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A Study of Style and Characteristics Guideline for Luangprabang Sim

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Abstract: **The main objective of the research is to identify the criteria for determination of forms and features of Luanagprabang Sim. The study is focus on proportion and form of Sim, which are discriminated by racial aspects. Due to the outstanding features and development of form are relevant to the architectural historic factors. The samples of research were selected from Sim, within and outside the UNESCO's conservation area of Luanagprabang. The benefit of the study are divided into two, one is for restoration of Sim in architectural conservation works and applying to the contemporary architectures in terms of vernacular intelligence. The procedure of study is to generate a framework referring to the study of history of architectures in Luanagprabang, by means of history of form and development of local architecture. Grouping the Sim types of Luanagprabang, especially, leads to consideration of measuring components of width, length, height and steep of roof as the standard dimensions of each group. The result has been revealed that Sim types are divided into 5 categories according to racial aspects: Lue style, Luanagprabang style, Xiengkhouang style, Composition style and Vientiane style. Referring to the five groups of Sim, filed data collected from samples has been analyzed by statistic program named SPSS, to determine the criterion of identifying the differences of dimension and proportion of Sim from five categories.**

Keywords: **Charateristics of Sim, Guideline of Luanagprabang Sim.**

I. INTRODUCTION

Luangprabang was capital city of Lao Lanxang, located between 2 rivers: Mekhong and Kharn; there is mountain settle in the middle of the city called Phusi. Chomsi stupa built in 1804 during the period of King Anurout (1791-1817) in another name is Nunthakanghisisuttanark.

Luangprabang has approximately 1,830,200 hectares. The north adjoins to Phongsaly province. The south adjoins to Vientiane and Xiangkhouang province. The east adjoins to Huaphun province. And the west adjoins to Udomxai and Xaiyaburi province. The population of Luangprabang as of 2007 census is 433,222. There are three main ethnic groups: Laos Loum (Low Lands) represent 36%, Laos Theung (Middle Altitude Lands) represent 46% and Laos Soung (live in the Mountains above 1000 meters) represent 17%, bring about unique culture and wisdom in Lanxang. In 1995 Luangprabang was praised from UNESCO as a World Heritage Site for unique architectural, religious and cultural heritage. There is urban legislation to control the construction and renovation of old buildings in conservation areas especially Sims (Viharns). On 27 August 2003, Lao Government joined with various units consisting Ministry of Transport, Ministry of Public Works and Transport, Institute of Urban Planning, Ministry of Public Security, Ministry of Health, Ministry of Information and institute of Culture and Buddhist religion for The Lao had a conference to create a framework and criteria for conservation in field of architecture, art and history. (Sanguan Rodboon, 2002).

According to the Studies and data field in Luangprabang found some generally conflict of Conserved buildings, when compared the characteristic of buildings to old reference documents discover that there is distortion from the original

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characteristic. One of the restoration problems is the lack of documented evidence that it can be referred to the form of traditional construction. In accordance with the context of UNESCO Law in Luangprabang, Sim (Viharn), house and townhouse which have been registered as a conservation building should be re-designed to have the same conditions and a certificate of recommendation for restoration and renovation of the old building in Luangprabang.

However, the summary report and terms of conservation and restoration of old buildings by UNESCO only has photos and sketches which show the external appearance and not cover the details of building components. Also, we are lack of skillful senior craftsman with a profound experience on this kind of work. For those reason, the restoration in this era is in a form of guesswork in terms of proportion and characteristic. It could be the cause of confusion in the original buildings in Luangprabang.

