Characteristics of Liao Dynasty Architecture in China

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Abstract: The Liao Dynasty architecture is an important part of Chinese architectural history. It inherited the style of the Tang Dynasty and was also deeply influenced by the living habits and residential customs of the Khitan people. Additionally, the widespread influence of Buddhism at the time contributed to the development of a unique architectural style. Liao Dynasty architecture used large building materials, similar to those of the Tang Dynasty. Roofs were elevated with gentle slopes, and columns were columns were set with side column and raised eave to enhance stability. This paper discusses the characteristics of Liao Dynasty architecture by analyzing existing buildings such as the Main Hall of Fengguo Temple, the Shakyamuni Pagoda of Fogong Temple, the Bojia Buddhist Canon Hall, the Main Hall of Shanhua Temple, the Mountain Gate and Guanyin Pavilion of Dule Temple.

Keywords: Late Tang Style, Gentle Roofs, Column Reduction Method

Chinese civilization has a long and continuous history, with various dynasties and ethnic groups contributing different elements, some distinct and some integrated. From the establishment of Nanzhao during the Tianbao period of the Tang Dynasty (AD 738) until the fall of the Southern Song Dynasty by the Yuan Dynasty (1279), China (including North and South China) was never controlled by a single unified regime. During this period of multi-ethnic competition, several different ethnic groups established ruling dynasties. For example, the Song Dynasty was governed by the Han ethnic group, the Liao Dynasty (AD 907-1125) by the Khitan people, the Jin Dynasty (1115-1234) by the Jurchens, and the Yuan Dynasty (1271-1368) by the Mongols. In addition to the power struggle between the Song, Liao, and Jin dynasties, other states like the Western Xia (1038-1227) and Dali (937-1254) also existed within China. Though the Liao Dynasty was founded by a minority ethnic group, its architecture reflected the influence of the culture and technology from the Central Plains area, with a significant resemblance to the late Tang architectural style.

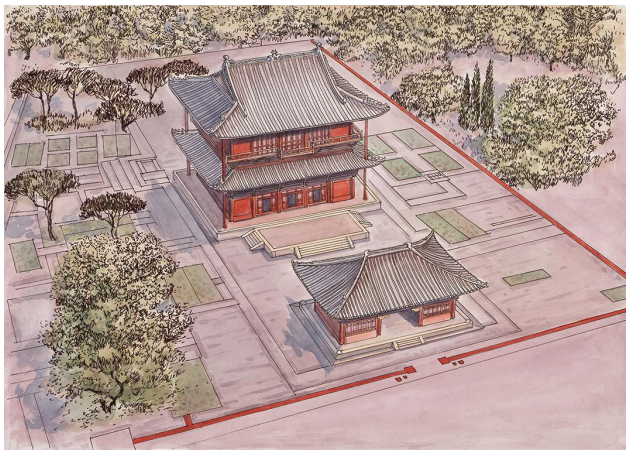

Figure 1. Mountain Gate and Guanyin Pavilion of Dule Temple

Liao Dynasty architecture is not only unique in its structure and decoration but also boasts significant achievements in construction techniques and artistry. These buildings still stand today, providing valuable material evidence for studying the history and culture of the Liao Dynasty.

The Liao Dynasty, founded by the Khitan aristocracy, ruled northern China during the 10th to 12th centuries. As a nomadic people from the north, the Khitan initially lived in felt yurts, which typically had doors facing east, reflecting their custom of reverence for the east. Influenced by this tradition, certain building complexes constructed after the establishment of the Liao state, such as Shangjing Palace and Huayan Temple in Datong, adopted an east-facing orientation for their main halls.

The Liao rulers governed their territories according to local conditions and saw a relatively stable period of development before their defeat by the Jin Dynasty in 1125. The Liao Dynasty established five capitals within its domain—Shangjing, Dongjing, Xijing, Zhongjing, and Nanjing—of which the surviving buildings are mainly located in Xijing, now part of Shanxi Province. Since the Liao rulers were devout Buddhists, most of the extant wooden buildings from this period are Buddhist temples. These structures were largely built by Han craftsmen, as the regions where these buildings are located were part of the Tang (618-907) and late Five Dynasties periods (907-979). Therefore, Liao architecture demonstrates a combination of late Tang and Five Dynasties styles, with some innovations.

Liao Dynasty architecture used large building materials similar to those of the Tang Dynasty. The roofs were raised gently, and the columns were constructed with a Side column ① and a Raised eave ② to enhance stability. Many Liao ③ buildings adopted the late Tang and Five Dynasties styles, where decorative elements like bamboo-shaped brackets were common, known as "Pi Zhu Ang ④," using genuine brackets with fewer intermediate ones. The primary construction method was the simplified "Tou Xin Zao ⑤" structure.

