

# Study on the Formation Mechanism of the Spatial Characteristics of Ancient Village Streets from the Perspective of Design Culturology: A Case Study of Hongcun, Anhui Province

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## Abstract

As the most representative element of ancient villages, street space reflects the development context and characteristics of ancient villages. In the face of the study of the characteristic form of street space, we should first understand the characteristics of street space. Articles in huizhou hong cun, for example, starting from the big cultural viewpoint of design cultural perspective, through on-the-spot investigation and the historical data, from the ancient village space elements, streets space interface composition and node space, etc., analyzed the cultural viewpoint about characteristics of street space in the form of the influence, we reveal the characters of street Spaces included, deep, It is expected to provide reference for the research and understanding of ancient villages from the perspective of design culture.

## Keywords

Hong Cun; Ancient Village; Design Culture; Street Space; Spatial Elements; Spatial Characteristics.

## 1. The Introduction

Ancient villages retain the original village pattern and a large number of historical sites, carrying rich and diverse art, culture, technology and other information. As the most representative element in ancient villages, street space can best reflect the development context and overall layout of villages. In the study and design of ancient villages from the perspective of culture, street space is the first to bear the brunt. By analyzing the external characteristics of street space, we can deeply explore its intrinsic value, so as to explore its connotation and highlight regional culture and spiritual characteristics.

## 2. The Research Status

### 2.1. Domestic Research Status

The present research shows that the influence of design culture in the field of clothing is quite profound.

The intuitiveness and vividness of clothes obviously reflect the obvious characteristics of Chinese and Western design culture. Design culture is also reflected in other fields of art and design. For example: the relationship between stadium landscape design and design culture, architectural design and culture, packaging design and culture, all of which can reflect the content and meaning of design culture, but most of them is the combination of clothing design and culture. It is because of the universality, popularity and intuitiveness of clothing that it can better reflect the relationship between design culture.

At present, the study of ancient village streets and alleys from the perspective of design culture is basically rare in China. In this paper, it is a new idea to study the spatial characteristics of ancient village streets and alleys from the perspective of design culture.

## 2.2. Domestic and Foreign Research Status

The study of design culture in foreign countries also presents a colorful situation with a hundred schools of thought contenting. It is also mainly focused on clothing design. As early as the Byzantine period, costume design entered the stage of the great exchange between Eastern and Western culture. Oriental costumes increase in interest, shape lines naive, is essentially Rome and Asian culture hybrid. The asceticism of the Middle Ages, the Renaissance and so on. All show the important influence of design culture on clothing.

## 3. Background and Environment of Hongcun Ancient Village

### 3.1. The Background of Hongcun

Hongcun is located in the northeast of Yixian County, Huangshan City, Anhui Province, 11 kilometers away from Yixian County. It is a unique ancient village in the shape of an ox in Taohuayuan, Ancient Yixian County, and a representative of Huizhou ancient villages with traditional farming culture as its typical characteristics. Hongcun was renamed Hongcun during the reign of Emperor Qianlong because of its "expansion into Taiyi Xiang, hence the beauty of Hongcun".

Hongcun was first built in the Southern Song Dynasty. Wang Yanji, the ancestor of Hongcun, was affected by a fire. His family moved up the stream from Qishu Village in Yixian County and built thirteen rooms in the area of Leigang Mountain. From the late Song Dynasty to the early Ming Dynasty, the scale of Hongcun gradually formed. By the Ming and Qing Dynasties, Hongcun had entered its heyday, and large academies such as Shuren Tang and Sanli Tang were built.



Figure 1. Regional map

The architecture of Hongcun has been completely preserved since the Ming and Qing Dynasties, and all kinds of buildings pay attention to the exquisite carving, wood carving, brick carving and stone carving, which vividly reflects the characteristics and connotation of Huizhou culture and has high artistic value and research value.

### 3.2. The Formation Environment of Village Pattern in Hongcun

Ancient villages are the accumulation of Chinese historical and cultural heritage. After years of inheritance and development, they have become a natural ecological system of development. Analyzing the generation environment from the perspective of design culture, it can be divided into feng shui culture, clan culture and Confucian culture.