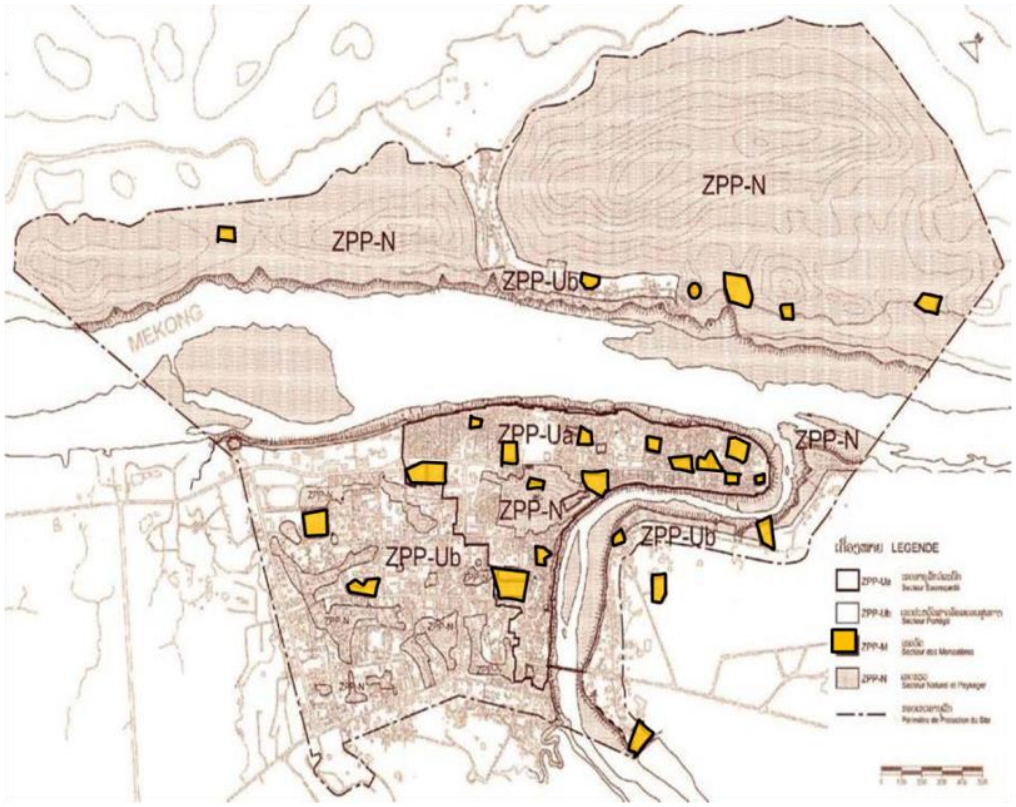

Figure 1: Luangprabang preservation area in the old town zone by UNESCO

(Source: The Institute of Public Works and Planning)

From the above mentioned reasons, it is possible to summarize the problems and the constraints of restoration and renovation in Luangprabang.

1. Luangprabang is a World Heritage Site, with architectural restructuring rules, especially for Sim which have to preserve the old character, whereas senior craftsman who specialize in designing and constructing in present are fewer which could not be able to give advices on constructing or renovating the building.

2. There is currently no text or construction guideline that specifies a clear renovation form for Sim which this made the new repair of Sims were slightly different from the old one because craftsmen are lack of comprehension and experience on the origin formats.

3. UNESCO preservation regulation points only photographs, sketches that show only external characteristic and do not mention about the details of building to be a reference for renovation.

4. The study of the form of Luangprabang Sim according to the principle of Henri Parmentier which uses plan layout and roof characteristics cannot be defined Sim format that represent architectural characteristics from various ethnic groups in Luangprabang.

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Figure 2: Sim in the outside of conservation area in Luangprabang started to worn-out. There is lack of evidence and reference to the original form. In the picture is Wat Ban Jarn in 2006

Figure 3: Wat Hor Siang

1.1 Relevant research and documents

Henri Parmentier "L'Art du Laos" (1988) a French archeologist had noted journal during explored Laos, Cambodia and other countries in Asia in 1911-1927; he collected drawing about styles of Sim and analyzed them. In that age, Sim construction was categorized by the form of roof, plan, pillars span; and the outcome divided into 3 styles: i. Style 1: the character of roof structure is one to three layers like Tai Lue style. ii. Style 2: the principle of this character used front and side balcony of Sim. iii. Style 3: the pillars of this character are close to the side wall, in a simple construction like folk house.

Houmphanh Rattanavong translated Tai-Lue old manuscript "Na Tup Pop Nung Sue Tong Mue Tong Vanh Pai Kao Mueng Yuod U Kheug Phong Sa Li Tae Lae Ner Lao Eauy" it is an old manuscript and cited in Treasures of Luang Prabang book. Old Lao manuscript is not use just only for house construction but for felicitousness to Buddhism. Components use for a perfect Sim construction ritual consist of giving alms and writing Tripitaka (Buddhist scripture) with a stylus on palm leaves (Bai Lan).

