

The Pilot Study of Munsell Color System for Chiang Mai Heritage

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Abstract: Chiang Mai is the largest and the most culturally significant city in Northern Thailand. It was a capital of Lanna Kingdom dating back in 1200s. The city has a long history and continues to be culturally prosperous while retaining evidence of the past as a cultural and religious center. Therefore, the city has been applied for a tentative list of a World Heritage City. To be included in the World Heritage List, the old city should be well conserved. Since 1988, Chiang Mai municipality has announced the municipality control aimed to advocate the conservation development of the city. One of the imposed tools is Kalare, a cross attached over the pediment of vernacular Lanna houses. It is presupposed that Kalare is an important component of Lanna architecture which can represent Lanna style, and thus should be placed on the buildings to signify Lanna, consequently enhancing the conservation development. However, there are many arguments about the Kalare implication which led to the revision of the municipality control in 2014. The color control has been proposed. Chiang Mai Municipality is collaborating with private and governmental agencies to initiate a pilot project to repaint buildings around the center of the old city, using prospect colors which are white, cream-white, off-white, and brown. It is assumed that the conformity of colors will strengthen the conservation development in the historic area. However, the residents would not perceive those colors as their names. According to a case study of Kyoto that applies color control in the conservation area, Munsell color system was chosen as the color pattern for the local act. Therefore, this article is aimed to examine the repaints using Munsell color system by a DIC application. The results reveal the color group of Munsell color system: Yellow, Red, Yellow-Red, Purple-Blue, Blue, and Neutral. It is suggested that Munsell color should be announced to control the color instead of the name of colors.

Keywords: world heritage, conservation, Chiang Mai, Munsell.

I. INTRODUCTION

Chiang Mai is the largest and the most culturally significant city in Northern Thailand. It was the capital of the Lanna Kingdom dating back since the 1200s. The city has a long history and continues to be culturally prosperous while retaining evidence of its past as a cultural and religious center. Consequently, the city has applied for tentative listing as a World Heritage City. To be included in on the World Heritage List, the old city should be well conserved. Since 1988, Chiang Mai Municipality assumed control of the conservation development of the city and in 2014 revision of a municipal control.

Color control has been proposed. Chiang Mai Municipality, collaborating with private and governmental agencies, initiated a pilot project to repaint the buildings around the center of the old city, using brown, cream, white and off-white as specified by the Municipality. Again, it is assumed that color conformity would strengthen conservation development in the historic area. However, local residents have objected to the names of the colors.

II. LITERATURE REVIEW

A. Chiang Mai Municipality Controls

The municipality of Chiang Mai announced the local act in 2014 to control built environment in the scope of heritage city. The main actions of this control are similar to the later and assemble the height control and façade control, including color control. Figure 1 displays two boundary control, the inner moat and the outer moat. Both areas require color control which describes at the below of the map. The color control recommends color of walls and color of roofs.

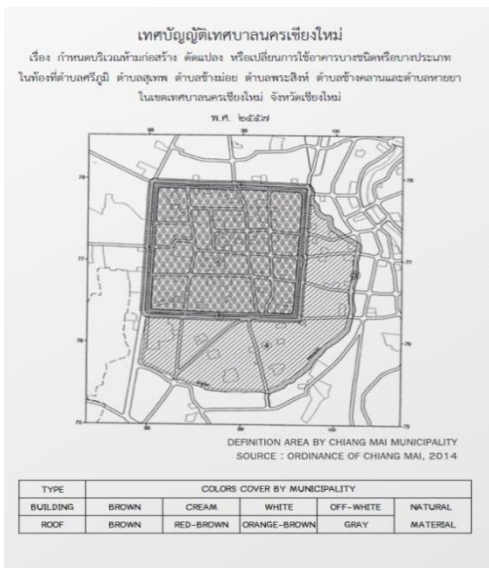


Fig.1 Chiang Mai Municipality Ordinance

B. Case Study of Kyoto, Japan

Kyoto city is similar to Chiang Mai city. Kyoto is the world heritage that uses the Munsell color system to specify colors permission in its conservation area [1]. This presentation recommends the use of the Munsell color system to specify the colors that appropriate to suggest to the conservation area of Chiang Mai rather than the color names which display in the municipality ordinance such as brown, cream, and white. The Munsell system is widely accepted for the specification of surface colors in many industries, especially in the standardized of the paint industry.