#### 3.2.1. Feng Shui Culture

Xixi Yi north ancient road in the west, Shigu Mountain; To the north of Huangshan; In the south, east and west rivers meet on the west side of East Mountain. Surrounded by peaks, flat in the middle. It is the "most expensive place" in feng Shui.

### 3.2.2. Clan Culture

Huizhou has always been a social ideology dominated by clan system. Therefore, the development of the village takes the ancestral hall as the main body, around the ancestral hall, and continues to develop. Hongcun is a clan village, the layout of the village around the ancestral hall, branch hall, family hall step by step. There are houses and shops near the branch temple, and the main buildings are connected with each other, forming a distinct street network space.

### 3.2.3. Confucian Culture

Since ancient times, Huizhou people have respected Confucianism and religion, with many ancestral halls and large academies. Outside the village - village entrance - street space - home house. On the surface, this space transition is from spacious to narrow, but from a deep level, it really reflects the Confucian philosophy view from nature to human desire.

## 4. Three, Hongcun Ancient Village Space Elements

### 4.1. Spatial Elements of Ancient Villages

Villages are mainly composed of terrain (surface), streets (lines) and buildings (points). The veins and features of villages are gradually formed with the production, development and life of residents under the combined action of surface (terrain environment and other factors), online (valley, river, street space) and point (single building, landscape node, etc.).

### 4.2. Hongcun Street System Composition

The system of Hongcun streets and alleyways presents a semi-natural and semi-artificial state through historical changes. The street network is mainly a continuation of the layout of the Ming and Qing dynasties, mainly in the shape of fishbone or grid. Streets and alleys can be divided into: peripheral road - main street - laneway - lane according to the functional grade. The outer road is Chengxu road, the widest scale, the main function is for vehicles to pass; The main street is formed with the layout of the whole village, is the vein of history and culture, is the longest road in the whole street space, running through the whole village, twists and turns along the river; Laneway is the most characteristic place of the whole street space, wide and narrow, play the role of connecting the whole village space environment; Lane, mainly as a path leading to the entrance door, the narrowest width.

The outer road, main street, laneway and lane are interlaced with each other, which jointly connect the street space system of the whole village.

Ditches are also a unique and important element of street space in Hongcun. It is closely related to the lives of residents. Ditches (ponds, water ports, Wells, etc.) connect the inner and outer Spaces of ancient villages. The distribution of ditches is affected by the terrain, and they flow slowly out along the roadway, or into the low-lying areas of the river system, or into the river.

## 5. Analysis of the Spatial Characteristics of Hongcun Streets from the Perspective of Design Culture

### 5.1. Huizhou Merchant Culture - The Bottom Interface of "Accumulating Wealth by Water"

Hui merchant culture is the most important part of Hui culture, which is reflected incisively and vividly in the bottom interface. From the perspective of design culture, it is the extension and expansion of the grand cultural view.

It is paved with stone slabs on the streets, supplemented by ditches, topography, steps, house wall bases and different joint Spaces of streets and alleys, which together constitute the bottom interface of Hongcun street and alley space.

The materials at the bottom of the street are mostly made of local materials, such as blue SLATE and brick with local characteristics. Most of the streets and alleys are paved with cement. The main streets and alleys are paved with stone slabs and pebbles, especially along the sides of the river, while the entrance lanes are paved with plain soil and cement because of their deep space. Steps are set at the entrance door of Hongcun village. The steps are divided into three levels to separate indoor space from outdoor space, which serves as a boundary to distinguish internal space from external space. Hui culture values Confucianism and religion, so three levels are set on the steps, corresponding to the township test, the test and the temple test.

The stone slabs were paved along the road, with ditches beside it. Huizhou merchants in the past were extremely wealthy. They paid attention to wealth because of their business. The water on both sides of the road flowed slowly along the terrain, to low-lying places or into rivers. The flow of water is used as a metaphor for wealth, which is born to accumulate wealth.

