

Analysis of The Shape and Architectural Characteristics of The Song Family Courtyard in Yuzhou, Henan*

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Due to the special geographical location and environment of Yuzhou and the convenient transportation conditions, the progress of political, economic, and cultural exchanges, has led to a wide variety of residential buildings and even prototypes of residential buildings in various parts of Henan and even in the middle reaches of the Yellow River are not uncommon in Yuzhou. Therefore, Yuzhou folk houses can be called one of the typical representatives of the traditional residential architectural culture in the Central Plains. Taking the Song Family Courtyard in Qianjing Village in Yuzhou Region as the research object, this paper obtains first-hand data and materials from fieldwork method and literature analysis methods. Besides, this paper not only comprehensively analyzes the shape system, architectural characteristics, and decorative art content of residential buildings through data measurement, on-site mapping, etc., but also sorts out and demonstrates the characteristics of residential buildings under the influence of the traditional religious ritual law system and social hierarchy. This paper provides theoretical support for further improving and enriching the theoretical achievements of traditional residential dwellings in the Yuzhou area and also provides a theoretical basis for the protection, inheritance, and reuse of residential dwellings in the Yuzhou area, aiming to lay a foundation for subsequent research.

Keywords: Yuzhou area, traditional dwellings, Song Family Courtyard, shape features

Introduction

The Yellow River Basin is the main birthplace of the earliest Chinese culture. Due to the different geographical, and historical traditions, cultural accumulation and cultural influences of different regions in Henan, the missions undertaken in the process of highlighting the Yellow River culture are also different. Yuzhou, known as Yangzhai in ancient times, is located in the hinterland of the Central Plains. At the end of the Warring States Period, it was already the “richest famous capital in the world” and is now one of the first batch of famous historical and cultural cities in Henan Province. Its cultural heritage is profound, its regional

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Image source: The pictures in this article are drawn and photographed by the author.

characteristics are distinct, and its architectural remains are rich., so it has great importance in the history of Chinese architecture (Zuo, Qu, & Wang, 2011). An in-depth study of the dwellings in Yuzhou can not only show the residents' affection for local culture and life but also enhance people's awareness and sense of responsibility for protecting traditional culture. At the same time, it also has high social, historical, folklore, and professional academic value.

Background Overview

The Song Family Courtyard is located in Qianjing Village, the hinterland of Juci Mountain in the north of Yuzhou City, Henan Province. It is a transition zone between the western Henan Mountains and the eastern Henan Plain. The area has a continental temperate monsoon climate (Yu, Li, & Lu, 2021). The precipitation is even, warm in winter and cool in summer and the frost-free period is long (Figure 1). The geographical position of Qianjing Village is superior. The mountains and rivers in the area are beautiful and the scenery is beautiful, forming a unique natural ecological landscape, which has an important impact on the formation of the characteristics of local dwellings.

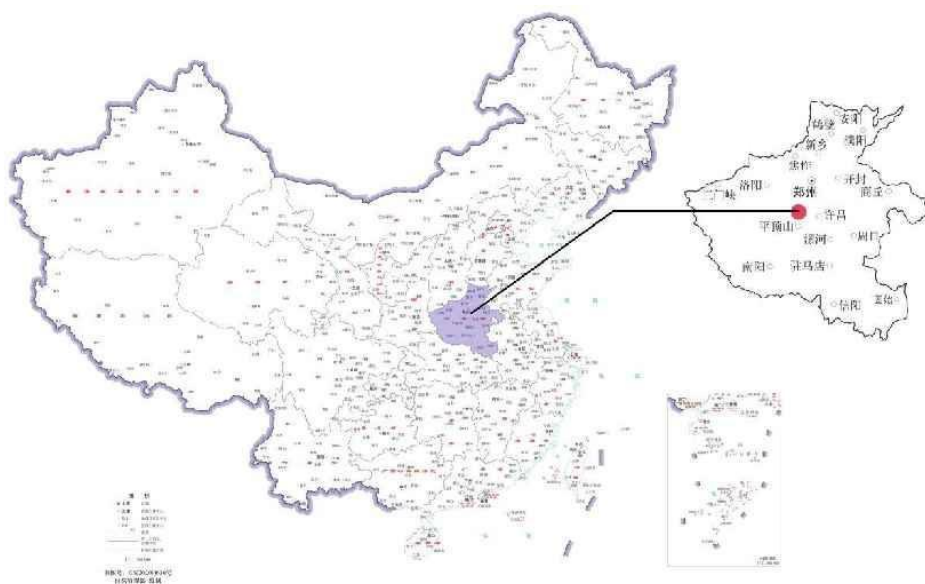


Figure 1. Location map of the Song family compound Original image.

