

# *Research on the Modelling Language and Formal Language in Harbin Russian-style Architectural Art*

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**Abstract:** Harbin's Russian-style architecture has experienced hundreds of years of wind and rain, not only showing the context of the historical development of the city of Harbin, but also a microcosm of the historical development of Harbin's unique Russian-style architecture. The formation and development of its architectural art is constantly integrating China. It is gradually formed in the process of elements and has a unique charm. Architectural art belongs to expressive art, which needs to be completed with the help of artistic language such as modeling language and formal language. Therefore, in view of the existing situation of Russian-style architecture in Harbin, this paper analyzes and researches the formal language such as the effect of modeling language and modeling relationship such as point, line, surface, shape, color, light and shadow, material and decoration, etc. in the building, to show Harbin The composition of the Russian architectural image and the aesthetics contained in the expression of artistic modeling.

## 1. Introduction

Harbin's Russian-style architecture is a microcosm of Harbin's century-old urban history. Combined with European-style architecture with Chinese characteristics, it shows the culture of Harbin city. Architectural art belongs to expressive art, which needs to be completed with the help of a certain artistic language <sup>[1]</sup>. Through the modeling language of point, line, surface, shape, color, light and shadow, material and decoration, the architectural image is formed; through the formal language such as the basic effect caused by the special relationship in form, the beauty in the building is used to express the aesthetics in artistic modeling. The analysis and research on the modeling language and formal language in the Russian-style architectural art in Harbin, to explore the cultural and artistic research value contained in it, is conducive to the protection of Russian-style architecture, and has certain economic value and social significance.

## 2. Modeling Language

Architectural art belongs to expressive art, which constitutes works of art through certain norms and symbols. Therefore, it also needs to be completed with the help of a certain artistic language. Through the modeling language of point, line, surface, shape, color, light and shadow, material and decoration, it forms the architectural image and forms the unique modeling beauty of architectural art <sup>[2]</sup>. This modeling language is an international language with no nationality, no vocabulary, pronunciation and grammar restrictions, and the images it expresses can be accepted and interpreted

by anyone. The expression of the modeling language in the exterior of the building makes the building permeate with a strong perceptual vitality.

## 2.1. Points

Minimal styling elements. Can be used as embellishment and decoration. Due to the particularity of human vision, the point is relative, and the local body can be directly regarded as the mentality of the point, which is helpful to grasp the overall image. Therefore, it is the finishing touch in the appearance of the building, forming a contrast in the whole building, creating a sense of jump, breaking the facade dominated by lines and surfaces, and playing the role of activating the atmosphere<sup>[3]</sup>; such as windows, doors, balconies Decorative embellishments, etc. can become points of visual perception. The entrance facade of the Madiel Hotel on Central Street in Harbin (as shown in Figure 1), the green dome and the small dotted windows form an embellishment throughout the building, giving the building facade a sense of contrast and flexibility.



Figure 1: Harbin Central Street Madiel Hotel

## 2.2. Lines

Lines have strong modeling expressiveness and are the most abundant and psychological modeling elements. They are divided into straight lines and curves. Different lines have different visual senses and psychological effects. Even if the same lines are combined in different ways, they will show different visual effects. The column style that best reflects the characteristics of the line breaks the traditional load-bearing function of the column style, but appears in the facade of the Russian-style building as a decoration, which enhances the overall slenderness of the building. The style and connotation of the building can be interpreted from the modeling language of the central line of the building exterior. Neoclassical style building - part of the teaching building of the School of Architecture, Harbin Institute of Technology (as shown in Figure 2), the buttress columns on the facade stretch the architectural features.



Figure 2: Part of the teaching building of the School of Architecture, Harbin Institute of Technology

### 2.3. Faces

A surface can be a collection of points, an arrangement of lines, and a decent turning point. Only through the expression of surface elements can architecture be intuitively displayed in front of people. The various facades of the building exterior can best reflect the surface elements, which are divided into pillars, moldings, concave corridors, doors and windows, forming many concave and convex blocks of different shapes and proportions. Each small block uses different materials, different colors, and presents different textures. The concavities and convexities form shadows, showing the beauty of the pattern and the organic organization, and obtaining a certain style <sup>[4]</sup>.

