

Architectural Form and Cultural Interpretation of the Zhu Fengyin Residence in Ji'nan, China*

WANG Ting-yu

Shaanxi University of Science and Technology, Xi'an, China

WU Li-yue

Shaanxi University of Science and Technology, Xi'an, China

Xi'an Zhongda Shiye Co., Ltd., Xi'an, China

LI Yan-jun

Shaanxi University of Science and Technology, Xi'an, China

The distinctive landscape of Zhujiayu Ancient Village in Zhangqiu District, Ji'nan, together with its long-established cultural traditions, has shaped a unique vernacular settlement character, within which traditional dwellings serve as a primary medium of regional culture. This study examines the residence of Zhu Fengyin, a jinshi degree holder, and adopts field investigation and measured drawing-based analysis. Discussion is organized around three dimensions: an overview of the dwelling, architectural form, and cultural expression. Particular attention is given to the multi-stage, multi-bay compound configuration developed in a mountainous setting, terrain-adaptive courtyard forms, and construction techniques. The analysis further interprets the concepts of ritual order and auspicious symbolism embedded in architectural decoration. By using this representative case, the study aims to deepen understanding of the architectural culture of gentry dwellings in the Ji'nan region and to provide an academic basis for the conservation and inheritance of traditional dwellings in the Ji'nan area.

Keywords: Ji'nan, China, Zhu Fengyin Residence, architectural form, construction techniques, architectural culture

Introduction

Ji'nan is located in the central and western part of Shandong Province. As a key node city along the lower reaches of the Yellow River and a nationally designated historical and cultural city, its administrative jurisdiction comprises 10 districts, including Lixia, Shizhong, and Huaiyin, as well as two counties, with a total area of approximately 10,244 km² (CPC Jinan Municipal Committee Party History Research Institute, 2023) (see Figure 1). Historically, benefiting from the convenience of Yellow River water transport and the advantages of water-

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WANG Ting-yu, graduate student, School of Design and Art, Shaanxi University of Science and Technology, Xi'an, China.

WU Li-yue, Ph.D. candidate, School of Design and Art, Shaanxi University of Science and Technology, Xi'an, China; Designer, Xi'an Zhongda Shiye Co., Ltd., Xi'an, China.

LI Yan-jun (corresponding author), Professor, School of Design and Art, Shaanxi University of Science and Technology, Xi'an, China.

land connectivity, Ji'nan developed into a hub for north-south circulation of goods and for cultural exchange, and gradually formed a plural cultural confluence integrating Yellow River agrarian culture, the spring-centered water culture of the “City of Springs”, and Confucian culture (Gao, 2008). This cultural continuum has persisted for millennia and constitutes a substantial historical foundation. Centered on the siheyuan courtyard house, traditional dwellings serve as tangible carriers of the regional cultural context and articulate a locally distinctive architectural form characterized by strong regional specificity.

