Influencing factors of urban architectural style in China: A case study of Danzhou City, Hainan Province

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Abstract. The architectural style of each city is the result of a variety of factors. In the long run, the architectural style of a region is generally affected by natural factors, human factors and architectural technology factors. Namely: the impact of local special natural geographical conditions on the architectural design style; the requirements of local long history and culture and people's living habits on the architectural design style; the promotion of architectural technology complying with the requirements of the times on the architectural design style. In this paper, Danzhou City carried out a systematic research and perfect style recognition. Based on the analysis of the identifiability, dominance, effectiveness and integrity of the investigated objects, the influencing factors of Danzhou architectural style are summarized. It also shows the remarkable characteristics of Danzhou City in urban space and architectural language.

1. Introduction
As a part of the urban characteristics formed in the long-term development of a city, urban style is the crystallization of economic development and cultural change, a comprehensive product of urban historical resources, natural resources, social resources, and a highly compound urban capital. It is precisely because of the differences in the city style that the city has more characteristics and identification. However, in the wave of globalization, China's cities are facing the dilemma of convergence of urban features. All parties attach great importance to this.

Danzhou City, as one of the three prefecture level cities in Hainan Province, although the urban and rural construction has made great progress in recent years, it also faces these problems like most cities in China. Therefore, in recent years, the Chinese government and the Hainan provincial government have formulated many policies to actively carry out urban design, shape the features of the city, protect the natural landscape pattern and inherit the historical context. In this case, this paper studies the natural factors, cultural factors and building technology factors of Danzhou City, which is of great practical significance to enhance the city style of Danzhou City.

2. The influence of natural factors on the architectural style of Danzhou City
Natural factors mainly refer to the geographical location of the building and the sum of various natural conditions associated with it, including climate, geological landform, hydrology, soil, animal and plant resources, etc. Among them, climate and geographical factors play an important role. It is closely related to our living environment and living conditions. It not only directly determines the natural landscape of an area, but also relates to the architectural form and material selection of the area.
2.1. The temperature affects people's subjective feelings and psychological reactions to buildings
In terms of color, people in tropical areas are more likely to accept light colors and colorless systems, such as light blue, white, light yellow, light gray, etc. People in cold regions are more likely to accept warm colors and pure colors. In terms of building materials, people in the tropics prefer to use materials with cold feeling, such as polished stone, ceramics, etc. In the cold zone, people prefer to use materials that look warm, such as wood, brick, etc. Where the temperature is high, the windows are often small to avoid direct sunlight.

For Danzhou, affected by the tropical humid monsoon climate, the annual average temperature is 23.5 °C. In July, the hottest month, the average temperature is 27.8 °C, the extreme maximum temperature is 33 °C, and in January, the coldest month, the average temperature is 17.5 °C; and the extreme minimum temperature is 3.2 °C. Generally speaking, there is no heat in summer, no cold in winter, and the temperature is moderate, so there are not too many restrictions on the selection of color and material of building materials. However, considering that Danzhou is located in the tropics and has a long hot time, the light color system with elegant and bright color should be the main choice.

2.2. The amount of precipitation affects the roof shape and the selection of building surface materials
In areas with heavy rainfall and snowfall, the roof slope is generally large, so as to speed up water drainage and reduce roof snow. Humidity will also affect the selection of building facade materials. Water and corrosion-resistant materials, such as stone materials, need to be used in areas with high precipitation and humidity. The rainfall in Danzhou City is moderate. The annual rainfall is 900-2200mm, the annual average is 1815mm, and the average humidity is 83%. The distribution of rainfall is uneven, decreasing gradually from southeast to northwest. Dry and wet seasons are distinct. Due to the influence of monsoon, the annual rainfall distribution is very uneven. The rainy season is from May to October, accounting for 84% of the annual rainfall. The dry season is from November to April, accounting for 16% of the annual rainfall. Therefore, Danzhou City's building materials are most suitable for the use of stone, brick and other building materials with strong water resistance and moisture resistance.

2.3. Sunshine and solar condition affect the orientation and spacing of buildings
Danzhou City is blocked by the “five finger mountain” in the central part of Hainan Island. It is on the leeward side and near the Beibu Gulf. Therefore, the climate of Danzhou City is characterized by strong solar radiation, sufficient light and heat, and annual average light hours of more than 2000 hours. The west coast is the most, about 2500 hours. Therefore, the heat dissipation and ventilation of buildings in Danzhou City are the key problems to be solved. The building is suitable for roof overhanging, window shading and corridor shading, and attention should be paid to the ventilation design inside the building. Residential buildings with a height of no more than 36m are suitable to adopt the form of sloping roof, and shops along the street of commercial street are encouraged to adopt the form of arcade.

