



An Assessment of the Values of French Colonial Townhouses in Hanoi Towards A More Sustainable Conservation

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Abstract: As the capital city of French Indochina, Hanoi was well planned by the French and immensely invested in the construction of public buildings as well as houses. In addition to public buildings and villas designed in French colonial styles that shaped the so-called distinctive architectural heritage in Hanoi throughout the colonial years, a large number of townhouses built during 1920 - 1950 which formed the cityscape of Hanoi in the first half of the 20th century should be noted. After nearly 70 years since the French army withdrew from the city, the number of French townhouses has considerably decreased. The remaining houses have shown that this is a real "treasure" that needs to be conserved because of their important values, not only in terms of urban architecture but also in cultural and historical aspects. However, a fact requiring special attention is that French townhouses in Hanoi - unlike French public buildings and villas - have not yet been recognised as heritage so that they can be kept to avoid the risk of deterioration or demolition under the impact of rapid urbanisation in the market economy. One of the main reasons for this negative urban development is that there has been no concrete or comprehensive rating system to assess the values of those townhouses which will closely correspond to their characteristics and contexts. Therefore, the authors - based on site surveys and by applying some appropriate methods such as expert consultations and case studies - have developed a full set of criteria to help evaluate those remaining townhouses as accurately as possible. This system can be used as a basis for a systematic assessment and classification towards a more effective conservation and even promoting the values of those townhouses with regard to the development of a modern society and in consideration of sustainable heritage conservation as a mainstream in the world.

Keywords: French townhouse, colonial style, Old Quarter, French Quarter, historical and cultural values, urban planning values, architectural values, landscape values, criteria, sustainable conservation

1. Introduction

1.1 Rationale

French townhouses in Hanoi began to be constructed more than 100 years ago. They have been eye-witnesses of the urban development of the historic centre of Hanoi throughout the 20th century and over the first two decades of the 21st century. Actually, as an integral part of the French colonial architectural heritage in Hanoi, but unlike the other two types namely villas and public buildings, French townhouses have not been systematically investigated. The database of French townhouses in Hanoi is generally rather limited. This type of urban housing has its own characteristics and is noted for high values in many cases. They need to be thoroughly and fully evaluated as a basis for a more efficient

conservation programme in the world's vision, towards sustainable conservation, in the context that French townhouses in Hanoi have been decreasing in both quantity and quality under the strong impact of urbanisation in recent years.

1.2 Establishment and Development of French Colonial Townhouses in Hanoi

The construction of French townhouses was associated with the urban development of Hanoi in the colonial period. The first French townhouses in Hanoi were built around 1885 in Paul Bert Street (Trang Tien Street and Hang Khay Street today) as part of the first road that the French planned in Hanoi to connect the Concession Area with the Old Citadel in 1884 (Masson, 1929). However, most French townhouses began to be constructed on a large scale from 1920 as seen on the front rooftop walls of many houses or as shown in the drawings of some houses that still remain. This was the period when the second French colonial exploitation programme was conducted and accelerated throughout Indochina to redevelop the economy in France from damage caused by the World War I (1914 - 1918). In order to reactivate the domestic economy, the French government decided to increase investment, thereby extracting material resources and consuming surplus goods, in the colonies in general and Indochina in particular by expanding urban areas and encouraging production, business and commercial activities of the indigenous population, instead of banning or restricting them as before (Tran, 2000). Seizing this opportunity, French construction contractors were licensed to build many rows of commercial townhouses with French colonial architectural styles in the French Quarter in the West of the Old Quarter (Ba Dinh District today) and the other French Quarter in the South (part of Hoan Kiem District and part of Hai Ba Trung District today).

In Hanoi Old Quarter (part of Hoan Kiem District and part of Ba Dinh District today), French townhouses were also built, but on a smaller scale in the first phase of development, because the structure of the Old Quarter in the late 19th century had become stable when the French troops invaded Hanoi. The French respected the tube houses there as much as possible. That is one traditional Vietnamese urban house style, which had been built throughout the Old Quarter before and the French only built French townhouses on vacant land lots or replaced the ones damaged by fire or as a consequence of poor restoration. The first French townhouses were built in Hanoi Old Quarter almost at the same time (in the 1920s) as those located within the French Quarters. After that the Vietnamese owners also gradually demolished their old houses to build multi-storey houses in French townhouse styles (Tran and Nguyen, 2004).

French townhouses built on a large scale in Hanoi met the demand for new homes of the city dwellers at that time, especially the Vietnamese intellectuals and bourgeoisies as well as the Chinese - the social groups who had early and frequent contact with French education and civilisation, so they led a spiritual cultural life and had ideas as well as conceptions more or less influenced by the Western culture, including in aesthetics and architecture.

The development of French colonial townhouses in Hanoi can be divided into six phases as follows:

Phase 1 - Establishment (1920 - 1929)

This phase took place in the context of the second French colonial exploitation programme. The needs for residence and business needs in some groups of urban residents increased and should be met in time: More spacious and comfortable townhouses became popular and replaced the traditional narrow shop-houses. French colonial townhouses were built on a large scale and better developed in the French Quarter, as seen in each row consisting of dozens of houses, while in the Old Quarter French colonial townhouses were only built in a limited number and mostly mixed with traditional houses. The designers paid more attention to the aesthetics of housing architecture, so the houses showed some new features because they were influenced by Western architecture, as reflected in a simplified form of the Neo-classical style, and at the same time some indigenous decorative elements could be found.

Phase 2 - Development (1930 - 1945)

This phase took place in the context of the global economic crisis of 1929 - 1933 and the world economy grew again until the outbreak of World War II (1939 - 1945). The demand for housing and business increased in the 1930s, followed by a decline during the World War II years. French colonial townhouses continued to be built in the French Quarter and especially in the Old Quarter, where tube houses were demolished to build new ones. Apart from Neo-classical architecture, Art Déco and Indochina were two new styles applied on the façades of some French colonial townhouses constructed in this period. The combination of Western architecture and indigenous architecture was shown more clearly than ever before.

Phase 3 - Destruction (1946 - 1947)

This phase took place when the French returned to Indochina and the Indochina War broke out at the end of 1946. Hanoi became the battlefield of fierce fighting between the French army and Viet Minh forces from the end of 1946 until early 1947. The Viet Minh evacuated the city residents from Hanoi and launched the policy called "destroying everything for the long-term resistance war", as they destroyed houses, roads, bridges, etc., including French townhouses, in order to prevent the French army from reoccupying the land. After two months, many French colonial townhouses were completely destroyed or severely damaged by bombs and shells.

Phase 4 - Recuperation (1947 - 1954)

This phase took place in the context that after nearly a year of fighting with Viet Minh forces, the French recaptured Hanoi and pursued the Indochina war (1946 - 1954) to restore the French domination in Vietnam. However,

this attempt was unsuccessful, forcing the French to withdraw their troops in accordance with the Peace Accord signed Geneva in 1954. In this period, the French wanted to restore Hanoi as the administrative centre of the French Far-East. French colonial townhouses were built on a larger scale than in the previous years to replace houses that had been destroyed or severely damaged by the war. By 1954, the system of French colonial townhouses in Hanoi was fully established, before Viet Minh army took over the capital city.

Phase 5 - Stable and unstable years (1955 - 1986)

This phase took place in the so-called peace-and-war context. The first 10 years after taking over Hanoi, the government of the Democratic Republic of Vietnam carried out programmes of economic recovery and development. From 1966 to 1972, the construction and development plan of Hanoi was interrupted by two bombardment operations of the US Air Forces. In this period, American bombs destroyed many densely populated neighbourhoods in the inner city of Hanoi. Many French colonial townhouses here were completely destroyed or severely damaged. However, there were no statistics ever published or announced. After the reunification in 1975, the subsidised economic mechanism applied throughout the country stunted almost all the development resources available, causing economic crises and the whole society fell into a recession. The economy stood still, construction activities were strictly controlled by the state, so this period was quite “stable” for French colonial townhouses, so the houses were “conserved” as they should be, because the actual situation did not allow people to decorate or renovate their houses or build new ones by themselves. However, the houses would gradually deteriorate over the years and since many households still lived there, as a result of the state’s housing distribution policy after taking over the capital city.

