A Study on the Architecture Culture of The Wind and Rain Bridge -- A Case Study of Huilong Bridge in Tongdao County

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Abstract: At present, minority tourism is booming. People hope to understand minority culture through minority tourism. Dong nationality is an ancient minority of China. The architecture of Dong nationality forms a unique architectural art in the long-term development. As one of the three treasures of Dong architecture, the wind and rain bridge is the classic of Dong architecture, which is closely related to the daily life of Dong residents with rich cultural connotation. To show visitors the brilliant culture of Dong nationality, this paper takes the Huilong bridge as the research target, to discuss the causes and functions of wind and rain bridge, the whole architecture and the art of decoration, so as to more people have a deeper understanding of the connotation of wind and rain bridge, and comprehensive the bridge systematically.

1. Introduction
At present, the tourism industry is booming. Minority cultural tourism is favored by more and more tourists. Tourists are interested in the unique culture of food, clothing and housing of minority, while the architectural art of ethnic minorities is a very intuitive and characteristic part of the living culture. This paper intends to take the Dong’s wind and rain bridge as the entry point to show the unique and elegant architecture of the Dong nationality. The Tongdao Dong Autonomous County, located at the junction of Hunan, Guizhou and Guangxi, is one of the five Dong autonomous counties in China and one of the birthplaces of Chinese Dong culture. It enjoys the laudatory name of “the original version of Dong culture”. In the long process of development, Dong minority of Tongdao has created its unique and splendid architecture art. The ancient villages of Pingtan, Longcheng and Pingyang in the south of Tongdao county enjoy good reputation of “Hundred li Dong culture corridor”[1]. Its unique architectural culture and art are the bright pearl in Chinese traditional art. The most typical one is the Huilong Bridge of Pingtan, which is known as the “bow for two hundred years”[2]. It was appraised as the sixth key cultural relic protection units in China in May 2006, which shows vividly its specialty.

2. The Wind and Rain Bridge
2.1. What is a wind and rain Bridge
The wind and rain bridge is also called “flower bridge” or “lake bridge”[3]. The beautifully decorated one is called flower bridge, and the relative simple one is called lake bridge. The wind and rain bridges are often built to be a path to access the village easily. So it was built in the entrance of village or not
far from the stockade field. The original function of the wind and rain bridge was to provide a safe and convenient passage for the villagers. Later, the railings and benches were built in the bridge corridor on both sides for people to rest and enjoy the cool. It gradually developed into a leisure place for people to live. Therefore, the wind and rain bridge with a long history is not only a building, but also a living place for communication and negotiation. The wind and rain bridge in Dong area combines bridge, corridor, pavilion together. It is the most representative bridge building of Dong nationality and even our country, which enjoys a high reputation all over the world.

2.2. The Cause and Social Function of The Wind and Rain Bridge

2.2.1. Natural Environment. The wind and rain bridge, as a unique architectural and cultural symbol of Dong nationality, is based on the local environment, emphasizes the search for beauty in nature. They mean their own understanding of beauty and imagination of beauty, and integrate the beauty of humanistic color into the building of drum tower, village gate and wind and rain bridge, which are closely related to Dong people's life, so that they echo one another and complement one another. All these jointly construct a unique artistic realm of “although it is done by people, it is like a union made by heaven”[4].

2.2.2. “Feng Shui” Concept. Dong people originally called the wind and rain bridge as a “Feng Shui bridge”. It not only acts as a common bridge. It also undertakes the village's rise and fall, and family’s prosperity, poverty and other missions. Therefore, the address of the wind and rain bridge is chosen by the prestigious elders and people who knows Feng Shui. Dong people subconsciously believe that the wind and rain bridge can connect the both ends of dragon veins together which is cut off by the river. So the wind and rain bridge is always built in the lower reaches of the village river to block wealth, which reveals vividly the role of wind and rain bridge in the Dong village[5].

2.2.3. Soul concept. It is an ancient legend in Tongdao county: “There is a river called yin-yang at the junction of the living world and the nether world. On the river, there is a bridge. A man who dies or rebirths has to go across this bridge. However, when it is too crowd for everybody to squeeze on the bridge, people have to build a fir bridge for themselves to cross the river without delay”[6]. The legend coincides with the ideology of Dong people that they believe people can reborn after dead. moreover, the Dong people think that the wind and rain bridge is a living thing. The completion of a wind and rain bridge will also lead to the death of someone. The soul of the deceased will leave their body to guard the bridge. With guidance of the spirit in bridge, the soul can go from living world to nether world, or from nether world to living world. Such a simple religious view of life and death convince Dong people that the wind and rain bridge can extradite them, bring them back to the world. So even they still fear death, but more calm when facing it.

3. Wind and Rain Bridge

The wind and rain bridge is one of the three treasures of Dong traditional architectural art. With profound cultural heritage, its construction has a very exquisite craftsmanship value, which can extensively reflect the wisdom of the Dong people and exquisite architectural technology. In general, the wind and rain bridge is not only a bridge, but also a corridor and a pavilion. This kind of bridge, which combines the advantages of various traditional buildings such as bridge, corridor, pavilion, terrace, building and attic in the land of China together, has a very high artistic standard and aesthetical value, and plays a great practical and realistic role. For better understanding the architecture art of the bridge, we intend to take the Huilong Bridge of Pingtan, Tongdao as an example.

