

Artistic Value of Architectural Heritage Protection -- Taking the Former Site of Lushun Industrial School as an Example

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Abstract: Lushun industrial school site is one of the few educational buildings, has unique artistic value, based on the perspective of cultural relics building heritage protection, and to lushun industrial school site as the research object, through field research and surveying and mapping, in turn, from the urban space form, architectural layout, architectural function, structural characteristics and other different levels to further explore lushun industrial school site ontology architectural features and decorative characteristics of artistic value, for lushun industrial school site building protection and use of reference.

1. Basic overview of the former site of Lushun Industrial School

Location and environment: The former site of Lushun Industrial School is located at 23 Xinhua Street, Guangrong Street, Lushunkou District, Dalian City, Liaoning Province, with Wanle Street on the east, Tai Guang Street on the west, Xinhua Street on the south, and Progress Street on the north. The surrounding environment of this cultural relic is quiet and beautiful, with low building density, high greening rate and low skyline, still retaining the urban style and landscape form of Lushun nearly a century ago, and this cultural relic is located in the core area of Lushun Sungou historical district, and the courtyard of the building is well preserved, surrounded by exquisite brick walls, with a small circular square on the south side of the building and a large number of old trees in the courtyard, with beautiful scenery. (Figure 1) At the same time the building forms an important urban axis together with the Lushun Museum, the Sino-Soviet Friendship Memorial Tower, the Museum of the Former Site of the Kwantung Army Command and other cultural relics [1]. (Figure 2)



Figure 1. Cultural relics located in the district environment aerial film

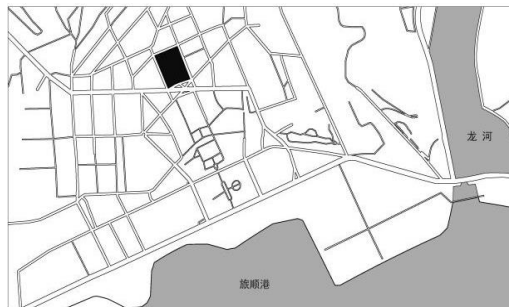


Figure 2. The cultural relics are located in the district schematic diagram

2. Building Layout and form of the Former Site of Lushun Industrial School

2.1. Layout of the Old Industrial School Site in Lushun

The general layout of the former site of the Industrial School reflects the modern Russian colonial urban planning idea of Lushun, emphasizing the colonial urban form and landscape aesthetic effect of the combination of radial road network and axis. By combining with the plot and topography, the general plan of the building is oriented toward the city center and the harbor as the main façade of the building, which together with the former site of the Kwantung Army Command and the Lushun Museum on the south side constitute an important urban axis. The layout of this heritage building presents the "mountain" form common to modern Russian schools in Lushun, and in addition, it is located on the central axis inside the compound, around which the old trees and other buildings are laid out [2]. The appearance of this layout form makes the heritage presents a solemn and grand and a strong sense of order. It is also one of the most important morphological landmarks and landscape architecture in the architectural complex of Lushun Sungou historical city. (Figure 3)

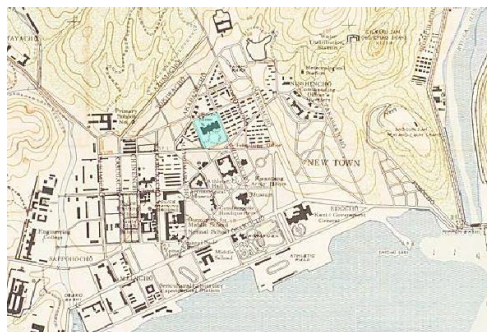


Figure 3. 1930s-1940s topographic map of the area where the cultural relics are located

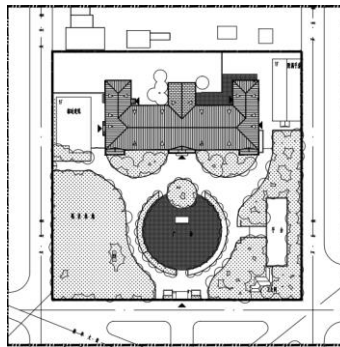


Figure 4. General plan of the former site of Lushun industrial school

2.2. Architectural Function of the Former Site of Lushun Industrial School

The former site of the Lushun Industrial School is an early example of a secondary vocational school for foreigners in modern China. The Russians wanted to use this site as a separation area between public and residential buildings, and to create a large square in front of the building as a civic gathering area for citizens to interact with each other. Although the former site of the Lushun Industrial School was a single-story building, the total area of its heritage buildings reached more than 1,600 square meters. (Fig. 4) Since 1945, when the Soviet Army turned it into a display hall for Soviet trophies, it has been opened as an exhibition hall, and has developed into a revolutionary military museum and a museum of old cars in Dalian [3]. The building plan is in the shape of a "mountain", entering from the main entrance (red triangle), and the interior space is mainly the exhibition hall space, which consists of a main foyer, 13 exhibition hall spaces, 3 resting spaces (former rental houses) and two washroom spaces on both sides. The building plan is north-south axis, the left and right spaces are symmetrical to each other, the building flow is clearly distributed, and the corridors are connected to each space area, thus also making the internal space of the building well arranged in size. Currently, it is used as the main venue for the activities of the Sungou Cultural Park.