Phase 6 - Major changes (1987 to date)

This phase began with the 6th Congress of the Communist Party of Vietnam in December 1986 which adopted the Reform policy. Hanoi saw many important socio-economic changes brought by the market economy. The demand for both housing and business increased dramatically, creating great pressure on Hanoi's Old Quarters. Plots of land to build French colonial townhouses have great appeal to corporations and individuals, even real estate companies, because those houses are located in very convenient and sometimes ideal places. French colonial townhouses therefore declined in both quantity and quality. Many old houses were demolished to build new ones. Others were renovated but did not take originality into account or enlarged significantly. They still stay relatively intact but deteriorate quickly because they are not maintained properly or repaired regularly. Under the impact of rapid and uncontrolled urbanisation, the cityscape of the Old and French quarters has changed negatively, and French colonial townhouses are largely influenced as aforementioned.

1.3 Number and Distribution of French Colonial Townhouses in Hanoi Today

As of December 2022, there were 1,932 French colonial townhouses in four central districts, namely Hoan Kiem, Ba Dinh, Dong Da and Hai Ba Trung. The number of French colonial townhouses per street is given in Table 1 and their distribution is shown in Fig. 2 with Hoan Kiem District as the most densely constructed area in Fig. 3.

Table 1 - Number of French colonial townhouses per street as of December 2022
(Tran Quoc Bao, Nguyen Hai Van Hien & Vu Thi Huong Lan, 2022)

No.	Old Quarter	Quantity	No.	French Quarter	Quantity
	STREET			STREET	
01	Bat Dan	19	01	Au Trieu	04
02	Bat Su	14	02	Ba Trieu	21
03	Cao Thang	02	03	Bach Mai	44
04	Cau Go	19	04	Bui Thi Xuan	06
05	Cha Ca	13	05	Chan Cam	04
06	Cho Gao	03	06	Chau Long	15
07	Cong Duc	05	07	Cua Bac	02
08	Cua Dong	17	08	Cua Nam	15
09	Dao Duy Tu	14	09	Dang Dung	02
10	Dinh Liet	09	10	Dinh Tien Hoang	06
11	Dong Thai	03	11	Doi Can	07
12	Dong Xuan	04	12	Hai Ba Trung	08
13	Duong Thanh	29	13	Ham Long	13
14	Gia Ngu	12	14	Hang Bai	11
15	Ha Trung	18	15	Hang Bun	04
16	Hang Bac	16	16	Hang Chao	02
17	Hang Be	10	17	Hang Dau	06
18	Hang Bo	31	18	Hang Khay	06

No.	Old Quarter	Quantity	No.	French Quarter	Quantity
19	Hang Bong	90	19	Hang Than	15
20	Hang Buom	27	20	Hang Trong	09
21	Hang But	02	21	Hang Voi	02
22	Hang Ca	02	22	Hoa Ma	11
23	Hang Can	15	23	Hoe Nhai	12
24	Hang Chieu	25	24	Hong Phuc	12
25	Hang Chinh	11	25	Hue	64
26	Hang Cot	24	26	Kham Thien	51
27	Hang Da	10	27	Le Duan	20
28	Hang Dao	43	28	Le Ngoc Han	01
29	Hang Dau	31	29	Le Van Huu	05
30	Hang Dieu	21	30	Lien Tri	03
31	Hang Dong	09	31	Lo Duc	25
32	Hang Duong	24	32	Lo Su	12
33	Hang Gai	42	33	Ly Quoc Su	03
34	Hang Ga	13	34	Ly Thai To	06
35	Hang Giay 1	11	35	Ly Thuong Kiet	01
36	Hang Giay 2	14	36	Mac Dinh Chi	02
37	Hang Hom	06	37	Mai Hac De	10
38	Hang Khoai	09	38	Nam Ngu	03
39	Hang Luoc	09	39	Nam Trang	02
40	Hang Ma	19	40	Ngo Tat To	03
41	Hang Manh	05	41	Ngo Thi Nham	14
42	Hang Muoi	02	42	Ngu Xa	02
43	Hang Ngang	33	43	Nguyen Binh Khiem	03
44	Hang Non	10	44	Nguyen Che Nghia	02
45	Hang Phen	03	45	Nguyen Cong Tru	03
46	Hang Quat	15	46	Nguyen Du	04
47	Hang Ruoi	12	47	Nguyen Khac Can	01
48	Hang Thiec	05	48	Nguyen Khac Nhu	02
49	Hang Thung	04	49	Nguyen Khuyen	11
50	Hang Tre	02	50	Nguyen Luong Bang	04
51	Hang Vai	19	51	Nguyen Thai Hoc	24
52	Lan Ong	23	52	Nguyen Thiep	02
53	Lo Ren	04	53	Nguyen Thuong Hien	04
54	Luong Ngoc Quyen	14	54	Nguyen Trung Truc	06
55	Luong Van Can	29	55	Nguyen Truong To	06
56	Ma May	18	56	Nha Chung	02
57	Ngo Gach	04	57	Nha Tho	04
58	Ngo Tram	11	58	Pham Hong Thai	07
59	Nguyen Huu Huan	14	59	Pham Su Manh	01
60	Nguyen Quang Bich	16	60	Phan Boi Chau	02
61	Nguyen Sieu	16	61	Phan Chu Trinh	01
62	Nguyen Thien Thuat	03	62	Phan Dinh Phung	01
63	Nguyen Thiep	09	63	Phan Huy Ich	09
64	Nguyen Van To	12	64	Pho Duc Chinh	09
65	Nha Hoa	03	65	Phu Doan	10
66	Phung Hung	57	66	Phu Dong	11
67	Ta Hien	15	67	Phung Khac Khoan	03
68	Thanh Ha	01	68	Quan Su	05
69	Thuoc Bac	28	69	Quan Thanh	22
70	Tran Nhat Duat	14	70	Quang Trung	02
71	To Tich	06	71	Son Tay	03
	LANE		72	Tay Son	05
72	Cau Go	03	73	Thai Phien	01
73	Phat Loc	02	74	Thi Sach	05
74	Tam Thuong	02	75	Tho Nhuom	01

No.	Old Quarter	Quantity	No.	French Quarter	Quantity
75	Trung Yen	01	76	To Hien Thanh	10
76	Yen Thai	02	77	Ton Duc Thang	07
	Total	1,113	78	Tong Dan	01
			79	Tong Duy Tan	08
			80	Tran Hung Dao	10
			81	Tran Nhan Tong	04
			82	Tran Phu	01
			83	Tran Quang Khai	03
			84	Tran Quoc Toan	07
			85	Tran Xuan Soan	10
			86	Trang Thi	09
			87	Trang Tien	14
			88	Trieu Viet Vuong	21
			89	Truc Bach	02
			90	Truong Dinh	07
			91	Truong Han Sieu	04
			92	Tue Tinh	09
			93	Van Mieu	05
			94	Yen Ninh	10
			95	Yen Phu	13
			96	Yet Kieu	05
				LANE	
			97	Bao Khanh	01
			98	Chau Long	02
			99	Hang Bun	05
			100	Hang Dau	01
			101	Hoi Vu	06
			102	Hue	01
			103	Ngo Huyen	03
			Total	819	

1.4 Literature Review

In the book entitled “Hanoi - Enjeux Modernes d'Une Ville Millénaire” published in 2002, François Charbonneau and Do Hau interpreted the years 1873 - 1920 as a period of transition between traditional and colonial architecture, and the 1920s until 1954 was the flourishing time of French colonial architecture. The two scholars also clarified the so-called not-so-positive transformation of French architecture in the market economy, when the buildings were not properly renovated or restored, or even demolished and built either in modern styles or in fake styles. However, French colonial townhouses were not mentioned because the authors just focused on the transformation of French villas. Only the case study - Bui Thi Xuan neighbourhood - with 15 street lots and over 700 houses of all kinds was selected, where French colonial townhouses were analysed along with other types of urban houses when they were classified by plot and purpose of use (Charbonneau and Do, 2002).

The book “Hanoi - A Cycle of Changes” published in 2005 and written by Piere Clément and Nathalie Lancret presented the development of Hanoi City through seven master plans made by the French authorities in 1873, 1890, 1902, 1911, 1925, 1935 and 1943. The publication primarily investigated French colonial public buildings and villas, such as Hanoi Opera House and the General Governor Palace of Indochina, villa at No. 3 Nguyen Binh Khiem Street, etc. French colonial townhouses are only mentioned to a very limited extent, with three separate examples of the formation and transformation of three cases: house at No. 24 Nguyen Van To Street, house at No. 94 Hang Bong Street and house No. 112 Bui Thi Xuan Street (half townhouse, half villa) (Clément and Lancret, 2005).