The magic Huilong bridge in Pingtan is also known as “Dragon Emperor Bridge”. It is founded in the 22nd year of Qianlong period in Qing dynasty. It got the name because its shape looks like “a long dragon sleeps across the water to guard village”[7]. Huilong wind and rain bridge also shapes like
tower, which is in harmony and unity with another classic architecture of Dong----drum tower. The bridge is 63.01 meters in length and 3.86 meters in width. It consists of four parts: the pier, the bridge body, the bridge gallery and the bridge pavilion (Figure 1). The piers are generally used to bear load. The body of the bridge appears as an arch across the river. The original pier is wooden pier. The bluish stone was used to build the outside pier with the building stone inside to be padding. In ancient times, in order to make the piers more durable, people take cooked lime, glutinous rice mixed with tung oil as adhesive to bond piers. In addition, the construction method of bridge piers adopts the common method of “using wooden pile fence to fix”. The piers are all in hexagonal shape with sharp angles in the upper and lower to reduce the strike of the flood. In 1964, the Huilong Bridge was repaired. In order to consolidate the bridge, the piers were rebuilt. and the wooden pile fence pier was replaced by two stone piers and three holes[8](Figure 2).

There are 22 bridge galleries on the bridge. The back of the bridge is decorated with wood braces which are the same height as the eaves to withstand the cold wind in winter. The south side of the bridge is decorated with breast board. Above the breast board, there is the wooden grating fence, which is convenient for people to cool and enjoy the distant scenery (Figure 3). At the eastern end, western end and central part of the bridge, there are three 3-stories six-pointed pyramidal roof pavilions with gourd-shaped top. The exterior of the pavilion is sealed with Chinese fir plates, and the word "Huilong Bridge" is written in block letters in the south. The west side of the bridge bears the weight of the bridge with an extended-arm wooden arch, with an arch under the bridge, which bears a span of 19.4 m(Figure 1). There are three rows of rounded fir pillows at the two ends of the bridge, with an angle of 30 degrees upward. It extends floor by floor, with the whole bridge looking like an upper-flat arch. The east side is the cantilevered sleeper beam pillow, with two holes and three piers. The middle pier uses the irregular rounded Chinese fir as a cross tie. It presents the cascade shape to bear the wooden bridge. The frame of the two ends of bridge is crisscrossed with over-hanging cantilevered and composite wooden structures. This kind of structure with various structures and shapes scientifically solves the span problem and load problem of the bridge, which embodies the unique bridge construction skills of Dong craftsmen. The three pavilions on the Huilong Bridge have different postures. The middle one is the primary one, so it is slightly higher, and the two ends are slightly shorter. The top of every pavilion is made of ceramic gourd top, which blends beauty and practical in one. When looking from far away, the bridge is like a colorful dragon lying in the water, which makes it look extremely spectacular.

The top of the bridge was slantingly covered with small green tile. The middle part was hollowed out as peacock train. The eaves have green tile with white edge, simple, natural and exquisite (Figure 4). The corner of the eaves of the pavilion is upward highly, which bear the symbol of propitious winds and rains, and bumper harvest. It fully reflects the unique architectural ideas and skills of Dong craftsmen (Figure 5). On the bridge deck, it is the promenade. The promenade is not empty. There are paintings on the columns with couplets. Outside the railing are the waist eaves, which not only enhance the integrity of the bridge structure, but also form a certain protective effect on the bridge deck, so that it will not be exposed to the sun and rain erosion.
The most amazing thing is the architecture technology. There is no design drawing for the construction of the whole bridge from preparation to completion. The shape of the wind and rain bridge, wood structure, accessories, beam length and so on are not marked on drawing paper. All are printed in the brain of the craftsman designer. Before building, the master constructed the dimensions of the bridge column, beams and other parts in the brain and marked them on a long pole; and the size of the tenon seal was written on a number of finger-wide bamboo chips. This kind of long bamboo pole called “fragrant pole”, and the bamboo chips are called “line”[10]. The symbols on the bamboos can only be understood by designers. During construction, the master in charge of the drawing shall underline the material according to the dimensions indicated, and the other carpenters shall work according to the marks on the fittings. The craftsmen thus built this magnificent wind and rain bridges with their simple tools, such as axes, planers, chisels, saws and hammers. The wood materials of building the bridge are the local Chinese fir and candlenut. Then people process the woods with mortise and tenon joint structure. All the beams, columns, purlins, fangs, railings and other components are all composed by this method as a whole, layer by layer. In addition, people use the wet rattan lasing method to make it more stability. So they are crisscrossed solidly without any crack. Besides woods, there is no any iron nail in the bridge. But its strength is no less than the iron bridge, or stone bridge, which can be extended for hundred years without damage. This fully shows the excellent architectural skills of Dong people. Its exquisite wooden architecture is unique in the history of bridges in China to the whole world. Therefore, the state-level key cultural relics evaluation experts rated it as “the living fossils of bridge construction in architecture in China.”[11]

