

MINISTRY OF EDUCATION
AND TRAINING

MINISTRY OF CONSTRUCTION

HA NOI ARCHITECTURAL UNIVERSITY

DU TON HOANG LONG

**THE INTEGRATION OF FRENCH COLONIAL
ARCHITECTURE WITH HUE URBAN PROPERTIES**

ACADEMIC FILE. ARCHITECTURE
CODE : 62.58.01.02

THE SUMMARY OF THESIS

Ha Noi - 2020

The thesis was completed at Hanoi Architectural University

Supervisors:

- 1. Assoc.Prof.PhD. Khuat Tat Hung**
- 2. PhD. Ngo Doan Duc**

Reviewer 1:

Reviewer 2:

Reviewer 3:

Thesis defended in the Council evaluated doctoral thesis at university level,
Ha Noi Achitectural University

At:day month year.....

The thesis cn be foud at:

1. National Library of Vietnam
2. Library of Hanoi Architectural University

INTRODUCTION

1. The urgency of the subject

French colonial architecture is an important component of Vietnam's urban heritage. In which Hue is the place where special interference occurred, manifested in the process of indigenous people acquiring Western technological achievements, and the French seeking solutions to integrate into the native environment, the parallel. This has created a unique Hue city today.

However, Hue was often concerned about the architectural heritage of the Nguyen Dynasty, or the poetic landscape, and the French colonial architecture was almost forgotten. So often the default Hue meditative image, nostalgia, old, thinking that leads to difficult set of policies developed to suit modern trends. The lack of interest in the French colonial architectural heritage fund caused many degraded buildings to hurt urban history, causing loss of aesthetics and waste of location.

Therefore, the thesis is really necessary to assert the important value of French colonial architecture in Hue through integrated evaluation with attributes of urban, landscape, climate and indigenous culture. Research is not only a basis for conservation, but also valuable for critics and assessing the quality of new building designs in an important cultural, historical and cultural context.

2. Research objective

- Characteristics of French colonial planning and Architecture in Hue
- Proposing and applying the method of assessing the integration of French colonial architecture with the properties Hue city.
- Influence of French colonial architecture on Hue urban architecture.

2. Research subject and scope

- The object of the thesis is colonial architecture, including public works, villas and religious buildings invested by the French.
- Scope of research is urban Hue period 1802-1945.

3. Research method

- The thesis uses methods of investigation, survey, data collection; professional solution; methods of comparison and classification; method of morphological analysis; evaluation methods according to norms; general analytical method.

4. Scientific significance

- Providing credible results in number, location and style of French colonial architecture funds in Hue. Supplement knowledge about the French

colonial architecture system in Viet Nam after the research in Ha Noi, Sai Gon, Hai Phong and Da Lat.

- Develop a method to assess the degree of integration of colonial architecture into Hue urban properties.

- Strongly affirming the important role of French colonial architecture in creating the overall structure of today's Hue city.

5. Practical significance

- Clarify an architectural development stage in Hue, serving research and teaching.

- The result of the integration assessment has reference value in preserving and promoting the value of the French colonial architecture fund in Hue.

- The method of assessing the integration of French colonial architecture can be an important and necessary tool for proposing architectural solutions in areas of important landscapes or heritage, as well as building the main list of legal documents on preserving the value of urban architectural heritage in general and French colonial architecture in Hue particular.

6. New contributions of the thesis

- French colonial architecture in Hue was firstly listed and categorized fully in number, location, characteristics, architectural style.

- The thesis discovered and clarified the characteristics and differences of French colonial architecture in Hue on basis of connecting with the historical process and other Vietnamese cities which were influenced by the French during the colonial period, geography.

- The thesis proposes a method to assess the integration of French colonial architecture with Hue urban attributes according to specific criteria to be quantified. This is a value assessment method established in accordance with the architectural features of French colonial in Hue, from the viewpoint of preserving urban heritage, not the single preservation of each project.

- The thesis demonstrates the effects of French colonial architecture on Hue traditional architecture in the integration process, based on the comparison of each traditional architecture type before and during the colonial period.

7. Thesis structure

- The thesis consists of 3 parts : Introduction, Content, Conclusions and Recommendations. In which the Content has 3 chapters, chapter 1 (54 pages), chapter 2 (45 pages), chapter 3 (53 pages).

CONTENT

CHAPTER 1: OVERVIEW OF GEOGRAPHICAL ARCHITECTURE AND PROPERTIES OF HUE URBAN AREA

1.1. Properties of Hue urban

There are many properties that make up an urban area, but Hue has some basic properties that make up the "substance" or Hue identity. In terms of urban architecture, Hue and French colonial architecture are connected by properties of urban morphology, landscape, climate and culture. These properties have a relatively stable status, combined with complete integrity, completeness, sustainability, helping Hue city not to blend into other cities.

Table 1-1: Geographical location and natural conditions of Hue city

Geographical location and natural conditions	Geographical location	- Located in the center of the country
	Climate characteristics	- Hot dry summer - The winter is cold, humid and prolonged.
	Natural landscape	- Water surface – Huong river : is a landscape that establishes the position of the capital, connects important works, and is the urban facade. - Trees are everywhere, from along of the river, to the streets, in Royal architecture and folk houses.

Table 1-2: Traditional urban morphology of Hue

Urban morphology	Urban structure	- Located mostly on the North bank - Along of the Huong River - The city is the center, the town area is the place for trade, and the nearby villages are the places to provide food and make supplies for the city.
	Axis	- Shinto axis of the urban
	Class	-The Citadel has 3 classes according to its importance : Citadel – Imperial City – Forbidden City - Folk houses have classes in order : Gate – yard – main house – garden.