Hanoi Capital City Master Urban Development Programme was a cooperation project between Japan International Cooperation Agency (JICA) and Hanoi City People’s Committee conducted from 2004 to 2007, under the section Pilot Project. The researchers discussed the conservation and sustainable development of the Old Quarter through the selection of a street block and a particular street for planning in Hang Buom Ward. The proposed plot development plan is expected to meet the requirements of an effective use of limited land and increase the value of land; including preserving, restoring and creating traditional values; strengthening economic activities with traditional and new values; facilitating social networks and communities; enhancing the attractiveness and originality of the streets with safety and comfort as two key factors. However, because the urban planning scheme only emphasised the conservation of French townhouses in the main street, the core of the block and most of the townhouses on the remaining streets would be

renovated into a Development Area including orchards in the core and new multi-storey houses built along the streets, so it was not feasible in the current urban development conditions of Hanoi (JICA and Hanoi City People's Committee, 2007).

Apart from that, there were a number of research projects related to the conservation of colonial architectural heritage in Hanoi, which discussed the development of a heritage assessment criteria system, but they focused on the villas in Hanoi City (Doan et al., 2011), colonial architectural heritage in general in Hanoi (Tran, 2016), or educational buildings (Tran et al., 2021). Each study has its own purpose, so the researchers targeted different sets of criteria for classifying French buildings in Hanoi.

In his research on the architectural values of French colonial townhouses in the French Quarter of Hanoi, Nguyen Quang Minh pointed out that the architectural values of French colonial townhouses would be reflected at two levels: planning and building. The outstanding architectural value of French colonial townhouses could be found in the harmony of proportions, façade divisions and sophisticated decorative details on the front sides, in some cases the year of completion was added to the rooftop pediment. In addition, the row of dozens of townhouses and the diversity (or similarity) of styles among houses in the same row are also remarkable values of French colonial townhouses (Nguyen, 2016).

Nguyen Quang Minh also conducted another study on French colonial townhouses in Hanoi's Old Quarter. He summarised the history, highlighted the distribution and analysed the characteristics of French colonial townhouses in the Old Quarter of Hanoi; then determined the values of French colonial townhouses in this area from a comprehensive perspective, including architectural values and other values. On that basis, he proposed a system of criteria for evaluating the values of and ranking French colonial townhouses in Hanoi Old Quarter; thereby providing some principles and a number of solutions to conserve the townhouses with the highest values in consideration of business activities and with regard to an improvement of the living quality for the house owners (Nguyen, 2017 and 2018).

In 2018, Nguyen Vinh Quang undertook an individual study on the identification of French colonial townhouses in the French Quarter. Then he clarified in his PhD thesis defended at Politecnico di Milano (Italy) in 2019 the historical, cultural and architectural values of French colonial townhouses along with their contribution to the cityscape, thereby identifying the characteristics and major changes over time of French colonial townhouses in the French Quarter. He also made recommendations on the conservation and management of French townhouses within this quarter in a modern view (Nguyen, 2018 and Nguyen, 2019).

An overview of studies on French colonial townhouses in Hanoi and a comparison with other studies on French villas and public buildings in the city together show that villas and public buildings have been systematically examined by international scholars and domestic research institutes. Hanoi City People's Committee has issued regulations on the management and use of French colonial buildings (Hanoi City People's Committee 2013 and Hanoi City People's Committee, 2014), while French colonial townhouses have been almost ignored and not yet recognised as heritage, and therefore there are still no management policies as well as regulations towards an efficient use and a long-awaited balance of benefits among those involved.

1.5 Research Objectives and Methods

The objective of the study is to identify, evaluate and rank French colonial townhouses as heritage in central Hanoi with 1,932 houses that still remain to date for better conservation solutions towards sustainability. The authors used the following methods: data analysis, field survey and expert consultation (with the assessment of ten experts in the form of questionnaires, showing high consistency in rating distribution per criterion) and case studies (with four typical French colonial townhouses carefully selected) in order to achieve the research objectives and obtain expected results. French colonial townhouses should be comprehensively and thoroughly assessed, including values in the following categories: 1. history and culture, 2. chronology, 3. maintaining of function, 4. originality, in addition to the probably well-known values in architecture and cityscape.

2. Characteristics of French Colonial Townhouses in Hanoi

French colonial townhouses in the Old Quarter and French Quarter are characterised with the following features:

Standing in a long row: This feature is more evident in the French Quarter than in the Old Quarter. The French colonial townhouses here are the same or similar in architectural style(s), forming a long row, sometimes 30 to 40 units (in the past), only interrupted by another street or a small lane leading to the core of the street block. Such a long row has itself shown the values of urban planning and design, as reflected in the order and unity (when the façades are the same) or the diversity and vividity (when the façades are different). In both cases, the French carefully studied the housing morphology to achieve both aesthetics for each house and harmony for the entire row. In the Old Quarter, except Ta Hien Street with 12 houses standing next to one another into a long row, other cases are either single houses or groups of two to five houses.

Height: The vast majority of French colonial townhouses are two storeys in height. A very small number of houses are built with one storey or three to four storeys. None of the original houses are more than four stories high as noted from the actual survey. Houses of five floors or more are all expanded by the residents. A typical house is usually 3.5 -

4 m/floor in height, depending on the width of the house. The stairs are completely made of wood or constructed with concrete slabs and brick steps.

Dimensions: A typical house is 4 m or more in width. The widest house can be up to 8 m. The length of the house may vary from 15 to 40 m. When the house is 30 m or more in length, it is normally divided into two to three blocks by one or two courtyards, hereby solving the problem of dark or stuffy rooms and providing sufficient daylight and natural ventilation for the living rooms (see Fig. 4a and 4b).

Structure: The main house consists of two blocks, with a staircase in the middle turning to the right into one household and to the left into another. Inside there is a small yard separating the main house from the one-storey sub-house (kitchen and bathroom - toilet area) at the rear.

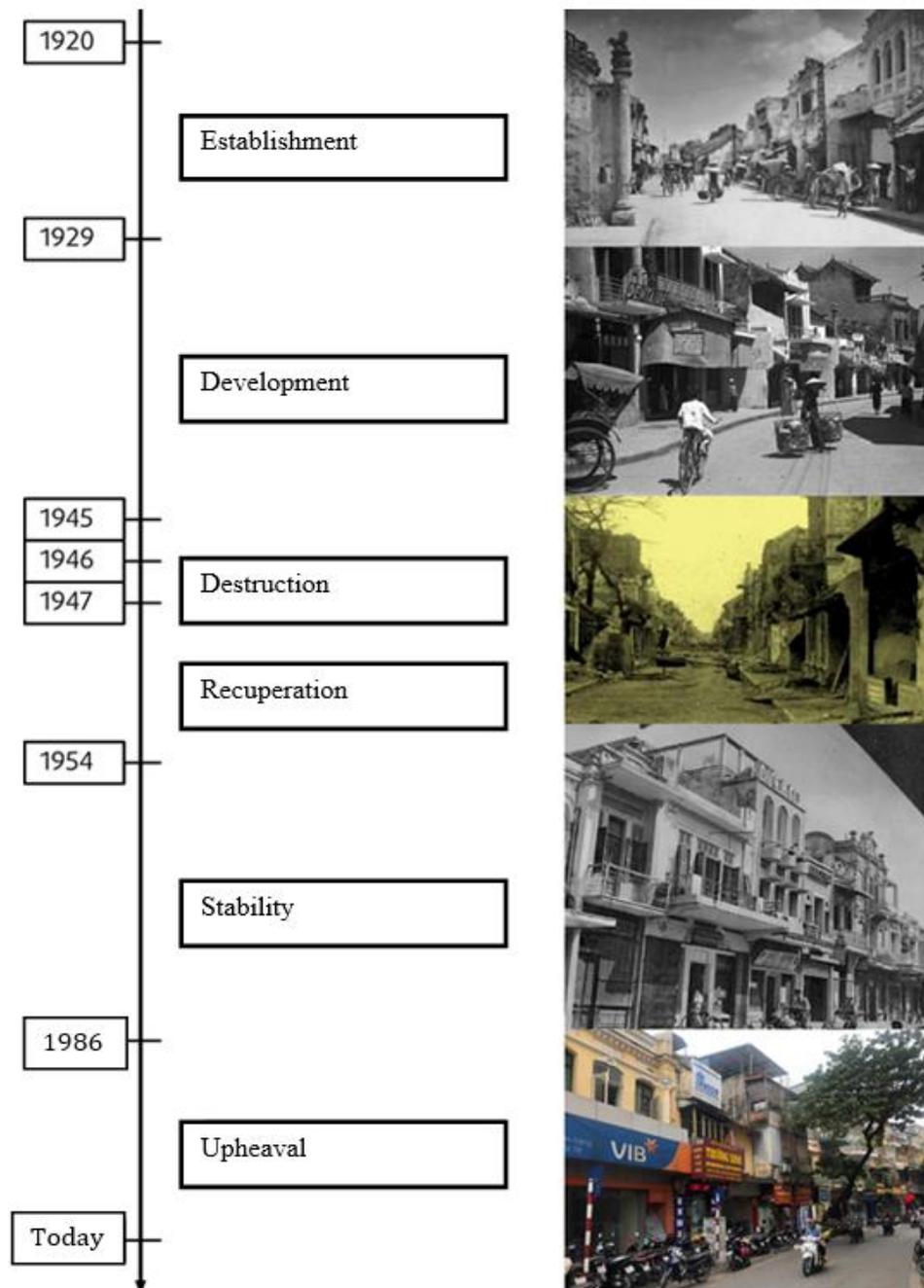


Fig. 1 - Timeline of development of French colonial townhouses in Hanoi (Nguyen Quang Minh, 2022)