2.3. Structural Characteristics of the Former site of Lushun Industrial School

First of all, the original structure system of the former site of Lushun Industrial School is masonry structure. The load-bearing foundations and footings of the former site of the Industrial School are made of masonry materials and stacked in the form of continuous strip foundations, which effectively prevented the rise of underground capillary water from causing damage to the walls. Secondly, the load-bearing wall of the relic is constructed by cement mortar and red brick material, and the wall surface is with angle, and the footing is built in the form of gray granite stone blocks with burin decoration on the surface, which has beautiful shape and high compressive strength, thus making the building more stable. Secondly, from the roof frame form, the relics are combined with wooden Howe roof frame, respectively, the upper chord, diagonal brace, diagonal rod and brick pillar and together erected on top of the load-bearing wall of the relics, clever use of brick pillar and roof frame combined technology, has a higher scientific value (Figure 5) In addition, the relics are educational architectural examples of cold insulation construction measures used in the Lushun area a century ago, using a unique The insulation layer of "triple clay - wooden roof" is a combination of structural measures. The roof wall of the building is constructed of red bricks, and the exterior wall is built of red clear water bricks, with decorative line footings, decorative patterns, columns, etc. The surface of the building is constructed in the form of precast concrete as a practice. The doors, windows, and internal wall openings of the heritage building are mostly constructed in

the form of brick arches, and the rectangular door and window opening transoms, sill plates, and window trim on the exterior walls of the building are composed of standardized prefabricated reinforced concrete elements. At the same time, the original doors and windows are made of solid wood and have a natural and beautiful shape. The interior of the building contains suspended ceilings, which are displayed in the form of double-pitched slatted plaster sheds. In addition, the interior walls of the building are made of brick walls and decorated with white plaster after applying saber plaster, and the overall structure of the building is a precious example of the exquisite brick construction techniques of the time.

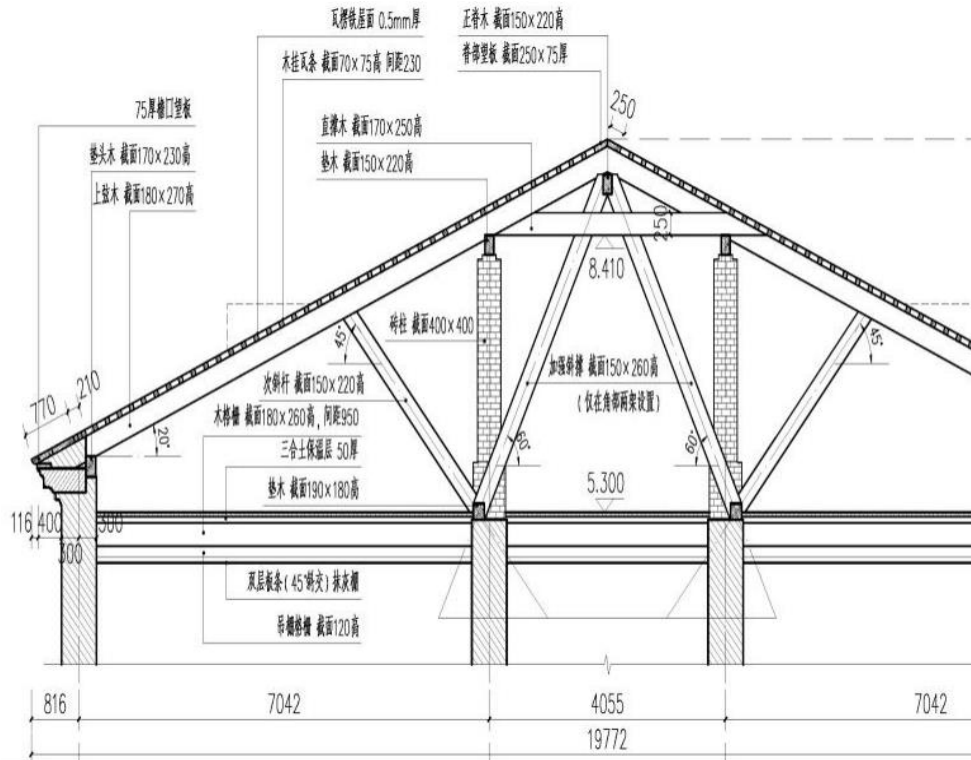


Figure 5. Detail of wooden roof frame at the former site of Lushun industrial school