## **5.2. Vernacular Culture - The Side Interface is High and Interspersed with Small Doors and Windows**

The life atmosphere of a primitive ancient village is naturally rich, colorful and strong, and the side interface of Hongcun can reflect the residential culture from the perspective of design culture.

Towering architectural gables, Windows and doors, eaves or natural landscape constitute the side interface of Hongcun street space.

Building gables on both sides of streets and alleys are mostly made of local materials and adapted to local conditions. The wall base of the building is mainly block stone, the wall is built of rammed earth or brick wall, plain surface or plaster for decoration, the mountain flowers are mostly Hui-style fire wall, with the change of roof slope and fall step by step, the material, color is simple and simple, organic combination with the surrounding environment. The contour of the side interface surrounded by the gable wall is continuous and coordinated, extending continuously, strewn at random.

There are a lot of small Windows on the gables, with daylighting and breathable. But differ somewhat with general big window again. Daylighting, breathable window IS VERY GOOD FOR certain, IT is small window here however, HAVE ITS REASON TO BE ABLE TO INVESTIGATE CERTAINLY. As early as in the early years of the Republic of China, the war, the new government governance is weak, bandits everywhere. Therefore, in order to resist the invasion of foreign robbers, high gables and small window holes were built on the side near the streets and alleyways, which were handed down to us. It is not difficult to see the high wall and small window of Hongcun during field investigation.

Overhanging eaves refers to the part of the roof that is lifted out of the outer wall, mainly for the drainage of the roof and also for the protection of the outer wall. In Hongcun, eave lifting varies according to the class and the gap between the rich and the poor. Due to their strong strength, the rich use more advanced materials and more prominent eave shaping, which are mostly combined with local cultural characteristics.

The natural landscape is mainly local vegetation, mainly Huangshan pine and poplar, and low shrub vegetation such as grassland. The rich and colorful nature of the landscape and the drab gables combine to form a sharp contrast, order and beauty coexist, is a beautiful place.

## **5.3. Market Culture -- The Top Interface with the Horse Head Wall as the Representative Element**

475/5000

The myths and symbols spread by the city are respected by people, and the market culture from the perspective of design culture is in harmony with the top interface of Hongcun.

The skyline formed by the traditional Huizhou horse head wall, the building eaves and the sky forms the top interface of the street space.

Horsehead wall, also known as firewall, firewall and wall wall, is an important feature of Hui-style architecture. Especially refers to the wall above the roof of two gables, that is, the top part of the wall of the gables, because the shape resembles the horse's head, so called "horse's head wall". The horse's head wall, named after its shape, can be either a firewall between two houses or a general gable.

The "Ma head" of the Ma head wall is usually "Jin seal style" or "Chao Wat style". In Huizhou, the culture of worshipping Confucianism is very serious, and the Ma head wall can exactly show the owner's pursuit of the ideal of "studying as an official". Therefore, in Hong village, horse head wall can be seen everywhere, high and low scattered in the village. At the same time, it also leads to the static and rigid wall, because of the horse head wall, thus showing a dynamic aesthetic feeling. Looking UP FROM ABOVE, THE UNDULATING HORSE HEAD WALL IN THE VILLAGE WHERE THE ETHNIC groups LIVE GIVES a VISUAL sense of "TEN THOUSAND HORSES galloping", which also SYMBOLIZES THE vitality and prosperity of the whole clan.

The space of the top interface is varied and varied. Or by scattered and different materials of eaves and horse head wall to form a landscape skyline, layered, full of change; Or eaves, gables and natural environment integration, virtual and real staggered; Or formed by two sides of the eaves narrow deep lane "one line sky".

#### **5.4. Geography Culture - The Three Interfaces of Virtual and Real**

The layout of streets and lanes in a village is influenced by its geographical environment. Under the influence, the top interface, side interface and ground interface blend with each other and complement each other to form the street and lane space. It is developed based on geography and culture from the perspective of design culture.