Dr. BounThiang Siriraphun studied on Sim of Luangprabang Luang Prabang Et Son Art which use roof characteristic as criterion of classification.

Luangprabang world heritage office (UNESCO) created a document "Plan de sauvegarde et de mise en valeur" (2001) to preserve valuable buildings in Luangprabang. the content of document is about exploring types and styles of architecture, details of architectural elements, construction materials using, color using, fence, vegetation, urban plan and temples. In cepter 8 refered to temple in Luangprabang; they studied types of Sims by plan, divided into 2 mains types or 4 types: Luangprabang style and Thai style.

Luek Singkkhamton, director of Fine Arts of Luang prabang University. "The study of art relationship between Lanna and Lanxang" (2001), it is a research between Thai and Lao by Social research Institute of Chiangmai University, take Chiangmai and Luangprabang as case study. The research had talked on many aspects such as history, architecture, sculpture and find art. In architectural perspective was composed by Luek Singkhamton, and Vararak Bounyasurut, had focused on the studying of relationship in two main points: Chedi and Vihara (Sim).

Laurent Rampon wrote the book "Les Monasteres De Luang Pha Bang". It is about grouping of Sim in Luangprabang and the book named "Luang Phrabang par THAO BOUN SOUK". He divided Sim by roof characteristic: simple roof, one tier roof and two tiers roof, which referance from Henri Parmentier research and based on analysis of Madeleine Giteau6 divided into 4 types: Luangprabang style: type 1, Luangprabang style: type 2, Luangprabang style: type 3 and Thai style.

Manivong Khattignarath is a craftsman of the Royal palace in the period of Sisavangvatthana King. From the interview can concluded that the design of Sim in Luangprabang study its unique environment under on ancient beliefs and customs. It is also found that there are theories from Bai lan that mention the construction and restoration of Sim. The temple

construction in Luangprabang had influence from different craftsman family, when we consider and divided superficially we could say that Luangprabang style Sim like Sim of Xiengthong temple has the similar character like Lanna style Sim, even so if consider in detail we could see the difference and the characteristic development which it looks lower than Lanna style Sim as local craftsman had said that the low shape of Luangprabang style Sim that look like a posture of Kraba birds (large-tailed nightjar bird) are hatching, which became a mannerism among the elders said that if intend to build temple it will have a shape similar to a Kraba bird are hatching; the roof shape that look gentle curved and low drag down cover Sim building. Some academicians had noted that Luangprabang style Sim is a female Sim because having lower proportion than Lanna and one cause might be a slightly difference of the proportion formula of construction.

Vararun Bounyasurut stated in the book "Admire the architecture, temples in Luangprabang" categorized Sim in Luangprabang by the name of the region and the name of the ethnic. This classification is a further extension of the study of Lao academicians, divided into 5 types: Luangprabang style, XiengKhuang style, Vientiane style, Tai-Lue style and Mix style.

The study of Mahabounlerd Thammajuk "Bai Lan Lao project National Library of Laos" the principle of ancient Tai-Lue has a detail of belief which state in the construction of house, Monastery shall have a ritual for material choosing and construction day choosing to match with the fortune of the builder by measuring the body of builder as a main measurement.

	Researcher	Year	Divide by plan layout and roof characteristic	Divide by name of the region	Source
1.	Henri Parmentier	1954	*		L'Art du Laos
2.	Houmphanh Rattanavong	1987		*	Treasures of Luang Pra Bang
3.	Dr. BounThiang Siriraphun	1994	*	*	Luang Pra Bang et son Art
4.	Luangprabang world heritage	2001	*		Plan de sauvegarde et de mise en valeur : Fascicules de Recommandation
5.	Luek Singkkhamton	2001	*	*	The Study of art relationship between Lanna and Lanxang
6.	Laurent Rampon	2003	*		Les Monasteres de Luang Pra Bang
7.	Manivong Khattignarath	2004		*	Interview
8.	Vararun Bounyasurut	2004		*	Admire the architecture, temples in Luangprabang
9.	Mahabounlerd Thammajuk	2005		*	Bai Lan

Figure 4: Show the criterion of Sim dividing of academicians

1.2 Hypothesis of Sim classification

The using of criterion by ethnic groups could clearly distinguishing Sim style, roof characteristic, proportion and architectural elements. Because of their wisdom is a represent of craftsmanship skill therefore it is worthy to use criterion by ethnic groups for distinguishing Sim in Luangprabang.