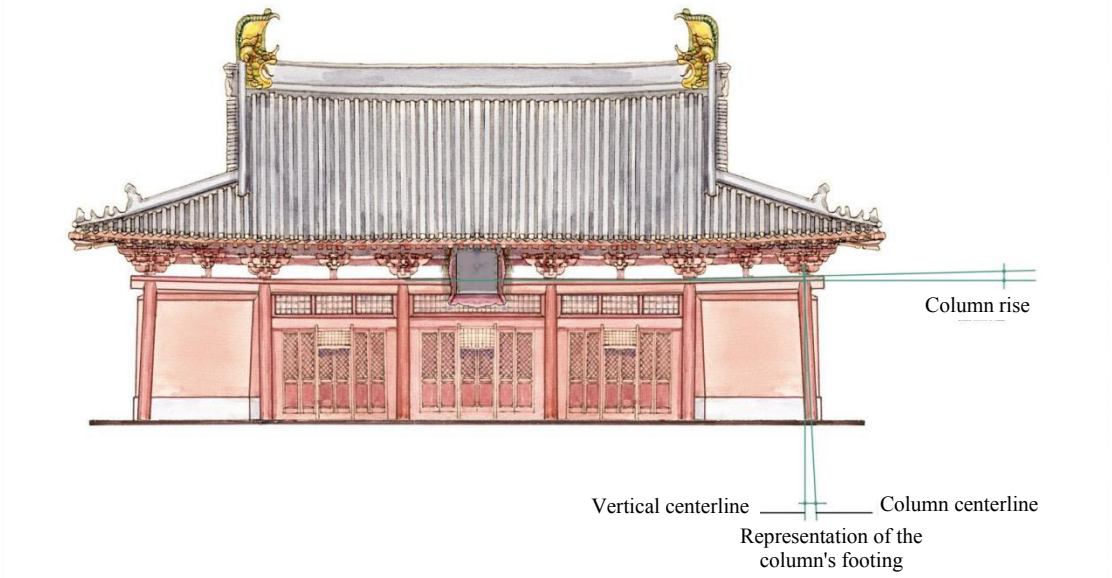

Figure 2. Diagram of Side Columns and Raised Eaves

Existing Examples of Liao Dynasty Architecture:

The Main Hall of Fengguo Temple, located in Yi County, Jinzhou City, Liaoning Province, China, is a Buddhist temple building with a history of over a thousand years. It was originally constructed in the ninth year of the Kaitai reign during the Liao Dynasty (AD 1020) under the name Xianxi Temple. It was renamed Fengguo Temple during the Jin Dynasty in the third year of the Mingchang reign (1192). This temple was built by Emperor Shengzong of the Liao Dynasty, Yelv Longxu, in honor of his mother, Empress Dowager Xiao, and is the highest-ranking Buddhist Hall among the surviving Liao Dynasty buildings.

Figure 3. Main Hall of Fengguo Temple

Fengguo Temple is one of the three major surviving temples of the Liao Dynasty in China. Its iconic structure—the Main Hall—is the largest surviving Buddhist Hall from ancient times. Inside the hall, there is the largest and oldest group of painted clay Buddha statues in China, but by the Ming and Qing Dynasties, only the Main Hall of the Liao period remained.

The Main Hall is the central structure of Fengguo Temple and is one of the largest single-eave wooden structures in China. The roof is in the form of a hip roof with five ridges and single eaves. The hall is built on a 3-meter-high platform, measuring 48.2 meters in length, 25.13 meters in width, and 21 meters in height, with a building area of 1,829 square meters and a front width of nine bays. The outermost part of the hall features 10 × 6 columns, with folding screen doors set in the central seven bays of the front and rear facades. The remaining columns are embedded in the solid walls. Inside, the hall originally had four rows of columns, with eight columns per row. However, to accommodate the Buddha platform, which extends across seven bays at the rear of the hall, and to enlarge the worship space in the front hall, the first and third rows of columns were

omitted, except for one column on either side, showing a tendency towards column reduction. To compensate, additional longitudinal and transverse wooden structural elements were added to ensure stability and safety, forming a complex multi-layer structure.

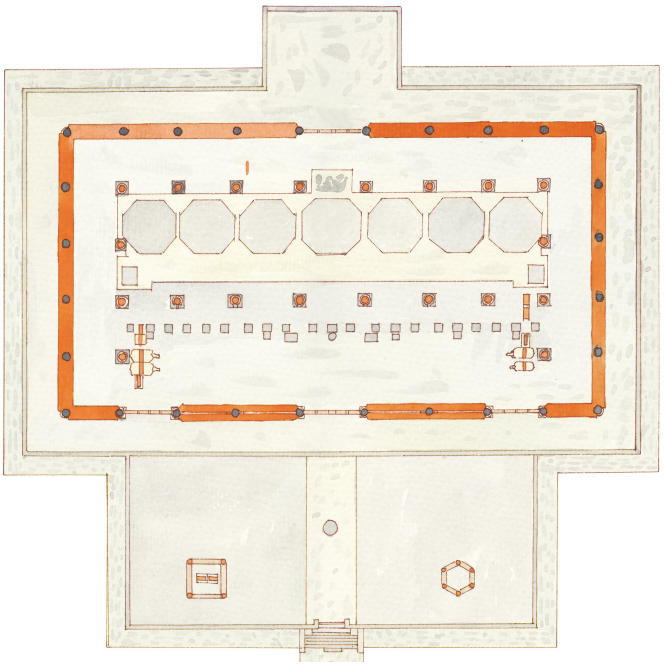

Figure 4. Floor Plan of the Main Hall of Fengguo Temple

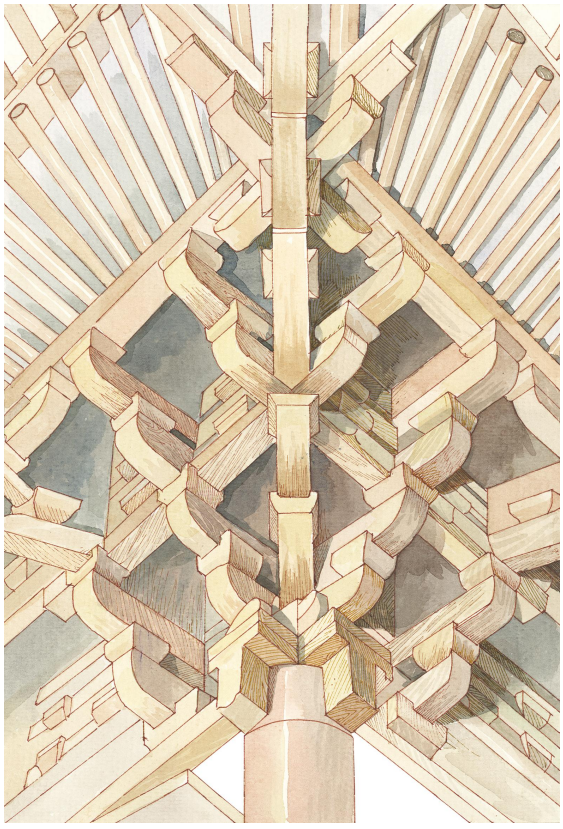

Figure 5. Corner Corbel Structure of the Outer Eaves of the Main Hall of Fengguo Temple