3. Analysis of the Urban Space Pattern of the Former site of Lushun Industrial School

3.1. Road Network Pattern

According to Lynch, the road is the habitual, accidental or potential movement channel of the observer, and it is also the dominant element in the imagery. The streets around the former site of Lushun Industrial School are characterized by a square grid structure, and the road axes are in the form of cross lines. This road form is also created from the characteristics of the city of Lushun. In order to make the main axis of the city to control the development of the city, but also to better extend to both ends of the axis, so also produced the main axis of the city as the symmetrical axis of the cross-line form. The advantage of this road form is that it allows the city to expand in an orderly manner to a larger area, and at the same time this road intersection form can produce more urban open space. There are two groups of road crossings in the core city of Lushun, one of which is formed by Central Street and Lenin Street, and intersects at the central square, while the other group is formed by the intersection of Xinhua Street and Glorious Street near Lushun Industrial School, and runs in the east-west direction of the city, which provides the observer with better identifiability and directionality. (Figure 6)



Figure 6. Cross road analysis diagram

As the former site of the Industrial School is located in the core area of Lushun Sungou, its surrounding square road network is divided into two groups, and the two groups of road networks also intermingle. The first group of blue road network is composed of Stalin Road, Friendship Road, Bayi Street and Baisan Street, which are parallel to each other in the central axis. The other group of black road network is formed by the east-west Lenin Street, Xinhua Street, Central Street, and the north-south Jiefang Street, Ronghua Street, Xinqi Street, etc. together to form the road network structure of due south and north [4]. At the same time, the intersection of the two groups of road network produced a large number of pinched lots, each lot has the corresponding heritage buildings, these heritage buildings are also built to fill these pinched pure in, thus also can make the urban space structure of Lushun that is rich and practical.

3.2. Spatial Nodes and Boundaries

Lynch considers nodes as strategic points in the city that are accessible to the observer and are the focal points of concentration in people's journeys to and from the city; they are also the intersection or convergence points that connect rest stops and roads in traffic routes, and then the transition points from one structure to another [5]. If we compare the solar trench to a circular plane for coverage, the center of the circle is the central square, and the surrounding spatial nodes are radiating outward around the center; the structure intersects the center of the circle in a symmetrical axis, extending north-south, and radiating out from the nodes and the center of the circle in three pairs of rays. One pair of green rays intersects the node in the area where the old industrial school is located, and the two rays are the spatial transition formed by the intersection of Xinhua Street and Guangrong Street Road, and can coincide with the central axis of the city, which has a unique and unusual position and can guide visual attention and human activities. Since the former site of Lushun Industrial School is located in the core area of Sungou New Town, this cultural relic also forms a landscape node on the main axis of this urban space together with the museum of the former site of the Kwantung Army Command, the Sino-Soviet Friendship Memorial Tower and the Lushun Museum, so it has excellent visual effects. Lynch also mentioned in "Urban Imagery" that "once the space has a shape, the effect of the space becomes strong and the features are unforgettable If one or two of the objects become the focus of the eye, the node becomes more compelling".

The former site of the Industrial School is not only more prominent in terms of spatial nodes, but its boundaries are also more unique. The location of this enclosed form, the boundary is the heritage compound wall, the old industrial school site of the southeast and northwest are enclosed by the wall masonry, the wall presents a lantern cross flower decoration, the wall is from the main gate on

the east and west sides of the enclosed masonry, east extended Wanle Street, west extended Taiguang Street to extend the maintenance of the compound. A large number of ancient trees and greenery are preserved in the courtyard, thus forming a natural green barrier to shield and maintain the heritage [6].

3.3. Iconic Architecture

As external reference points for the observer, landmarks are simple material elements that vary in scale. Often, landmarks are instructive in the process of understanding or recognizing streets, areas and cities. The former site of Lushun Industrial School is a typical modern building, although the skyline is low, its building is within the core area of Sungou bottle type, and also one of the landmarks on the spatial axis of the city. Because of the overall structure of Sungou New Town extending axially from north to south and symmetrically developing from east to west, the structural axis takes the main spatial sequence as the symmetrical axis and radiates outwardly with the landmarks in the space for extension. The former site of Lushun Industrial School, Lushun Museum, the former site of Kwantung Army Command Museum, Sino-Soviet Friendship Tower and the former site of Sino-Russian Dosheng Bank form the group of landmarks in this core area. The landmarks in the area are mainly military-administrative, while the former site of the Industrial School is one of the few educational landmarks appearing on the axis of the area, which was built for the subsequent training of military-administrative professionals, thus giving the existence of this landmark an independent meaning [7].