Arcade is a unique architectural style developed in rainy and hot areas to take into account the multiple functions of rain protection, sun shading and ventilation. It combines the characteristics of traditional houses in southern China and integrates the essence of Western classical architecture. For example, the old arcade building on "Zhonghe town Fu Xing Street" in Danzhou City. Most of the arcade buildings are 2-3 floors, and the facade is divided into three sections (Figure 1- Figure 3). The lower colonnade provides shelter from wind and rain. Most of them are shops and houses. The middle wall, with exquisite decoration and complex shape, is mostly used for living. At the top of the parapet, there are some complicated decorations and exquisite carvings, while others are simple and simple without decoration.
2.4. Local building materials make the building have local style
In the past, in places with underdeveloped transportation, building materials were mostly local materials. Due to the texture and color of the local materials, the building has formed a relatively recognizable local architectural style. For example, "Yanding village, eman town", in the north of Danzhou City, is built along the coast, with unique seaside volcanic lava landform. The unique coastal stone houses and roads here are made of volcanic rocks and built to prevent sea breeze (Figure 4, Figure 5). Most of them are low and thick.

3. The influence of human factors on the architectural style of Danzhou City
Humanistic factors are the generalization of urban social humanistic activities, including urban intangible elements such as cultural context, religious belief, national custom, aesthetic concept, social value orientation, and landscape elements that can highlight the style of the city. In the shaping of urban style, we should attach great importance to and inherit the historical culture and national cultural characteristics, properly use the local traditional architectural modeling and cultural elements, and comply with the requirements of the times.

3.1. The city's historical remains preserve the city's memory
Many historical buildings are important carriers of urban historical and cultural continuity. In time, they record the history of the city vertically; in space, they display the broad context of the city
horizontally, and show the unique features of each city in the vertical and horizontal. These precious historical and cultural resources are the important basis for us to shape the city style of Danzhou.

Danzhou has a long history and many historic sites, such as Fubojing, Dongpo academy (Figure 6), Zhonghe ancient town (Figure 7), etc. Danzhou City has a large number of ethnic groups, including more than 20 ethnic groups, such as Li, Zhuang, Miao, and so on. Like the boat house of Li nationality (Figure 8), the boat house is a traditional house with Li nationality characteristics. It is named after the boat with inverted shape. Li people call it "bulongting pole", which means "bamboo shed house". Because of its unique form, it is very representative of local ethnic characteristics. Near the exit of Haikou airport, there is a billboard based on its prototype. The architectural design style needs to look for the reference from these historical evolution and the historical existing remains.

In addition, in the long-term exploration of life, Danzhou people have also developed many building patterns that are convenient for life according to the requirements of the times, such as the single span long house developed by the quadrangle (Figure 9). Regardless of the building group relationship or the material and color of the building monomer, these buildings take the essence and remove the dross, and identify and extract the elements that have historical value and reflect the cultural style of Danzhou. They form a certain symbol to guide people to interpret, recognize and feel.

3.2. The requirement of times development arouses local vitality

The building style should also reflect the requirements of the times. It is mainly to meet the requirements of national macro background, development strategies and overall positioning of urban landscape. Different macro policies will have different countermeasures, that is, the different focus and ways of economic construction will directly affect the city style and architectural style. In Danzhou City, the urban design should implement the principles and requirements of spatial management and control determined in the master plan of Hainan Province (space class 2015-2030) and the master plan of the city and county, and create a distinctive urban style. And Danzhou, as a part
of Hainan, should also contribute to improving the quality of the development and construction of the international tourism island of Hainan.

4. The influence of architectural technology factors on the architectural style of Danzhou City

Construction technology is a variety of construction technology operation methods and skills developed according to production practice experience and natural science principles.

In the era of low productivity and low level of science and technology, people's ability is limited, the available tools are limited, and they can only rely on the existing natural environment and technical conditions to obtain the best building materials. Local sand, soil, wood and stone are the most easily available building materials. Different building materials also make the local conventional technology and technology have their own characteristics. Outside the scope of carriage transportation, the urban environment of the two places is quite different, and the natural conditions make the architectural style have clear regional characteristics. For example, in Yanding village, eman Town, Danzhou City, stone houses made of volcanic rock materials still exist in a large area, which is a mark left by history in the form of local materials.

Today, with the development of science and technology, from the perspective of technology, the binding force of such natural conditions is gradually reduced, or even will become very small. New technology and materials provide the possibility for the generation and succession of style. Advanced technology and high-tech materials can be a driving force and catalyst to drive and promote the change of architectural style. The sense of technology of metal and the sense of time of glass are widely used in today's architectural design. With the different application of technology and materials, different architectural styles will be formed, such as simple, modern, atmospheric, wild and so on. Modern architectural technology is promoting the renewal of architectural style in Danzhou City.

5. Conclusions

Danzhou City style is closely related to the local natural factors, human factors and building technology factors. In the development and construction, we must follow the principle of "one region, one feature, one city, one style", integrate the historical context and cultural environment characteristics of the city and county, coordinate the layout, style, volume, scale and color of buildings, handle the relationship between mountains, water, forests, fields and cities, improve the infrastructure and public service facilities, and promote the harmony between buildings and the environment, people and nature.

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