The structure of the Main Hall of Fengguo Temple reflects signs of reform in classical Chinese wooden architecture. Although this reform did not significantly simplify the structure and instead increased the number of beams and purlins, the structure clearly shows signs of transformation. The hall's wooden structure is based on a bay-frame form, and the multilayered stacking of beams and purlins simplifies the dougong system. While the Main Hall of Fengguo Temple adopted a new structural form, it remains an improvement based on Tang Dynasty architectural structures. Its complex construction contradicts the trend toward a simplified wooden frame system, which is why this approach gradually disappeared. The simplification of wooden frame and dougong system observed in Liao Dynasty architecture also signals the transition of classical Chinese wooden architecture from its early to mid-late development stages.

Inside the Main Hall of Fengguo Temple, seven large Buddha statues are enshrined, representing the "Seven Buddhas of the Past," a concept in Buddhism referring to the seven Buddhas of previous worlds. The seven Buddha statues are original Liao Dynasty creations, all seated on Sumeru pedestals, each over 9 meters in height. The central statue of Vairocana Buddha is the tallest, standing at 9.5 meters including the platform, seated in a lotus platform, with a carved halo behind. The sculptures display the solemn style of Tang Buddhist art. In front of each Buddha, there are two attendant figures, each about 2.5 meters tall. Unlike the stately demeanor of the main Buddhas, the attendants are depicted with expressive poses and lively facial expressions, making them visually captivating. Additionally, remnants of Liao Dynasty paintings, including images of flying deities, lotuses, and peonies, can still be seen on the temple's wooden roof structure, showcasing vibrant colors and natural imagery.

Figure 6. Buddha Statues in the Main Hall of Fengguo Temple

The Main Hall of Fengguo Temple is not only valuable for its architectural techniques but also for its interior sculptures, paintings, and murals, which are treasures of ancient Chinese art.

The Shakyamuni Pagoda of Fogong Temple, also known as the Yingxian Wooden Pagoda, is located in Ying County, Shuozhou City, Shanxi Province. It was built in the second year of the Qingning reign of the Liao Dynasty (1056) and is the oldest and tallest surviving wooden structure in China. From the outside, the pagoda appears as an octagonal, five-story, six-eaved building with a total height of 67.31 meters, from the ground to the top of the spire. The diameter of the base is 30.27 meters, and the total weight exceeds 7,400 tons.

The structural design of the Yingxian Wooden Pagoda is particularly unique, reflecting the sophisticated techniques of ancient Chinese wooden architecture. The octagonal shape helps disperse wind and earthquake forces, reducing the damage to the structure. The overall design tapers gradually as it ascends, forming a visually pleasing and stable silhouette, with the towering spire on top enhancing both the pagoda's aesthetics and its role as a lightning rod.

Figure 7. Shakyamuni Pagoda of Fogong Temple in Ying County, Shanxi

The pagoda employs a "tube within a tube" structural form, using two circles of wooden pillars—24 outer pillars and 8 inner pillars—creating a sturdy double-layered framework. This arrangement effectively distributes the weight of the pagoda evenly, enhancing its stability. Additionally, the staircases within each floor are positioned at alternating locations, avoiding the instability that might arise from a straight-line staircase design.

The pagoda uses 54 different types of dougong (interlocking wooden brackets), which serve both decorative and structural functions, dispersing and buffering seismic forces to improve the building's earthquake resistance. All the components are connected using mortise and tenon joints ⑥, without a single nail, demonstrating the masterful carpentry skills of ancient craftsmen and their deep understanding of the properties of wood.