Table 1-3: Cultural and architectural elements of Hue urban

Architect	Feng Shui	- Urban feng Shui : Ngu Binh mountain is a pre – project, Huong river is Minh Duong, Con Hen is described to Thanh Long, Da Vien is Bach Ho.
------------------	------------------	--

-tural culture		<ul style="list-style-type: none"> - The main direction of the City is Southeast in accordance with the mountain river position. To the south of the citadel, the direction of the Nam Dan is on the south of the Huong river where sacrifices are made. - Architectural works such as mausoleums or folk houses all follow the principles of Feng Shui with natural landscapes or screens, artificial shallow.
	Layout of space	<ul style="list-style-type: none"> - Small-scale works, integrated with nature - Large works with scattered layouts - Architecture developed according to horizontal percentile - Four-sided roof system - Slender columns of porch
	Decorate	<ul style="list-style-type: none"> - Red and yellow colors dominate - Delicate sculpture, traditional motif - Pham la mis a typical material in rotal architecture.

1.2. Characteristics of traditional Hue urban architecture

1. In 1636, Lork Nguyen moved the capital from Quang Tri to Phuoc Yen
2. In 1744, Lord Nguyen moved the capital to Kim Long
3. In 1802, Gia Long King built a citadel in Phu Xuan village
4. After 1874 the French built a new town on the southern of the Huong River.

Picture 1-1: Stages of development of Hue urban

Table 1-4: Components of Nguyen Dynasty architecture

Citadel	<ul style="list-style-type: none"> - Vauban style combines Western technology and Eastern tradition
Imperial city architecture	<ul style="list-style-type: none"> - Ngo Mon Gate and the auxiliary gates - The palace where the King worked and living - Thuong Uyen gardens - The temple of the King
Mausoleum	<ul style="list-style-type: none"> - The Nguyen Dynasty had 13 kings but only 7 tombs - Unique mausoleum architecture as a second palace, has landscape value.

Table 1-5: Components of Hue urban folk architecture

Garden house	<ul style="list-style-type: none"> - Including 3 parts of water surface – green trees – small rocky mountains. - Abundant types of trees - Characteristics of Hue culture
Nha – Ruong	<ul style="list-style-type: none"> - The architecture is in the shape of a spear, or crossword, a peacock or a foreign national letter. - Carved motifs on elaborate wooden columns. - Roofs made of <i>ngoi liet</i>, mainly of four-sided roofs tile
Houses in town, port	<ul style="list-style-type: none"> - <i>Bao Vinh, Gia Hoi</i> Old Quarter, <i>Truong Tien, Cua Dong</i>. - Intersection of French colonial architecture

1.3. Phases of development of French colonial architecture in Hue city

- Until 1874 the French had not built any buildings in Hue, however, French colonial architecture had influences since the early days of the Nguyen Dynasty establishing the capital. This was the prerequisite stage for French colonial architecture to join Hue city later.

- In 1874, the work of Trung Ky Porcelain Court was built on the southern bank of the Perfume River to mark the appearance of French colonial architecture in Hue, but it was not until the Giap Than 1884 Peace Treaty that the French works began. Head built extensively.

- After 1919, France stepped up colonial exploitation, the scale of investment quadrupled compared to before World War I. Hue appeared banks, light industrial enterprises, houses of experts France as well as business people from France to trade. Building architecture is more integrated with Hue urban properties.

1.4. Integration of French colonial architecture in several urban areas in Vietnam

Table 1-6: : Compare the integration of French colonial architecture with properties of some urban areas of Vietnam and Hue

	Ha Noi	Hai Phong	Sai Gon	Hue
Set location	<ul style="list-style-type: none"> - Located around <i>Thang Long</i> citadel and south of <i>Hoan Kiem</i> lake, located alternating with traditional villages. - Destroy part of 	<ul style="list-style-type: none"> - Located in a new area south of <i>Cam</i> river - An artificial canal separating the French Quarter from the local population 	<ul style="list-style-type: none"> - Located completely on the West of <i>Sai Gon</i> river - Completed destroyed and superimposed on the old city position built by King Gia Long 	<ul style="list-style-type: none"> - Located mainly in the new area on the south of <i>Huong</i> rive. - Retain complete traditional urban structure

	the City's structure			
Urban morphology	<ul style="list-style-type: none"> - Urban turned away from the <i>Hong</i> river - The urban main is the Opera House - The street structure follows existing large lakes and towns , vilages to intervene at different levels 	<ul style="list-style-type: none"> - The urban area overlooking the seaport - The urban main is the Opera House - Street structure has an inhomogeneous chess pattern 	<ul style="list-style-type: none"> - The urban area overlooking the <i>Sai Gon</i> river - The urban main is <i>Duc Ba</i> church - The urban organization of chess board, modern 	<ul style="list-style-type: none"> - Urban areas along the river - Urban areas with core buildings - The urban center is along the <i>Huong</i> river - The city has a ray pattern and is planned in “Garden City” style
View	<ul style="list-style-type: none"> - Exploiting natural landscape factor . - Many small parks are scattered among the diagonal intersections in the city. 	<ul style="list-style-type: none"> - Axis green space running between the city - Many influences of rivers 	<ul style="list-style-type: none"> - Lots of green spaces. Large green spaces connect important locations in the city and follow the <i>Sai Gon</i> river 	<ul style="list-style-type: none"> - Exploiting landscape <i>Huong</i> river - Many small parks are scattered among the urban diagonal intersections
Architectural style	<ul style="list-style-type: none"> - After 1919, many great works in Indochina style appeared - Large-scale building, sophisticated decoration 	<ul style="list-style-type: none"> - Pre-colonialists, Classical, Neoclassical, Local French. Less exploitation of indigenous architecture. - Small-scale buildings, simple decoration, many works of unclear style 	<ul style="list-style-type: none"> - There is a variety of interference: French-Chinese, Vietnamese-Chinese, French-Vietnamese - Large-scale building, sophisticated decoration 	<ul style="list-style-type: none"> - Simple decoration. There is no great capacity building - Many buildings of French Local architectural style - Some special variations from indigenous factor interference
Inclusive expression.	<ul style="list-style-type: none"> - Urban has a ancient culture, interwoven between old and new 	<ul style="list-style-type: none"> - New urban areas in water areas 	<ul style="list-style-type: none"> - The capital of <i>Nam Ky</i> rich and dynamic 	<ul style="list-style-type: none"> - Urban interection between feudal-colonial. Respect for indigenous

1.5. Related studies.

Research the relationship between architecture and location attributes

Thesis “*Lardil properties of place - An ethnological study in Man-Environment relations*” of P.Memmott in 1979 at University Queensland. Thesis “Exploiting the factor of place to create an urban identity. Take *Da Nang* city as a research area” of Nguyen Van Chuong at National University of Civil Engineering in 2011. The article “The concept of place and sense of place in architectural studies” of Mina Najafi, Mustafa Kamal Bin Mohd Shariff published in the International Journal of Science and Technology of the Academy of Sciences, World Technology and technique, in 2011.