4. Performance of the Artistic Characteristics of the Former site of Lushun Industrial School

4.1. The Architectural Style of the Former Site of Lushun Industrial School

(1) Russian architectural style

The former site of Lushun Industrial School is one of the few remaining modern Russian-style buildings in Lushun area, which retains the original artistic style features. First of all, two simplified Tuscan-style columns are located at the two ends of its entrance porch to decorate the main entrance, and the columns are composed of three parts: crown, body and base, and the base is carved with the five-pointed star symbol of the Russian socialist period. The proportions of each part of the column are 1:3:4:1.4, and the body of the column shows a neat and smooth feature, with a clear division, which also clearly defines the entrance space of the building, and adds a sense of calmness and heaviness to the building together with the stone [8]. Secondly, the roof of the building is in the form of two-sided sloping tin tile roof, and the upper side is inlaid with exquisite semicircular tiger windows, and blends perfectly with the entire roof of the building, and these components present a more prominent Russian style of the building itself. (Figure 7)



Figure 7. Entrance Tasmanian giant column

(2) Classical architectural composition form

Although the height of the old Lushun Industrial School has a one-story volume, the overall shape and decoration is simple, the semicircular windows are neatly arranged, and the scale of the ratio is pleasant. The overall pattern of the building is axisymmetric form, and is composed of classical two-wing symmetrical three-section red brick stacking. This balanced composition and the horizontal outline of the building body produce a dignified and elegant effect different from the Baroque style. The composition of this artifact is similar to the original Chinese horizontal three-stage traditional architectural composition of wall, pedestal, and roof. In addition, the interior of the foyer and some of the rooms have pilasters, such as the four pilasters in the main hall, two of which are embedded in the wall and serve to support and decorate the space, and are interconnected with the semicircular arches in the hall to beautify the space.

(3) Harmonization of architectural colors

In terms of architectural color, Lushun Industrial School conforms to the basic color composition principle of the city as a whole, ensuring its own coordination and matching of "dominant color", "regulating color" and "key color". The relationship between "dominant color", "adjusting color" and "accent color" in its own coordination [9]. As most of the buildings in Lushun area are dominated by warm colors, most of the building colors are dominated by warm colors such as light pink, orange, light gray, etc., which constitute a relatively rich "adjusting color". The building of Lushun Industrial School is decorated with red as the main color and white as a supplement. Because the external structure of the building is made of red bricks and cement mortar masonry, the color sense is softer and simpler, so that the architectural style shows a classical state, so that people visually achieve a sense of harmony and unity.

First of all, the main door and other entrance doors are decorated with brown paint, and the door panels are decorated with carved patterns, and the combination of brown oil and carving adds a sense of cultural heritage to the building. Secondly, the color of the windows of the building is richer, and there are two colors of the windows of the building, one of which is decorated with green paint on behalf of the eastern exterior windows, and the other part is decorated with light blue paint on the northern exterior windows, and due to the serious aging of the paint decoration of the windows, the windows show a dull color, without the bright and shiny color of the past, but it does not affect the overall appearance of the building at all. In addition, the building facade in the eaves crown, girdle, Gable and coupon face and other parts are decorated with external white paint, but also for the entire building facade adds a bright and dignified feeling. In the internal color and details of the heritage, the heritage building internal door frame, door and window coupons and other parts are red paint for decoration, while the building's internal wainscoting is also red paint for decoration, the internal walls are decorated with yellow paint, presenting a soft visual impact to people, these color matching can show the building body color, at the same time, also enhance the building's indoor and outdoor space. The color combination not only shows the color of the building itself, but also enhances the identifiability and integrity of the indoor and outdoor spaces of the building.

4.2. Building Façade Decoration and Detailing Characteristics and Patterns of the Former Site of Lushun Industrial School

(1) Building façade decoration

First of all, from the window decoration of the old industrial school site, the window form of the old industrial school site façade presents the Russian traditional residential style semi-circular front window, this window is referred to according to the rectangular window body, and in the width of the rectangle as the center of the circle, to draw the semi-circle, the basic scale of the heritage

window body is about two circles, the window form and structure is completely unified, the ratio of height to width is 3:2 golden ratio, and the window body The upper part of the window has an arched stone component corresponding to the cave entrance with a semicircular brick voucher. The brick coupons (diameter is about 1350mm) and the few window openings are oval brick coupons (the long axis is about 1775-2140mm). The repeated combination of semi-circular brick coupons and round windows serves to increase the rhythmic beauty and hierarchy of the building façade.