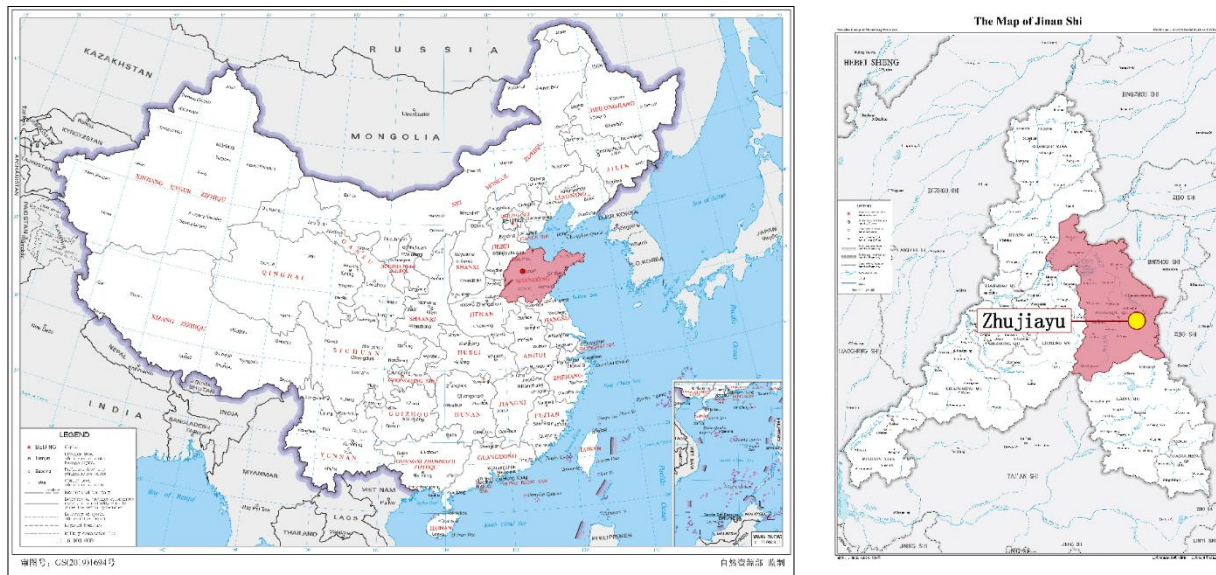


Figure 1. Location map of Zhujiayu Village, Ji'nan City, Shandong Province, China.

Historical Background and Location of the Zhu Fengyin Residence

Village Overview

Zhujiayu Ancient Village is located in Zhangqiu District, Ji'nan, Shandong Province. It is a Ming-Qing period village with a history of more than 600 years, and is reputed as the premier ancient village of Shandong and a settlement exemplar north of the Yangtze River. It was listed as a Chinese Historical and Cultural Village in 2005 (Li, 2005). The village exhibits a distinctive geomorphological setting described as mountains on three sides and a stream on one side. Mountain ranges such as Wenfeng Mountain and Bijiashan Mountain enclose the village to the east, west, and south, while the northern side opens onto a broader plain, forming a traditional feng shui image likened to an armed chair. Constrained by the natural terrain (Li, 2011), the site selection and spatial organization present an elongated linear pattern, extending north-south and narrowing east-west. Buildings follow the topography and are arranged in concave, curvilinear bands along contour lines. A north-south dual-track ancient route functions as the primary spine of the village, linking key public spaces such as Li Gate, Wenchang Pavilion, and the Zhu Clan Ancestral Hall (Li, 2018).

The village's buildings are predominantly constructed with locally available materials, including bluestone and sun-dried earthen bricks, resulting in an architectural character that is plain and robust. A relatively complete range of building types has been preserved, including ancestral halls, schools, temples, and various forms of vernacular dwellings, which provides an authentic reflection of the organizational structure and everyday life of an agrarian society. Springs are dispersed throughout the village, and watercourses run through the settlement,

integrating the built environment with the surrounding landscape and indicating an ecologically informed approach to site selection. Zhujiayu's significance, understood as a community of life shaped through the integration of natural, historical, cultural, and technical dimensions, offers a valuable case for the study of traditional Chinese settlements.

Residence Historical Background

The Zhu Fengyin Residence was constructed in the 16th year of the Guangxu reign of the Qing Dynasty (1890). Its owner, Zhu Fengyin, was the 14th-generation descendant of the Zhu clan in Zhujiayu and was appointed by imperial decree as a mingjing jinshi, the highest degree in the imperial civil service examination system, during the Guangxu Gengyin year (AD 1890), representing a late-Qing Confucian scholar with broad learning.

Zhu Fengyin was well known locally for his contributions to education. He trained civil officials such as Liu Yuanliang, who later served as a bianxiu at the Hanlin Academy, as well as military figures such as Liu Zhongdu, who served as a regional commander in Fengtian Region, reflecting the village's Confucian tradition of sustaining the family through farming and learning. His examination success also directly influenced the construction and symbolic display of the Zhu clan ancestral hall. After he obtained the mingjing jinshi title, a flagpole base was erected outside the entrance of the Zhu clan ancestral hall, demonstrating clan prestige associated with civil examination achievement and indicating the close linkage between individual attainment and collective honor under the clan system of the Qing Dynasty. The Zhu Fengyin Residence is not only a representative late-Qing gentry dwelling, but also a material carrier of Zhujiayu's emphasis on education and the tradition of entering official service through the civil examinations.

Residence Location

The Zhu Fengyin Residence is located in the south-central part of the village, at the junction between the upper and lower routes. The residential compound follows the terrain and is built along the upper route, with the main gate seated on the south and facing north. A tall screen wall is set outside the gate. This screen wall also separates the two branches of the route, namely the upper and the lower routes, which ultimately converge at the southern end of the village.