### 2.4. Body

If the point, line and surface represent the details of each facade of the building, then the body is the overall visual effect of the overall shape of the building and the architectural detail elements composed of points, lines and surfaces. As far as the building is concerned, it is the size and composition of the body. Whether the appearance and decoration are moderate in size and reasonable in matching, this is also an important symbol of the formation of style.

## 3. Formal Languages

Beauty in architecture is the basic effect caused by special relations in form, such as height, size, width and color <sup>[5]</sup>. It resides in the form itself or its intuition, an emotion directly caused by the form, and is limited to the aesthetic field in artistic modeling. Mainly by means of the laws of contrast and harmony, symmetry and balance, change and unity, rhythm and rhythm, proportion and scale, etc., to deal with the architectural volume, the harmony of modeling, the contrast and unity of decoration, the proportional relationship between doors and windows, etc. in the appearance of the building. Show the beauty of architectural art.

### 3.1. Change and Unification

Change is the juxtaposition and combination of different visual elements to form different effects. Unity reflects the commonality and overall connection of various things. Unified to form a harmonious shape and composition <sup>[6]</sup>. If there is no change, there will be no innovation and development, and without unity, there will be chaos and no perfection. Unity can create harmony and beauty; change can break monotony and dullness, and the combination of the two can make architectural expression reasonable and vivid. Heilongjiang Provincial Institute of Culture and History (the former site of Huayu Daosheng Bank) is a brick-concrete building (as shown in Figure 3). From the exterior of the building, we can see that the building is neat and orderly. The same window and roof corner shape make each the shape of the façade is harmonious and unified. What changes is the wall brick decoration. The protruding wall brick decoration produces a concave and convex feeling, which enhances the three-dimensional effect of the wall.



Figure 3: Heilongjiang Provincial Institute of Literature and History



Figure 4: Russian-style Chinese baroque architecture



(a)

(b)

(c)

Figure 5: Central Street Russian Architecture

### 3.2. Repetition and Rhythm

The simplest form of repetition is to simply copy an element and arrange it together in a certain way. In architecture, we can use the repetition or similarity of a decorative motif to enhance the unity of the whole. Repetition creates a sense of rhythm. The way of rhythm in architecture is to use the same and similar architectural functions or decorative components to be arranged and displayed according to certain rules, so that the building can be unified and coordinated on the facade, so as to achieve the effect of decorating and beautifying the building. Architectural semiotics analyzed that "the reason why reading architectural works is different from general structures is that architecture has a lot of repeated information that repeatedly acts on people's senses and transmits it to those who come into contact with it" [7]. In the architectural design, the repetition rhythm is particularly important. In addition to the repetition of a single shape, there are also gradual repetitions and approximate repetitions. In the appearance of Russian-style buildings in Harbin, it is mainly reflected in the repetition of shapes, such as: doors, windows, columns, walls, decorative patterns, etc. repetition of dimensions, such as the size and span between walls and columns. In Russian-style

Chinese Baroque architecture (as shown in Figure 4), the horizontal and vertical rhythms come from the repetition of windows, carvings and parapets; the horizontal is the repetition of repeated shapes and sizes, and the vertical forms a clever gradient rhythm. —The large-scale gradient makes the building neat and beautiful, with a sense of rhythm.

### 3.3. Contrast and Harmony

Contrast is to emphasize the difference of things, show the respective characteristics of the size, direction, space, location, etc. of the modeling elements, and enhance the visual stimulation. Harmony is the harmony between the elements and the harmony with each other. Contrast and harmony complement each other, too much contrast will be too strong [8]; and too much harmony will be mediocre and monotonous. In architectural design, we should pay attention to the appropriateness of contrast and harmony, handle the balance between the part and the whole, and focus on being bright but not stimulating, harmonious but not plain. The contrast and harmony embodied in the Russian architecture in Harbin are mainly manifested in the contrast and harmony of straightness and curve, square and circle, color and texture, solid and virtual. Most of the main bodies of Russian-style religious buildings are earth-red brick facades, the domes are green with grid-like textures, and the red walls and green roofs are in strong contrast. Central Street Russian-style building, a building has arched windows and rectangular windows in contrast, straight lines and curves in contrast, and virtual windows and solid windows in contrast. The echoes are reconciled so that the building does not look cluttered and enhances the visual aesthetics, as shown in Figure 5(a).

