THAI ARCHITECTURAL LIGHTING AND EMOTIONAL VALUES CREATION CASE STUDY AT THE UBOSOT OF WAT YAI SUVARNNARAM IN PHETBURI PROVINCE

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Abstract— This research is aimed to study characteristics and volume of light within the Ubosot of WatYaiSuvarnaram which have impact in creating three emotional values: peaceful, respectable, and magnificent; to be used as guidelines for ambience creation lighting in Thai style. The study was done by simulation of the lighting patterns and questionnaire survey from which the derived data was analyzed using the average and percentage values. The research indicates that, first of all, light emanating from the ceiling alone can create a peaceful emotional value at the highest level, with the average value of 4.53 (S.D.=0.77). Secondly, the average value of light emanating from both the rear door panels of 4.57 (S.D.=0.77) and that from the front door panel of 4.50 (S.D.=0.50) can create a respectable ambience at the highest level. Lastly, the light illuminating from behind on both left and right sides and one scattering from above to below can create a magnificent ambience at the highest level with the average of 4.53 (S.D.=0.50).

Keywords— Light, Thai Architecture, Emotional Values, Chapel, Wat Yai Suvarnaram in Phetburi Province, History.

I. INTRODUCTION

All of human civilizations have utilized natural light and light from candles or gasoline for various purposes. The diverse light dimensions beneficial for appropriate use can affect the perception of human emotion while beauty in the design causes valuable creation.[1] The most apparent example of this is the lighting inside Buddhist ubosots in the past which tended to create a hazy atmosphere to promote peaceful emotion within the visitors [2] as well as encourage faith and appreciation which allowed Buddhist teachings to impress them.

WatYaiSuvarnaram is one of the four royal monasteries in Phetburi Province. It is reckoned for its greatness in various aspects: history, art, archeology, and numerous craftsmanship families skills. The architectural style of the ubosot is from Ayudhaya era which can be seen in the features of brick and plaster work and the gable decorated in stained glass [3][4]. The distinct feature of this ubosot is the existence of the twin door panels both in the front and the back of the building's walls; the front is also installed with a large window pane in between the doors. The architectural style is not only spectacular for its artistic esthetic but also latent with copious Buddhist doctrine [4].

Furthermore, utilization of these creative worksas guidelines in decorative design creates not only a focal point in the work but also a charm of decoration and design in Thai style.

OBJECTIVE

To study the features and volume of light in the Ubosot of WatYaiSuvarnaram which affect in the three emotional aspects: peaceful, respectable, and magnificent; to be guidelines for lighting design to create Thai style ambience.

II. DETAILS EXPERIMENTAL

2.1. RESEARCH METHODOLOGY

1. Study patterns of light panels at the Ubosot of WatYaiSuvarnaram, Phetburi Province.

1.1 In studying the information related to this research, the researcher conducted a study in related data from books, articles, theses, theories, and researches.

1.2 Field data collection was done with photography and notes taking.

2. The instrument used to collect data for this study was a questionnaire with structural points designed to cover the research objectives. The findings from the study of patterns of light panels at the Ubosot of WatYaiSuvarnaram, Phetburi Province, were simulated using 3-D program to assist with the questionnnaire.

3. The data obtained from the questionnaire was analyzed for score levels using statistical package and the results were concluded.

III. RESULTS AND DISCUSSION

3.1. RESULTS

The study was focused on the features and volume of natural light in the Ubosot of WatYaiSuvarnaram which affect in three emotional aspects: peaceful, respectable, and magnificent; to be guidelines for lighting design to create Thai style ambience by

finding the Mean and Standard Deviation of the levels that could express emotional values and feelings from lighting in the Ubosot of WatYaiSuvarnaram. The criteria is as follows.

4.50-5.00 means most
3.50-4.49 means much
2.50-3.49 means medium
1.50-2.49 means little
1.00-1.49 means least

The analysis results can be summarized as follows.