Book "*Tropical moist architecture*" by Hoang Huy Thang, in 2002. The article "*The relationship between climate, architecture and people - an important basis of traditional Vietnamese architecture*" by Nguyen Huy Con, Vietnam Architectural Magazine in 1996. Book "*From the traditional thatched roofs*" by Nguyen Cao Luyen, 2007 by Kim Dong Publishing House. "*The climate factor in shaping the ethnicity of Vietnamese architecture*" by Tran Hung, Ethnography Magazine in 1983.

Thesis “*Cultural influences on architecture*” of Stephen F. Kenney at University of Technology Texas Hoa Ky in 1994. Thesis “*The relationship between culture and architecture in folk houses in the Northern Delta region*” of Khuat Tan Hung at Ha Noi Architectural University in 2007. Book “House Form and Culture” of A.Rapport, publishing company Prentice-hall, Hoa Ky. Book “*Culture – meaning – architecture*” of K.D. Moore, publishing company Ashgate, Anh, in 2000. The article "*Architecture and cultural attributes*" by Nguyen The Cuong, Architecture Magazine in 2011.

Research of French colonial architecture

The article “*The politic of design in French colonial urbanism*” of Gwendolyn Wright in 1991, publishing company Chicago University, Hoa Ky. Thesis "*Natural factors and native cultural traditions in French colonial architecture in Vietnam*” by Nguyen Dinh Toan at Hanoi Architectural University in 1998. Thesis “*Cultural symbiosis between tradition and modernity in architecture Vietnam late 19th century to mid-century*” of Le Thanh Son at Ho Chi Minh Architectural University in 2003. Thesis "*Vietnam architectural trends from the end of the 19th century to the end of the 20th century*” of Ton Dai at Ha Noi Architectural University in 1988. Thesis "*Maintaining and promoting the value of urban architecture heritage Phap Hai Phong*” of Nguyen Quoc Tuan at Ha Noi Architectural University in 2015. Thesis

"Identification of French colonial architectural heritage in Hanoi and sustainable conservation solutions" by Tran Quoc Bao at National University of Civil Engineering in 2016.

Research on Hue urban architecture

Thesis “*Черты евро-пейского влияния в архитектуре и градостроительстве Вьетнама колониального периода (на примере г. Хюэ)*” (European influence on Vietnamese architecture and planning during the colonial period - for example in Hue)” of Ho Hai Nam at Saint Petersburg National University of Architecture - Building, Russia in 2007.

Some articles published in the Song Huong Magazine. Some master's thesis such as *"Features and value of small-scale villas on the southern bank of Huong River in Hue City"* by Nguyen Quang Huy, *"Characteristics and architectural value of the southern bank of Huong river in Hue, the French colonial period took Le Loi axis as the object of research"* by Nguyen Van Man, *"Features and values of the architecture of the house Quadrilateral in the ancient town of Bao Vinh - Hue City"* by Nguyen Quoc Thang.

1.6. The research issues posed for the topic

Researches in Hue city mostly focus on architectural heritage of the Nguyen Dynasty, so the value of the French colonial architecture fund has not been taken seriously.

Hue urban has unique basic characteristics in terms of morphology, landscape, culture and climate, so the integration of French colonial architecture into Hue urban environment is different from urban areas. other. Analyzing the characteristics of French colonial planning and architecture in Hue will clarify this particular feature, supplementing the awareness of the diversity of French colonial architecture in Vietnam.

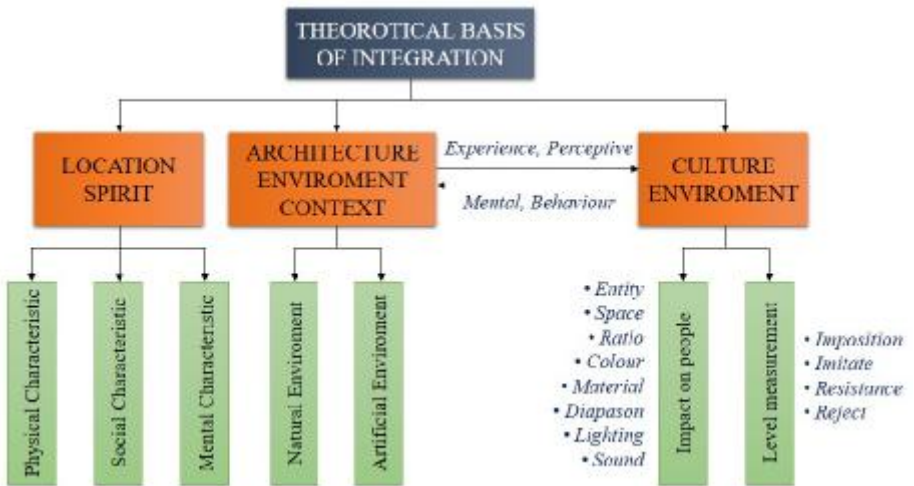
Hue traditional town possesses a abundant architectural and character that has influenced French colonial architecture through scale, spatial structure, roof form, decoration. In addition, factors such as social context, missionary activities of influential figures, and urban planning management policies helped French colonial architecture go from imposition, to adaptation and to becoming integration into Hue urban environment.

PhD student proposed to develop a method to assess the integration of French colonial architecture with Hue urban properties. The results of the assessment will be the basis for conservation in accordance with Hue's historical, architectural features and economic conditions.

The thesis analyzes the influence of Western architecture in shaping the Citadel in the early 19th century, and the transformation of Hue traditional architecture in the early 20th century will prove the integration of French colonial architecture, creating Hue architectural identity.