1.2.1 Objective of the study

i) Summarized the criteria of distinguishing Sim style by ethnic groups.

ii) Study the characteristics of Sim proportion in Luangprabang by using statistical data to analyze and summarize Sim characteristic of each types to become criteria for Sim designing related to the surrounding temple in Luangprabang.

1.2.2 Expected results

i) Be a principle of Sim characteristic dividing in Luangprabang to be able to comprehend.

ii) Be information for applying to restore or rebuild religion architecture appropriately as before.

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II. RESEARCH METHODOLOGY

Procedures of research use Non Participant Observation as a method, using an open-ended question and implement field survey as follow:

2.1 Data collecting

i) Documentation information used in the analysis was from old document which related to the construction of Luangprabang Sim of Tai ethnic groups in form of history book, message from antecedents, old manuscript (Bailan) that are kept in the Lao national library, EFEO library, UNESCO World Heritage Centre in Luangprabang.

ii) Survey master plan layout of Sims on both internal and external area of Luangprabang city.

iii) Field survey information will collect by measuring Sim building that were selected in the area of UNESCO conservation in term of architecture, structure and elements; taking picture.

2.2 Analysis

i) Analyze a group of sims and record the details of Sim characteristic of each ethnic.

ii) Use statistic to find the balance and the inclination of Sim proportion.

iii) Create a three-dimensional model for the experts considering.

2.3 Evaluation, Conclusion and Recommendation

i) Summarizes detail of Sim styles.

ii) Evaluate the comments of the experts on Sim characteristic.

iii) Introduce architectural criteria for designing and restoration.

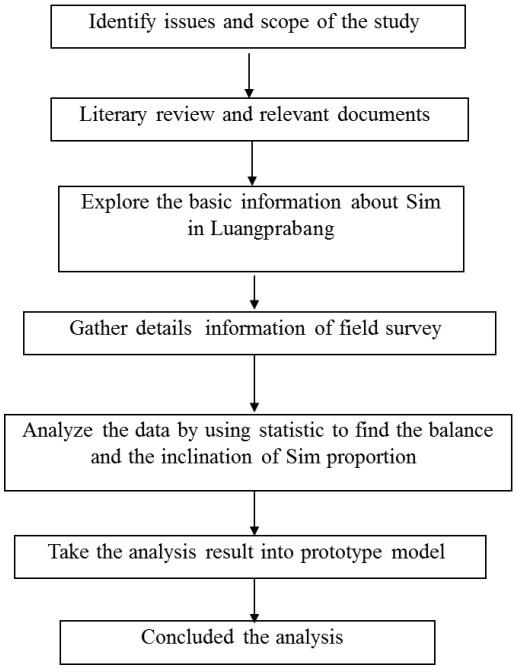

Figure 5: Research method diagram

III. DATA ANALYSIS AND PRESENTATION

3.1 Research areas and representative samples

The area that will do research is in the area that was preserved by UNESCO which has divided into 4 areas: Preservation area (ZPP-UA), Protection area (ZPP-UB), Nature and scenery (ZPP-N) and Temples (ZPP-M). The representative samples will be choose from temples (ZPP-M) area.

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The criterion was based on the unique craftsmanship of tribes in Luangprabang and the population sampling were chosen to study was from 2 areas of Luangprabang city; first area is under preservation by UNESCO consist of 29 temple populations and second area is not under preservation by UNESCO consist of 20 temple populations. Those temple sampling are unique traditional architecture that were built by tribal folk wisdom and importantly in the ancient they were in strong relationship with royal court of Luangprabang.