Table 1 shows the Mean and Standard Deviation of the lighting that promotes peaceful feeling.

Item	Mean	S.D.	level
 1	4.30	1.02	Much
 2	3.87	1.25	Much
 3	3.33	0.99	Medium
 4	3.53	1.16	Much
 5	2.87	0.97	Medium
 6	4.33	0.71	Much
 7	4.07	1.27	Much
 8	3.17	1.11	Medium
 9	4.53	0.77	Most

From table 1, characteristics of light create the peaceful feeling at three levels:

1. The Most level is obtained by designing the light to shine from top to bottom.

2. The Much level:

2.1 Natural light enters from behind, left, and right at 50%.

2.2 Natural light enters from behind, left, and right at 100%.

2.3 Natural light enters from all directions at 100%.

2.4 Natural light enters from the middle front only at 100%.

2.5 Design of light entering from behind, left, and right at 100%.

3. The Medium level:

3.1 Natural light enters from the left and right at 100%, and 100% from the middle front.

3.2 Natural light enters from all directions at 100%.

3.3 Design of light entering from the left-behind, right-behind, and from top to bottom.

Table 2shows the Mean and Standard Deviation of the lighting that promotes respectable feeling.

Item	Mean	S.D.	level
 1	3.09	1.02	Much
 2	4.57	0.50	Most
 3	4.20	0.80	Much
 4	4.07	0.74	Much
 5	4.50	0.77	Most
 6	4.70	0.46	Most
 7	3.63	1.12	Much
 8	4.20	0.80	Much
 9	3.23	1.16	Medium

From table 2, characteristics of light create the respectable feeling at three levels:

1. The Most level:

1.1Natural light enters from the left-behind and right-behind at 100%.

1.2 Natural light enters from all directions at 100%.

1.3 Natural light enters from the middle front at 100%.

2. The Much level:

2.1 Natural light enters from the left-behind and the right-behind at 50%.

2.2 Natural light enters from the left-behind and the right-behind at 100% and the middle front at 100%.

2.3 Natural light enters from the left-behind, right-behind and both left and right of the front at 100%.

2.4 Design of light entering from the left and right behind at 100%.

2.5 Design of light entering from the left and right behind as well as from top to bottom.

3. The Medium level is obtained by designing of light shining from top to bottom.

Table 3 shows the Mean and Standard Deviation of the lighting that promotes magnificent feeling.

Item	Mean	S.D.	level
1 	2.97	1.03	Medium
2 	3.47	0.77	Medium
3 	4.20	0.66	Much
4 	3.87	0.68	Much
5 	3.90	0.84	Much
6 	3.23	1.00	Medium
7 	2.93	1.04	Medium
8 	4.53	0.50	Most
9 	3.23	0.89	Medium

From table 3, characteristics of light create magnificent feeling at three levels:

1. The Most level is obtained by designing of light entering from the left-behind and right-behind as well as shining from top to bottom.

2. The Much level:

2.1 Natural light enters from the left-behind and right-behind at 100%, and 100% from the middle front.

2.2 Natural light enters from the left-behind and right-behind at 100% and from the left-front and right-front at 100%.

2.3 Natural light enters from all directions at 100%.

3. The Medium level:

3.1 Natural light enters from the left-behind and right-behind at 50%.

3.2 Natural light enters from the left-behind and right-behind at 100%.

3.3 Natural light enters from the middle front at 100%.

3.4 Designing of light entering from the left-behind and right-behind at 100%.

3.5 Designing of light shining from top to bottom.

3.2 SUMMARY AND DISCUSSION

According to the study of features and volume of light in the Ubosot of WatYaiSuvarnaram, focusing on the patterns and volume of light shining through the light panels, which affect in the three emotional aspects: peaceful, respectable, and magnificent; to be guidelines for lighting design to create Thai style ambience; with the Ubosot of WatYaiSuvarnaram's distinct design where there are not any windows but five door panels - 3 in the front and 2 in the back, designation of lighting directions and volume can most create the ambience that affects visitors respectable feeling. This can be achieved with three different designs of lighting direction and volume: light entering from the left-behind and right-behind at 100% (Picture 1); light entering from the left-behind and right-behind at 100% and also 100% entering

from the left-front and right-front (Picture 2); and the light entering from the middle front at 100% (Picture 3). It is worth observe that all three patterns are created with natural light.