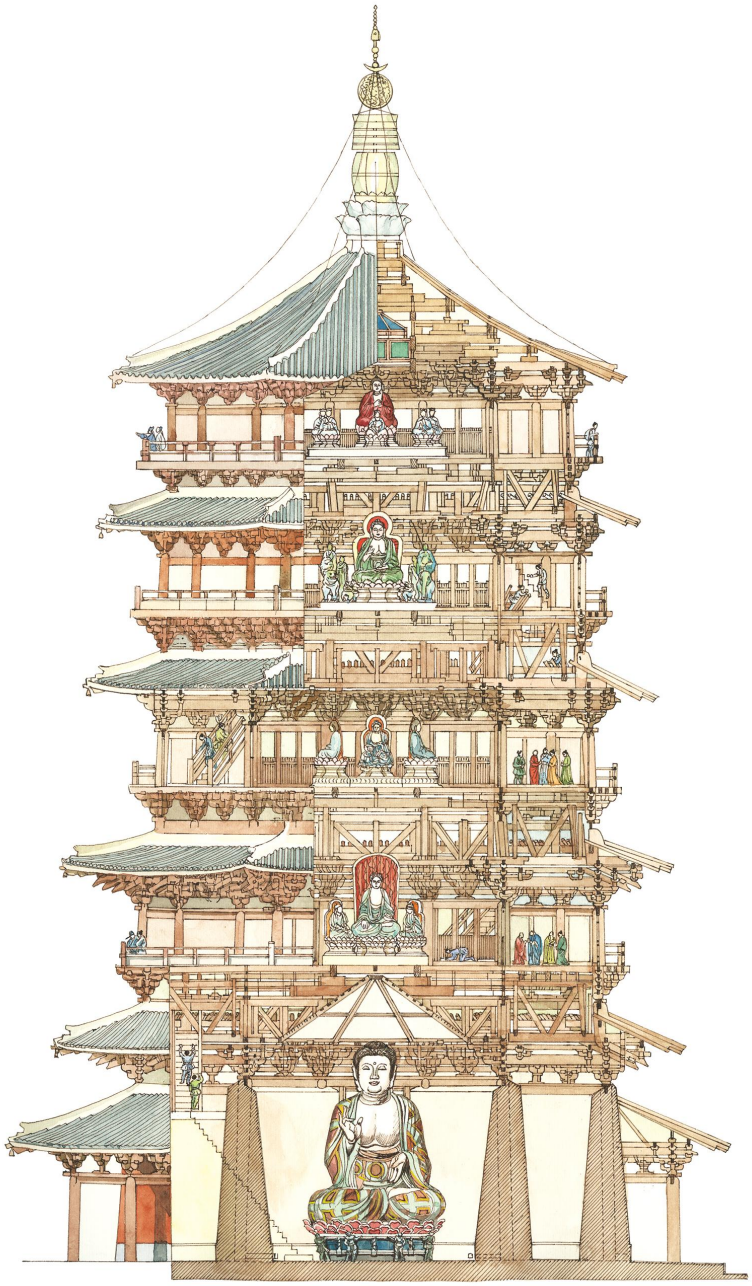

Figure 8. Elevation and Section Views of the Wooden Pagoda of Ying County

Although the pagoda appears to have five visible stories from the outside, it actually has nine, as it employs the "five open, four hidden" structure. This means that while five stories with six eaves are visible on the exterior, there are four hidden intermediary levels, creating a total of nine stories. In traditional Chinese pavilion architecture, hidden levels (called "pingzuo layers") were often added between visible floors, a characteristic feature of multi-story pavilion buildings in the Tang and Song dynasties. These hidden layers, though structurally essential, were concealed from the exterior by decorative panels, with verandas and railings added to obscure them. Thus, the actual number of stories inside the building does not match the exterior. These intermediary layers consist of triangular truss structures, similar to modern trusses, enhancing the overall rigidity of the tower.

Figure 9. Corbelled Platform of the Wooden Pagoda of Ying County

Early Chinese pagodas typically had a central pillar extending from the base to the top, which facilitated construction but limited the use of interior space. The Yingxian Wooden Pagoda, however, does not have a central pillar, allowing each floor to accommodate statues of Buddha in a central position. This design also creates a spacious, well-lit interior, ideal for religious worship and tourism. Inside the pagoda's five main stories are 26 distinct Liao Dynasty Buddha statues, along with well-preserved murals of high artistic value.

Figure 10. Buddha Statues and Caisson Ceiling inside the Wooden Pagoda of Ying County

The design and structure of the Yingxian Wooden Pagoda demonstrate the ingenuity of ancient architects and their pursuit of architectural beauty, making it a monumental achievement in the history of Chinese architecture. The pagoda currently has a slight lean, and preservation and restoration efforts are ongoing.

The Bojia Buddhist Canon Hall of Xia Huayan Temple is located in Datong City, Shanxi Province, and was built in the seventh year of the Chongxi reign of the Liao Dynasty (1038). It is one of the most well-preserved Liao Dynasty Buddhist temples in China. According to the Khitan tradition of reverence for the east, the entire temple complex is aligned west to east. The complex is divided into the upper and lower temples (which refers to the Shang Huayan Temple and Xia Huayan Temple), centered around the Main Hall and the Bojiao Buddhist Canon Hall. The Bojiao Buddhist Canon Hall of Xia Huayan Temple is an outstanding representative of Liao Dynasty architecture. The construction date of this building has been confirmed because an inscription found on the bottom of a beam in the Bojiao Buddhist Canon Hall reads: "Built on the fifteenth day of the tenth month in the seventh year of the Chongxi era (1038)."

The term "Bojia" is a transliteration of the Sanskrit word "bhagavat". This pavilion was built to house the scriptures on a convex-shaped platform, which is 3.2 meters high, 30.9 meters long, and features an 18.75-meter-long terrace that extends forward, 3 meters above the ground. This type of convex platform design is commonly seen in Liao and Jin dynasty temples in Datong.