### 3.4. Symmetry and Equilibrium

Symmetry means keeping the same volume and shape on both sides of the central axis, with an obvious axis, and completely symmetrical on the left and right sides of the axis. Symmetry can maintain quietness and stability, solemnity and majesty. Equilibrium is the balance of the center of gravity, the same amount of different shapes. Balance can find an active point, that is, it maintains quietness and stability, and there are changes and activities, so as to obtain a good sense of beauty. The plan of the Harbin Russian-style church building is basically centralized, and the building facade takes the entrance as the central axis of the building, showing a symmetrical or balanced sense of form. The layout of Russian-style public buildings is very unique. Many buildings are located at the corners of the street, and the two sides are L-shaped facing the street. This layout allows people to see multiple sides of the building. The overall facade of the building is mostly symmetrical. The Russian-style buildings on Central Street have a symmetrical layout at the corners, and the building facade adopts a three-segment type.

### 3.5. Specific

The peculiarity is the breakthrough of the general law, intentionally violating the order, attracting attention by breaking the law, forming a sharp contrast and increasing the interest <sup>[9]</sup>. Psychological research has confirmed that people's vision pays more attention to some irregular and novel shapes to mobilize people's memory. In architectural design, the special performance is that the local composition highlights the visual center, especially the architectural opening design. In the Russian-style buildings in Harbin, because most of the buildings have a corner shape, and the corners are all entrances, in order to highlight the entrance, a specific iso-diagram is used. Domes or raised parapets are set at the top of the corners, and the exterior wall at the entrance is Morphological processing is also different from the other two sides, and it is easy to form the visual

center. The Russian-style building on the Central Street uses a peculiar form to highlight the entrance, and at the same time makes the building more vivid and no longer bland, as shown in Figure 5(c).

## 4. Materials and Colors

### 4.1. Materials

#### 4.1.1. Traditional Wood Structure Materials

In Russian residential buildings and church buildings, the main building materials are basically wood, which are carved with traditional tools and axes <sup>[10]</sup>. Although the architectural style has similarities with traditional Chinese architecture, as far as the "wood-cut corrugated" architecture in Harbin is concerned, its structure, color, pattern, decorative style and other aspects can be seen with obvious typical characteristics of Russian architecture, which belongs to traditional Russian architecture. The main body of the wood-cut corrugated house is covered with solid wood, the thick round logs are stacked to form a load-bearing wall, the corners are made of round logs and tenoned with each other <sup>[11]</sup>, and the walls are nailed with long boards of different widths, some of which are also carried out outside the wooden walls. Plastering and brushing treatment, the roof is wood, mostly two-sided or four-sided slope. The most typical ones are St. Nicholas Church and Songhua Riverside Restaurant. The St. Nicholas Church (as shown in Figure 6) was reconstructed in Harbin Volga Manor according to its original appearance, showing the appearance of a typical Russian-style wooden structure at that time. The well-proportioned contours of the wooden chapel hat and tent top are in perfect harmony with the northern natural environment, as if they had grown with the centuries-old stout trees in the boreal forest <sup>[12]</sup>.