Source: Gallery Network of Ministry of Natural Resources, modified by the author.

Today, only eight courtyards from the Ming and Qing dynasties remain undestroyed, covering an area of more than 6,000 square meters, and their architectural structures are relatively intact (Chen, 2016). Each courtyard and each house are built according to the terrain. The arrangement is orderly, the density is consistent, the monomer is beautiful and the craftsmanship is exquisite. At present, the most well-preserved is the Song Family Courtyard (also known as “Song Zhigan’s Mansion” and “Grand Courtyard”) built in the 33rd year of Emperor Guangxu’s reign in the Qing Dynasty.

The Form of the Residential Dwellings

Henan is located in the Central Plains and is the birthplace of Confucian culture. Yuzhou area is deeply influenced by its traditional culture and still retains the distinctive features of Confucianism in many aspects. Its architectural form also has obvious regional characteristics (Cao, 2011). Among them, the Song Family Courtyard in Qianjing Village fully demonstrates the local natural environment conditions and humanistic characteristics in terms of its courtyard form and architectural features. The courtyard has two yards. The main gate is connected to the reversely-set rooms. The front yard is three rooms wide. The rooms in the backyard are all double-story buildings. The principal room is three-room wide. And the east and west wing rooms are of “apparent 3 rooms hidden 5 rooms” structure with a long and narrow patio yard in the middle (Figure 2). The courtyard is magnificent, simple but elegant.

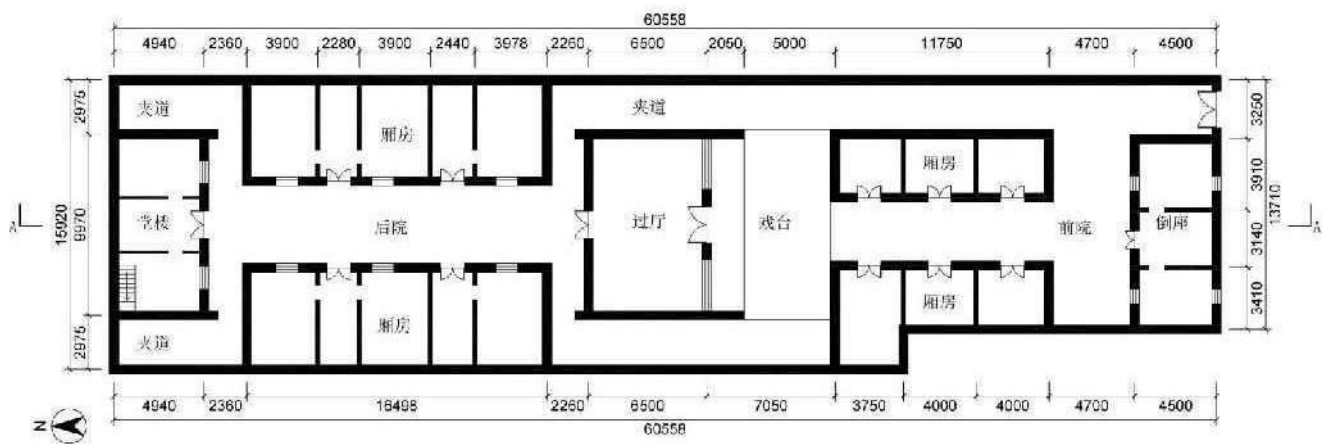


Figure 2. Courtyard floor plan. Source: Drawn by the author.

In terms of the layout of the courtyards, the dwellings of Qianjing Village are typical northern China courtyard-style buildings (Liu, 2016). Most of the rooms in the backyard are two-story buildings. Influenced by the local climate and culture, the courtyard layout is square with clear priorities which reflects the traditional religious etiquette system and the social hierarchy system. The Song Family Courtyard sits in the north and faces the south, which not only plays the role of shelter from the wind but also easy access to a good lighting environment. Because of the high buildings and the courtyard-like structure, the climate of the courtyard is warm in winter and cool in summer (Figure 3).

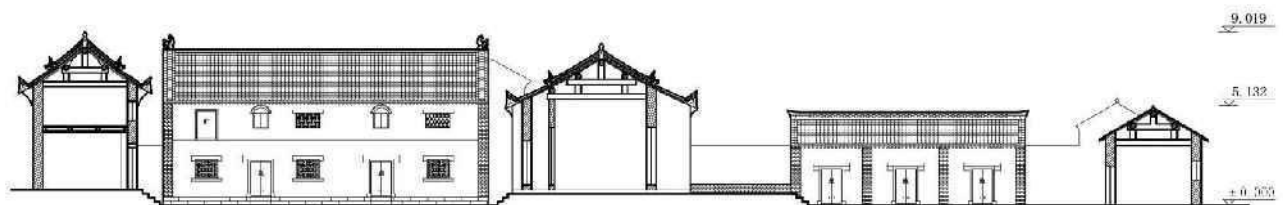


Figure 3. Longitudinal section of the courtyard. Source: Drawn by the author.