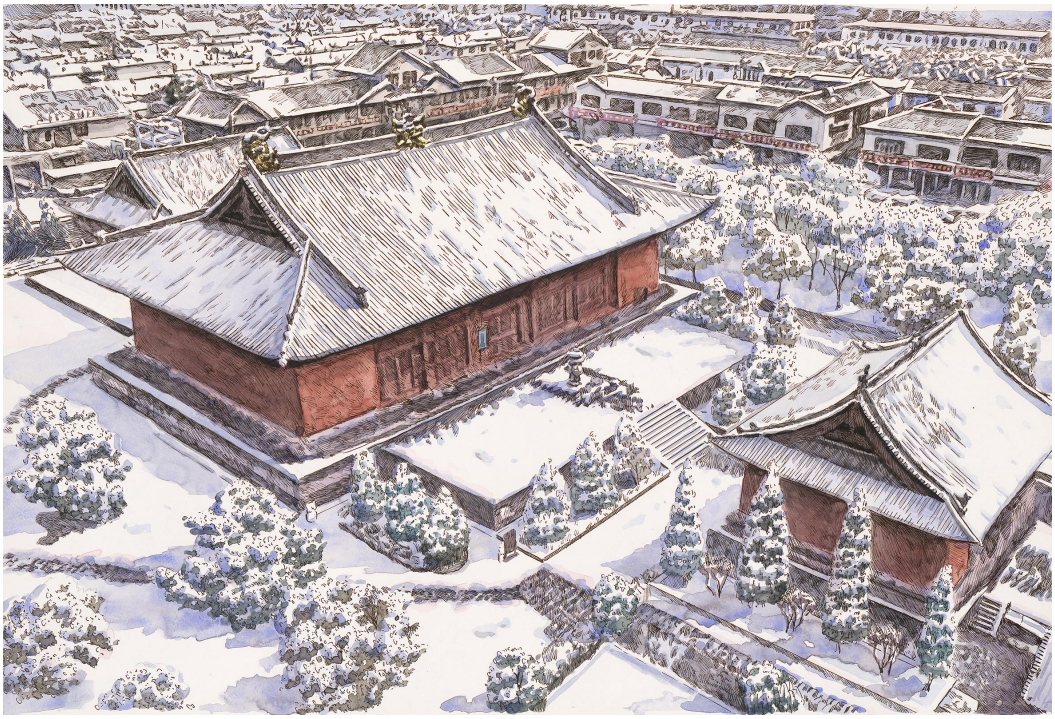

Figure 11. Bojia Buddhist Canon Hall of Xia Huayan Temple, Datong

The Bojia Buddhist Canon Hall is a rectangular hall, five bays wide (approximately 25.65 meters long) and four bays deep (approximately 18.47 meters long), with three concentric rows of pillars. The outermost row is arranged in a 6×5 pattern, with some columns embedded into the north, west, and south walls. The hall's east-facing front facade features lattice doors in the center, with solid walls on either side. The roof is a nine-ridge hipped structure (restored during the Qing Dynasty) with a gentle slope of 24 degrees, one of the shallowest roof pitches among surviving Liao and Jin buildings. Although the roof structure was altered during later restorations, measurements reveal that the roof's height-to-span ratio is about 1:4.5, reminiscent of late Tang Dynasty buildings, retaining a distinctly Tang-style aesthetic. In contrast, later Chinese buildings tend to have steeper roofs, losing the graceful flatness of earlier designs.

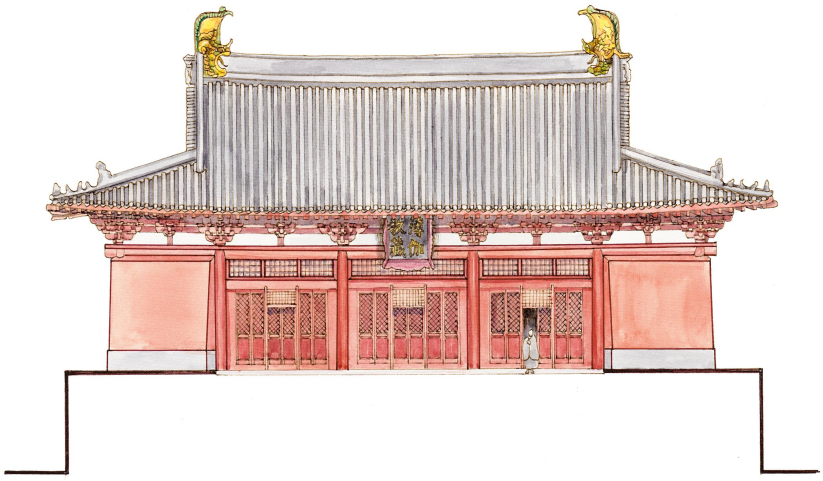

Figure 12. Front Elevation of the Bojia Buddhist Canon Hall

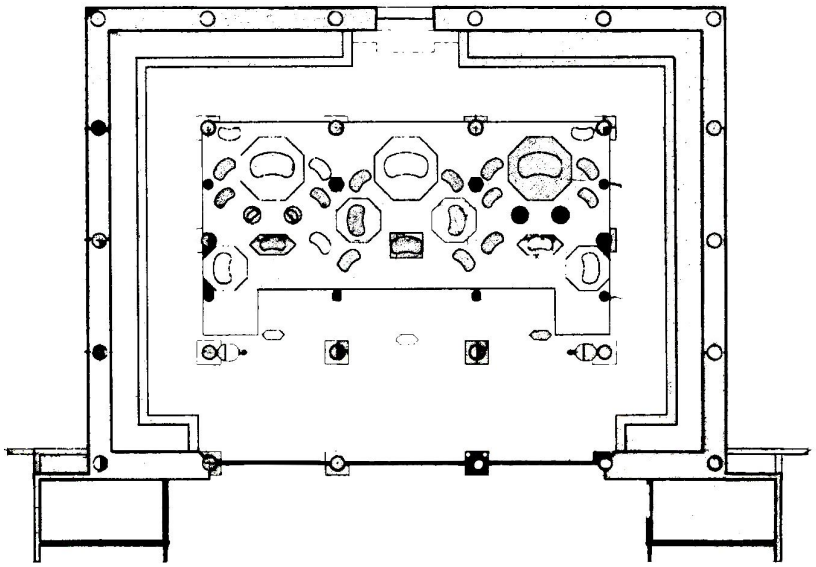

Figure 13. Floor Plan of the Bojia Buddhist Canon Hall

The interior of the building features a column grid structure with two concentric circles, and all the columns are of the same height. The gabled roof is supported by two sets of roof frames: one exposed below the ceiling and the other concealed above it. The overall structure of the Bojia Buddhist Canon Hall still follows the structural principles of the Tang Dynasty hall-type architecture, consisting of a lower layer of supporting columns, a middle layer of flooring, and an upper layer of roof frames. The Bojia Buddhist Canon Hall features eight types of dougong (bracket sets) classified into two categories based on their locations. There is one type of dougong located beneath the external eaves, above the horizontal beam between two columns (inter-column brackets), and one type at the four corners of the building (corner brackets). In the interior, there are two types of dougong above each column (cap brackets) and two types above the horizontal beams between two columns (inter-column brackets), along with one type for corner brackets. The styles of dougong vary across different eras, making them significant for chronological studies in the history of Chinese architecture.