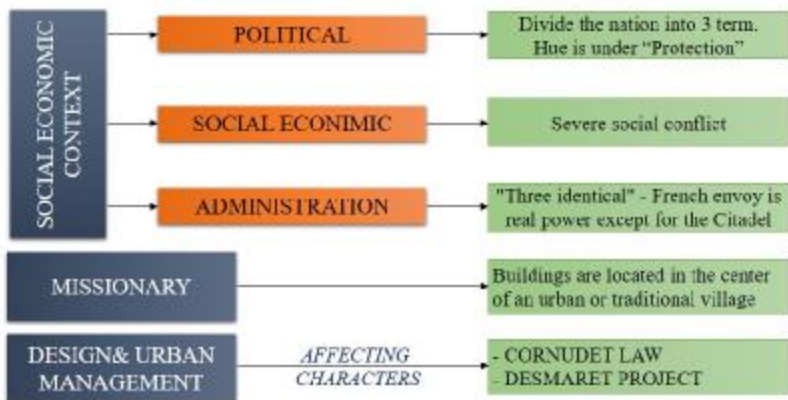
CHAPTER 2: SCIENTIFIC BASIS ON INTEGRATION OF GEOGRAPHIC ARCHITECTURE WITH HUE URBAN PROPERTIES

2.1. Theoretical basis of integration



Picture 2-1: Theoretical basis of intergration

2.2. Các yếu tố ảnh hưởng đến quá trình hòa nhập của kiến trúc thuộc địa Pháp với các thuộc tính đô thị Huế



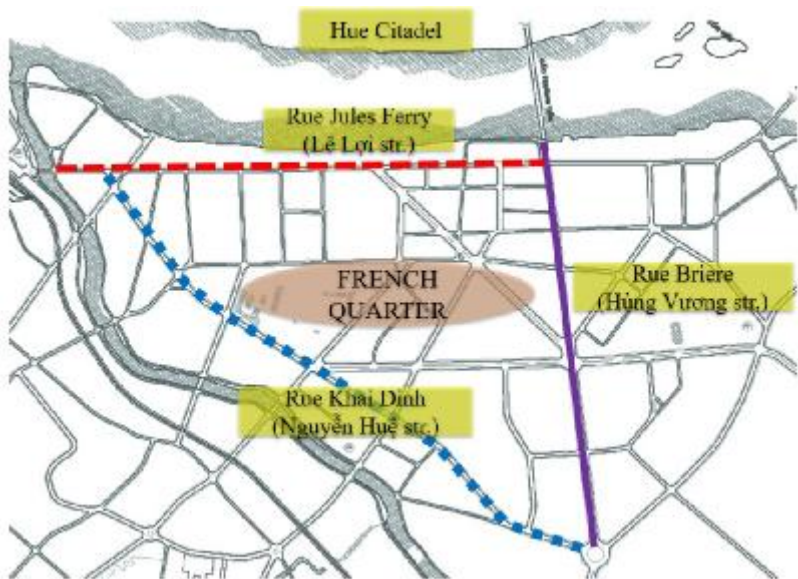
Picture 2-2: Diagram of factors affecting the integration process

2.3. Characteristics of French town planning in Hue city

2.3.1. Factors shaping

The French town is located on the southern bank of the Huong River, limited by Nhu Y River, Ba Trieu Street, and An Cuu River, the main roads are planned to follow the rivers, so the urban space becomes very harmonious. The main transport axis is Hung Vuong street starting from Truong Tien bridge connecting to Cua Dong - Gia Hoi - Dong Ba market on the north bank of Huong river. This is a reasonable plan when the city is pushed to the East compared to the main direction of the Citadel, helping to increase trade connectivity while respecting the space of the urban feng shui axis.

2.3.2. Function subdivision



Picture 2-3: Function subdivision of Frech Quarter in Hue

The towns is parallel to the Huong river in downtown early stage development for convenient connections with the North bank, especially at Le Loi street. Here the majority of the most important buildings such as schools, hospitals, Kham Su court, Cong Su Palace, the memorial, the Club ... The station was moved out of An Cuu river to avoid affecting urban activities.

The central axis, including Truong Tien Bridge and Hung Vuong Street, is emphasized by many building built on either side of the road, the highlight is the square - the center of the ray-shaped town. Nguyen Hue Street is where the layout of the official villa in the French government, Church and Sports Center.

2.3.3. Garden city



Lý-Thường-Kiệt 6 junction

Hùng-Vương center point

Picture 2-4: Diagram of the central intersections of French Quarter

French Quarter in Hue has the form of "Garden City" variation according to reality. The city has ray – shaped traffic with many intersections of 5-6 roads, separated from the traditional urban area by the green Belt Road of landscape, the Perfume River along the strip of parks along the road. The city has a low building density, close to nature.

The green Belt Road of the French Quarter is emphasized by the Huong River, separated from the traditional town on the north bank of the Huong River, constructions were pushed back on the Rue Jules Ferry street to create a large park along the river. In addition, the French also organized additional parks evenly distributed to different areas of the city, creating a separation between the areas just created a natural spatial transition of harmony.

2.4. Architectural characteristics of French colonial architecture in urban Hue

2.4.1. Location characteristics

- Public colonial architecture and villas appeared first and foremost on Le Loi Street along the southern bank of the Huong River, starting from Truong Tien Bridge and ending at Hue Station. At the main roads forming the form of urban ray-shpaed, buildings are also built with more number of secondary roads.

- The Catholic buildings are mostly located on Kim Long Street and Phu Cam area, these are two important positions for Hue traditional urban structure.

2.4.2. Plan characteristics

Public buildings are usually rectangular in plan, symmetrical, mostly surrounded by corridors. The villa-style buildings have a different layout of the traditional Vietnamese house. There are many functions in one plan, kitchen

and auxiliary buildings are integrated into one block, so the volume of French villas is bigger than Vietnamese ones. The door is covered on all 4 sides to catch the wind and light, the window system is opened into a long trail. Balcony is rarely used. The entrance hall is simple in detail, usually in the form of a forward-facing eaves, The spaces are high, create a grave, airy feeling. Each construction's plan has a different form depending on the design style and the preferences of the owner. Near the end of the French colonial period, a number of mansions were organized more modern, free plan, no longer symmetrical.