When entering the courtyard, it is surrounded by the main gate, reversely-set rooms, east and west wing rooms, and a hallway. A small stage is built in front of the hall, which is 10.4 meters long, 5.2 meters wide, and 0.6 meters high. Therefore, although the east wing rooms of the front yard are built in the middle of the courtyard the view is still very wide. The main gate is located at the southeast corner of the house, with a width of one room, five purlins deep. The gable walls on both sides bear the load. To show the main position of the gate, its roof is about 0.5 meters higher than the reversely-set rooms. The head of the gable also exceeds the rear eave wall of the reversely-set rooms.

Entering the gate, there is a long and narrow passage. Although there is no screen wall, the left and right sides of the passage are walls, which also play a role in isolating sight and protecting privacy. After entering the gate, turn left and enter the front yard. The front yard reversely-set room is three rooms wide, facing north, and is connected to the main gate in form. It is an “embracing gable” structure which is completely different (Figure 4). The hallway is three-room wide, and seven purlins deep, with an “apparent one room and hidden two rooms” structure out of the front and rear corridors (Wu, 2021). There is a platform in front with outside and concealed pillars. The overall width is 9.5 meters and the depth is 8.3 meters. The beams and pillars’ load-bearing is a beam-lifting wood frame. There are colonnades on the sides of the hallway. A partition door is located in the center of the bright room and a partition window is in the second room. A doorway is opened in the center of the rear eave wall. As the main building of the first courtyard, the hallway is mostly used for daily hospitality. So, the building is magnificent and its construction method is recorded in “Treatise on Architectural Methods”. Kaifeng, as its birthplace, is greatly influenced by the official style, so this type of construction is rare in local residential courtyards. There are three east and west wing rooms under the stage in front of the hallway. After the Cultural Revolution, the front yard of the courtyard was used as a commercial space. The east and west wing rooms played the role of cooking vinegar, soy sauce, and other condiments, which are now collapsed.



Figure 4. Main gate and reversely-set room. Source: Photographed by the author.



Figure 3. Wall. Source: Photographed by the author.

The second yard is surrounded by the hallway, east and west wing rooms, and hall building. The courtyard is 17 meters long from north to south and 4.2 meters wide. Except for the hallway door, the east side passage can also lead to the backyard. Since the buildings in the backyard are all two-story buildings, the courtyard

appears to be particularly long and narrow. The hall building is three-room wide, with a front eave and a two-story double-sloping roof. The east and west wing rooms are all of the structure of “apparent three rooms and hidden five rooms”. The first floor is the children’s study, guest room, and dining room. The second floor is the utility room and storage room.

Influenced by the traditional idea of orderly superiority and inferiority, residential courtyards are divided into reception, storage, masters’ rooms, and factotum rooms. During the Cultural Revolution, part of the building structure was destroyed, so a staircase was built next to the west wing rooms, leading directly to the second floor, which provided convenience for people’s daily activities.

Since the Republic of China, the front yard of the Song Family Courtyard food business was operated, mainly selling moon cakes. The front yard hallway and the reversely-set rooms cover a large area and have a wide field of vision, therefore they were used for business. Meanwhile, the east and west wing rooms were used for making condiments. Qianjing Village is located at the junction of the mountains in western Henan and the plains in eastern Henan. The temperature difference between day and night is large, so the structure of the building has the performance of heat preservation and cold protection. It has a very good effect on the preservation and storage of food. The second floor of the wing rooms in the backyard was used as storage space, some rooms were also used as the living space for servants. The rest of the rooms were living spaces for the owner of the courtyard and their children.

Architectural Features

The Walls

The walls of the Song Family Courtyard are mostly made of heavy red slate and blue bricks. The red stone slates used in the front lower part of the wall are relatively large, so the wall is relatively thick, reaching about 0.5 meters (Figure 5). The walls on the side are built with red stone slates on the left and right sides, which play a load-bearing role (Song, 2012). The backyard buildings are bounded by windows, the base is built with red slates with blue brick on the top. Yuzhou is located at the junction of the mountainous area in western Henan and the plain in eastern Henan. The temperature difference between day and night is large, and the thick walls can provide the rooms with thermal insulation and cold resistance (Li, Cao, & Chen, 2021). Part of the wall is painted with lime, which not only plays a bonding role but also increases the aesthetics of the building.

