the curved surface formed by the roof also provides a great deal of shade^[17].

3.5.2 Colours

The Bai dwellings are even more colourful. The wooden structures are painted with coloured paints to protect the wood from moisture and corrosion. These paints make the otherwise dull wood colourful. The method of colour painting emerged as early as the Spring and Autumn period and became increasingly sophisticated. It developed into the Tang and Song dynasties, when a strict set of rules for painting was formed. At that time, most of the buildings were set off by cool colours. Painted decoration at the lower parts and at plaques, and the floating tiles on the roofs of the dwellings present an antique appearance. In contrast, the Bai dwellings are more colourful, but in general the use of colour is moderate and restrained.

3.6 Characteristic construction

3.6.1 The Shade Wall

The wall is the wall opposite the main room. For the inner side of the door, it serves to isolate the room, making it more quiet and elegant, and for the outer side of the door, it serves to enhance the momentum (Figure 2). The wall often faces east, and when the sun rises in the east, it usually shines on the wall first. The Bai therefore believe that the wall is a feng shui wall, bringing good luck, happiness and well-being to the whole family. The Dali Bai wall has the cultural characteristics of the Chinese wall, but with a combination of the ethnic characteristics of the region. The walls can be divided into single-angle walls, three-drop walls and window walls. From the top to the bottom of the wall are the roof, the body and the seat. The roof is the uppermost part of the wall, and is built in different sizes depending on the size of the wall and the importance of the building. The four corners of the roof project upwards to give it a more lively appearance^[18]. The central part is the wall, which is also the main part of the wall and plays an important decorative role. The wall base is the base of the wall and is mostly constructed of stone clad masonry.



Figure 2: Illuminated wall (Photo credit: author's own photograph)

3.6.2 Gates

The gates of Bai dwellings are also distinctive and are divided into gates with a mansion (Figure 3) and gates without a mansion (Figure 4). The gate is an important element in architecture, which can reveal theoretical ideas and social ethics in society. Xiamen is mostly found in Bai architecture of the Ming and Qing dynasties. There are two types of Xiamen: the flat-headed style and the pavilion style. The lowest part of the doorway in Xiamen is paved with green stone, and the left and right sides of the

door are paved with marble and topped with green brick columns. The stone door stacks and brick pillars above the gate project from the wall. At the same time, a roof will be built over the gate. The style of the pavilion is quite similar to that of the Xiamen gate, where there will be crossbeams and squares between the two brick pillars of the roof. The square has wooden fighting arches. The overhanging shape of these fighting dogs is rather unique. They protrude layer by layer to support the roof above. At the top of the roof, two flying buttresses will be designed to give a more distinctive shape. The gables of the gatehouse have crossbeams and architraves, both decorated with painted carvings. The shape of the flat-headed doorway is similar to that of the attic-style doorway. The biggest difference is the position of the door. Most of the doors of the pingtou gatehouse are of masonry construction^[19].

The absence of the door is no different from the influence of foreign cultures. During the Republican period, influenced by economic development and increased foreign trade contacts, many expatriate villages emerged in the Dali area. These expatriate towns brought foreign cultures into marble architecture, which also took the form of a mixture of East and West. Wuxiamen is similar to Youxiamen in terms of its door stacks, stone walls and brick columns, but differs in that it uses brick and stone stacked pagodas.



Figure 3: With the Xiamen Gate (Photo credit: author's own photo)



Figure 4: No Mansion Gate (Photo credit: Author's own photo)

3.6.3 Characteristic decoration

The decoration of Bai dwellings mainly consists of wood carvings, stone carvings and coloured paintings... These wood carvings are rich in content and have a wide range of subjects, including elements from both the Middle Kingdom and the Bai region. The two combine to form a very distinctive sculpture. While the Central Plains region is mostly carved with subjects such as peonies, dragons and phoenixes, deer and horses, the Bai have combined their own regional characteristics to create their sculptures. This

has resulted in motifs such as two dragons grabbing a treasure. The latticed doors of the dwellings are made of wood such as pine, and the upper and lower parts of the doors are hollowed out and carved with some relief carvings. In general, the wood carvings of Bai dwellings pursue a romantic, unique and elegant idyllic atmosphere. Stone carving is also a major decorative feature of Bai dwellings. Stone has a durable character and has long been widely used in architectural decoration. The Bai people of Yunnan often use stone carvings on door frames and steps. It is also relatively rich^[20].