Analysis of the Architectural Form of the Zhu Fengyin Residence

Overall Compound Configuration

The Zhu Fengyin Residence integrates the entrance courtyard, the main residential courtyard, the private school courtyard, and the library building into a unified compound. According to oral accounts from descendants of the Zhu clan and on-site investigation, although the complex was altered in later periods and subdivided for use by four households, its original large-scale framework remains legible. It comprises seven courtyards combined as an organic whole. The plan forms of these courtyards are diverse, including square and trapezoidal geometries (Shao & Bu, 2022) (Figure 2). The complex takes the single spatial stage as a basic unit. These units are connected through gate structures or lanes, forming a compound of interlinked courtyards. The main buildings are generally regular and orthogonal. By contrast, courtyard spaces and perimeter walls are shaped in response to local conditions and may take irregular forms. Overall, the residence exhibits the fundamental characteristics of northern courtyard dwellings. Influenced by mountainous terrain, the layout is comparatively flexible and variable, combining ritualized spatial order with pragmatic adaptation.

This flexibility results partly from the need to accommodate irregular street and lane boundaries, and partly from craftsmen's terrain-responsive construction logic. Because the site has pronounced changes in elevation, the courtyards are not arranged on a single level but are staggered in accordance with the landform. Through the use of steps and ramps to negotiate height differences, the craftsmen established a vertically progressive spatial sequence across the complex, in which ritual order and pragmatic considerations are simultaneously evident.

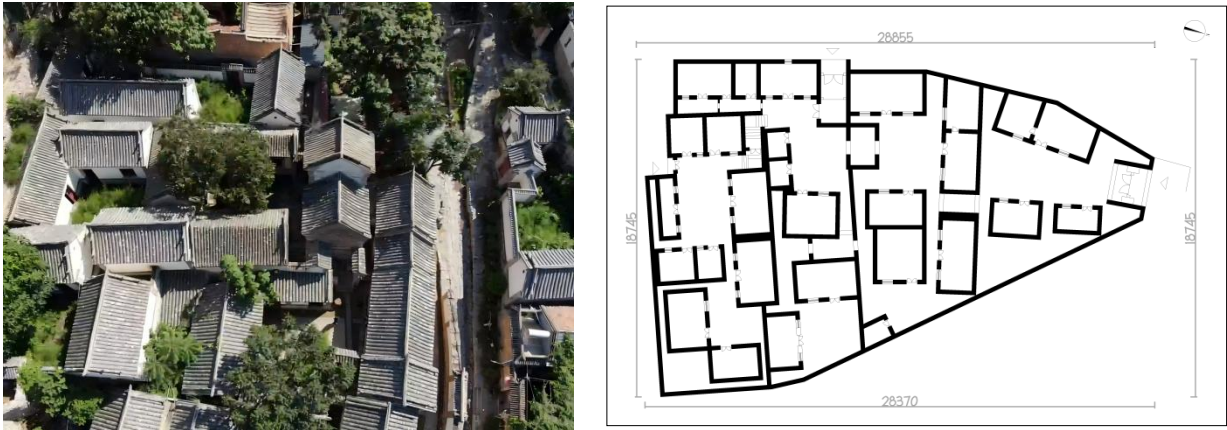


Figure 2. Aerial view of the South and North Courtyards, and the overall plan of Zhu Fengyin's Residence.

According to the survey, the Zhu Fengyin Residence retains two courtyards, referred to as the South Courtyard and the North Courtyard, arranged as an east yard and a west yard. The entrance sequence begins on the western side. Visitors ascend three steps to enter the main gate, where a screen wall stands directly ahead. Functionally, this element blocks direct sightlines into the inner courtyard. Spatially, it marks the transition from the public street network to a private domain. The North Courtyard is a three-sided courtyard compound composed of a reversely-set room and two wing rooms. The west wing room serves as a reception space, three bays wide, with a depth of 3.5 m. The reversely-set room functions as a kitchen, with a depth of 1.5 m. The east wing room has a depth of 4.2 m, and the east-west length of the North Courtyard is approximately 8.4 m (Figure 3).