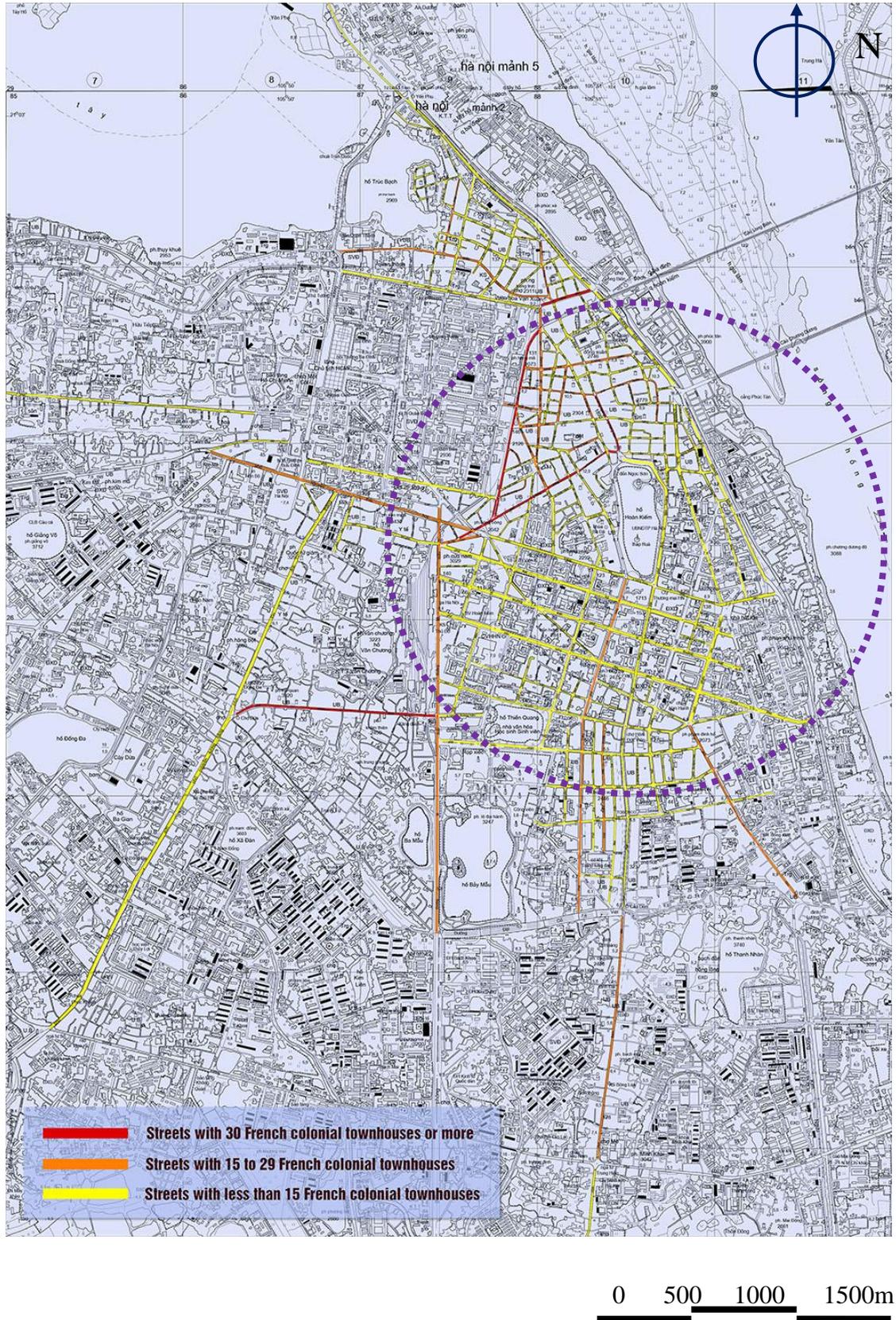


Fig. 2 - Distribution of French colonial townhouses in Hanoi as of December 2022 (Dang Viet Long, 2022)

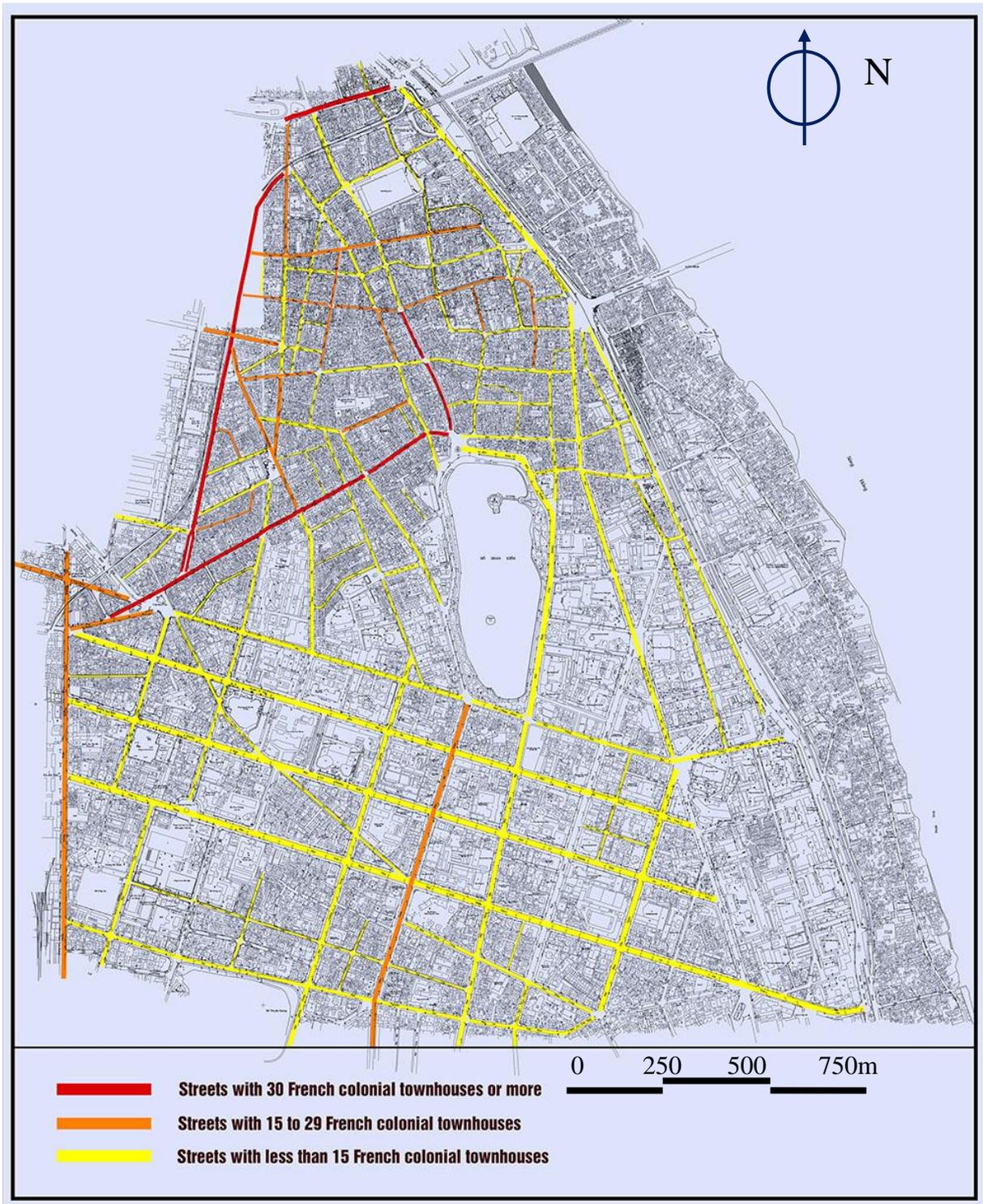


Fig 3 - Distribution of French colonial townhouses in Hoan Kiem District as of December 2022 (Dang Viet Long, 2022)

Number of households: Initially only one or at most two households lived in one house. When there was only one household, the use of space would be very simple. In case of two different households that were not relatives living in the same house, there would be two possibilities: 1) Household A occupied both floors in the front whereas both floors at the back belonged to Household B (divided by block and people shared the common stairs) or 2) Household A lived on the ground floor and Household B took the entire upper floor (divided by floor, and the stairs were mainly used by members of Family B). If there was no narrow lane alongside the house from the front to the back of the block at one end of the row, one path - about 1 m wide - should be separated from the ground floor plan for households living at the rear or on the second floor.

