The Analysis of Characteristic Coastal Landscape Design

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Abstract: With the development of social economy and the progress of science and technology, nowadays, coastal landscape design has attracted more and more attention from all walks of life. The focuses of paper are that how to combine natural conditions to create beautiful coastal space environment, solve coastal ecological problems, innovate coastal regional characteristics and show coastal culture. Through expounding the principles of coastal landscape design, analyzing the key points of coastal landscape design, and combining with the coastal design cases of Tianjin and Xiamen, this paper further studies the key points of coastal landscape design and characteristic expression channels, and guides and promotes the construction and development of coastal areas in the landscape field from a higher level.

1. Introduction

Since ancient times, living by the coast has been the basic pattern of human habitation site selection. About 60% of the cities with a population of over 1 million in the world are located in coastal areas[1]. It can be seen from this data that living by the sea is because the sea has more unique charm. People are born with a desire to "enjoying the sea scenery". The sea not only meets people's visual needs, but also forms a natural, open and culturally rich coastal landscape. The scale of coastal construction can reflect the economy and development of the coastal area. At present, there have been relatively complete theories and numerous successful cases of coastal landscape design in foreign countries, but there are few successful cases of coastal landscape design in China, and a perfect theoretical system of coastal landscape design has not been formed[2]. This paper attempts to analyze the characteristics of coastal landscape by combining the theory of coastal landscape with practical cases. It is hoped that the research content of this paper can improve the theory of coastal landscape design and provide reference for the latecomers.

2. Coastal Landscape Design Principle and Orientation

2.1. Design Principle

2.1.1 Functional Principle. In the process of designing the characteristic coastal landscape, one of the principles that should be paid attention to is the functional principle. This principle has high requirements for the comprehensive quality of the characteristic coastal landscape design staff, and it is necessary for them to take into account not only the needs of the surrounding urban residents in terms of work and life, but also the needs of tourists going sightseeing along the major coastal passages in the process of project planning[3]. In short, the design of characteristic coastal landscape actually serves the broad publics, including both local residents at the project site and the vast number
of tourists going sightseeing. Therefore, in the process of designing characteristic coastal landscape, it is necessary to take the actual functional requirements of both into consideration.

In the coastal landscape of Gulangyu Islet, the advantages of the local unique natural landscape and human landscape resources are fully utilized, and both the tourists’ functional needs and the local residents’ development needs have been effectively met in the continuous development process.

2.1.2 Ecological and Environmental Protection Principle. In the process of coastal landscape project design, the priority is to formulate the corresponding construction plan on the basis of following the principle of ecological and environmental protection according to the actual development of society. Project design staff should design according to the actual original ecological basic conditions of the project, work according to the basic principles of ecology, and focus on the water cycle and plant growth laws in coastal landscape projects. For example, as for the design of coastal trail landscape in Yantai, Shandong Province, we pay highly attentions to the design principles of the project. There are stable water circulation systems in the coastal wharf and coastal forest park, and the geographical environment of Yantai has been fully utilized in the whole project. Because Yantai itself has the geographical environment of low mountains and hills, 90% of the coastal trail landscape in Yantai has a wide direction, multi-faceted landscape community and unique aesthetic after the design has been completed.

2.1.3 Characteristic Principle. In the process of coastal landscape project design, it is necessary to follow the characteristic principle. In the actual design project, the staff should use local materials as much as possible, so as to save the transportation cost of related materials to the greatest extent. In addition, some plant materials are often used in the process of coastal landscape design. However, it is necessary to know that different plant materials have different suitable growth environments. If some beautiful plant materials in less suitable growth environment are forcibly used in the process of coastal landscape design, the high material cost will appear in the characteristic coastal landscape design, which is not conducive to achieving higher cost performance.

For example, in Gulangyu Islet's characteristic coastal landscape design work, the local characteristic materials were fully utilized and designed into different types of landscapes, including parks, baths and gardens. There are many local plant materials of Gulangyu Islet in Liuzhuang Garden, which adapt to the local climate types, and the use of local materials also makes Gulangyu Islet's characteristic landscape design show local regional culture.

2.2 Design Orientation

In the design work of characteristic coastal landscape, the word "characteristic" is closely related to the project orientation, and it is also a key part of the whole design work, so relevant staff should attach importance to it. However, if we want to realize the precise characteristic coastal landscape design's orientation, we need the design staff to carry out sufficient research work, and investigate the local natural landscape resources and cultural landscape resources. Thus, full understanding will be achieved and a characteristic coastal landscape integrating ecology, leisure and vacation will make efforts to be built into.

In the process of designing the characteristic coastal landscape of Gulangyu Islet, it has achieved a precise positioning, and giving full play to its unique geographical and cultural advantages, due to the precise characteristic coastal landscape design. Up to now, Gulangyu Islet is still the leading tourist scenic spot in China and famous both at home and abroad, in which coastal landscape design also plays an important role.

