Study on the Guideline of Urban Landscape Color Planning in Zhengzhou City

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Abstract

This paper took the color as the starting point and drew on the latest theory and design practice of the urban landscape color research at home and aboard, to analyze the landscape color form and pattern of Zhengzhou city. From the natural environment and human environment perspectives, we developed a set of guidelines for urban landscape color planning which can be used in Zhengzhou and promoted to other cities. Furthermore, new thoughts were put forward for the development, inheritance and renewal of future urban landscape colors.

Keywords: Landscape Color, Guidance, Planning System, Zhengzhou City.

1. INTRODUCTION

In recent years, with the acceleration in China's urbanization construction speed, many urban buildings and public facilities have sprung up. However, due to the lack of overall color planning awareness for structures and landscapes in urban construction, most Chinese cities have not formulated a uniform landscape color planning guideline and the corresponding monitoring and management method in the urban planning and development course, disordering the color application to architectures and landscapes. As a result, urban landscapes are visually polluted, which is negative to the establishment and promotion of the overall city image. As one of the country's eight ancient capitals, Zhengzhou City is no exception. With the climax of urban construction based on the economic take-off after the reform and opening-up, the exquisite color pattern of old Zhengzhou buildings has rapidly collapsed like broken tiles scattering over the urban construction site. The old house painting work in the name of city beautiful movement, however, misses the original aesthetic beauty of external walls because of uncontrolled color selection. The stereotyped, faceless urban color almost repeats the blunder of recoloring disorder in Tokyo, Japan in the 1960s. Obviously, the urban landscape color in Zhengzhou is facing a contemporary challenge brought by economic development and modern construction technology advancement.

Therefore, our research team applied for the 2013 Henan Province soft science research project "Urban Regional Characteristics and Zhengzhou City Landscape Color Design Research in Creating Overall City Image". Supported by the research fund, we were enabled a scientific and statistic survey on Zhengzhou landscape color. Through data analysis and summarization, we developed a landscape color planning pattern that fits for this famous historical city. In the following part, we will demonstrate part of our research outcomes (due to the limited space of the periodical layout, we will only expatriate on the masterplan).

2. THE GENERAL STATEMENT OF THE PLANNING GUIDELINES

2.1 Planning objectives

The landscape color planning guideline in Zhengzhou City should be formulated in compliance with Zhengzhou city master plans, targeted at establishing good urban landscapes and improving the overall city image. Founded on the original landscape characteristics, the guideline includes the optimal color application range that shows the charm of street scenery and the lowest limit of color range required by the urban construction, so as to ensure the flexible use of this guideline in instructing structural design and urban construction. The urban color planning guideline is related to the urban impression and regional characteristic expression, whose application can better showcase the urban landscape color at the regional level and lay the foundation for the brand building and improvement of overall city image.
2.2 Application method

The urban landscape color planning guideline applies to urban construction, urban updating and other situations. The guideline composition and process in the Figure below provides a set of references and effective approaches to landscape color selection in urban construction.

![Figure 1. The application method of the Zhengzhou city landscape color guideline](image)

2.3 Color system representation method

To represent landscape colors more accurately and objectively, the “Munsell color system” is adopted in formulating Zhengzhou landscape color principles. It has been general in the international community to specify color and make color cards based on three Munsell color dimensions: hue, value and chroma. The National Technical Committee 120 on Color of Standardization Administration of China also prepared the Color Standard Album of China. In this paper, the Minolta spectrophotometer and color brightness meter are used to test the two color system samples, the final experimental results showing that when the HV/C value is unchanged, the two color samples are basically the same. Therefore, the internationally accepted Munsell color system is used to represent color in this paper.

The following introduction to color representation based on the Munsell color system is from Baidu Baike.

2.3.1 Hue

Hue differentiates colors. Each horizontal circle Munsell divided into five principal hues: Red, Yellow, Green, Blue, and Purple, along with 5 intermediate hues (YR, YG, GB, BP and PR) halfway between adjacent principal hues. Each of these 10 steps, with the named hue given number 5, is then broken into 10 sub-steps, so that 100 hues are given integer values. These hues almost reach the human eye’s limit in distinguishing hues. Let R be red, YR be yellow-red, Y be yellow, etc. Each principal hue and intermediate hue are divided decile, so that further definitions can be specified according to the hue steps.
2.3.2 Brightness

Brightness, or value, distinguishes bright and dark colors. When the color is grayscale, the brightness is on the neutral axis, from black (0) to white (10) in order.

2.3.3 Chroma

Chroma represents the “purity” of a color (related to saturation). The neutral color is 0; the farther a color is away from the central axis, the greater the saturation value is. The system usually produces a color sample at intervals of every two chroma levels. Each color has different maximum chromas, some of which can reach 20.

2.3.4 Specifying a color

Any color can be specified by listing the three numbers for hue H, value V, and chroma C in that order and be assigned a number.