Purpose of use: Doing business (the front room on the ground floor) and living (the remaining area of the ground floor and the entire upper floor). Almost 100% of French colonial townhouses have the front room on the ground floor to be used as a business store or for rent as an office, or to provide a variety of daily life services. The living space takes up the remainder of the ground floor and the entire upper floor(s). In some cases of French colonial townhouses, especially those with façades over 6 m in width, there are two or three shops with two or three different types of business activities in the front. Almost 100% of the ground floor façades in French colonial townhouses with shops have been renovated, so the façade is different from the original one (with modern structures and materials, such as rolling doors outside and glazed or aluminium glazed doors inside, stone cladding, installing billboards with lights in the evening and at night, as well as a movable awning to cover the shop from the rain and sun, etc.). Therefore, it is necessary to accept the fact that the value of architecture and art combined as well as the originality of almost all the French colonial house is shown only on the second floor façade (and third floor façade in some cases).

Structures and materials: French colonial townhouses are all built with load-bearing brick wall structures, with additional supporting pillars made of bricks wherever appropriate. The floor can be made of reinforced concrete with square flooring tiles of 20 cm x 20 cm, or ironwood with wooden beams, except for wet areas such as kitchens and toilets. Similarly, stairs can be made entirely of good-quality and termite-free wood or reinforced concrete slabs with brick steps.

Architectural styles: French colonial townhouses were built in two main styles: French neo-classical architecture which prevailed in the first period (1920 - 1930) and modern architecture (Art Déco and Art Nouveau) appeared and became popular in the later years (1930 - 1945 and 1947 - 1954).

Built form: Relatively simple, square, and not as diverse as in French villas.

Decorative details: Decorative details are quite diverse and different classifications can be applied.

- + Symmetry: There are two main types of French colonial townhouses in terms of morphology, namely completely symmetrical and partially symmetrical, depending on the location of the house in a row as well as on the number of households living in that house. In French colonial townhouses with only one household living inside, located whether at one end or in the middle of the row, the structure of the house is symmetrical with a door in the middle and two small windows on both left and right sides, both downstairs and upstairs. If there is no balcony, the upper floor will have three windows instead of two windows and one door. In French colonial townhouses with many households living inside, at any one end of the block, the house will have an extra path from the side of the house (alley or perpendicular street) leading directly to the common staircase area, from which people gain access to each household. The morphology of the house in this case remains symmetrical. But if that house is built in the middle of the row, the façade will become asymmetrical due to a side walkway leading directly to the stair area and out to the rear courtyard (see Fig. 5). Only in case of one multi-family house with a wide front side, this common passage can be put in the middle, the width of the remaining two rooms is about 3 - 3.5 m per room, sufficient for business, then the built form should be morphologically symmetrical.
- + Roof: Tile roofs are usually sloped on two sides - front and back. Flat roofs are rare, often applied to houses in the Art-Déco style.
- + Rooftop wall pediment: It goes with or without rooftop wall pediments, depending on the roof form.
- + Balcony: Such a house may go with or without a balcony. If there is a balcony, it is quite small, in the middle, rarely built in a solid form, but made with railing consisting of either iron bars or concrete spokes. In their simplest form, these concrete spokes are straight bars. More sophisticated is the casting of the letter “swastika” or “longevity” in Chinese language. Balconies running across the width of the house were also applied, but are rarely seen today. Some houses have porches on the second floor with a setback space of about 1.5 m, instead of building a balcony out from the front wall.
- + Façade division: The houses all have horizontal façade divisions, as shown in the floor cornices. For townhouses with a width of more than 6 m, vertical façade divisions including wall pillars or embankment columns are applied to create a more harmonious façade. Such pillars and/or columns divide the façade into three intervals, the one in the middle is usually a little wider than the other two on both sides.
- + Decorative details: A very simple form is a flat cornice with a large knurled band. A more delicate pattern is the one with frills to create a horizontal division for the façade. Even more sophisticated is a type of decoration with embossed stucco details in elegant floral motifs in French classical style (see Fig. 6a and 6b) or simple motif in Art Déco style (see Fig. 6c and 6d). On the façade of some French colonial townhouses, there is a combination of Vietnamese details (reliefs in the form of paper or silk scrolls that look like the Royal ordinances as often seen in pagodas or ancient epitaphs) with border decorations in French frills as described above. Some special cases should be noted, such as a row of French colonial townhouses near Central Grand Cathedral with religious decorative mouldings on windows, three pointed arches from Gothic churches interspersed with three-petal flowers, because the owners of those house were formerly parishioners or dignitaries in the church.

- + Colours: The frequently used and preferred colours are light yellow, saffron yellow, light pink, grey blue and ivory white. Decorative details such as mouldings, floral cornices, etc. are made of mortar, embossed and painted white on a darker background to ensure the contrast in colours.
- + Special features: Those special features cannot be found in any French colonial villas, only seen in some French colonial townhouses, in one of the following two types:
 - Type 1: The year of completion is shown on the front rooftop wall, in the middle, made of mortar, usually framed with a rectangular or circular border, or sometimes a polygonal shape. This detail can be regarded as a very special feature of a French colonial townhouse and as an “open profile” about the house as well (see Fig. 6e).
 - Type 2: Letter blocks are plastered with mortar or cast in concrete and then mounted on the rooftop front wall. If these letters are Chinese characters, it reveals that the first owners of these French colonial townhouses came from China. In case of Vietnamese characters, these shops were own by Vietnamese people who succeeded in doing business and became famous. Such French colonial townhouses can still be seen today in Hue Street, Hang Bong Street, Cua Nam Street, etc (see Fig. 6f).

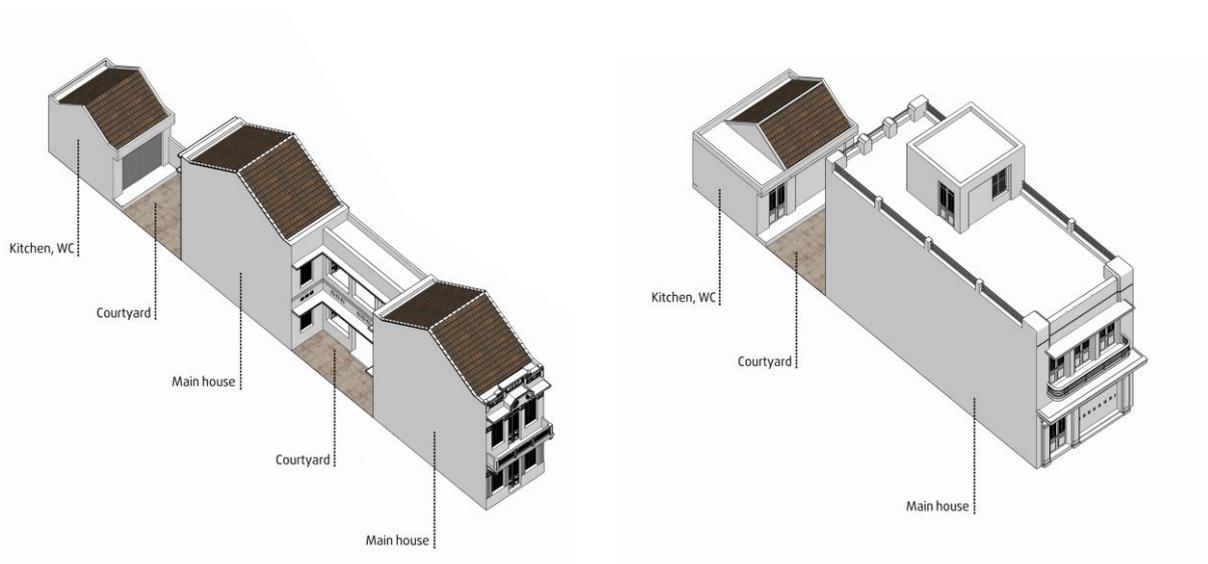


Fig. 4a - Structure of a typical French colonial townhouse in the Old Quarter of Hanoi (Dang Viet Long, 2022)