Most of temples in Luangprabang were built by ethnically diverse of Tai-Lao descent; there are many ethnic in Laos such as Tai-Dam, Tai-Deng, Tai-Kheun, Tai-Yuan, Tai-Puan, etc. Tai-Lue had immigrated to this area since the 5th century and became a big ethnically descent in Lanxang Kingdom and had connection with many ethnic of other Kingdoms. For example, some Tai-Yuan became citizen of Lanxang Kingdom which made Lanxang and Lanna Kingdom has connected relationship consistently. This is the reason why temple construction in Luangprabang had influence from different craftsman.

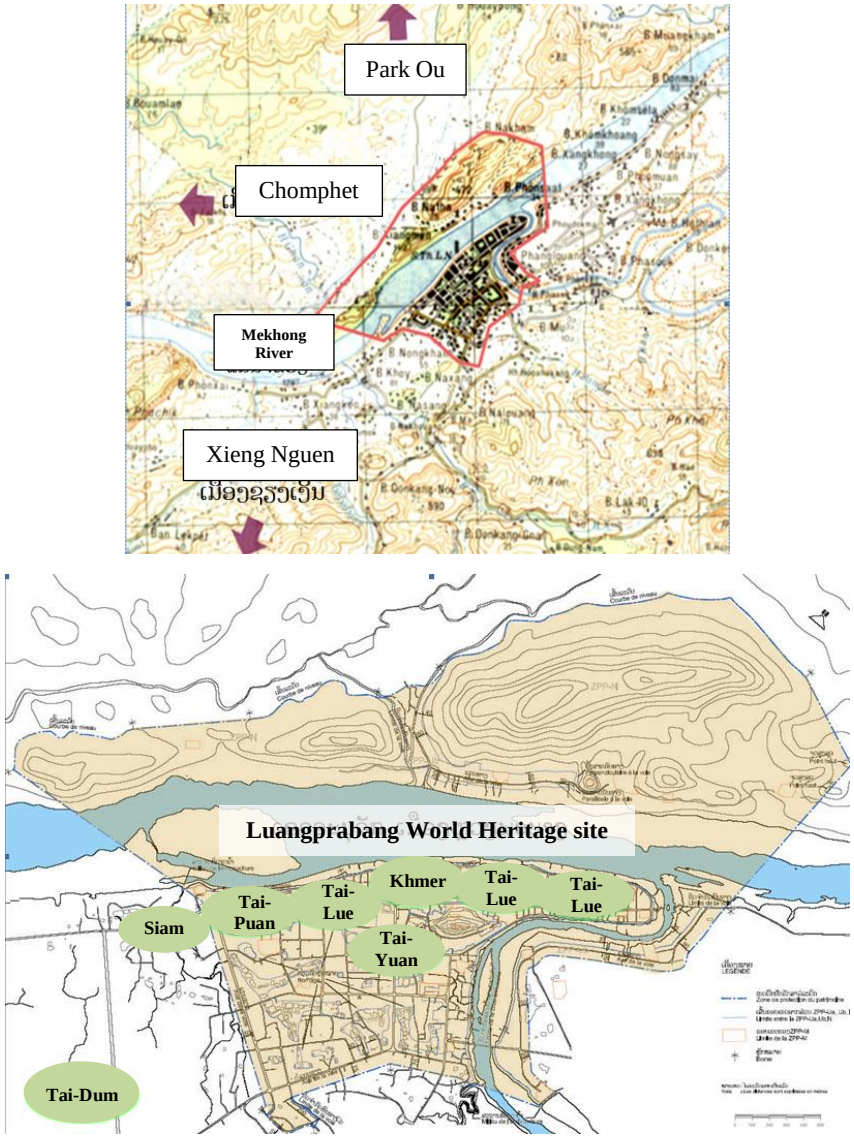

Figure 6: Display the location of immigrant settlements in Luangprabang province of various ethnic groups

3.2 Data collecting process

Field data collection will be measure Sims in term of architecture, structure and elements. Furthermore, taking picture and sketching are options to use for field survey.

The interview will discuss with people who have knowledge of the area, about the history and origin of the temple. And will be interview academicians who specialize in temples.

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3.3 Data analysis

Analyzes the values from representative samples by Using statistic to find the balance and the inclination of Sim proportion which can be done in two steps after the data collection as follows:

Step 1: Using statistic to find the average of elements such as height, width and roof angle.

Step 2: Take the average value to compare to find the balance value of each Sim group.