The three Spaces of the streets and alleys form the rhythm of the virtual-real changes of the streets and alleys under the varied changes of the environment and terrain, which reflects the complexity and uniqueness of the streets and alleys. Because of the geographical environment in which the terrain is located, there will be a drop, high and low, leading to changes in the spatial layout of the whole street, there are ups and downs, forming a drop beauty; Its environment is also due to its location, adapted to local conditions, from vegetation to fruit trees, are full of local characteristics of the landscape.

The bottom interface is the foundation. Different processing methods, such as pavement material and way, will produce different effects on the definition and feeling of the street space. The side interface is composed of architectural and surrounding environmental elements, which not only defines the outer space of the street and alley, but also defines the inner space outside the building, affecting the visual continuity of the spatial contour of the street and alley, as well as the overall style of the village. The roof interface is dominated by the sky, which is composed of the eaves of the building and its surrounding environment. High and low scattered, open and close degrees, affecting the openness of people's vision.

#### **5.5. Aesthetic Culture -- Harmonious Street Aspect Ratio**

The aspect ratio set in the streets and lanes is closely connected with the aesthetic culture from the perspective of design culture. In order to conform to people's aesthetic nature, a reasonable aspect ratio is set. Generally speaking, the scale of the traditional street space is small, which is not only affected by the terrain environment, but also defined by the size of the village and the function of the street. Spatial scale is generally accepted in accordance with the scope of the standard. This paper takes the aspect ratio (D/H) mentioned in the Aesthetics of Streets by Lu Yuan Yixin as the research method to explore the aspect ratio of Hongcun streets. It is found that the outer road is the widest, the road width is 5-6m, and the vertical interface aspect ratio

D/H value of the street is between 1.5-3.0, which is mainly used for traffic vehicles. The width of the main street is 3-4m, and the D/H value is between 0.5-1.3, which is used by small vehicles and pedestrians; The width of most roadways is 1.2-3m, and that of small and narrow alleys is 0.8-1.2m. The D/H value ranges from 0.3 to 1.0, mostly around 0.6.

The spatial scale of streets and alleys also affects people's psychological, visual and behavioral activities when they move in streets and alleys. For example, the outer road is the widest, the D/H value is the largest, giving people a broad vision, so it can become the traffic center and commercial core area; The D/H value of the main street is between 0.5 and 1.3, which gives people friendly, moderate conversation and good privacy, so the flow of people is also relatively urgent; The D/H value of the alley is between 0.3 and 1.0, the visual feeling is depressed, the road is narrow, and the privacy is poor. Therefore, most of them are single travelers, for the way of returning home, for people to pass.

## 6. Ecological Culture - Well-Scattered, Evenly Distributed Node Space

Villages are formed by the wisdom of people, and the ecological culture from the perspective of design culture is reflected incisively and vividly in the space of street nodes. The main node space, such as stone bench, sketch, stone bridge and small square, is either connected or expanded in the street space.

According to functional attributes, important nodes in Hongcun can be divided into four main categories: entrance space, public space, wellhead space and intersection space.

### (1) Entrance space

The relationship between the street and the courtyard not only plays the function of connecting the courtyard entrance transition space, but also is an important place to rest, chat and play. When people have interpersonal communication, social activities are generated, and the place where such social activities take place reflects the nature of the combination of streets and people. The spatial scale of the entrance is relatively random, which is a free space without clear division and boundary.

### (2) Public space

Public space is the central place for villagers to carry out public communication activities. The public activities mainly include commercial trading, family sacrifice and recreation. These centers are often located at the intersection of streets and alleys and serve as evacuation centers. Around these sites are also local vegetation and fruit trees. The centrality of its location, the evacuability of its function, and the creativity of the combination of artificial and natural landscape make it easy for people to reach, circulate and enjoy.