3. Key Points of Coastal Landscape Design

In the process of actual characteristic coastal landscape design, besides precise design positioning and following relevant design principles, it is also necessary to firmly grasp the key work contents of coastal landscape design, so that the characteristics of different coastal areas can be brought into full
play and the actual characteristic coastal landscape construction work can be carried out. Therefore, in the follow-up coastal landscape design work, it is necessary to pay close attention to the key design contents and promote the development of construction work.

3.1 Organic Combination of Surrounding Environment and Terrain

As for the design of characteristic coastal landscape, it is necessary to organically combine the coastal area topography with the surrounding natural environment and humanistic environment, so as to make a unique coastal landscape with characteristics and suitable for the local environment. In Gulangyu Islet's characteristic coastal landscape design, its topography increases with height and is winding. The relevant design staff firmly grasps the key point of "organic combination of surrounding environment and topography" in the characteristic coastal landscape design, so as to make Gulangyu Islet's coastal landscape system rich and diverse, including common human landscapes (style buildings, amusement squares and coastal parks). Besides, there are many natural landscapes (beaches, reefs, and rock walls), among which the organic combination of surrounding environment and terrain has been realized, and Gulangyu Islet has also realized the complementary functions of each area, and the two are integrated under natural conditions. For example, the southern part of Gulangyu Islet is connected with the blue sea and blue sky, and the characteristic coastal landscape with winding beaches naturally catches tourists' eyes.

3.2 Landscape Style

Different landscapes have different styles and characteristics. It is one of the main reasons why various landscapes have specific audiences, and it is the same for characteristic coastal landscape design. If the style construction of characteristic coastal landscape isn't paid much attention, there are not characteristics by just learning from domestic and foreign coastal landscapes blindly. Then, the coastal landscape will become a replica, and the whole characteristic coastal landscape design will lose its significance. Therefore, in the actual design process, designers need to focus on the design of characteristic coastal landscape style, and can make use of the cultural characteristics of different regions to make them "characteristics", because it is very important for characteristic coastal landscape design.

Here is the example, the unique landscape style of Gulangyu Islet's coastal landscape design. From the coastal landscape of Gulangyu Islet in Figure 1, it can be seen that Gulangyu Islet is surrounded by the sea. Designers have grasped this point and applied the religious and cultural characteristics of Gulangyu people. Thus, tourists feel novelty and mystery. In addition, religious culture has also been used in architecture, reliefs and other aspects, forming Gulangyu Islet's unique coastal landscape style over time. This not only shows the historical and cultural connotation of Gulangyu Islet, but also strengthens the uniqueness and localness of historical accumulation, so that the historical context of Gulangyu Islet scenic spot can be inherited and extended.

![Gulangyu Coastal Landscape](Source: Network)

3.3 The Coordination between Plant Landscape and Nature

Plant design is an important aspect of coastal landscape design. However, historically, some coastal parks in China lacked scientific allocation of plants, which resulted in unreasonable selection of tree
species and violation of the principle of suitable trees, the death of a large number of tree species, poor growth of some tree species, or single tree species and monotonous landscape. To solve these problems, firstly and plant plants should be selected scientifically. Trees, shrubs, lawns and ground cover plants are combined into a reasonable artificial plant community. Taking plant community as the basic greening unit, this paper rationally and artistically configures plants into a complex and three-dimensional plant community coexisting for a long time by means of artistic unification, harmony, contrast and balance, and emphasizes the coordination between plant landscape and natural environment. At present, in the design process of characteristic coastal landscape, tropical plants with wind resistance, drought resistance and acid resistance are mainly selected, such as Casuarina Equisetifolia and Ficus Altissima with low cost and easy to grow. The allocation pattern of coastal artificial ecological community is shown in Table 1 below.

| Pattern Type         | Plant Features                                      | Typical Plant                                                                 | Pattern Effect                                                                 |
|----------------------|-----------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Hierarchical Type    | Mainly trees, with shrubs and herbs                 | Chinese Scholar Tree, Locust, Ailanthus, Hibiscus, Pearl Plum, Yellow Rose, and Tall Fescue etc. | The ecological benefits are good, but the accessibility is poor, so people's activities in the space will be affected to some extent. |
| Forest Type          | Mainly trees, densely dotted with herbs and flowers  | Willow, Empress Tree, Tall Fescue, Bent Grass, Lonicera Maackii, and Flowering Peach etc. | The landscape effect is outstanding, which makes people feel pleasant and comfortable, and also has certain ecological effect. |
| Open Space Type      | Taking trees as the background and open lawn as the prospect | Willow, Empress Tree, Buffalograss, Tall Fescue, and Bent Grass etc.          | The space has broad and bright vision and strong accessibility, which provides conditions for the occurrence of various activities. |
| Group Type           | Mainly composed of four-season flowers and colorful shrubs | Rose, Hibiscus, Pearl Plum, Lonicera Maackii, and Elm Leaf Plum etc.            | It can form a strong sense of the times and attractive rhythm. |
| Protective Forest Belt | Applicable to coastal areas with protection as the main purpose | Chinese Tallow, Taxodium 'Zhongshansha', Taxodium Mucronatum Tenore, Salicaceae etc. | Guard and protect coastal foundation |

4. The Analysis of Coastal Landscape Design Plan

4.1 The Construction of Coastal Wetland Ecological Landscape in Tianjin Binhai New Area

Tianjin Binhai New Area is located in the northern of North China Plain. In 2010, Tianjin Binhai New Area began to transform its industrial structure and development mode. In order to gradually deteriorate the ecological environment and effectively solve the water shortage, it began to plan the construction of coastal wetland ecological landscape in Tianjin Binhai New Area. At this time, the per capita green area reached 40 square meters and the green coverage rate reached more than 36%. Finally, a perfect wetland garden system was established in 2015.