For example, Kyoto city specified the color of exterior wall under Munsell system, which are red hue and yellow-red hue, that saturation exceeds to 6. There is only one exception for natural materials such as clay and copper.



Fig.2 Kaminokyo-Kokawa area in Kyoto City

B. Case Study of Sydney, Australia

Main Street heritage paint scheme is a program designed to improve the street appearance and retail quality of King Street and Enmore Road [2]. Main Street consultants, Rod Howard and Neustein & Associates had prepared color schemes for the area based on the heritage color that would have been used originally on the historic buildings to improve their buildings as part of a general scheme intended to upgrade the area by using a heritage theme.



Fig.3 Color Control for King Street, Newtown and Enmore Road, Enmore at Sydney

C. Munsell Color Theory

An American artist in 1898 designed a color system that looked like a circle which spread colors from the middle. This theory is credible and favored in industries which show relation in 3D, hue value and chroma [4].

1. Hue is the property of color that has 10 colors: red, yellow-red, yellow, green-yellow, green, blue-green, blue, purple-blue, purple, and red-purple.
2. Value is the property of shade or white, gray black divided by 9 grades.
3. Chroma is property of hue mixed with value. It is called “saturation”

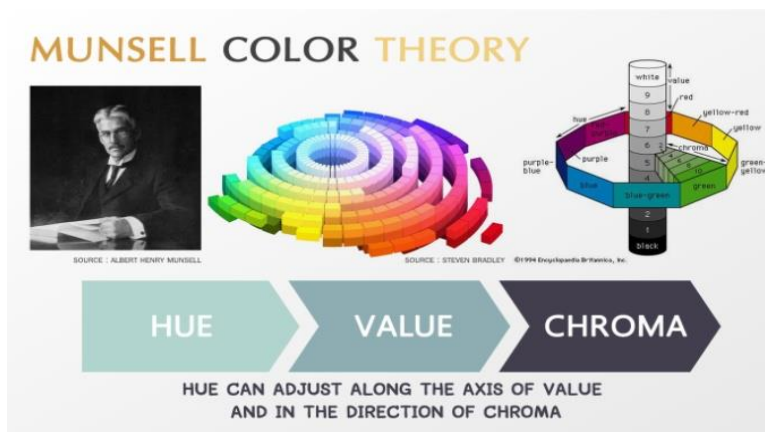


Fig.4 Munsell Color Theory

III. RESEARCH METHODOLOGY

A. The Study Area

The study area scopes the buildings around Three Kings Monument on Phra Pokklao Road, which has been repainted by Chiang Mai municipality which has the sponsors from private sectors. The municipality made the participation to the owner of the buildings and introduced the color recommendation to promote the heritage city. The research gave a symbol name to each building. In the east side, the name began with E and then run the number sequence. On the other side, the W is at the beginning of building name which present the West side building of the road.



Fig.5 Chiang Mai and Three Kings Monument Area



Fig.6 Graphic of Building on Phra Pokklao Road, East Side

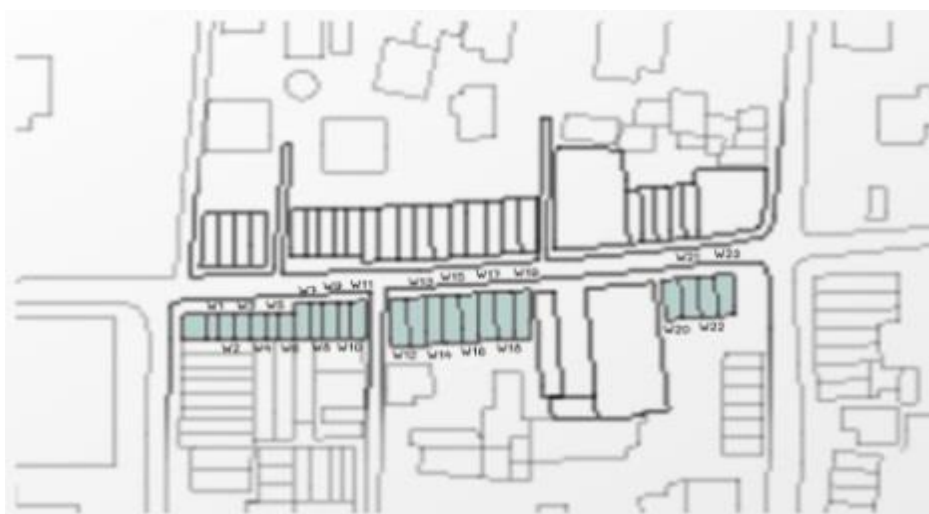


Fig.7 Graphic of Building on Phra Pokklao Road, West Side

Figure 8 to figure 10 are the photos of the buildings on both sides of Phra Pokklao road, which took during the daytime.