HV/C = hue value/saturation. For example, a color will be numbered 10Y8 / 12 with 10Y meaning the color hue between yellow and green-yellow, 8/ a lightness of 8, and a chroma of 12. The number also shows that the color...
is relatively bright, with a high degree of saturation. 3YR6/5 means that: hue between red (R) and yellow-red (YR), nearer to yellow-red, a brightness of 6, and a chroma of 5. N represents black and white series (neutral color), followed by value V and with no more chroma. NV/= neutral color value /. For example, the number N5 / means: gray at the value of 5.

In addition, for a neutral color with a chroma of less than 0.3, the following formula can be used for precise specification: NV / (H, C) = neutral color value / (hue, chroma). For instance, the color N8 / (Y, 0.2) is yellowish light gray at a brightness of 8.

3. THE ENVIRONMENTAL COLOR CHROMATOGRAM OF ZHENGZHOU CITY

3.1 Overview of Zhengzhou natural environment color status quo

The intrinsic natural environment color of a city is reflected in the main building, street, vegetation and other material entities. In the former macro, meso and micro survey and sampling analysis of urban color, we summarized and compiled the environmental color chromatogram of Zhengzhou City, as shown in Figure 5. This figure is a comprehensive manifestation of Zhengzhou natural environment color, basically reflecting the overall color perception and feature of Zhengzhou City.

As can be seen from the environmental color chromatogram, the major natural environment color of Zhengzhou is warm gray and yellowish brown. In developing modern Zhengzhou, despite the presence of red system, yellow-red system and blue system with high chroma, they are basically integrated with the warm gray and yellowish brown in old buildings, plus with a small proportion.

In addition, for the presence of abusive or unplanned colors, we can formulate plans to restrict their use and take them as the basis for developing color planning guidelines in the next stage.

3.2 overview of Zhengzhou human environment color status quo

Zhengzhou City has a long history. 3,600 years ago, Zhengzhou was one of the important cities in the Shang dynasty. It is one of China's eight ancient capitals, a Chinese historical and cultural city, the world historical city alliance member city, the main birthplace of Chinese civilization and the Chinese nation, and the center of central plain history and culture. Zhengzhou has been a traffic fortress since the ancient times. As early as 4,200 years ago, Zhengzhou was the capital of the Xia Dynasty and the Shang Dynasty. For six times, it was a capital during the five dynasties of Xia, Shang, Guan, Zheng, and Han (called as Dengfeng, Xin Mi, Zhengzhou, Xinzheng), and a prefecture during the eight dynasties of Sui, Tang, Five Dynasties, Song, Jin, Yuan, Ming, and Qing.

Therefore, the four thousand years of human heritage endows the city with unique human environment color system.
3.2.1 Broad-yellow

"As one of the birthplaces of the Chinese civilization, Zhengzhou breeds the Chinese nation and its glorious culture. It is the cradle of the Yellow River civilization, exerting far-reaching impacts on the formation of Yellow River culture, Huangdi culture, Songshan culture, Shaolin culture, Shangdu culture, Heluo culture, surname culture, Hakka culture, etc." The profound humanity and history in Zhengzhou forever interprets the Chinese nation’s attachment to yellow—— a color of our earth, the Yellow river and our skin. Therefore, whether the yellowish wall of the ancient city remains or the brick wall of old architectures in the College Road is a deep imprint of yellow.

Second, as the provincial capital of the major agricultural province, Zhengzhou city witnesses a joy of golden harvest in the high-yielding season. The Central Plain people’s love for earth and agriculture contributes to the proportion of yellow in the human environment colors in Zhengzhou city.

![Figure 6. The vast yellow land in Zhengzhou human environment colors](image)

3.2.2 Openness, innovation-gray

"Openness" is the distinctive personality and brand of the city of Zhengzhou. Zhengzhou City was once known as the "city pulled by train". Geographically located in central China, Zhengzhou is the joint of people flow, logistics, and information flow in all directions in China. Today, Zhengzhou population mobility has been among the highest in China. Floating population exceeds half of the total population in Zhengzhou. Every day, several hundreds of thousands of floating populations transfer at Zhengzhou. As a result, Zhengzhou people is humble, magnanimous, good-hearted, open-minded, readily receptive to fresh things, and inclusive to different cultures and customs. The “openness” style provides more opportunities for the all-aspect development of Zhengzhou city. We are also impressed by the low-key and introverted tendencies of Zhengzhou people reflected in the environmental colors —— the warm grey which is generous and not impetuous is everywhere in Zhengzhou.

![Figure 7. The inclusive “grey” in Zhengzhou human environment colors](image)

Meanwhile, “innovation” is the summary of the past and present spirits of Zhengzhou City as well as the reflection of future development trends. In the early 1900s, a whistle sounded the Chinese modern workers’ movement. Workers are brave and fearless in front of the Northern Warlords’ bayonet. They struggled hard for their rights and freedom without the scare of bloodshed and sacrifice, and gained the final triumph. After the reform and opening-up, Zhengzhou people caught again the opportunity of commercial development, creating new service and operational ideas in the field of business and retail industry. In the 20th era, Zhengzhou people opened new paths in the fields of manufacturing, car industry, food processing, garment making, and industrial raw materials. Zhengzhou is now focused on the creation of a national civilized city, the strengthening of itself by culture, and the leapfrog development if its economy and society. All of them need a pioneering spirit and
innovative mind, and environmental color reflects them.