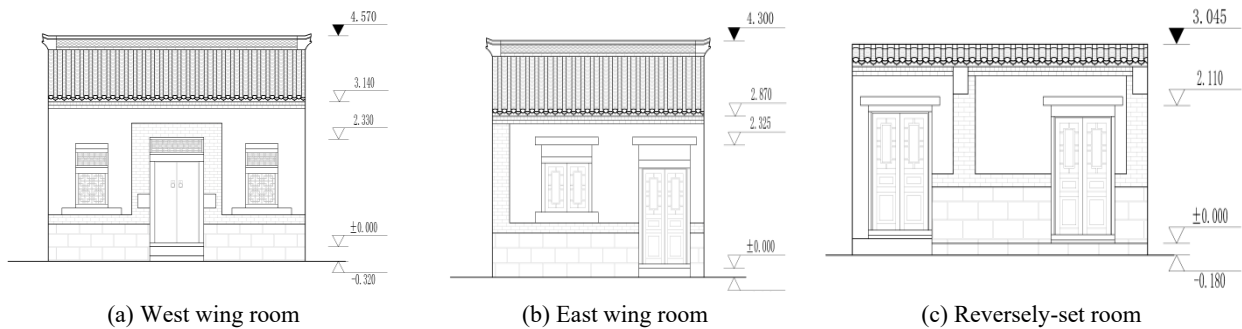


Figure 3. Elevations of the North Courtyard of the Zhu Fengyin Residence.

From the North Courtyard, the South Courtyard is reached through a gatehouse and a nine-step turning staircase. The spatial experience upon entering the South Courtyard is clearly layered. After passing through the gatehouse, the gable wall of the main hall becomes the visual focus. A tall window at the center of the wall

provides a strong sense of direction and anticipation. The route then turns right and continues along a short corridor before arriving at the core space: a siheyuan courtyard enclosed by the main hall, reversely-set room, wing rooms, and the library building. The route shifts from a compressed entry sequence to a more open courtyard space, reflecting deliberate control of spatial pacing in traditional dwellings.

The main hall of the South Courtyard is three bays wide, with a depth of 3.7 m. The reversely-set room is three bays wide, with a depth of 1.5 m. Both the west and east wing rooms are three bays wide, with a depth of 3.2 m, and adopt a three-bay, two-room layout. A partition wall is built at the center bay, dividing the three bays into two rooms. The west wing room is organized as a library on the second floor and a wing room on the first floor. The library is the tallest structure in the complex, emphasizing the importance of reading and learning in the private school (Wang, 2024). The South Courtyard is approximately 5.6 m long from south to north and 8.7 m long from east to west (Figure 4).

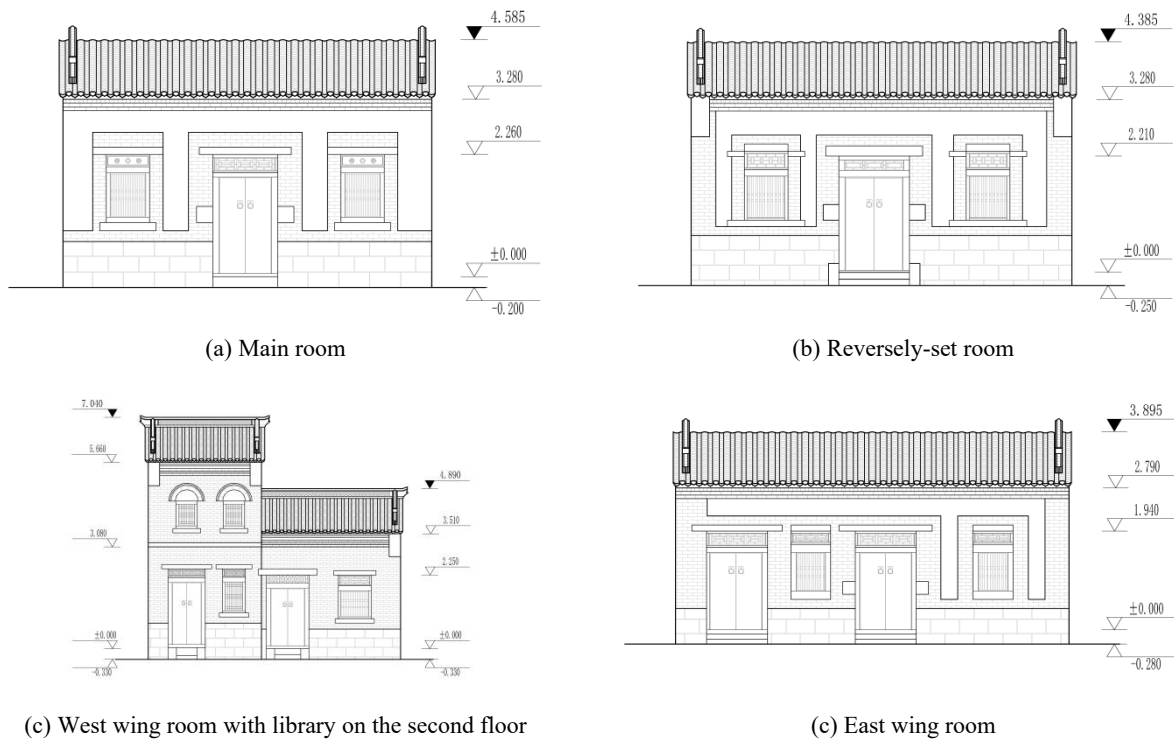


Figure 4. Elevation of the South Courtyard of Zhu Fengyin's Residence. Source: Self draw by the author.