Fig. 4b - Structure of a typical French colonial townhouse in the French Quarter of Hanoi (Dang Viet Long, 2022)

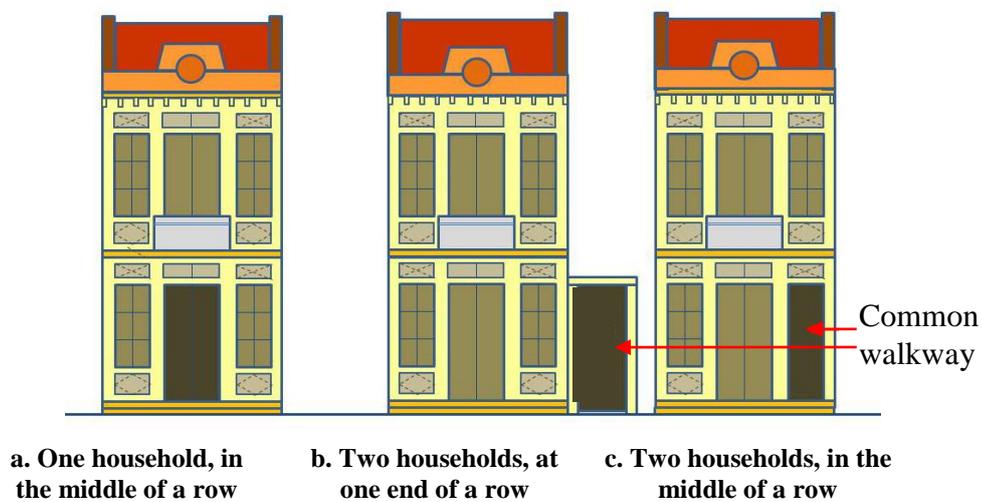


Fig. 5 - The symmetry of a French colonial townhouse depends on the number of households and location of the house in one row (Nguyen Quang Minh, 2017)



Fig. 6a - Façade of French colonial townhouse at No. 57B Hang Bo Street - Typical for French classical style (Nguyen Quang Minh, 2022)



Fig. 6b - Façade of French colonial townhouse at No. 61 Ma May Street - Typical for French classical style (Nguyen Quang Minh, 2022)



Fig. 6c - Façade of French colonial townhouse at No. 37 Hang Bo Street - Typical for Art Déco style (Nguyen Quang Minh, 2022)



Fig. 6d - Façade of French colonial townhouse at No. 48 Hang Ngang Street - Typical for Art Déco style (Nguyen Quang Minh, 2022)



Fig. 6e - Façade of French colonial townhouse at No. 58A Hue Street - with year of completion 1922 on the rooftop front wall (Nguyen Quang Minh, 2022)



Fig. 6f - Façade of French colonial townhouse at No. 95 Hang Bong Street - with the name of the shop and shop owners on the rooftop front wall (Nguyen Quang Minh, 2022)

3. Method of Assessment and Classification of French Colonial Townhouses in Hanoi

3.1 Background for Evaluation Criteria

French colonial townhouses in Hanoi are not only valuable in terms of architecture and cityscape, but also in terms of history - culture, chronology, preservation of function and originality. Therefore, in this study, the authors decided to go into the assessment of the above-mentioned values by means of interviewing people living or working in those houses while undertaking field surveys in order to understand more about the houses and their intangible values.

- History and culture: Some of the French colonial townhouses are somehow related to an important event of Vietnam and/or a celebrity in the country's or the city's history, for example the house at No. 48 Hang Ngang Street, in which President Ho Chi Minh drafted the Declaration of Independence for Vietnam in September 1945. Cultural values can be reflected in certain houses that used to be the residence or workplace of a famous writer or artist, for instance, house No. 108 Hang Bong Street was the residence of famous physician Nguyen Ngoc Doan. Traditional handicrafts are still maintained by some households to this day, such as Hang Duong Street specialises in making jams and candies, Hang Thiec Street and Lo Ren Street deal in metal utensils and household wares, Hang Bac Street is famous for gold and silver smith, Hang Dong Street sells copper incense burners, vases and jars for worshipping, Hang Ma Street produces folk toys for children as well as thanksgiving goods for ancestors and gods, Lan Ong Street provides herbal medicines, etc. These products are also considered cultural values. In the decoration of the façade, there is a combination of French, Chinese and Vietnamese motifs and patterns that are evidence of cultural exchange in architecture;
- Chronology as another value can be reflected in the time of construction of the house. French colonial townhouses were built from the late 19th century until 1954, so the year of construction forms part of the values of the house. Although the year of construction can only be accurately determined in a small number of houses with evidence showing the year of completion either on the pediment or in the building documents that are still kept by the house owners, it is possible to approximately determine the time of construction by interviewing the house owners or through the architectural styles of the façades in comparison with another house supposed to be built at the same time with clear evidence;
- Conservation of function is demonstrated in whether the house still retains its original function as a residence for one family or has been converted into a residence for many households, or has even completely changed the function, for example, it has become the headquarters of an agency which is quite important because it affects the façade of the house when the brand name signboard or some temporary decorations may be attached to the front wall and hide part of the façade;
- Originality is shown in the state of preservation of the initial built form of a house, parts and details defined to be as close to the "original" as possible. A degraded building, if it is properly repaired or restored in accordance with its original state thanks to adequate archival documents (design drawings, old photographs, etc.) is still accepted, not necessarily maintaining the deterioration in order to be considered "original";
- The architectural value of a French colonial townhouse can be seen on the façade because these houses were built next to one another into a long row. A house in the middle of a row has only one façade facing the street, but the one on the street corner has two façades, thus it can be better observed. The architectural value of such a townhouse can also be assessed through the width-to-height ratio of the façade, the special features, the horizontal and vertical façade divisions, the harmony of the details, such as doors, windows, balconies, components, details and especially decorative motifs. An architectural style or a harmonious combination of styles can also be noted with special features representing each style and generally included in the architectural values;
- The value of cityscape is partially reflected in the location of the house. Accordingly, the value of the house will increase if it is built in areas with more business and/or tourism activities so that many people can see and feel the atmosphere as much as possible. If a house is located in good places, such as at T-junctions or street intersections, where the house enjoys a nice view over a relatively large space, or in the main streets with a large enough street width, so that the house can be more easily observed from afar. Because it is a row of townhouses, the continuation of the houses and the length of the row should be taken into account as a criterion. Accordingly, houses that stand next to each other (two houses) or one another (three houses or more) are obviously better than the one standing alone. The houses can be exactly the same or similar, or even different in styles and details. If there is a similarity, the houses have a value in terms of unity. Otherwise, diversity can be highlighted. This needs to be considered and assessed case by case.

3.2 Criteria for Assessment and Classification of French Colonial Townhouses in Hanoi

On the basis of studying the characteristics of French colonial townhouses in Hanoi as presented in sub-section 2.2 and the values of these houses as analysed in sub-section 3.1, a full system of evaluation criteria and rating scale can be developed in Table 2 below. Among the six aforementioned values, architecture and particularly the façade of the

house should be the most important part with the highest score (52 out of 100 points). This system can be used to assess the values of any individual French colonial townhouse and put into its profile.