The Doors and the Windows

The house-style gate of the Song Family Courtyard is very eye-catching (Figure 6). There is a simple wall door on the outside of the reversely-set room. The brick frame of the window is round. In the period of the Republic of China, it was used as a door to facilitate the operation of the moon cake factory.

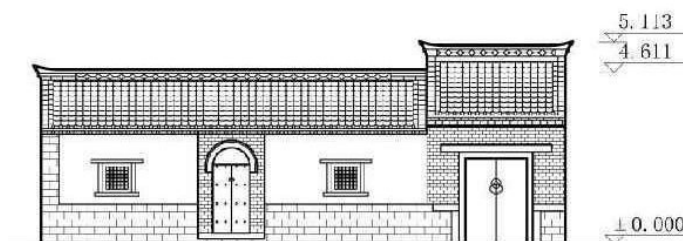


Figure 4. Main gate, Reversely-set room elevation.
Source: Drawn by the author.



Figure 5. Front yard hallway. Source: Photographed by the author.

In the front yard, there is a wooden grille from top to the bottom on the wall of the principal room. The window lattice is carved with a “Bubugao pattern”. The beam heads and the pillars are decorated with relievo. The frescoes of “Eight Immortals Crossing the Sea” are painted above the windows on both sides. There are four on the left and four on the right. The pictures are vivid. When the “Cultural Revolution” first broke out, some people specially painted the two frescoes above the front windows of the hallway in this house with clay to protect it. Up to now, the frescoes are still as bright as ever (Figure 7). The lintels and windows of the buildings in the backyard are made of red slates. The hall building and wing rooms are double-story buildings. The hall building is engraved with “Taofangjin” style window lattices, implying integrity and auspiciousness and representing uprightness in form and heart. On the second floor, the “Yima Sanjian” pattern window lattice symbolizes the endless long arrows hanging on the doors and windows. This can not only drive away evil spirits but also show their majesty. The first floor of the wing rooms is carved with a Fylfot patterned window lattice (Li & Zhang, 2021), which symbolizes longevity. The second floor is carved with a windmill-patterned window lattice, which symbolizes an endless stream of power and wealth (Table 1).

Table 1
Window Lattice Types.

Types	Trellis pattern	Taofang pattern	Fylfot pattern	Windmill Pattern	Diamond pattern	Yima Sanjian pattern
Example						

The Roofs

All the buildings in the Song Family Courtyard are built with five ridges and six beasts, carved beams, and painted pillars. The roof is a double-sloped gabled roof (Figure 8). At that time, a worker could only hang one rafter and grind three red stone slates a day. Therefore, the house was designed exquisite and magnificent. The straight-ridged beasts of the house are the same as the vertical-ridged beasts, both of which are mainly in the

shape of kyryns. The lowermost end of the vertical ridge of the dwelling is all turned heads and its appearance is more prominent than the immortals used in official buildings (Hui & Lu, 2012). In general, this component is also one of the important features of the eaves of Henan dwellings. After the liberation of the People's Republic of China, Qianjing Village's buildings were smashed because they did not conform to regulations.