4. Case Study

4.1 A typical example of Bai folk dwellings - Yan Family Courtyard

The Yan Family Courtyard is a typical example of a Bai residence. It was built in 1919 by Yan Zizhen, a capitalist from Xizhou, and is located in Sifang Street, Xizhou Town, Dali. The compound consists of two "four courtyards" and a separate three-storey building, making a total of five courtyards, forming a "six-contract spring" layout. The layout of the first two areas of the Yan family courtyard is in the style of the "Three Courts and a Shining Wall", with the East Shining Wall and the houses to the north, south and west. The front courtyard is laid out in a 'four courtyards and one five courtyards' layout, while the back courtyard is laid out in a 'small courtyard' layout. The first two courtyards of the Yan family compound form a pattern of 'walking horse corner buildings'. Upstairs, the front porch and terrace are enclosed by a number of 'beauty windows', while downstairs, the front porch is open, making the building accessible from above and below. The layout of the courtyard is more elegant, with many flowers and trees, and flower beds underneath the illuminated walls, creating a situation where people and nature live in harmony. The clever integration of architecture and nature makes the building more tranquil and creates a vibrant realm that enhances the elegance of the building while satisfying people's need for privacy. The Yan Family Courtyard embodies the aesthetic interest of the Bai people in the pursuit of harmony in their homes. The Yan Family Courtyard emphasises the beauty of symmetry and harmony, which can be seen in the gates and the layout of the building. But this symmetry is not absolute symmetry. For example, although the styling of the flower pond is similar in style, it also reflects the divine charm in which it is scattered but not dispersed^[21].

4.2 The dilemma of inheritance, protection and development of Bai folk architecture and countermeasures to solve it

4.2.1 The dilemma of inheritance, protection and development of Bai folk architecture

(1) The planning is unreasonable enough, and the traditional settlements are gradually disappearing

There are still some shortcomings in the planning and deployment of the Dali Bai settlements. There is the phenomenon of blindly developing the settlements. The planning of each village and settlement is rather blind and not unified with the overall planning, which is not conducive to the preservation of the traditional settlement pattern. For example, some settlements have blindly expanded in size in pursuit of economic development, destroying the original settlement pattern, becoming chaotic and destroying the original traditional layout. Some of the less economically developed settlements will move out of their original old houses, which are often uninhabited, in disrepair and deserted.

(2) The inheritance of architectural features is in contradiction with development.

As a result of economic development, people's living standards are rising and they are putting forward higher requirements for their living environment. The traditional buildings of the Bai past no longer meet the needs of life. The ideology of the Bai people has also changed, and the traditional family structure has changed. So they began to build new houses. The new houses are restricted by land and are often built after knocking down traditional dwellings, which is very detrimental to the preservation and transmission of traditional architecture. In addition, the government has not done enough to promote the preservation of traditional culture. Influenced by the gradual increase in the foreign population and the varying levels of education, local villagers are less aware of the inheritance and development of traditional culture, and they blindly imitate new buildings, while the features of traditional residential architecture are rarely applied to new houses. These new buildings do not fit in with the overall style of Dali. The mix of small Western-style houses, matchbox-style brick buildings and traditional residential houses has greatly changed the appearance of the original traditional settlements. The character has been gradually lost. At the same time, the high cost of construction is also an important factor in the reluctance of the Bai to build traditional dwellings.