Table 2 - Criteria and rating system per criterion for the evaluation of a French colonial townhouse

Criteria	Sub-criteria	Max. point	Given point
1. History and Culture (HC) (12 points)	1.1. History	4	
	- Related to a historical event of Vietnam	2	
	- Related to a historical event of Hanoi	1	
	- Related to a historical celebrity of Vietnam	2	
	- Related to a historical celebrity of Hanoi	1	
	1.2. Culture	8	
	- Related to a cultural celebrity of Vietnam	2	
	- Related to a cultural celebrity of Hanoi	1	
	- A handicraft has still been well kept	2	
	- A handicraft has still been partially kept	1	
	- A traditional business has still been well kept	2	
	- A traditional business has still been partially kept	1	
	- A cultural exchange can be reflected in the way the house is decorated	2	
	2. Chronology (CH) (5 points)	Construction time	5
- Before 1930		5	
- From 1930 to 1945		3	
- From 1946 to 1954		1	
3. Maintaining the Function (MF) (6 points)	Initial function and current function of the house	6	
	- Still in use, the same as the initial function	6	
	- The initial function has slightly changed	4	
4. Authenticity/Originality (AO) (8 points)	- The initial function has considerably changed	2	
	4.1. Authenticity/Originality of the ground floor	4	
	- Staying intact	4	
	- Staying almost intact, with minor damage	3	
	- Repaired with respect to authenticity/originality	2	
	- Repaired, almost the same as authenticity and/or originality	1	
	4.2. Authenticity/Originality of the first floor (and second floor, if applicable)	4	
	- Staying intact	4	
	- Staying almost intact, with minor damage	3	
	- Repaired with respect to authenticity/originality	4	
- Repaired, almost the same as authenticity and/or originality	1		
5. Architecture of the Façade (AF) (52 points)	5.1. Façade ratio (close to Golden Ratio)	6	
	- Very high level	6	
	- High level	4	
	- Medium level	2	
	5.2. Front wall	33	
	- Pediment with fine details and decorations	3	
	- Pediment with simple details and decorations	2	
	- Pediment with just a few details and decorations	1	
	- Rooftop wall with shop name or year of construction made of mortar	3	
	- Wall underneath pediment with fine details and decoration	3	
	- Wall underneath pediment with simple details and decoration	2	
	- Wall underneath pediment with just a few details and decoration	1	
	- Wall pillars with fine details and decorations	3	
	- Wall pillars with simple details and decorations	2	

Criteria	Sub-criteria	Max. point	Given point
	- Wall pillars with no details and decorations	1	
	- Fine cornices and details on both sides of the door	3	
	- Simple cornices and details on both sides of the door	2	
	- Just a few cornices and details on both sides of the door	1	
	- Fine cornices and details on both sides of the windows	3	
	- Simple cornices and details on both sides of the windows	2	
	- Just a few cornices and details on both sides of the windows	1	
	- Fine cornices and details above the door	3	
	- Simple cornices and details above the door	2	
	- Just a few cornices and details above the door	1	
	- Fine cornices and details above the window	3	
	- Simple cornices and details above the windows	2	
	- Just a few cornices and details above the windows	1	
	- Fine cornices and details underneath the window	3	
	- Simple cornices and details underneath the windows	2	
	- Just a few cornices and details underneath the windows	1	
	- Balcony with fine rail decorations	3	
	- Balcony with simple rail decorations	2	
	- Balcony with no rail decorations	1	
	- Balcony without rails but with other details	1	
	- Balcony with fine hand rails	3	
	- Balcony with simple hand rails	1	
	5.3. Doors and windows	10	
	- Doors with arches	2	
	- Doors with simple rectangular door frames	1	
	- Windows with arches	2	
	- Windows with simple rectangular window frames	1	
	- Doors with fine grids	2	
	- Doors with simple grids	1	
	- Windows with fine grids	2	
	- Windows with simple grids	1	
	- Symmetrical door and windows (door in the middle, windows on both sides)	2	
	- Asymmetrical door and windows (door on one side, windows on the other side)	1	
	5.4. Architectural style(s)	3	
	- One style, clearly reflected	3	
	- Two or more styles, harmoniously combined	2	
	- No particular style	1	
6. Cityscape (CS) (17 points)	6.1. Location of the house	10	
	- Located in one area with many business and tourism activities	4	
	- Located in one area with many business activities	2	
	- Located in one area with many tourism activities	2	
	- Located in one main street, at the crossroads with another main street	6	
	- Located in one main street, at the crossroads with a narrow street	5	
	- Located in one main street, between two crossroads	4	
	- Located in one narrow street, at the crossroads with another narrow street	3	
	- Located in one narrow street, between two crossroads	2	
	- Located in one narrow lane	1	

Criteria	Sub-criteria	Max. point	Given point
	6.2. Continuity of townhouses (length of the row)	5	
	- More than eight houses in one row	5	
	- Seven to eight houses in one row	4	
	- Five to six houses in one row	3	
	- Three to four houses in one row	2	
	- Two houses next to each other	1	
	6.3. Harmony of houses in one row	2	
	- Harmony in the number of storeys and styles	2	
	- Harmony in the number of storeys	1	
	- Harmony in the styles	1	
Total		100	

Each French colonial townhouse (CT) out of a total of 1,932 townhouses that still remain to date (as of December 2022) will be evaluated based on the total score of 06 values as described and calculated as follows:

$$CT = HC + CH + MF + AO + AF + CS$$

Each French colonial townhouse was rated independently by five members of the team and five external specialists. The final score will be the average ratings of ten experts. The results should be agreed upon by all members of the research team.

3.3. Proposal for the Classification of French Colonial Townhouses in Hanoi

It is proposed to classify French colonial townhouses in Hanoi to understand well the value of each house. The classification will support the future research projects on the conservation of Hanoi townhouses towards sustainability in terms of economy, society and cityscape which can solve the conservation problems corresponding to the value of each townhouse and the whole street.

The value of French colonial townhouses in Hanoi will be ranked on the score given by experts. As presented in sub-section 2.2, the research team proposes four groups of values:

- Group A means special value: total score from 76 to 100 points (of which the score of the façade is not less than 38 points);
- Group B means high value: total score from 51 to 75 points (of which the score of the façade is not less than 25 points) and those with 76 points or more but the score of the façade is below 38 points;
- Group C means medium value: total score from 26 to 50 points and those with 51 points or more but the score of the façade is below 25 points;
- Group D means low value: total score less than 25 points.

4. Results of Evaluation and Classification of French Colonial Townhouses in Hanoi

4.1. Case Studies

- Criteria to select case studies

The research team selected four houses out of 1,932 houses surveyed to illustrate the rating and classifying process based on three criteria:

- The selected houses represent four value groups proposed by the research team: Houses of special value, houses of high value, houses of medium value and houses of low value.
- The selected houses represent the two main styles on the façade of French colonial townhouses in Hanoi: Beaux Arts and Art Déco.
- The selected houses should be distributed in both quarters where French colonial townhouses were built: the Old Quarter and the French Quarter.
- Case studies:
 - Case 1 - Houses at No. 127 - 129 Phung Hung Street: Built in 1922 (inscribed on the rooftop wall); façade in Beaux Arts style; 15 m in width, 12 m in height; The façade of the ground floor is still relatively intact, the façade of the first floor is intact (the left wing is being repaired to the original state); Both households are doing business in providing wreaths for funerals.
 - Case 2 - House at No. 7 Hang Ngang Street: Built in the 1930s (in architectural style); façade in Art Déco style; 10 m in width, 15 m in height; the façades is kept original, some temporary sun-shading structures have

been added; still used as a shop-house, but the part of the shop on the ground floor is divided among two business households.

- Case 3 - House at No. 78 Tue Tinh Street: Built in 1932 (according to the design year indicated on the drawing + 1); 5 m in width, 10 m in height; the house has changed its function from residence only to shop-house.
- Case 4 - House at No. 12 Dang Dung Street: Built in the 1920s (according to the year of construction indicated on the façades of adjacent houses); 6 m in width, 8 m in height; the façade of the ground floor has been renovated, the façade of the first floor is seriously degraded; the house has changed its function from residence only to shop-house.



Fig. 7a - Houses at No. 127 - 129 Phung Hung Street (Tran Quoc Bao, 2022)



Fig. 7b - House at No. 7 Hang Ngang Street (Tran Quoc Bao, 2022)



Fig. 7c - House at No. 78 Tue Tinh Street (Vu Thi Huong Lan, 2022)



Fig. 7d - House at No. 12 Dang Dung Street (Tran Quoc Bao, 2022)

Table 3 - Scores and ratings of four selected case studies

Criteria	Sub-criteria	Max. score	Case 1	Case 2	Case 3	Case 4
1. History and Culture	1.1. History	4	0	0	0	0
	- Related to a historical event of Vietnam	2				
	- Related to a historical event of Hanoi	1				
	- Related to a historical celebrity of Vietnam	2				
	- Related to a historical celebrity of Hanoi	1				