3.4 Analyzes the architectural proportion of each Sim group

The main objective of the architectural proportion study is to create criterion of Sim dividing in Luangprabang and it is also an analysis of Sim proportion in Luangprabang which use statistical analysis principles on the analyzed process.

Collection of data of this study will perform measuring Sims of each group and then analyzing the data by SPSS software which can classify into four main categories:

- The width of Sim

- The height of Sim

- The height of king post

- Roof angle

The SPSS program will find value of each group such as the maximum value, minimum value, mean value and standard deviation. After that, the values of each group will be matched to each other and then find the coefficients of each of the equations that can be calculated in 3 forms:

- Coefficient of proportion between the width and the height of Sim (L/H)

- Coefficient of proportion between the width and the height of king post (L/h)

- Coefficient of proportion between the width and roof angle (L/α)

Table 1: Comparison of mean, standard deviation and coefficients of all five samples

Category	Coefficients						
	L/H1	L/H2	L/H3	L/h1	L/h2	L/h3	L/α
Wat Pak Kharn	1.03	1.96	0.00	2.12	2.19	0.00	0.14
Wat That Luang	1.91	3.56	0.00	2.66	4.14	0.00	0.18
Wat Vixoun	1.49	2.25	0.00	4.55	4.41	0.00	0.27
Mean	1.48	2.59	0.00	3.00	3.49	0.00	0.19
SD	0.44	0.86	0.00	4.89	6.64	0.00	0.45
Wat Xiengthong	2.28	3.89	0.00	4.05	5.48	1.74	0.28
Wat Sibounheung	1.63	2.98	0.00	3.54	3.61	0.00	0.16
Wat Sob	2.83	5.12	0.00	3.19	6.33	0.00	0.20
Wat Pafang	1.42	2.84	1.00	2.36	2.82	0.00	0.13
Wat Phun Luang	2.56	3.31	2.00	5.75	11.24	1.50	0.21
Mean	2.14	3.63	0.60	3.78	5.89	0.65	0.20
SD	0.60	0.93	0.89	1.26	3.30	0.89	0.06
Wat Kili	1.71	0.00	0.00	1.25	0.00	0.00	0.07
Wat Xiengmoaun	1.38	2.95	0.00	2.56	2.55	0.00	0.15
Wat Paphai	1.66	0.00	0.00	1.61	0.00	0.00	0.13
Wat Longkhun	1.80	0.00	1.00	1.31	0.00	0.00	0.09
Mean	1.64	0.74	0.25	1.68	0.64	0.00	0.03
SD	0.18	1.48	0.50	0.61	1.27	0.00	0.03
Wat That	2.14	0.00	0.00	2.67	0.00	0.00	0.24
Wat Mano	2.33	3.07	0.00	2.48	9.64	1.73	0.26
Wat Phoxai	2.31	0.00	0.00	3.13	0.00	1.93	0.25
Wat San	1.75	0.00	1.00	2.89	0.00	1.39	0.22
Mean	2.13	0.77	0.25	2.79	2.41	1.26	0.24
SD	0.27	1.54	0.50	0.28	4.82	0.87	0.02
Wat Pahuak	1.31	0.00	0.00	1.16	0.00	0.00	0.11
Wat Pakhae	1.38	0.00	0.00	1.51	0.00	0.00	0.13
Mean	1.34	0.00	0.00	1.33	0.00	0.00	0.12
SD	0.05	0.00	0.00	0.25	0.00	0.00	0.01

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Table 2: Comparison the value of the size of elements in each group