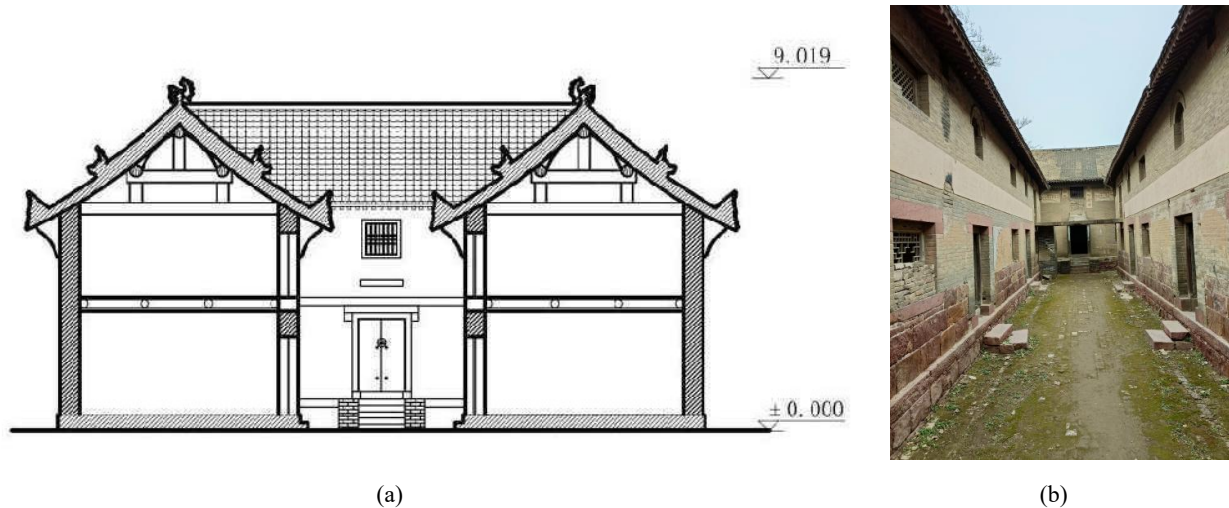


Figure 8. Elevation of backyard. Source: Drawn and Photographed by the author.

The Materials

Timber: Timber is an indispensable building material in traditional buildings. It has the characteristics of energy saving, is reusable, and is sourced locally. As a carrier of traditional culture, applying it to traditional residential buildings not only supports and connects its building structure but also the wood carvings carved by craftsmen's exquisite craftsmanship have a strong sense of stereoscopic and perspective. It can highlight the individual characteristics of residential dwellings, thereby reflecting the local culture and aesthetics. In the Qing Dynasty, the population increased sharply and wood was relatively scarce. The houses built by ordinary citizens were mainly brick-soil structures or masonry structures. Only a small amount of wood was used mostly for beams and rafters (Li & Qi, 2019). The Song family made a good fortune through business, so the front yard of the Song Family Courtyard used a large area of wood components such as doors and windows, and relief sculptures. The backyard hall building also used wooden doors as partitions. There is no problem of lack of wood and restraint in use.

Stone: The mountains in Yuzhou City are stretched. The ridges are undulating, the hills are winding and the ridges are winding. Its stone reserves are very rich and easy to mine. Its compressive ability and durability are very good. Therefore, stone is a unique building material. In terms of stone materials, blue, red, and white stone and sand are inexhaustible. Bluestone can be used not only for construction but also for burning white ash, crushing stones, or carving steles and tablets. Redstone can be used for walls and bridge foundations, as well as for carving door and window lintels or pillow stone patterns. Especially Yushan Shikeng red stone has the unique characteristics of hard texture and bright color. As a result, it is widely used in local architecture. Among them, the building walls, platform foundations, and steps of the Song Family Courtyard, including the

pavement of the street in front of the gate are paved with red stone slates in large areas. The biggest issue in building houses in Qianjing Village is the transportation and carving of red stone. The craftsmen can only grind three red stone slabs per day. The walls of the completed residential dwellings are properly matched with stone materials in different sizes which fully demonstrates the exquisite and meticulous skills of the craftsmen.

Lime: Lime has good plasticity and water resistance and is the main bonding material in traditional Chinese architecture (Chen & Dai, 2020). In the construction of the Song Family Courtyard, only a little lime was used but it has a great effect. The walls above the front eave wall and the windows are not only built with traditional blue bricks but also painted with lime into geometric shapes, which plays a bonding role as well as decorating the simple masonry walls.

Conclusion

With the rapid development of my country's economy, more and more people are pursuing novelty and fashion. Reinforced concrete buildings have replaced the original vernacular buildings (Ma & Li, 2015). The historical traditional buildings have been destroyed and the regional characteristics of the village environment have become weaker and weaker. The Qianjing Village houses are also facing the same problem. Through the study of Song Family Courtyard, this paper analyzes the layout of its courtyard, architectural structure, building materials, and spatial functional division, and expounds on the architectural construction methods produced under certain natural conditions. The Song Family Courtyard has the characteristics of adapting to local conditions, blending in with nature, and adapting to the climate. The construction of the houses is adapted to the local climate, which is warm in winter and cool in summer. The courtyard has a square layout, clear layers, and an orderly distinction between inside and outside, which fully reflects the local ideology under the influence of Confucian culture. The courtyard is built with brick, wood, and stone structure with a wide range of materials. The construction scale of the hallway and hall building is more stylish than that of the wing rooms and the reversely-set rooms, which highlights the main body of the courtyard. Yushan Shikeng red stone is widely used in traditional dwellings. This is not only because the red stone slates have strong compression resistance and thermal insulation storage performance but also because of their hard texture, bright color, and easy mining. It is a unique building material produced by the local climate and terrain (Shi, 2022). Combined with the local climate environment and human history, through the systematic arrangement and demonstration of the architectural form and characteristics of this mansion, the construction concepts and strategies of Song Zhigan mansion are summarized, which has important reference significance for the protection and inheritance of traditional dwellings in the Yuzhou area.

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