Fig.8 Building E1 – E19 of the East side



Fig.9 Building E20-E25 of the East side and W1-W6 of the West side



Fig.10 Building W7-W23 of the West side

B. The Experimental Apparatus

The research provided the DIC application on IOS operating system which can be transfer the photo colors to Munsell color system. This application is reliable because it is the application of Munsell standard which developed to communicate to other color systems [3]. To collect the Munsell values, pointer can pick up at any area of the photos and record the values by handwriting.

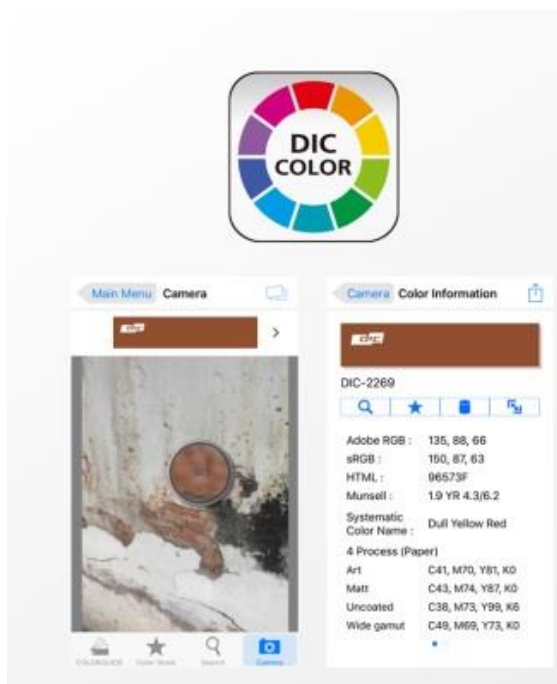


Fig.11 DIC Application of Munsell

IV. RESULTS

The results show the buildings photos with Munsell values and the examples of colors. Figure 12 displays the E1-E4. There are nine-color ranges. The Munsell values cover five hues which are yellow, yellow-red, red, purple-blue, and blue.

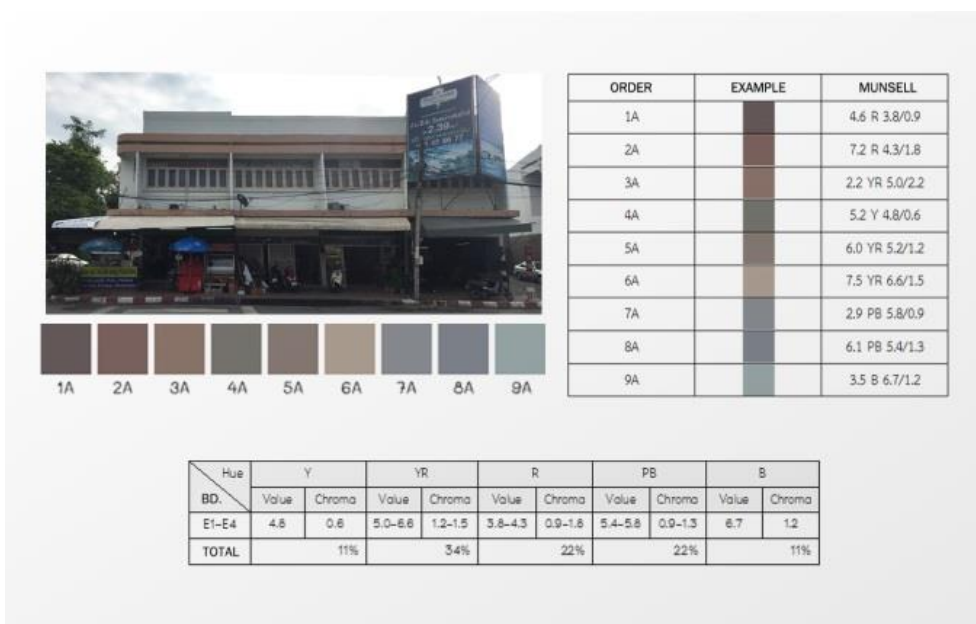


Fig.12 Munsell color values of E1-E4 Building

Figure 13 displays E5-E9. The newly refurbished buildings are the colors of red, yellow-red, purple-blue, and neutral.