2.4.3. Elevation characteristics

Most of the French colonial architecture in Hue city had a simple elevation, the first period was pre-colonial style, But later, the architecture was closer to the indigenous architecture, creating a featured of Indochina architecture, or having changes in the generous of Moderne style.

For public buildings, cubes are usually organized in long form. The lobby is always decorated with ornate decoration to create a highlight, the French colonial architecture in Hue is often decorated simply, not rising in the middle of the building. Between the floors often use only moulding to stratify, most elevation are without balconies if any, the railing is also built of brick. Window doors mostly use double-layer system in the outside glass to blink against the adverse conditions of the weather.

Elevations of French colonial architecture are classified into 6 styles: Pre-colonialism, Neoclassical, Neo-Gothic, Local French, Indochinese, Moderne.

2.4.4. Specification and building materials

The main bearing structure is brick / stone wall, At small aperture gates, we use brick arches with different styles. The original common floor structure is an I-shaped iron beams bearing hollow brick, Later, steel beams used to support concrete floors. Folk-style wood-truss sets are combined with the steel rafters on the roof. Wood for floors, doors and decorative details.

The import of new materials and technologies has led to changes in housin building techniques, such as calcination techniques, brick production, cement, glass production techniques, iron and steel, paving bricks, ... Many materials are manufactured from local companies and villages.

2.5. Methodology evaluating the integration of colonial architecture with Hue urban attributes

2.5.1. Viewpoints and principles

Location attribute of the area is overlay the historical period, rather than a permanent outdoor museum. The right approach to assess the connection of buildings to effective space through the evaluation of site attributes with clear evidence

The integration of a new architecture into the historical space does not need to appear old or copy existing architectural style. New constructions need to show contemporaryity, showing developments in architectural language and construction technology.

The system of criteria ensures a full assessment of the architectural components and architectural space of colonial architectural works in Hue.

2.5.2. Experience in developing evaluation methods

Nahoum Cohen's assessment of the potential for urban heritage preservation. This method compares urban areas / research cities with similar urban areas to find differences and assess their aesthetic and historical value.

Methods of evaluating new buildings in the historical space of English Heritage and CABE. This method locates the building in the context, thereby asking many detailed research questions from the overall to the building details in the assessment of integration with location space.

2.5.3. Develop a system of evaluation criteria Group of criteria to assess the integration of urban morphology

Table 2-1: Group of criteria to assess the integration of urban morphology

TEAM CRITERIA	TOTAL CORE	COMPOSITION CRITERIA	MAXIMUM SCORE	NOTE
a. Group of criteria to assess the integration of urban morphology	100 Mark	1. Urban location does not conflict with existing urban areas	10 mark	The rating is divided into 5 levels: High: 10 mark Good: 8 mark Average :6 mark Below average: 4 mark Weak: 2
		2. The scale of the French Quarter is suitable to the existing urban area	10 mark	
		3. The urban density is suitable to the existing urban area	10 mark	
		4. The form of urban planning expresses a clear structure	10 mark	
		5. Urban organization space in layers and closed	10 mark	
		6. Urban morphology preserves important views	10 mark	

		7. Urban morphology shows an axial link with an existing urban center	10 mark	mark
		8. The urban morphology is different, adding to the diversity of existing cities	10 mark	
		9. Urban structure suitable to landscape terrain	10 mark	
		10. The urban is full of public utilities.	10 mark	

Table 2-2: Group of criteria to assess the integration of the landscape

TEAM CRITERIA	TOTAL CORE	COMPOSITION CRITERIA	MAXIMUM SCORE	NOTE
b. Group of criteria to assess the integration of landscape	35 mark <i>(Weighting: 01)</i>	1. Density shows respect for the existing buildings	5 mark	The rating is divided into 5 levels: High: 5 mark Good: 4 mark Average: 3 mark Below average: 2 mark Weak: 1 mark
		2. Height shows respect for existing works	5 mark	
		3. The ground layout preserves important views	5mark	
		4. Architecture reflects the topographic and water surface factors	5mark	
		5. Architecture reflects green factor	5mark	
		6. Material surface compatible with traditional architecture	5mark	
		7. Material colors compatible with traditional architecture	5 mark	

Table 2-3: Group of criteria to assess climate integration

TEAM CRITERIA	TOTAL CORE	COMPOSITION CRITERIA	MAXIMUM SCORE	NOTE				
				5mark	4mark	3mark	2mark	1mark
c. Group of criteria to assess climate intergration	30 mark <i>(Weighting: 0,5)</i>	1. The roof reaches out from the wall	5 mark	1,0m	0,8m	0,6m	0,4m	0,2m
		2. The door window has a awning (a capony) or a balcony	5 mark	1,0m	0,8m	0,6m	0,4m	0,2m

		3. Doors and windows are structured in shutters	5mark	Trong kính ngoài chớp			Glass door	Shutter window
		4. Insulate using thick walls and buffer space	5mark	Thick 0,6m+ Buffer space	Thick 0,4m+ Buffer space	Thick 0,2m+ Buffer space	Thick 0,4m	Thick 0,2m
		5. The ground floor of the building is enhanced	5mark	1,8m	1,4m	1m	0,6m	0,2m
		6. The building has the main wind direction to benefit	5mark	Nam	East South	North-Northeast	Northwest – South west	West

Table 2-4: Group of criteria to assess cultural integration

TEAM CRITERIA	TOTAL CORE	COMPOSITION CRITERIA	MAXIMUM SCORE	NOTE
d. Group of criteria to assess cultural intergration	25mark <i>(Weighting: 02)</i>	1. The scale of works is suitable with the living culture of indigenous people	5mark	The rating is divided into 5 levels: High: 5 Good: 4 Average:3 Below average: 2 Weak: 1
		2. 4-sided roof system	5mark	
		3. Decorate with traditional themes and motifs	5mark	
		4. Application of traditional feng shui factors	5mark	
		5. Works participate in urban feng shui structure	5mark	

The total score of the evaluation is calculated according to the formula:

$$\mathbf{Max} = a \times 1 + b \times 0,5 + c \times 2 = 100$$

Therein: a : is the criterion of integration in landscape

b : is the climate inclusion criterion

c : cultural inclusion criteria

a. Group 1: The buildings integrate into the landscape, culture, climate of Hue urban at a special level.