![Figure 8. The innovative grey in Zhengzhou human environment colors](image)

3.2.3 Harmony-Green

“Zhengzhou is the birthplace of the Yellow Emperor culture. In the Yellow Emperor era, tribal integration is a major feature, which is consistent with the cultural point of harmony.” At the same time, the spirit of tolerance also shows the harmony between the rapidly developing economy and the preservation of human culture. As the leading force of the Central Plain economic zone, Zhengzhou city has continuously achieved breakthroughs of development in recent decades. The modern aviation economy and green industry has covered the city with green “martial attires”.

![Figure 9. The plain green in Zhengzhou human environment colors](image)

3.3 Summarization of Zhengzhou environmental colors

The natural environment colors and human environment colors are summarized into 10 color systems, each of which has similar brightness, chromas and hues. With an intrinsic sense of order, they constitute the color
harmony and become the basis of the urban color system.

The yellow system, yellow-red system and grey system with middle-to-low chroma and middle-to-low values compose the principle tone of Zhengzhou ancient city remains. Other areas are predominated by the high-value, low-chroma warm grey system, supplemented harmoniously by the blue system and green system.

3.4 Zhengzhou City, the establishment of environmental color score - yellow land of the city of green
green lush fashion business

![Figure 11. Zhengzhou city environmental color concept summary](image)

The urban environment color score is a conceptual description of the overall color of the city. As the primary indicator of urban color planning, he must be logical relations, easy to use and memory, the formation of the overall impression of the city play a vital role. This requires the development of color score must be based on research, based on the existing natural environment color and human environment color, according to the chromatic relationship, according to the urban functional zoning to develop a complete set of color concept score, and according to the score for the next A phase of the city's overall color planning guidelines specify the direction.

4. ZHENGZHOU CITY ENVIRONMENT COLOR OVERALL PLANNING CONCEPT AND GUIDELINES

4.1 Basic principles of environmental color

Zhengzhou is one of the eight ancient capitals of China, the historical and cultural city of China and the members of the World Historical City Alliance. It is the main birthplace of the Chinese civilization and the Chinese nation. Its natural environment and human environment gave birth to the profound and simple color mechanism of the Central plains. Therefore, the development of its environmental color should follow the several points below:

Preserve the cultural heritage of the Shang Dynasty

Take good advantage of the city's green plant resources, to form a living city landscape

Each functional area should have its own distinctive environmental color to create an impressive city image.

4.2 The status quo of environmental color
The loss of traditional culture

The continually loss and disorder of urban environmental colors

The lack of professional, overall, long-term environmental color planning and design image.

4.3 Environmental color general guidelines (reference value and recommended value)

4.3.1 Purpose of color planning:

The reference chroma and recommended chroma should be limited to the range of low-to-middle chroma.

<table>
<thead>
<tr>
<th>Coloring point</th>
<th>Coloring object</th>
<th>Hue</th>
<th>Value</th>
<th>Chroma</th>
</tr>
</thead>
<tbody>
<tr>
<td>External wall</td>
<td>Base color</td>
<td>0R~5Y</td>
<td>--</td>
<td>Below 5</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td></td>
<td></td>
<td>Below 2</td>
</tr>
<tr>
<td>roof</td>
<td>Roof color</td>
<td>0R~5Y</td>
<td>--</td>
<td>Below 5</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td></td>
<td></td>
<td>Below 3</td>
</tr>
</tbody>
</table>

The above table contains the scope of application of the brightness of achromatic colors (N)

Colors should be recommended within the referred value of base color and roof color, ensuring the coordination with regional features and surroundings and the adaptiveness to natural green and the sky color.

4.3.2 External wall color reference case

Figure 12. The main Zhengzhou building’s exterior wall color reference case
4.3.3 Color reference range

![Color reference range diagram](image1)

**Figure 13.** The overall color reference range of Zhengzhou

4.3.4 The main buildings’ roof and wall environment color diagram

![Color diagram](image2)

**Figure 14.** The main buildings’ roof and wall environment color diagram

5. CONCLUSION

Although as one of the eight ancient capitals, Zhengzhou City has lost the unique ancient charm due to historical reasons. Based on the detailed urban landscape research in Zhengzhou City, this paper analyzes the overall color system, and designs and formulates the guideline for landscape color planning in Zhengzhou. The guideline is then applied to the city color selection, obtaining four color-selection modes: reference color range, color recommended color range, application object, and color exceptions. Based on the guidelines for the overall environmental color of Zhengzhou City, we conduct a conceptual color planning and color scheme research.
Of course, the implementation of Zhengzhou landscape color design schemes is subject to a variety of factors, and the implementation process will be modified and improved according to the response of real situations. In short, it is our desire to rejuvenate Zhengzhou with its own historic and cultural connotations and unique regional characteristics by means of landscape color planning.

REFERENCES