Structural System and Construction Techniques

The courtyards follow the steep mountainous terrain. By building elevated pedestals and using steps and ramps, the complex forms a staggered spatial pattern. Pedestal height is also an important marker of building hierarchy. The sequence of steps leading into the principal spaces constitutes an expression of rites (Wen, 2016).

In terms of structure, the main buildings primarily adopt a load-bearing wall system. The walls are substantial, typically 35-50 cm thick, and the room depth is relatively small. Exterior walls rarely have windows, or only small high windows. To maintain privacy, daylighting and ventilation rely mainly on the internal courtyards. To improve structural stability, the dado is commonly built of bluestone, about 80-90 cm high, and corners as well as door and window openings are often reinforced with stone strips. The upper wall is either

brickwork, or it is plastered on the exterior with a mixture of earth and adobe brickwork, showing a material strategy adapted to local conditions.

The roof adopts the flush gable roof form. In most cases, the roof curvature is slight, the rafters are closely spaced, and reed mats are laid above before an earthen layer is applied for thermal insulation. Roofing materials are mainly locally sourced yellow grass, white grass, or small gray tiles. The roof pitch is generally above 30°, which facilitates rapid drainage. The roof frame is a tripod-type timber frame. In this triangular framing system, timber frames are placed on the load-bearing walls, purlins are set on the frames, and the roofing layers are laid above. The load path differs from other systems, and the use of timber is more economical (Figure 5).



Figure 5. Roof structure of Zhu Fengyin's Residence.

The building complex accommodates changes in site elevation by grading the courtyards to create controlled drainage slopes. Rainwater is conveyed through open drains or covered drains to the roadside runoff channel and then into the pond north of the village, forming an integrated drainage system. Water jars are also commonly placed in the courtyards for daily use and for firefighting water storage, reflecting construction practices that balance practicality and safety.

The west gate of the Zhu Fengyin Residence is a typical jinzhū type, with the gate panels set between a pair of golden columns. It has six ground-set columns and finely jointed brickwork, representing a typical gate form used by northern official and gentry households. A bearing stone is set horizontally beneath the door frame; it supports the door leaves and stabilizes the pivot. One half of the stone is embedded within the frame and includes a pivot socket that supports the lower pivot, as well as a groove that secures the threshold. The other half is exposed to the exterior and has developed a thick patina through long-term wear, with a muted sheen. The high threshold also provides a direct indication of Zhu Fengyin's jinshi status.

Architectural Culture of the Zhu Fengyin Residence

Architectural Decoration

Architectural decoration in the Zhu Fengyin Residence is dominated by wood carving, supplemented by brick carving, stone carving, and ironwork, forming a rich decorative system with layered meanings. Wood carving is mainly found on the lintel, hanging panels, sparrow braces, and window lattice, among other

elements. For example, the hanging panel beneath the eaves of the west gate is a rectangular openwork carving in zitan wood. It is divided into three parts. The central panel depicts a motif of bats with peaches, implying blessings and longevity. The two side panels are symmetrical and feature peony and plum-blossom patterns, symbolizing prosperity and honor. Beneath the decorative cylinder, nine gourds are carved on the door hood. Their homophonic association conveys wishes for fortune and emolument, and further implies abundant descendants and continuity. The carving set also includes four animal motifs—cicada, katydid, bee, and butterfly—which respectively allude to knowing one's destiny, smooth advancement in official career, promotion in office and rank, and enduring blessings, indicating a dense cultural content. Intertwined gourd vines further suggest expectations of flourishing descendants and success in study. On the two door jambs, a pair of miniature vases is carved in high refinement; each vase contains three halberds, implying promotion by three ranks (Figure 6). Wood carving on the windows is placed on the transom board, or on a widened window stool. Coin motifs and swastika-pattern designs are carved on these elements, conveying wishes for auspiciousness and blessing (Zhang, 2012).



Figure 6. Wooden carving on the lintel of the west gate.