Figure 6: Central Street Russian Architecture



(a)



(b)



(c)

Figure 7: Buildings dominated by bricks



Figure 8: Building with masonry

#### 4.1.2. Brick-concrete Buildings

One is a brick-based building. Most of the railway workers' residences and churches built in the early stage of the construction of the Middle East Railway used bricks as the main building materials, with clear red bricks without whitewashing. Unique floral decoration. Brick-based church buildings, the wall brick decoration of Harbin Saint Sophia Church, Nangang Shike Street Catholic Church, and Dongdazhi Street Orthodox Church of Our Lady of the Guardian are also made of clear water red bricks. The tent top or Byzantine dome is decorated with various moldings, pointed coupons, round coupons, petal coupons and exquisite brick decorations on the facade of the church <sup>[13]</sup>. In addition, there are residential buildings called "yellow houses" in Huayuan Street and Company Street. As shown in Figures 7(a) and 7(b), the building facades and gables are decorated with materials themselves, and exquisite geometric shapes are designed. Brick decoration not only plays a decorative role but also integrates with the building. It is obviously different from Chinese-style houses, forming a unique Russian-style residential house in Harbin. Its form basically inherits the traditional Russian-style national architectural style. Another category is masonry. The building uses a combination of bricks and stones, such as the European-style buildings on Central Street, as shown in Figure 8.

### 4.2. Color

#### 4.2.1 Color of Wood Frame Buildings

The Russian architectural color of the wooden frame can be seen from two aspects. One is public buildings such as churches, restaurants, etc. These buildings draw on the architectural colors of Moscow's Red Square. Most of them have strong colors and rich decorations. The main wooden buildings are painted with original color paint. The wooden plastered facades are mostly orange or yellow, and the iron roofs are mostly painted in brown or green. The whole building presents a warm tone, which is suitable for the northern climate and endows the senses with vitality and life. The wooden openwork enclosures on the top of the fence around the eaves are in contrast to the warm colors, and are mostly painted in cool colors such as green, blue, and purple, which make the building form a greater visual contrast and reflect its decorative interest. Part of the wood carving patterns not only become the key decorative parts of the building, but also have practical value, taking into account the function of guiding the icicles on the eaves <sup>[14]</sup>. The riverside restaurant by the Songhua River, as shown in Figure 9, is not so gorgeous in color. The overall color is light yellow, simple and elegant, soft and friendly, and it is very integrated with the surrounding grass and forest. Harbin Jiangbei Russian-style town villa building, as shown in Figure 10, the contrast of cold and warm colors in the "wood-cut ridge" building, the contrast between the rough building body and the delicate carvings, the contrast between the rough wooden walls and the fine decoration, forming a wood-cut ridge The unique charm of the building.



Figure 9: Riverside Restaurant

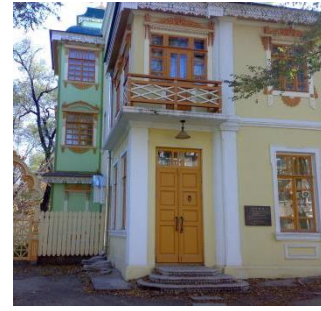


Figure 10: Russian style town villa architecture

#### 4.2.2. Brick-concrete Building Color

Most of the church buildings in the brick-concrete buildings inherit the red-brown color of the red bricks in the Russian buildings. They are strengthened by natural colors, emphasizing the true color of the building facade decoration materials, and then matched with gray and dark green roofs, and golden decorations to highlight their natural attributes. The most direct and simplest processing method often achieves good decorative effect. The natural texture of the exterior of the building is solemn and serious; the warm tones bring warmth to people in the cold climate environment of the north. Residential and other public buildings are basically based on light beige and gray-white, with pink green, orange, and light gray to form rich auxiliary colors. The colors are concise, calm and elegant, setting off the humanistic and elegant atmosphere of the space.

#### 5. Conclusion

Architectural art is the concentrated expression of the characteristics of urban architecture, and it is also the symbolic artistic expression of urban architecture, which records the development history of the city. Harbin Russian-style architecture is a European-style architecture with unique charm, and it should be paid attention to the high historical value, cultural value and economic value contained in it. Therefore, through the analysis and research of the modeling language and formal language in architectural art, the unique architectural image and unique modeling beauty of Harbin Russian-style architecture are discovered, showing the organic combination of architectural art and urban symbols, and the culture contained in it. And art research provides a certain reference value.

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