Second, according to the complexity of the gable combinations, they can be divided into even two categories: simple and complex, with only one type of simple gable being the Tuscan gable and the rest being the complex type, while the gable of the old industrial school is the Ionian gable of the complex type. This type of gable is characterized by a dentil shape (gale) between the girdle and the frontal square, and the combination of this dentil shape and the line foot can enrich the proportion of the upper part of the building and outline the contour line of the building facade, making the overall artistic image of the building fuller.

Finally, from the perspective of the daughter wall, the daughter wall of the old industrial school is a parapet located at the top of the building and has the role of the skyline of the building, so its decoration is the part of the building that is most likely to attract people's attention, and the daughter wall of the old industrial school is basically detached from the use function and becomes a purely decorative element on the building. The strong sense of order forms a perfect integration with the upper part of the whole building, and its position is moderate and has a good ornamental status, which is also one of the key points of the façade decoration of the building. (Figure 8)



Figure 8. Building front daughter wall

(2) Detailed features

The detailing is also one of the easiest parts of the architectural decoration to highlight the style of the building. From the viewpoint of the exterior space, the detailing of the Lushun Industrial School is neither hedonistic Baroque style nor pretentious Victorian style, but Rococo style with S-shaped and swirling arcs. The specific expression is in the main entrance of the exterior windows under the wall with obvious decorative symbols in the form of swirling arcs. The use of this style makes the details of the building break through the original simple and elegant, adding an elegant and gorgeous decorative features. In addition, although the Industrial School does not have a tent roof like the Lushun Railway Station, each facade of the building, especially the part of the building's hill wall near the eaves, is decorated with circular symbols. The circular symbols on the façade of the building use the principle of addition to highlight the decoration, which can form a good coordination relationship with other elements on the façade of the building, highlighting the priority and softening the overall decorative effect at the same time. From the viewpoint of the internal space of the building, the door of the central hall inside the industrial school is displayed in the form of a wooden four-panel hair coupon with a decorative door head with mountain flowers, and this façade decoration is integrated with the overall spatial tone of the hall and is rich in magnificent and elegant effects. At the same time, the interior walls are decorated with air vents, which are made into high-grade ironwork. This iron decoration is characterized by a symmetrical

composition with flowers and four leaves drawn on it, which is more similar to the flower pattern on the interior doors, and its exquisite shape has a strong decorative effect and increases the decorative nature of the detailed features of the artifact.



Figure 9. Figure of the group of bats and the entwined branch pattern

(3) Detailed patterns

The artistic value of the former site of the Industrial School is not only expressed in its façade decoration, but also in the richness of the pattern decoration of the building itself. The details of this heritage building are clearly decorated with traditional Chinese motifs, respectively with plant motifs and animal motifs. From the perspective of the building facade, the details on the door of the building are carved in the form of wood carvings, and the details are presented with the traditional Chinese motif of the group of bats, which depicts the phenomenon of six bats circling and flying around an object. As the word "bat" is the same as the word "fu", it means the ideal of good fortune and blessing for all people [10]. At the same time, the edges of the gate are surrounded by a circle of twining patterns, which are closely shaped and integrated with animal patterns, not only giving people a sense of vigor but also expressing the good fortune. (Fig. 9) Secondly, from the interior of the building, the interior plant patterns are divided into two patterns, the first pattern is the interior red lacquer door bucket and ceiling is decorated with scrolling grass pattern, the leaf veins rotate and roll, and the door bucket is closely connected, rich in dynamic state. The other is on the interior wooden wainscoting and some of the interior wooden doors, which are decorated with a circular floral pattern, and the overall structure is full and gorgeous. These architectural patterns are a perfect fusion of Chinese and Western construction culture, not only with the artistic characteristics of European architecture, but also present the traditional Chinese pattern art image, with high artistic value.

5. Conclusion

The artistic features of the former site of Lushun Industrial School are unique among the educational buildings in the entire Lushun area. With the traditional Russian architectural style, classical three-stage architectural composition and layout, harmonious and unified color relationship and unique decorative patterns, the presentation of these artistic features not only adds artistic interest to the ornamental function of the building, but also satisfies its practical function in the core area of Lushun. It not only realizes the symbiosis with other buildings in the core area of Lushun, but also reflects the presentation of the artistic characteristics of the building itself, which has high artistic value.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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