Criteria	Sub-criteria	Max. score	Case 1	Case 2	Case 3	Case 4
	1.2. Culture	8	4	1	0	0
	- Related to a cultural celebrity of Vietnam	2				
	- Related to a cultural celebrity of Hanoi	1				
	- A handicraft has still been well kept	2				
	- A handicraft has still been partially kept	1				
	- A traditional business has still been well kept	2	2			
	- A traditional business has still been partially kept	1		1		
	- A cultural exchange can be reflected in the way the house is decorated	2	2			
	2. Chronology	5	5	3	5	5
	- Before 1930	5	5		5	5
	- From 1930 to 1945	3		3		
	- From 1946 to 1954	1				
	3. Maintaining the function	6	6	4	2	2
	- Still in use, the same as the initial function	6	6			
	- The initial function has slightly changed	4		4		
	- The initial function has considerably changed	2			2	2
	4.1. Authenticity/Originality of the ground floor	4	3	0	0	0
	- Staying intact	4				
	- Staying almost intact, with minor damage	3	3			
	- Repaired with respect to authenticity/originality	2				
	- Repaired, almost the same as authenticity and/or originality	1				
	4.2. Authenticity/Originality of the first floor (and second floor, if applicable)	4	4	3	1	0
	- Staying intact	4	4			
	- Staying almost intact, with minor damage	3		3		
	- Repaired with respect to authenticity/originality	4				
	- Repaired, almost the same as authenticity and/or originality	1			1	
	5.1. Façade ratio (close to Golden Ratio)	6	4	6	2	2
	- Very high level	6		6		
	- High level	4	4			
	- Medium level	2			2	2
	5.2. Front wall	33	31	22	10	3
	- Pediment with fine details and decorations	3	3	3		
	- Pediment with simple details and decorations	2				
	- Pediment with just a few details and decorations	1			1	
	- Rooftop wall with shop name or year of construction made of mortar	3	3			
	- Wall underneath pediment with fine details and decoration	3	3	3		
	- Wall underneath pediment with simple details and decoration	2				
	- Wall underneath pediment with just a few details and decoration	1			1	
	- Wall pillars with fine details and decorations	3	3			
	- Wall pillars with simple details and decorations	2		2		
	- Wall pillars with no details and decorations	1			1	1
	- Fine cornices and details on both sides of the door	3	3			

Criteria	Sub-criteria	Max. score	Case 1	Case 2	Case 3	Case 4
	- Simple cornices and details on both sides of the door	2		2		
	- Just a few cornices and details on both sides of the door	1			1	
	- Fine cornices and details on both sides of the windows	3	3	2		
	- Simple cornices and details on both sides of the windows	2				
	- Just a few cornices and details on both sides of the windows	1			1	
	- Fine cornices and details above the door	3	3			
	- Simple cornices and details above the door	2		2		
	- Just a few cornices and details above the door	1			1	
	- Fine cornices and details above the window	3	3			
	- Simple cornices and details above the windows	2		2		
	- Just a few cornices and details above the windows	1			1	
	- Fine cornices and details underneath the window	3	3			
	- Simple cornices and details underneath the windows	2		2		2
	- Just a few cornices and details underneath the windows	1				
	- Balcony with fine rail decorations	3				
	- Balcony with simple rail decorations	2				
	- Balcony with no rail decorations	1				
	- Balcony without rails but with other details	1	1	1	1	
	- Balcony with fine hand rails	3	3	3		
	- Balcony with simple hand rails	1			2	
	5.3. Doors and windows	10	8	8	6	2
	- Doors with arches	2				
	- Doors with simple rectangular door frames	1	1	1	1	1
	- Windows with arches	2				
	- Windows with simple rectangular window frames	1	1	1	1	1
	- Doors with fine grids	2	2	2	2	
	- Doors with simple grids	1				
	- Windows with fine grids	2	2	2		
	- Windows with simple grids	1				
	- Symmetrical door and windows (door in the middle, windows on both sides)	2	2	2	2	
	- Asymmetrical door and windows (door on one side, windows on the other side)	1				
	5.4. Architectural style(s)	3	3	3	1	1
	- One style, clearly reflected	3	3	3		
	- Two or more styles, harmoniously combined	2				
	- No particular style	1			1	1
6. Cityscape	6.1. Location of the house	10	8	8	6	4
	- Located in one area with many business and tourism activities	4	4	4		
	- Located in one area with many business activities	2			2	2
	- Located in one area with many tourism activities	2				

Criteria	Sub-criteria	Max. score	Case 1	Case 2	Case 3	Case 4
	- Located in one main street, at the crossroads with another main street	6				
	- Located in one main street, at the crossroads with a narrow street	5				
	- Located in one main street, between two crossroads	4	4	4	4	
	- Located in one narrow street, at the crossroads with another narrow street	3				
	- Located in one narrow street, between two crossroads	2				2
	- Located in one narrow lane	1				
	6.2. Continuity of townhouses (length of the row)	5	2	3	1	0
	- More than eight houses in one row	5				
	- Seven to eight houses in one row	4				
	- Five to six houses in one row	3		3		
	- Three to four houses in one row	2	2			
	- Two houses next to each other	1			1	
	6.3. Harmony of houses in one row	2	2	1	1	0
	- Harmony in the number of storeys and styles	2	2			
	- Harmony in the number of storeys	1		1	1	
	- Harmony in the styles	1				
	Total	100	80	62	35	19
	Score-based classification		A	B	C	D

4. Conclusions

The study has proposed an alternative method to evaluate the French colonial townhouses in Hanoi. Applying this method, apart from the architectural values, the research team is also interested in the other values, including history and culture, chronology, conservation of function, authenticity/originality and cityscape. The method is developed on the basis of systematic and scientific studies to provide a premise for the preparatory steps of a future plan towards sustainable management and conservation of French colonial townhouses as heritage. The method deals with French colonial townhouses in Hanoi but can also be applied to similar historical cities in Vietnam and used as a reference for the assessment of colonial townhouses in Southeast Asian countries due to many similarities in history and culture.

The determining of the values of each townhouse will help classify houses into value-based groups from A to D. Value-based grouping facilitates the decision making about management and conservation. The houses in the same group may require similar conservation and management policies.

Therefore, this assessment method can be regarded as a basis for the state agencies in architecture, planning and construction of Hanoi to apply the long-awaited solutions for management, conservation and promotion of the heritage values of French colonial style townhouses. The city authorities of other historical cities in Vietnam should refer to this assessment method and applying this as the first step in the process to find out appropriate policies on sustainable management and conservation of the colonial townhouses as part of heritage in the French Quarters.

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References

- Charbonneau, F. & Do, H. (2002). *Hanoi - Enjeux Modernes d'Une Ville Millénaire*. Éditions Trames. Montréal.
- Clément, P. & Lancret, N. (2005). *Hanoi - A Cycle of Changes*. Science and Technology Publisher. Hanoi.
- Doan, M. K. et al (2011). *Reviewing, Classifying and Establishing a List of French Colonial Villas in Hanoi City*. Hanoi City Department of Planning and Architecture. Hanoi.
- Hanoi City People's Committee (2013). *Regulations on Management and Use of Old villas Built Before 1954 in Hanoi City*. Hanoi.
- Hanoi City People's Committee (2014). *Regulations on Management of Planning and Architecture of Hanoi's Old Quarter*. Hanoi.
- Japan International Cooperation Agency (JICA) & Hanoi City People's Committee (2007). *Hanoi Capital City Master Urban Development Programme (HAIDEP)*. Final report. Hanoi.
- Masson, A. (1929). *Hanoi pendant le Période Héroïque (1873 – 1888)*. Oriental Library Paul Gautner. Paris.
- Nguyen, Q. M. (2016). *Architectural Value of French Colonial Townhouses in Hanoi's French Quarter*, Journal of Architecture, No. 8/2016. Vietnam Association of Architects. Hanoi.
- Nguyen, Q. M. (2017, 2018). *French Colonial Townhouses in Hanoi's Old Quarter*, Journal of Architecture No. 11/2017, 12/2017, 01/2018. Vietnam Association of Architects. Hanoi.
- Nguyen, V. Q. (2018). *French Colonial Townhouses in Hanoi's French Quarter: Forgotten Heritage That Needs To Be Identified for Conservation*, Journal of Architecture, No. 10/2018. Vietnam Association of Architects. Hanoi.
- Nguyen, V. Q. (2019). *Conservation of the French colonial architectural heritage in Hanoi city: French colonial houses, now shop-houses as a case study*. PhD Thesis, Politecnico di Milano. Milan.
- Tran, H. & Nguyen, Q. T. (2004). *Thang Long - Hanoi, Ten Centuries of Urbanisation*. Construction Publisher. Hanoi.
- Tran, H. L. (2000). *History of Hanoi*. Hanoi Publisher. Hanoi.
- Tran, Q. B. (2016). *Identifying French Colonial Architectural Heritage in Hanoi and Solutions for Sustainable Conservation*. PhD Thesis. Hanoi University of Civil Engineering. Hanoi
- Tran, Q. B. et al (2021). *Establishing an Assessment Criteria System for Architectural Heritage of Colonial Educational Buildings in Hanoi*, International Journal of Sustainable Construction Engineering and Technology, Vol.12, No.3, pp128-134.