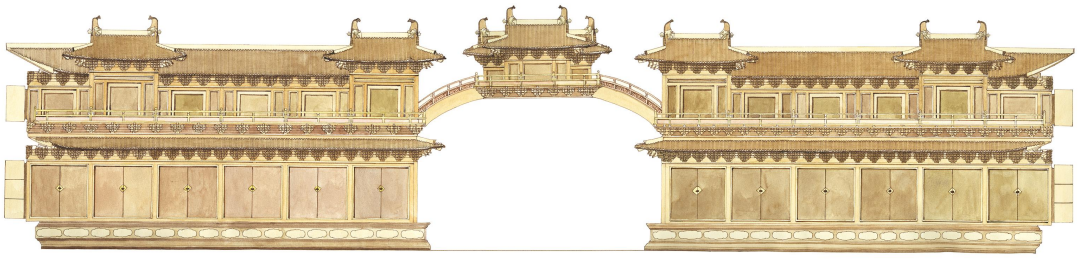

Figure 14. Wall Storage Cabinets in the Bojia Buddhist Canon Hall

The Bojia Buddhist Canon Hall employs the architectural technique known as "reduced column method," meaning that columns are not set strictly at the intersections of horizontal and vertical

coordinates. Instead, the use of interior columns is minimized in public space areas, allowing for increased span of the upper beams and expanding the front space, facilitating the arrangement of Buddha statues and religious activities. The Bojia Buddhist Canon Hall is not only a treasure of Liao Dynasty architecture but also one of the earlier examples of the "reduced column method" in ancient Chinese architecture, possessing significant historical, artistic, and scientific value.

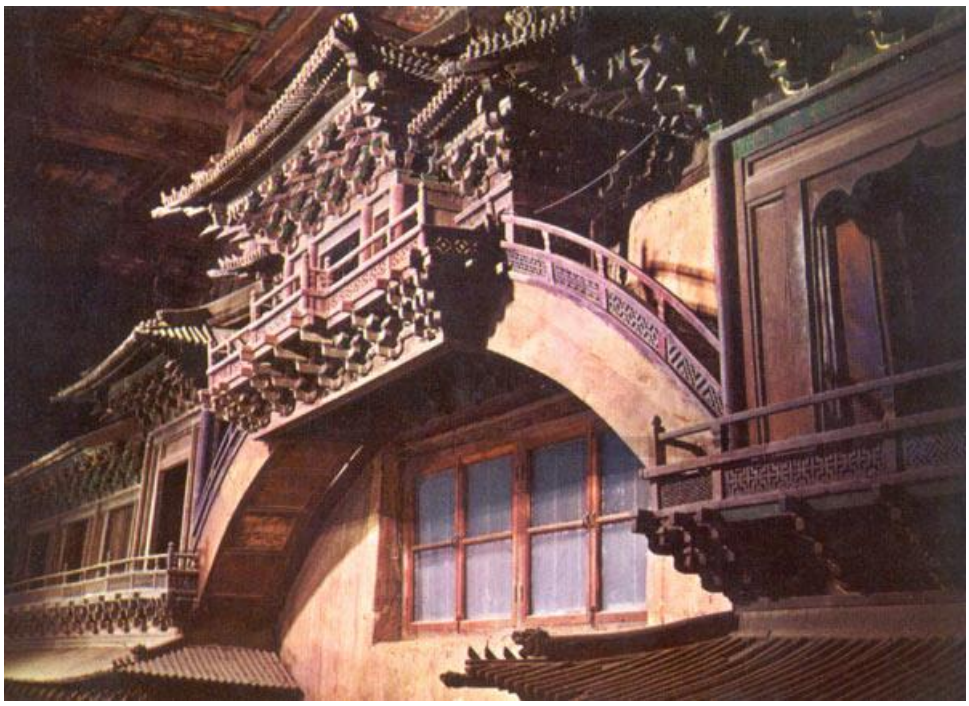

Figure 15. Close-up of the Bojia Buddhist Canon Hall

The interior of the Bojia Buddhist Canon Hall is surrounded by wooden wall cabinets, which serve as storage for scriptures and are the most important decorative elements of the hall. There are a total of 38 long wall cabinets, all designed as two-story structures, consisting of a brick-built Sumeru pedestal at the bottom and wooden cabinets above. Each cabinet features a two-sloped roof shrine. The wall cabinets are entirely made of wood, and their construction and dougong are scaled-down representations of real architectural structures, crafted with exquisite detail, making them an accurate miniature model of Liao Dynasty wooden architecture. In addition, the hall contains 31 Liao Dynasty sculptures, including statues of the Three Buddhas, bodhisattvas, disciples, and heavenly kings. Among them, a bodhisattva sculpture with folded hands and a visible smile is especially famous in Chinese art history, considered a masterpiece of Liao sculpture.

Figure 16. Bodhisattva Statues in the Bojia Buddhist Canon Hall

The Main Hall of Shanhua Temple, located in Datong City, Shanxi Province, is another significant Buddhist structure from the Liao and Jin periods. Initially built during the Kaiyuan reign of the Tang Dynasty (713-741) and later renovated during the Ming Dynasty, the temple complex is arranged in a tiered, symmetrical layout, with clear primary and secondary structures. It is also one of the largest and most well-preserved examples of Liao architecture in China.