Category	Elements of Sim									
	Width	Height of Sim Type 1	Height of Sim Type 2	Height of Sim Type 3	King Post Type 1	King Post Type 2	King Post Type 3	Roof Angle Type 1	Roof Angle Type 2	Roof Angle Type 3
Wat Pak Kharn	6.6	6.4	3.39	0	3.12	3.01	0	48	55	0
Wat That Luang	9.4	4.91	2.64	0	3.53	2.27	0	53	24	0
Wat Vixoun	11.5	7.71	5.1	0	2.53	2.61	0	42	26	0
Mean	9.17	6.34	3.71	0.00	3.06	2.63	0.00	47.67	35.00	0.00
SD	2.46	1.40	1.26	0.00	0.50	0.37	0.00	5.51	17.35	0.00
Wat Xiengthong	13.43	5.9	3.45	1.71	3.32	2.45	1.74	48	32	29
Wat Sibounheung	7.5	4.6	2.52	0	2.12	2.08	0	48	36	0
Wat Sob	10.5	3.71	2.05	0	3.29	1.66	0	53	22	0
Wat Pafang	8.25	5.83	2.9	0	3.49	2.93	0	63	39	0
Wat Phun Luang	10	3.91	3.02	1.53	1.74	0.89	1.5	47	38	21
Mean	9.94	4.79	2.79	0.65	2.79	2.00	0.65	51.80	33.40	10.00
SD	2.31	1.04	0.53	0.89	0.80	0.78	0.89	6.69	6.91	13.98
Wat Kili	4	2.34	0	0	3.2	0	0	56	0	0
Wat Xiengmoaun	8	5.8	2.71	0	3.112	3.14	0	55	50	0
Wat Paphai	6.5	3.92	0	0	4.03	0	0	49	0	0
Wat Longkhun	5.2	2.89	0	0	3.98	0	0	55	0	0
Mean	5.925	3.7375	0.6775	0	3.5825	0.785	0	53.75	12.5	0
SD	1.7193	1.5230	1.3550	0.000	0.4894	1.5700	0.0000	3.2016	25.0000	0.0000
Wat That	12	5.62	3.33	0	4.49	2.29	0	51	32	0
Wat Mano	16	6.88	5.21	3.48	6.44	1.66	1.73	62	38	28
Wat Phoxai	15	6.5	4.45	2.53	4.8	2.04	1.93	59	43	22
Wat San	11.5	6.58	4.78	3.4	3.98	1.8	1.39	53	39	29
Mean	13.625	6.395	4.4425	2.3525	4.9275	1.9475	1.2625	56.25	38	19.75
SD	2.2127	0.5419	0.8043	1.6263	1.0635	0.2771	0.8707	5.1235	4.5461	13.5247
Wat Pahuak	6.5	4.97	0	0	5.62	0	0	58	0	0
Wat Pakhae	7	5.07	0	0	4.63	0	0	55	0	0
Mean	6.75	5.02	0	0	5.125	0	0	56.5	0	0
SD	0.3536	0.0707	0.0000	0.0000	0.7000	0.0000	0.0000	2.1213	0.0000	0.0000

IV. CONCLUSION

From the study of historical documents and architectural evidence of Luangprabang Sim is possible to classify into 5 characteristic and divide the architectural study process in two ways:

i) Architectural study

ii) Architectural history study by studying in three main ways:

- Ideas or concepts of design
- Architecture designing
- Architectural design values

Table 4: Display the classification of the Sim construction in Luangprabang

Group	Amount	location area of Lunagprabang city	Characteristic	special Characteristic
Group 1	4	Internal	Tai-Lue	2-tiered roof
Group 2	39	Internal & External	Luanagprabang	1-3 tiered roof
Group 3	5	Internal	Xiengkhouang	1-tiered roof
Group 4	6	Internal	Composition	1-3 tiered roof
Group 5	2	Internal	Vientiane	1-tiered roof

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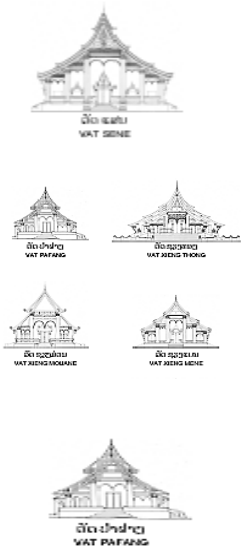
Table 5: Display five characteristic of Sim in Luangprabang

Group 1	Group 2	Group 3	Group 4	Group 5
				

The study of variant of architectural proportion analysis is to summarize the average of proportion of each Sim group, compared by representing average assumptions statistics for Two or more groups. There is also a comparation of statistical data such as standard deviation (SD) and coefficient of dispersion (CV). According to study, it has been found that the classification of Sim in Luangprabang can be divided into five categories according to racial aspects: Lue style, Luanagprabang style, Xiengkhouang style, Composition style and Vientiane style.

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