Buildings with a total of component points ≥ 80 .

b. *Group 2: The buildings integrate into the landscape, culture and climate of Hue urban at a high level*

Buildings with a total of component points from 65 to 79 point

c. *Group 3: The buildings integrate into the landscape, culture and climate of Hue urban at a average level*

Buildings with a total of component points from 50 to 65 point

d. *Group 4: The buildings are less integrated into the landscape, culture and climate of Hue urban, playing a faint role in the urban structure.*

Buildings with a total of component points < 50.

CHAPTER 3 : THE INTEGRATION ASSESSMENT OF FRENCH COLONIAL ARCHITECTURE WITH HUE URBAN PROPERTIES

3.1. Integration with urban morphology

French Quarter shows a good integration with Hue urban form. The city is fully structured and operates independently without affecting traditional urban areas. The urban form of ray-shaped in the direction of the new "Garden City" has created an open space, has added to the diversity and development of existing cities. However, the French Quarter does not have any buildings that are the focal point of the opening or opening of a view. This made the city less attractive for the site, reducing the overall value of the French colonial architecture system in Hue.

Integrate the structure

The choice of French urban establishment on the southern bank of the Huong River in Hue city has helped preserve the old urban structure completely. The new urban spatial structure is almost inviolable to the Citadel area on the north bank of the Huong River, North-South traffic system is pushed to the side and bypassed the area.

Reserved view direction

The urban structure has absolutely reserved the main view of Hue Citadel. The urban structure of the southern bank of the Huong River is pushed to the east with the starting point being Truong Tien Bridge located in the east, just convenient for trade with urban areas east of the Citadel, while avoiding the direct view of the Citadel on the North bank. Buildings built close to the banks of the Huong River was also pushed to both sides, with priority overlooking the Huong River by the green park space.

The buildings built along Le Loi Street have a scattered dispersed layout, the building blocks rotate their short sides to the main road and the long sides to the side. This layout ensures to minimize obstructions overlooking the Huong River, The

landscape of the Huong River is still integrated into the city.

Link urban axes

The French Quarter on the southern bank of the Huong River is linked to the Hue traditional city by clarifying the importance of the urban axes, including: Shinto axis, spiritual axis and landscape axis.



Picture 3-1: Link urban axes



Picture 3-2: Looking at Flag Tower from Nam-Giao Altar

3.2. Integrate with the landscape

- 92,2% % of buildings has good density, total ground and height, with a score of over 3 points. Up to 56.3% of buildings achieved a maximum of 5 points in this criterion. 87.5% of terrain integration buildings, of which 9.4% of the buildings achieve the maximum score with reasonable solutions when located on the banks of the Huong River.

- 53.1% of buildings do not integrate with the green factor mainly due to the location of the land area and the total horizontal rotation occupying a large area of construction.

- 95.3% of buildings have colors and surfaces that are in harmony with the landscape, of which 17.2% of the works have colors that best suit the landscape of Hue
Integration with the climate

- 54.7% of buildings have climate adaptive roof solution. This parameter corresponds to the number of French local style buildings, tile roof out away from the wall. However, roofing wood system is not the highest solution to climate integration, Festival Restaurant bulidngs thanks to solid concrete material, the roof's reach is 3m, best shielding the impact of rain and sun.

- Most of the French colonial architecture, accounting for 71.88%, has 2-layer doors, buildings with a 1-layer structure are usually small villas or typically works with large spaces that only need to be lit like the Youth Cultural House.

- Only 17.19% of the guaranteed limit flooding in Hue characteristics of winter when the ground floor height is above 1 meter.

- Few buildings with awnings, balconies to shield the door system account for 28.13%.

- Only 3.13% of the buildings have thick solutions, windowed buffer corridors to ensure maximum climate adaptation, while 57.8% of buildings do not have a corridor design.

- The number of buildings with good direction only accounts for 40.63%, showing that the direction of the buildings is not an important factor of French colonial architecture in Hue.

3.3. Integration with climate

- 54.7% of buildings have climate adaptive roof solution. This parameter corresponds to the number of French local style buildings, with tile roofs racing away from the wall. However, the roofing wood system is not the highest solution to the climate, the Festival Restaurant works thanks to the concrete material so the roof reach is 3m, best shielding the effects of rain and sun.

- Most of the French colonial architecture accounting for 71.88%, has 2 layer doors, the building has 1-layer structure are often small villas or specific buildings have large spaces that need to be lighted just like Youth Cultural House.

- Only 17.19% of buildings can restrict the characteristics of Hue flooding in winter by the ground floor height is above 1 meter.

- Few buildings with awnings, balconies to shield the door system account for 28.13%.

- Only 3.13% of buildings have concurrently thick wall solutions, windowed buffer corridors to ensure maximum climate adaptation, while up to 57.8% of buildings do not have executive design.

- The quantities of buildings with good direction only accounts for 40.63%, showing that the direction of the works is not an important element of French colonial architecture in Hue.

3.4. Integration with culture

- 81.25% of the total number of French colonial architecture well integrated in scale buildings, shows the appropriateness with the scale of Hue traditional buildings.

- 82.8% of the total works are suitable to the culture of roof solutions, of which 48.4% simulate roofs of indigenous constructions.

- Only 7.8% of the building exploits the traditional decoration of Hue. 53.1% of the buildings have no or few Hue-style methods but are also appreciated for their expression suitable to the local culture.

- Feng shui is an element of French colonial architecture in Hue that is not

applicable, only 4.68% of constructions have shallow *Be-can*, 15.6% of the campus has a small area of trees planted in the front creating an access to both sides of the main hall. Also only 2 buildings is taking part in *Phong* structure.

3.5. Characteristics of integration with Hue urban attributes

Landscape properties

Low land use density, small scale, promoting green spaces, low construction density. A number of large buildings have scattered layout, preserving important visions, increasing the aesthetic of landscape architecture.. The color of the building is lightly, some buildings with hot tones, the color is also darkened to reduce attention behind the trees.