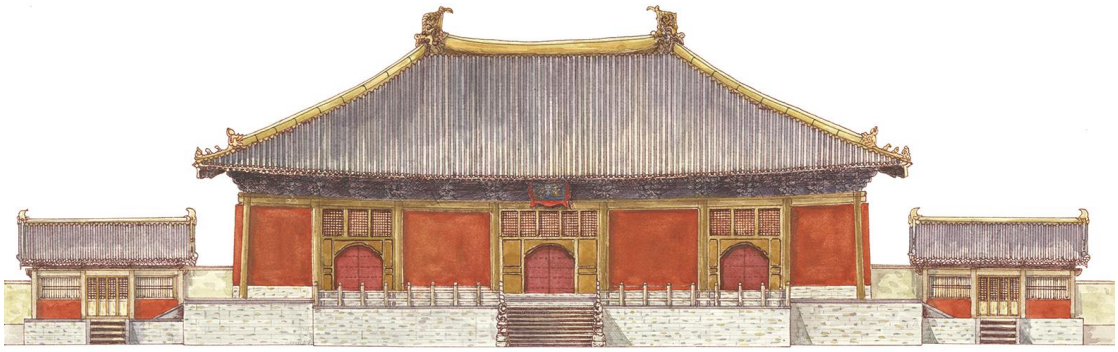

Figure 17. Front Elevation of the Main Hall at Shanhua Temple, Datong, Shanxi

The main buildings of Shanhua Temple are arranged along a north-south axis, gradually unfolding and rising tier by tier. The front features the Mountain Gate, followed by the Hall of Three Saints, while the Main Hall from the Liao Dynasty is situated on a high platform at the rear. The Main Hall is the largest structure in Shanhua Temple, with a moon platform at the front and bell and drum towers on either side. The hall has a width of 7 bays (40.7 meters) and a depth of 5 bays (25.5 meters), topped by a single-eaved, five-ridge roof (hip-and-gable roof). Among Liao Dynasty buildings, it ranks third in China for single structure area, covering over 1,200 square meters. Inside the hall, five Buddhas are enshrined in the center, arranged from east to west: Akshobhya Buddha in the east, Ratnasambhava Buddha in the south, Vairocana Buddha in the center, Amitabha Buddha in the west, and Amoghasiddhi Buddha in the north. On the east and west brick platforms inside the hall stand statues of the Twenty-Four Heavenly Kings, bringing the total number of statues inside the Main Hall to 34.

The Mountain Gate and Guanyin Pavilion of Dule Temple are located in Jizhou District, Tianjin, and are among the earliest surviving wooden structures in China. The temple's oldest buildings, the Mountain Gate and Guanyin Pavilion, were rebuilt in the second year of Tonghe reign of Liao Dynasty (984). Dule Temple is renowned for its unique architectural artistry and historical significance, praised as a model that "inherits the legacy of the Tang Dynasty and heralds the construction style of the Song Dynasty."

The Mountain Gate of Dule Temple is not only the temple’s main entrance but also the oldest surviving mountain gate with a hip-and-gable roof in China, holding significant historical and cultural value. Its architectural style closely resembles that of the Tang Dynasty, showcasing Liao Dynasty features such as large-scale dougong brackets, sturdy columns, and deep eaves, embodying the grand and solemn qualities of Liao architecture. The dougong brackets and beam structures of the Mountain Gate are intricate and sophisticated, reflecting the exceptional craftsmanship of Liao artisans.

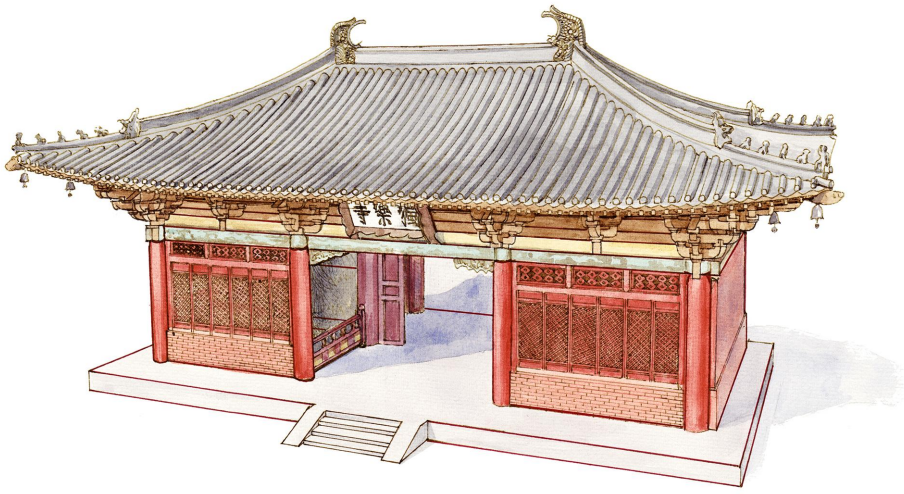

Figure 18. Mountain Gate of Dule Temple, Jixian, Tianjin

The Mountain Gate's front face consists of three bays, with rooms on either side divided into front and rear sections. In the front sections of both side bays are two clay sculptures of Vajrapani, while the rear sections are adorned with colored murals of the Four Heavenly Kings, both of which are valuable cultural relics of Liao Dynasty art.

Dule Temple was originally built during the Sui Dynasty, and the Guanyin Pavilion was rebuilt in the second year of Tonghe reign of Liao Dynasty (AD 984). It is the oldest surviving multi-story wooden pavilion in China and one of the few remaining Liao Dynasty structures in the country. The Guanyin Pavilion stands 23 meters high, appearing as a two-story building from the outside, but with a hidden middle level inside. The pavilion contains 28 pillars and thousands of beams and rafters, ranging from simple to complex, displaying the advanced timber construction techniques of the Liao Dynasty. The dougong system of the Guanyin Pavilion is complex, featuring 24 different types of interlocking joints without the use of nails. These dougong structures not only serve a load-bearing function but also hold immense artistic value. Despite having endured numerous earthquakes, including 28 significant ones, the Guanyin Pavilion remains standing, demonstrating the ancient craftsmen's remarkable seismic design skills.