Fig.13 Munsell color values of E5-E9 Building

Figure 14 displays E10-E19. The newly refurbished buildings are the colors of yellow, yellow-red, and red.

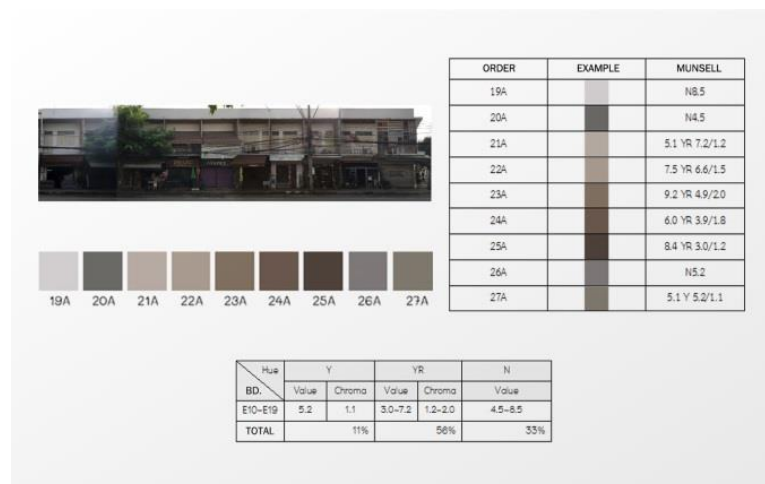


Fig.14 Munsell color values of E10-E19 Building

Figure 15 displays E20-E25. The newly refurbished buildings are the colors of yellow-red, red, red-purple, purple-blue, and neutral.

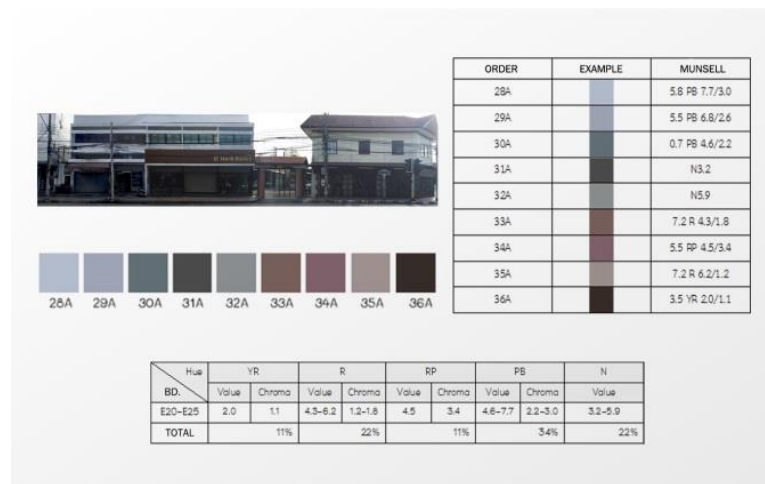


Fig.15 Munsell color values of E20-E25 Building

Figure 16 displays W1-W6. The newly refurbished buildings are the colors of yellow, yellow-red, red, and neutral.

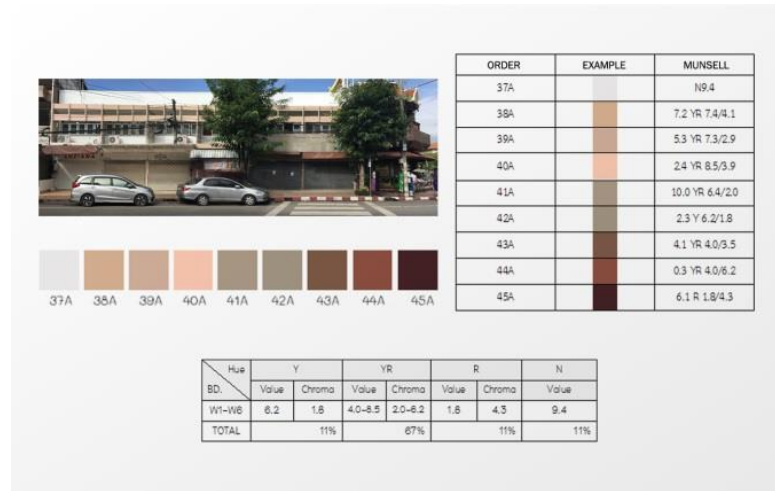


Fig.16 Munsell color values of W1-W6 Building

Figure 17 displays W7-W11. The newly refurbished buildings are the colors of yellow, yellow-red, and green-yellow.