4. The Interior Decoration of Huilong Wind and Rain Bridge

4.1. The Carving Decoration of Tong Column and The Vertical Column
Tong column, which is also called Gua column, is widely used in the construction of the wind and rain bridge. It is a short column standing between the two beam column, the middle tong column used for supporting is called ridge melon column (Figure 6). The ridged melon column of Huilong wind and rain bridge was peeled into cuboid. The top of it was slotted to support the ridge piece and the ridged purlin. The bottom of it is thinner than the upper part. Its side face was carved patterns of wavy lines, like snake-shape weapon. The design and decoration concept of tong column possess the unique symbolism: The wind and rain bridge gathers many ghosts. Many of them will get reincarnation. In order not to let them reincarnate randomly, the carpenters make the snake-shaped weapon on the top of the bridge to hold the ghost. The vertical column is a column suspended in the air, neither on the ground nor on the back of the beam. Another typical column is called vertical column. The vertical column of the Huilong wind and rain bridge is supported by an outstretched beam. It is used to support the eaves column in the air. Lotus petals are carved on the vertical column. Under the petals there is a circle of concave-convex modelling like lotus seeds. On the bottom there are the seedpod of the lotus and a plump stamen. This is the result of the primitive nature worship and absorption of Buddhist culture. The natural ecological characteristic of lotus flower is that “lotus root sprouts, tosses and turns,
creates unceasingly”. And this becomes the primitive nature worship of Dong nationality, which complies with the outlook of life of Buddhism. The carving on the pillars is relatively simple, without detailed decoration treatment. The whole carving is clumsy, but of primitive simplicity[12].

4.2. The Carving Decoration of Huilong Wind and Rain Bridge
Under the influence of the mountain environment and the constraints of social and economic development, the decoration of Huilong wind and rain bridge in Tongdao County is simple and natural. It is neither as beautiful and elegant as the palace’s architectural decoration, nor as delicate and exquisite as garden’s. But it shows Dong people's design talent of being close to nature and integrating into nature. They emphasize that the design concept can make the best use of the circumstance according to the proper choice of natural environment. They concentrate the bridge building into a grateful type of natural worship psychological culture to display the exquisite architectural technology and Dong’s culture. To prevent corruption on the bridge deck, traditionally, the carpenters paint the tung oil on the wood surface (Figure 3). It also prevents borers from gnawing. Meanwhile, the tung oil can keep the bridge stay in the natural color and texture. Sometimes craftsmen will put the pot ash into the tung oil, so that both the new and old materials are in natural and uniform color. Some wooden materials in the interior of wind and rain bridge are painted with red, yellow, green and black color, reflecting the natural texture of simplicity. This color carries their ancient and rich experience and cultural accumulation, showing their expectations for a good life as well as venting their feelings. The red color in bridge is an important color in the art of wind and rain bridge carving. The carpenters use red color to draw patterns, showing the enthusiasm of the Dong people. Red color also symbolizes witchcraft. It protects life, exorcises evil and eliminates evil. Yellow color is also very common on the wind and rain bridge. Yellow is the color of the earth, symbolizing the prosperity of the six livestock and grain. In addition, the turquoise color is to symbolize the Dong people’s endless life. Last but not the least, the white color symbolizes purity and brightness[13].

In addition, the outside decoration of Huilong wind and rain bridge also reflects the Dong people’s totem worship, such as the treasure gourd shape (Figure 5). It is affected by Buddhism, which represents the Dong people’s good willing to remove evil and protect peace. The gourd shape looks like an abbreviating pagoda. The number of gourds is generally odd. At the same time, the 3 pavilions in Huilong bridge set the temple of Jiangliang, Jiang mei (the creation ancestor of the Dong nationality), and the temple of the Holy Guan. During the festival, the village people will come to worship and pray for the blessing of the gods. Furthermore, there are some carvings to depict the natural pattern of plants and flowers in the interior of bridge carving, because Dong nationality lives in the mountainous area with dense plants and various flowers. The plant and flower’s carvings embody the harmony between man and nature, which express Dong people’s love to nature and their pursuit of a good life. Finally, a magic feature of Huilong bridge is that the hundred flowers and birds on the bridge pavilion can rotate with the wind with whirring sound, which reflects the excellent architectural skills of Dong craftsmen. It is really a fine work of art of Dong’s architecture.

5. Conclusion
The wind and rain bridge connects the life of the Dong people. It is a microcosm of the Dong architectural culture that embodies the spiritual life and culture of the Dong people. Its unique shape, ingenious concept, and delicate decoration art make the bridge’s practicability and beauty integrate together perfectly. As a valuable material wealth and the cultural heritage left by the Dong people, it has the high folk custom research value and artistic esthetic value. Therefore, it’s of positive practical significance to experience the culture of Dong people and understand the architectural skills of Dong people for the protection and inheritance of architecture technology of wind and rain bridge.

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