Although the religious buildings are relatively large in size but by flexible method, The building has many levels, the location of the building backward is very deep compared to the land boundary, so create the integration into the general landscape.

Climate attributes

While the wind direction is an important factor of a Vietnamese house, French colonial architecture in Hue does not consider it a major priority in the design of the building, which resolves through architectural solutions, engineering and landscape creation. Som buildings in the early period did not pay attention to measures to shield the negative impacts of the climate, buildings with relatively low bases account for the majority, often inundated in winter.

Cultural attributes

Many French colonial buildings simulate the 4-sided roof system typical of Hue traditional architecture, none of the buildings have a *Mansard* roof type often found in other cities. Simple elevation architecture, little decoration, many green campuses, consistent with the culture of gentle living, close nature of Hue residents.

French colonial architecture in Hue does not emphasize the factor of Feng Shui, however, they proactively arranged the Quoc Hoc Hue School and the Battle of the Soldiers. participate in the Shinto axial space connecting Hue Citadel and Ngu Binh Mountain.

3.6. The transformation of traditional urban areas in the integration process of French colonial architecture in Hue

3.6.1. *Permise planning*

King Gia Long, after ascending the throne, conducted a survey to build Hue Imperial City with the great help of Western engineers. Since then, Western imprints have been shown in the Eastern citadel through the

appearance of the Ngu Ha River that flows between the Imperial City and the position of Flag Tower.

3.6.2. The appearance of French-style housing architecture

Town house

Table 3-1: Comparison table of urban houses and traditional houses

Expression	Traditional houses	Town houses
Landscape		
General plan	<ul style="list-style-type: none"> - The plan is developed horizontally - Dispersed layout: Separate main and auxiliary houses 	<ul style="list-style-type: none"> - Mặt bằng phát triển theo chiều dọc - The plan is developed vertically - Centralized composition: All functions are concentrated in a project
Height	- 1 storey	- 2 storey
Colour	- Dark colors of wood and bricks	- Bright colors of lime paint
Garden	- Large surrounding garden	- No or very limited yard area.
Climate		
Door Window	- Door 1 layer: <i>buc-ban</i> door or <i>thuong-song-ha-ban</i> door	- Door 2 layers: Glass inside, shutter outside
Wall	- Thin walls, made of wooden planks, mud	- Thick walls, made of bricks
Base	- Low base, made of clay, some finished with ceramic or cement bricks	- High ground, made of bricks, perfected French style flower tiles
Cultural		
Roof form	- Roof of 2 or 4 sides, racing away from the outside wall	- Most build walls too high
Decorate	<ul style="list-style-type: none"> - Decorative a lot on traps, trusses, lash bars, ... - Decorative engraving style. - Themes of traditional Eastern decor 	<ul style="list-style-type: none"> - Little decoration density - Mainly decorated in high-rise walls too roof. - Decorated with simple horizontal and vertical strokes, some works are decorated according to classical Western columns
Spirituality	<ul style="list-style-type: none"> - Garden with screens, rockery - The altar is located in the nave 	<ul style="list-style-type: none"> - In some houses with garden, just make a garden in the middle, without front screen. - Only 37.5% of houses have their altars placed in the middle of the first floor

House in Bao Vinh port town

Previously, the Vietnamese house had only two sloping roofs, like a ridge or roof in the Nguyen dynasty buildings, in Bao Vinh, it was the only

place where the Quadrilateral pyramid roof appeared, cupping 4 sides of the house are even. This is a unique feature appearing in the process of colonial architecture integrated into Hue urban.

3.6.3. Change of style of decoration in Royal architecture

Table 3-2: Comparion table of Palace building

Architectural elements	Before <i>Khải-Định</i> King	After <i>Khải-Định</i> King
		- <i>Trường-Sanh, Diên-Thọ</i> - <i>Thái-Hòa, Long-An</i>
Architectural style	- Traditional	- Roman style - Baroque style
Roof	- Large scale, far away	- Small scale, not far away from from the wall of gable
Door Window	- <i>Ban-khoa</i> door, <i>buc-ban</i> door - Red	- Glass inside, shutter outside door - Yellow, white door
Hall	- Only poach form	- Western style hall
Base	- Low	- Height
Material construction	- Burnt bricks, lime and wood	- steel, cement
Column	- Thin column	- Large column, strengthening tendon
Landscape	- Natural, important feng shui element	- Garden trimmed in a Western-style geometry
Decorate Colour	- Mainly on roof parts such as roof tops, roofs, <i>bờ-quyết</i> , <i>cổ-diềm</i> , etc. - Traditional topics - Deep colors	- Decorate on every part of the building - In addition to traditional topics, there are topics from the West - Diverse and vibrant colors
Scalce Storey quantities	- Small scale - 1 storey	- Large scale - 2-3 storey

Table 3-3: Comparion table of Pavilion building

Architectural elements	Before <i>Khải-Định</i> King	After <i>Khải-Định</i> King
		<i>Phu-Văn</i> pavilion
Door Window	- <i>Ban-khoa</i> door, <i>buc-ban</i> door	-Glass inside, shutter outside door
Hall	-Only poach form	-Western style hall (<i>Thái-Bình-Lâu</i> and <i>Tĩnh-Minh-Lâu</i>)

Column	- Thin column	- Large column, reinforced concrete
Decorate Colour	- Few decorate on roof parts such as roof tops, roofs, <i>bờ-quyết, cổ-diềm, mái-đào</i> . - Red, yellow	- Densely decorated in roofs and lobbies (<i>Thái-Bình-Lâu</i>) - Diverse and vibrant colors

Table 3-4: Comparison table of Gate building

Architectural elements	Before <i>Khải-Định</i> King	After <i>Khải-Định</i> King
	<i>Hiển-Đức</i> Gate, <i>Hồng-Trạch</i> Gate, <i>Khiêm-Cung</i> Gate	<i>Hiển-Nhon</i> , <i>Chương-Đức</i> , <i>Trường-An</i>
Roof	- Less roof	- Many roof steps
Decorate Colour	- Little decorative a lot on traps, trusses, lash bars, ... - Not decore in column and wall	- Decorate on every part of the building - Using porcelain enamel and glass as decoration materials - Diverse and vibrant colors
Material	- Burnt bricks, lime and wood	- Sắt thép, xi măng
Scale Storey quantities	- Small scale - Mezzanine floor	- Large scale - 2 storey