### (3) wellhead space

The well was an indispensable living measure in the ancient village. For easy access to water, Wells tend to be in relatively low

The open and bright site forms the wellhead space centered on the well. Because of the large scale of the wellhead space, the wellhead is often specially raised and reinforced, with round and square shapes and unique paving methods. Hongcun streets and alleyways are long and narrow, interspersed with wellhead space is conducive to breaking the monotony of the street space and increasing the sense of rhythm of the street space.

### (4) Intersection space

The intersection of streets and lanes plays a guiding and expanding role in the space of streets and lanes. The intersection space of Hongcun is dominated by "T" type and "ten" type, and most of them are dominated by "T" type. This is because the traditional concept of emblem culture is very rejected the rigid shape of the cross. The intersection will also be placed at the square and other spatial nodes to hinder the formation of the intersection space.

## 7. Conclusion

Through detailed elaboration and analysis of the village pattern of Hongcun and the traditional street space of Hongcun, this paper draws the following conclusions:

First, the spatial elements of Hongcun village are composed of three elements: terrain (surface), street (line) and building (point). The spatial structure of streets and alleys is clear, in the shape of fishbone and grid grid. The outer streets, main streets and alleys combine to form the spatial system of streets and alleys. Most of the buildings are in the traditional style of Huizhou ancient architecture. The street space and the building are each other's cornerstones and echo each other, forming the overall environment of the spatial layout of the whole village, which not only reflects the natural beauty of the natural growth of ancient villages, but also reflects the artificial beauty of the organic combination of people and the environment.

Second, from the perspective of the generation environment of cluster villages, it is explained from three aspects, namely feng shui culture, clan culture and Confucian culture, based on the design culture. The FENG SHUI PRINCIPLE IN SITE SELECTION, THE CLAN SYSTEM IN the FAMILY, AND THE Confucian THOUGHT in ETHICS have combined TO form the generation environment OF Hongcun VILLAGE from the ideological, political, and social aspects respectively.

Third: From the view of the spatial characteristics of streets and lanes, based on the perspective of design culture, from the Hui-shang culture, residential culture, market culture, geographical culture, aesthetic culture, ecological culture to explain.

(1) Hui-shang culture: The main material is blue SLATE, paved on the road with ditches as the main characteristics of the interface at the bottom of streets and alleys. Gathering wealth by water is the essence of Hui culture and has been handed down to this day.

The selection of materials is mostly local materials, full of regional characteristics; The steps are also divided into three levels according to the concept of Confucianism in the Hui culture since ancient times, corresponding to the township examination, the examination and the temple examination.

(2) Folk culture: towering gables and small doors and Windows supplemented by overhanging eaves are the main features of its side interface. In the early years of the Republic of China, the war, bandits, so the gables built high, narrow mountain window, is to resist foreign invasion; The eaves are also different in materials and shapes because of their classes and wealth. The natural environment is local to Huangshan pine and regional vegetation.

(3) Market culture: horsehead wall as a representative element is the prominent feature of its top interface. Huizhou worshiped Confucianism seriously and longed to be an official. The horse is also a metaphor for taking the lead and soaring into the sky. Therefore, the horse head wall is made to place the yearning of the heart.

(4) geographical culture; Virtual and real staggered three interfaces. Because of its geographical environment, Hongcun will form elevation differences, bulges and depressions. In this geographical environment, the bottom, side and top interfaces should be connected with each other, forming a high and low, orderly street space.

(5) Aesthetic culture; The harmonious aspect ratio is the main feature of its street scale and proportion. Using the D/H proposed in the Aesthetics of Streets by Lu Yuan Yixin, it is found that the outer streets, main streets and some small and narrow lanes are from spacious and bright to friendly and comfortable, with good privacy to depressed and poor privacy. The image explains the principle.

(6) Ecological culture: well-scattered and evenly distributed node space. On this basis, the node space is divided into four parts: the rationality, convenience and comfort of interpersonal communication in the entrance space; The centrality of the environment and the evacuation of

the function of the public space; Harmony of artificial and natural combination; The geography and communication of wellhead space location; The intersection space with part of the node space to break its cross-shaped design reflects the overall spatial ecology of Hongcun village streets and lanes.

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