Brick carving is mainly applied to the projecting gable-end wall (chitou), the screen wall, the tile end, and the drip tile. The pillar-head motifs combine scrolling cloud patterns, meander patterns, and swastika patterns, implying upward advancement and auspicious fulfillment, uninterrupted prosperity, and enduring continuity. The screen wall is commonly decorated with the character fu or the characters jiangou (fulu), expressing wishes for an auspicious life.

Stone carving appears at structural elements such as the column base, balustrade panels, and arches, with a plain form and a rhythmic character.

Ironwork is most evident in the gate hardware, including the door knocker ring (pushou) and iron sheathing on the door panels. These features strengthen protection while enhancing decoration, demonstrating the integration of local craft and practical requirements.

In Zhujiayu, architectural decoration is not merely appended. It is the aesthetic shaping of functional elements. Craftsmen work with the specific properties of each material to unify technique, artistic expression, and symbolic meaning. In this way, decoration supports practical use and conveys local beliefs, ethical norms, and aesthetic values (Figure 7).



(a) Projecting gable-end wall



(b) Tile end and drip tile



(c) Screen wall

Figure 7. Brick carvings on Zhu Fengyin's Residence.

Characteristics of Interior Furnishings

Interior furnishings in the Zhu Fengyin Residence provide direct evidence of gentry domestic life in northern China during the late Qing period. Their arrangement indicates how ritual hierarchy was maintained while meeting daily needs and responding to local conditions. This perspective is critical for understanding the cultural significance of the residence.

The interior arrangement centers on the gentry household emphasis on ritual order and hierarchy, and it also supports the practical goal of sustaining the family through farming and learning. Spatial organization follows ritual conventions. In the central bay of the main hall, dark red furnishings of regular form are typically placed, including a console table, a square table, and armchairs (Zhang, 2012). This subdued and dignified palette aligns with gentry aesthetic preferences. It also carries conventional auspicious meanings associated with stability, thereby reinforcing the owner's status and authority. The east and west side bays serve as the primary living spaces and are commonly organized around a heated kang bed, a raised masonry sleeping platform heated from below by flues connected to a stove. A kang table and kang cabinets are placed on the platform, enabling heating, rest, and daily activities, and indicating climate-responsive strategies in northern dwellings. Practical use and storage are further emphasized. Tall cabinets and trunk cabinets, widely installed in the wing rooms and ear rooms, have a plain appearance and prioritize function. Decorative items also participate in the interior system. Landscape and bird-and-flower paintings hung on the walls, together with carved motifs on objects such as jewelry boxes, correspond in color and subject matter with the furniture arrangement. They express aspirations toward natural appreciation, civil examination success, and auspicious well-being. Overall, through hierarchical furniture placement, clear functional zoning, and symbolic expression in decorative elements, the interior presents a gentry domestic setting that combines ritual order with everyday comfort (Figure 8).



(a) Square table, armchairs and console table



(b) Heated kang bed



(c) Enclosed-front cabinet



(d) Tall cabinet



(e) Jewelry box

Figure 8. The interior furnishing and artifacts of Zhu Fengyin's Residence.

Conclusion

As a representative late-Qing gentry residence in the Zhangqiu area of Ji'nan, the Zhu Fengyin Residence demonstrates an integrated relationship among natural setting, cultural tradition, and ritual concepts through its architectural form and spatial organization. The courtyard layout follows the mountain terrain. Through multi-courtyard combinations, strategic use of level changes, and a flexible spatial sequence, it illustrates how northern courtyard-house traditions were adapted to complex topography. The structural system relies primarily on load-bearing walls. Together with a bluestone dado, flush gable roofs, and the use of locally available materials, it reflects a pragmatic building approach shaped by regional climate and resources.

At the level of cultural expression, the decorative system combines wood carving, brick carving, stone carving, and ironwork. Auspicious meanings, ethical concepts, and aesthetic preferences are embedded in construction details, giving material form to ritual order and gentry identity. Interior furnishings further reinforce spatial hierarchy and functional zoning. They highlight the family tradition of sustaining the household through farming and learning, as well as literati taste. The Zhu Fengyin Residence is not only a well-preserved vernacular heritage site with strong regional characteristics, but also an important record of gentry cultural life and construction techniques in the Shandong region during the Qing Dynasty.

This case study provides a clear example for understanding how traditional dwellings in the Jinan area developed their architectural form and cultural expression under both environmental constraints and cultural drivers. The residence embodies approaches to ecological adaptation, values of craft transmission, and spatial-cultural meanings. These features offer useful reference for current conservation work on traditional settlements and dwellings, and they merit further investigation and development in future research.

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