Table 3-5: Comparison table of Temple building

Architectural elements	Before <i>Khải-Định</i> King	After <i>Khải-Định</i> King
	<i>Minh-Mạng</i> , <i>Tự-Đức</i>	<i>Khải-Định</i>
Architectural style	- Traditional	- Baroque
Roof	- Large scale, far away - Tile royal storage	- Small scale, not far away from from the wall of gable - Ardoise tile
Door Window	- <i>Ban-khoa, buc-ban</i> door - Red	- Glass inside, shutter outside door - Yellow door
Material	- Burnt bricks, lime and wood	- steel, cement
Column	- Slender - Gold paint	- Large column, embossed sculpture
Landscape	- Natural - Diverse lakes and trees	- Completed concrete

<p>Decorate Colour</p>	<ul style="list-style-type: none"> - Mainly on roof parts such as roof tops, roofs, <i>bờ-quyết, cổ-diềm</i>, etc. - Traditional topics - Dark colour 	<ul style="list-style-type: none"> - Decorate on all parts of the building - In addition to traditional topics, there are topics from the West - Gray white
<p>Scale Storey quantities</p>	<ul style="list-style-type: none"> - Small scale, scattered works 	<ul style="list-style-type: none"> - Large-scale and block Western-style

3.7. Discuss the research results

While Hanoi, Saigon, Haiphong, Dalat,... both deeply influenced by French colonial architecture, even becoming an urban identity, then in Hue, the integration of French colonial architecture took place in two directions, transforming each other to reach a harmonious urban architecture and landscape. Thus, French colonial architecture has become deeply integrated into urban properties, causing no conflict because of differences but helping to improve Hue architectural identity. In addition, craftsman skill plays an important role in perfecting the fine aesthetic architectural details. In particular, the clear imprint of King Dong Khanh in creating the style of royal architecture interfering with French style with sophisticated, unique and brilliant decoration, becoming an Asian urban masterpiece.

French colonial architecture in Hue is more modest than other major cities in size and quantity. Most of the projects exploit the traditional traditional roof form, organize the ground to raise the landscape, the Neoclassical style appears less and not picky style to show off the power. The urban structure basically followed the topography and morphology of the rivers, but there was a section of the river from Truong Tien Bridge to near the embankment Sports Club that did not integrate into the general landscape. The planned roads have narrow crossroads, the building boundary is close to the roads, which limits the ability to connect with satellite towns in the future. The location of the central area is also contradicted between the center of the radiation pattern and the neighborhood along the Huong River, so the city lacks the focal points and lacks the development motivation to the south.

The method of assessing integration with location attributes is highly compatible with the characteristics of Hue urban and French colonial architecture at here. Can be used as a basis for ranking conservation lists, or assessing the quality of architectural designs of newly constructed buildings in areas with special historical, landscape or cultural factors.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. Hue is an urban that contains many unique properties including climate, landscape, traditional architecture and feng shui. Studying the integration of colonial architecture into the properties of Hue urban is necessary to clarify the urban identity, help fully assess the existing French colonial architecture, and determine the role of this architectural fund in Hue city.

2. The thesis summarizes and clarifies characteristics of colonial architectural planning in Hue by map analyzing method according to the stages of urban development.

3. The thesis has used the method of assessing the integration of buildings with location attributes by evaluating spatial characteristics with clear evidence. This method can also be applied to the evaluation of the integration of new building in heritage areas or special landscape elements

4. The results of the rating are ranked according to 4 levels according to the descending total score. This is the basis for proposing conservation recommendations according to levels appropriate to the legal basis as well as the actual context.

5. The thesis has discovered the imprints of Western-style urban planning in Hue Imperial City, clarifying the differences of traditional architecture before and after the appearance of French colonial architecture. These results demonstrate the important role of French colonial architecture in Hue city

Recommendations

1. The Ministry of Culture, Sports and Tourism should incorporate with the Ministry of Construction in additional the concept of Urban Heritage and strict legal institutions according to international practices.

2. The People's Committee of Thua Thien Hue Province needs to take measures:

- Do tally, expertise the current situation of buildings, for accurate assessment of usage, the ability to conserve

- Recognizing the colonial architecture fund as an urban heritage, upgrading a number of works to become provincial-level monuments in accordance with the Cultural Heritage Law to quickly implement measures against degradation and protection current buildings.

- Applying the method of integration assessment in the management of heritage works as an additional criterion, and in granting new building permits

in areas with heritage elements as a compulsory criterion.

- It is necessary to complete a set of criteria for urban centers and new constructions. The process of developing this set of criteria requires the consultation of international organizations and experts in the field of cultural conservation, urban architectural planning.

1. The People's Committee of Hue City should have solutions such as restricting new construction permits, controlling the height scale, controlling the facade of the French Quarter in Le Loi Street from Hue Station to Truong Tien Bridge.

2. Academically, research the integration of French colonial architecture into Hue urban properties creates a scientific basis for further studies on conservation and evaluation of solutions to new constructions. The direction is as follows:

- Researching and preserving and promoting the fund of colonial architectural heritage in Hue city

- Research the relationship between colonial architecture and Hue urban identity.

- Researching and assessing the suitability of new construction structures in existing areas.

- Research the structural transformation of the French Quarter on Le Loi street in the context of modernization.

LIST OF PUBLISHED SCIENCE ARTICLES RELATED TO THE TOPIC

1. "*Planning on the southern bank of Huong River in Hue during the French colonial period*", Journal of Construction Planning, No. 91+ 92 in 2018, pp.76-79.

2. "*The integration of Colonial Architecture into the properties of Hue city*", Vietnam Architectural Magazine, No. 223-2019, pp.74-76.

3. "*The imprint of French colonial architecture in Hue urban poem before 1945*", Journal of Architecture, No. 5-201, pp.55-57.

4. "*Preserving the French colonial architecture in Hue city, approaching from the method of evaluating the integration into location attributes*", Construction magazine, No. 617 August-2019, p.18-21