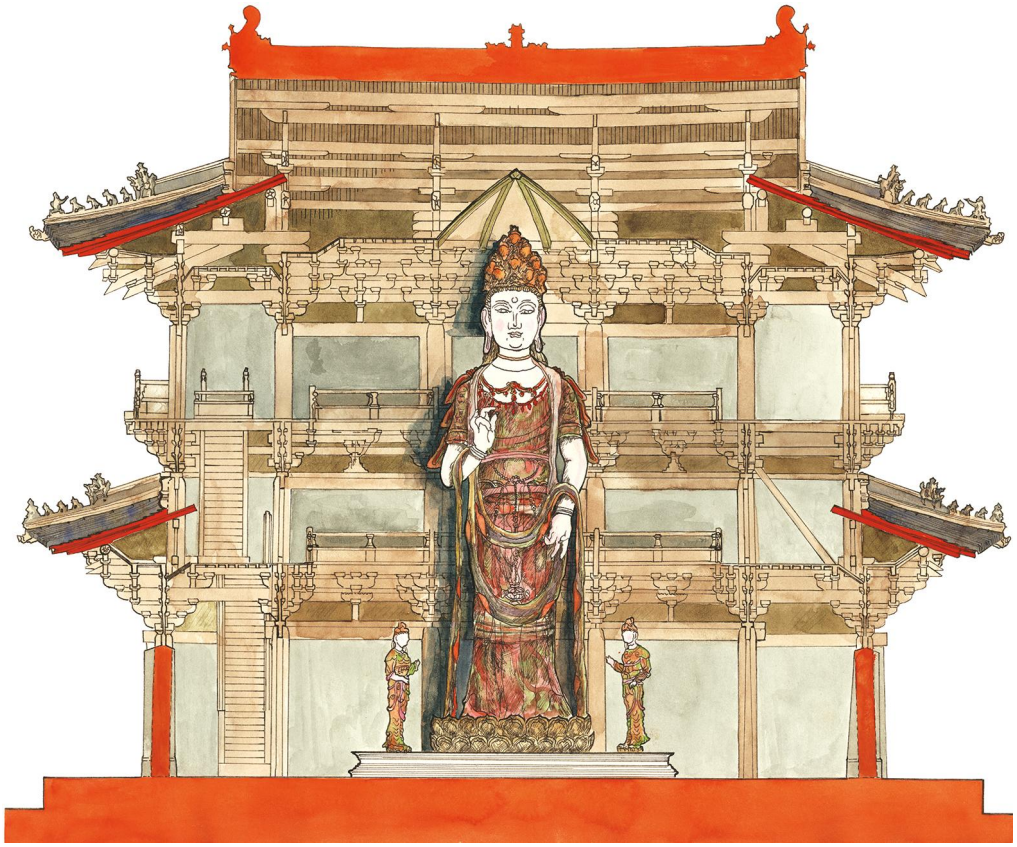

Figure 19. Longitudinal Section of the Guanyin Pavilion at Dule Temple

Inside the Guanyin Pavilion stands an 11-faced Guanyin statue, 16.08 meters tall, one of the tallest surviving painted clay statues in China, revered for its artistic and historical significance. Surrounding the Guanyin statue are exquisite Yuan Dynasty murals, repainted during the Ming Dynasty. These murals span a total length of 45.35 meters and cover an area of 142.85 square meters, making them a rare treasure in ancient mural art.

Figure 20. Cross Section of the Guanyin Pavilion at Dule Temple

Liao Dynasty architecture holds an important place in Chinese architectural history. From a historical perspective, these structures bear witness to the rise of the Khitan people and the ebb and flow of the Liao Dynasty, offering invaluable material for studying the history, culture, religion, and art of the Liao period. From an architectural history perspective, since few Tang Dynasty buildings have survived, Liao Dynasty structures, which closely resemble Tang designs in terms of layout, structure, and decoration, provide essential insights into Tang architecture. Furthermore, Liao architecture has its own distinctive artistic style, including the design of dougong brackets, decorative roof tiles, painted details, and sculptures, all of which showcase the skilled craftsmanship and aesthetic sensibilities of the Liao artisans. Innovations in structure and construction techniques during the Liao period, such as the use of side columns, raised eaves, and the column reduction method, had a lasting influence on later architectural developments.

Liao Dynasty buildings are a product of cultural exchange between multiple ethnic groups. They not only reflect the architectural characteristics of the Khitan people but also incorporate elements from Han culture and Buddhism, making them an important window into the study of ancient intercultural exchanges in China. Liao architecture had a profound impact on the architectural styles of subsequent dynasties, including the Jin, Yuan, Ming, and Qing dynasties, influencing both construction techniques and artistic trends.

In conclusion, Liao Dynasty architecture is not only a gem of ancient Chinese architectural art but also a valuable resource for studying the social history and culture of ancient China.

Notes:

① Side column: To enhance the stability of the structure, the upper sections of the outermost columns are slightly tilted inward, giving the building a subtle "narrower at the top" shape.

② Raised eave: The height of the columns gradually increases from the center toward the ends, creating a roofline that dips in the middle and rises at the ends, enhancing the aesthetic appeal of the roof's upward sweep.

③ Dougong: Also known as "corbel brackets," this unique structural element of Chinese Han architecture connects columns and beams with layers of interlocking wooden brackets that both distribute weight and provide structural support.

④ Pi Zhu Ang: A type of long, straight wooden component in the dougong structure that functions like a lever, supporting and balancing the weight at both ends. It is named "Pi Zhu Ang" due to its resemblance to the sharpened end of bamboo.

⑤ Tou Xin Zao: A method of reducing the number of horizontal brackets in the dougong structure to create a more streamlined appearance and optimize material usage.

⑥ Mortise and Tenon Joint: A traditional Chinese woodworking technique where protruding tenons fit into corresponding mortises, allowing for a secure, nail-free connection between structural components.

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