(3) Impact of tourism development

Dali is one of the most important tourist cities in China and is blessed with natural and humanistic scenery, making tourism an important pillar of the local industry. However, with the development of tourism, the Bai dwellings have been over-exploited and under-protected. While tourism could have served to promote architectural culture and cultural heritage development, the tourism resources of the Bai dwellings in Dali have been over-exploited and commercialised very strongly. This commercialisation has also caused the unique characteristics of the Dali residential community to disappear. The homogenisation of the architectural style of the ancient town has also made the real cultural connotation of the Bai dwellings in Dali not reflected.

4.2.2 Countermeasures for the inheritance, protection and development of Bai folk architecture

(1) Strengthen planning and promote reasonable development of settlements

The protection and development of the buildings should follow the policy of "protection first, rescue first, reasonable use and strengthening management". The government should reasonably control the size of villages and prevent them from expanding blindly due to economic development. At the same time, some of the old buildings that have fallen into disrepair should be reasonably protected and maintained, and practical conservation policies and developments should be put forward according to the actual situation. Planning to find a sustainable path conducive to the inheritance, protection and development of Bai dwellings, so that the cultural connotations of Bai dwellings can be better inherited alongside economic development.

(2) Innovative design concepts to inherit the connotations of the dwellings

Due to high costs, difficulties in meeting living needs and changes in lifestyles and traditional concepts, Bai people rarely build traditional Bai dwellings, and some of the cultural connotations of Bai dwellings are difficult to pass on. In order to make the Bai dwelling meet current living needs while continuing its cultural connotations, the design concept should be innovative and build a building that can both meet current living needs and pass on its cultural connotations. In terms of the internal layout of the building, while retaining the traditional layout of the house, the layout of the residential building is improved by combining the modern way of setting up the building space to make it more comprehensive in function. The innovation of design concepts can also better inspire and guide the Bai people in the construction of their buildings, preventing them from blindly pursuing new architectural forms to a certain extent.

(3) Integration of cultural tourism and promotion of cultural heritage.

For the current situation of strong commercialisation and serious homogenisation of the ancient city, the Dali Culture and Tourism Bureau should innovate the tourism development model, dig deeper into the cultural connotations and unearth tourism resources with Dali's regional characteristics. In the case of large crowds, the "One Mobile Phone Touring Yunnan" app can be used to guide visitors and disperse them so that the traditional architecture is not damaged by the large crowds.

5. Conclusions

The Bai folk houses in Dali are influenced by historical, natural and humanistic factors, forming a unique architectural style that reflects the local regional culture, coalesces the national colours of Dali and has high cultural and artistic value. The Bai dwellings combine the traditional Han dwellings with their own regional characteristics to form a unique dwelling architecture. The Bai folk architecture reflects exquisite craftsmanship and unique artisanship. The layout of the Bai houses is typical of the courtyard style of architecture, with a 'three square and one shade wall' and 'four and one and five patio' layout. The Bai dwellings are characterised by their characteristic walls and gates. They are not only a means of isolation from the outside world, but also a means of decoration. Bai families also attach great importance to decorative art. Corridors, arches, beams, roofs and windows are all decorated with wood, stone and painted carvings, fully reflecting the artistic creativity of the Bai people^[22].

In recent years, the Bai dwellings have faced many problems in the process of inheritance, protection and development. There are problems such as unreasonable planning, contradictions between inheritance and development, and high pressure on tourism development. We must solve these problems rationally so that the Bai dwellings can be better inherited and protected. Bai dwellings carry the cultural connotations of the Bai region, reflect the Bai people's outlook on life and values, are rich in religious and philosophical ideas, and embody the craftsmanship and high cultural and artistic connotations of Bai

artisans. Therefore, studying the architectural characteristics of Bai dwellings can better inherit and carry forward the excellent ethnic culture of the Bai people, as well as enriching the theory of dwelling studies in a more comprehensive manner.

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