Fig.17 Munsell color values of W7-W11 Building

Figure 18 displays W12-W19. The newly refurbished buildings are the colors of yellow, green-yellow, blue-green, purple-blue, red, yellow-red, and neutral.



Fig.18 Munsell color values of W12-W19 Building

Figure 19 displays W20-W23. The newly refurbished buildings are the colors of yellow, yellow-red, blue, purple-blue, and neutral.

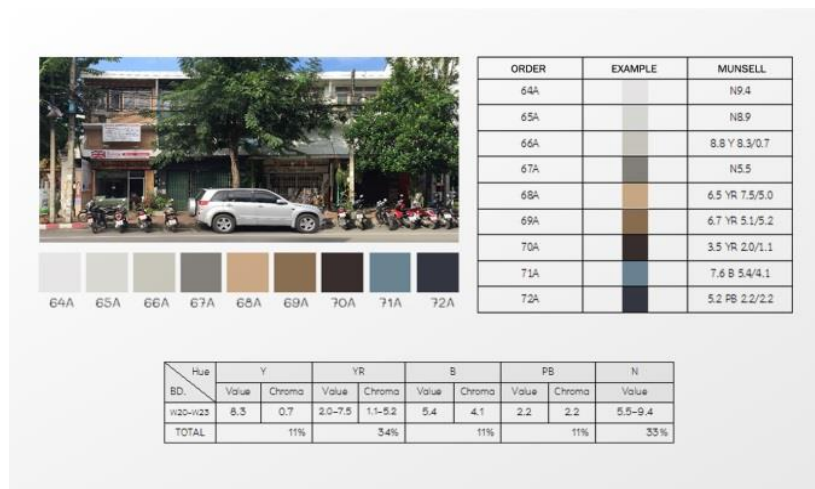


Fig.19 Munsell color values of W20-W23 Building

V. CONCLUSIONS

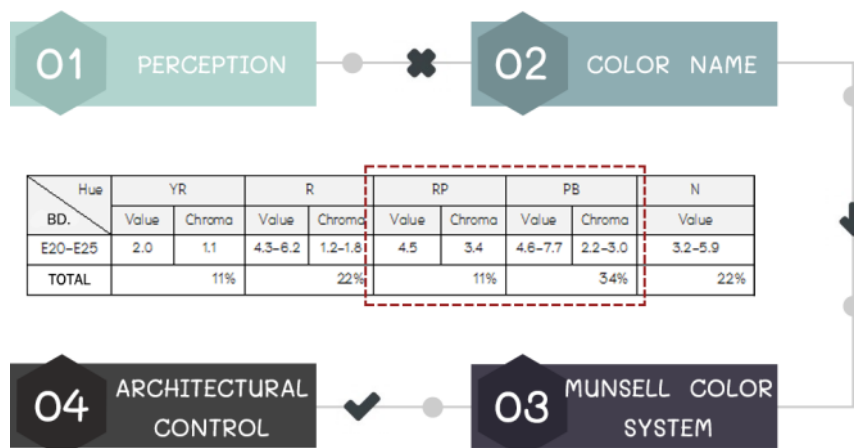


Fig.20 Conclusion from Pilot Study

The results reveal the different values of color name and the hue of Munsell color system. According to the ordinance color, Chiang Mai municipality chose the colors and repainted. When the study tested by DIC application, the color hues are not the same as the selected color names. This can prove that the color name is not appropriate to be a control in the ordinance. It can conclude that as long as people make their repaint under the name of the ordinance color, their buildings may not show the color as a name of controlled color.

The municipality ordinance should be revised the color control. This research suggests that the municipality should study the Munsell system and review other heritage ordinance. Critiques and apply are required. To revise the color control, this research suggests the Munsell color system. Because this color system is appropriated to any conventional colors and it is reliable.

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