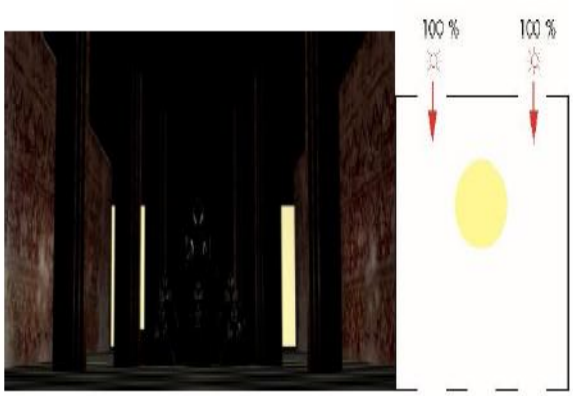

Fig.1: Light direction creating respectable feeling, pattern 1

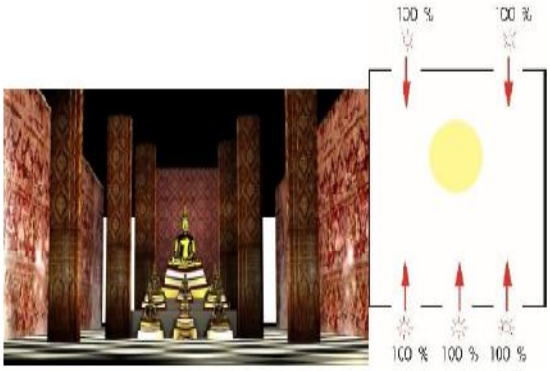

Fig. 2: Light direction creating respectable feeling, pattern 2

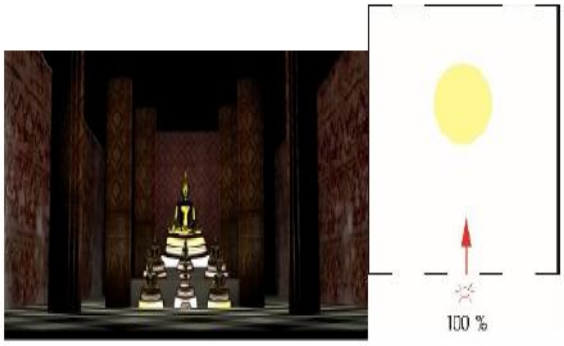

Fig. 3: Light direction creating respectable feeling, pattern 3

However, sole natural light cannot create peaceful and magnificent feelings. Lighting design is required to achieve such complete ambience. The lighting design for peaceful feeling requires that all natural light from all directions be closed and only light that shines in scattering manner from top to bottom will be applied (Picture 4). Whereas, when increasing the light shining from the left-behind and right -behind in the bottom-up direction, the magnificent feeling can be created (Picture 5).



Fig. 4: Light directions creating peaceful feeling



Fig.5: Light directions creating magnificent feeling

From such patterns, it can be observed that natural light only can create respectable feeling. Thus, it may be concluded that the purpose of building the Ubosot with less light panels reflects not only art and cultural wisdom passed along since the Ayudhaya era, but also the design that focuses on encouraging respect and faith amongst the visitors, which will consequently assist with impressing the Buddhist teachings. Besides, this can also create the atmosphere in which the visitors feel their retail from the outside world, contributing to a sense of peace as well.

SUGGESTIONS

1. Studies of other components may be necessary in order to increase value of Thai atmosphere creation.
2. There should be comparison studies of various ages' chapels to provide options of application.

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