The landscape construction of Binhai Wetland Ecological Park in Tianjin Binhai New Area is mainly based on "water". It mainly has five landscape systems: forest landscape system, main recreation landscape system, wetland landscape system, riverside landscape system and coastal...
landscape system. These unique five landscape systems with different connections with “water” as the link, not only realize the development and development of regional tourism, but also effectively promote the ecological protection. From this perspective, the construction of coastal wetland ecological landscape in Tianjin Binhai New Area plays a dual role. The establishment of the whole water system also promotes the long-term characteristics of coastal wetland ecological landscape in Tianjin Binhai New Area, and subsequent development will be guaranteed. At present, rich and diversified coastal ecology has been formed.

Moreover, the author can find that the coastal wetland ecological landscape in Tianjin Binhai New Area is designed according to the "ecosystem self-design theory". Thus, it enables the coastal wetland ecological landscape in Tianjin Binhai New Area to carry out its own quality according to different environmental conditions. As time goes by, the wetland ecosystem will become more improved, and then the self-design function and self-recovery function can be realized.

It is obvious that the design and construction of coastal wetland ecological landscape in Tianjin Binhai New Area has gradually formed a distinctive coastal landscape, in which the establishment of water system is more conducive to the flow of water resources. Thus the important functions of groundwater replenishment, water storage, and freshwater wetland maintenance have been realized. It is beneficial to the following protection of ecological environment and utilization of natural ecological resources. The ultimate construction goal of Tianjin Binhai New Area is to become an ecological economic zone suitable for human settlement, and up to the standard of environmental quality and sustainable economic and social development. Therefore, it is synergistic with the sustainable development strategy implemented in China for a long time.

4.2 Xiamen Siming District Characteristic Coastal Landscape Design

As we all know, Gulangyu Islet is a famous tourist resort in China, located in the southwest corner of Xiamen Island, and facing Xiamen Island across the sea. Because there is a sea cave in the south of Haixi, impacted by the tide, it sounds like a drum roll, and its present name is an elegance nomination by people in the Ming Dynasty. The distinctive coastal landscape design has laid a solid foundation for the development of tourism in this area.

Gulangyu Islet, rich in natural landscape and cultural landscape, lays a solid foundation for the design of characteristic coastal landscape, and is also helpful for the relevant design staff to carry out accurate design positioning. Before the actual design work, the staff fully understood and investigated the folk culture and national culture of Gulangyu Islet.

From the aspect of folk culture, Gulangyu Islet has rich and colorful folk culture, including local customs, national etiquette and distinctive local lifestyle etc. Because of Gulangyu Islet in rich folk culture, designers have carried out scientific and rational layout and design work. For example, they began to use some materialized elements such as reliefs, paintings and landscape lamps to show the folk culture in Gulangyu Islet's characteristic coastal landscape. This makes tourists have a clearer understanding of Gulangyu's characteristic coastal landscape. This is also one of the main reasons for Gulangyu Islet's long-lasting tourism, and it has a guiding role for the follow-up work of characteristic coastal landscape design in other areas.

From the aspect of national culture, the folk culture of Gulangyu Islet is mainly reflected in two aspects: religious belief and resistance to foreign invasion. Most local residents in Gulangyu Island believe in Daogong and Mazu. From the overall structure of religious belief, this is a very small branch, which makes the residents of Gulangyu Islet hold traditional worship ceremonies when special festivals don’t fall on. This is also a distinctive humanistic landscape in Gulangyu's characteristic coastal landscape. The aspect of resisting foreign invasion is the heroic history of Zheng Gongcheng. In order to give full play to these two aspects, the relevant staff began to use the architecture and sculpture of coastal landscape, which made Gulangyu have a coastal landscape and space with high-strength humanistic connotation. Among them, Zheng Chenggong's giant granite sculpture in Haoyuexuan reflects the local people's memory and reverence for the national hero Zheng Chenggong.
5. Conclusion

This paper deeply studies the principles and key points of coastal landscape design, and comprehensively analyzes the relevant theories and existing problems of the current coastal landscape design through the characteristic coastal landscapes of Tianjin Binhai New Area and Siming District of Xiamen. Some design suggestions are put forward, such as the combination of coastal artificial landscape and terrain, the emphasis on characteristic landscape style, and the coordination between plant landscape and natural landscape. It can be seen from the content of the proposal that the characteristic coastal landscape plays an important role and significance, which can not only promote the economic development of the coastal area, but also protect the surrounding ecological environment. Therefore, it is necessary to pay enough attention to the design work of the characteristic coastal landscape, and constantly make optimizations and improvement during the development of design work.

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