

Ecological Maintenance in Tourism Resort Landscape Plan

Architectural Landscape Design of Yantai Longkou Nanshan Tourism Resort

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Abstract—In the traditional agricultural civilization and industrial civilization, we sometimes neglect the natural environment in exchange for the development of economy and society, thus making human face the ecological crisis. People come to realize: to get rid of the current ecological crisis, we must not only control and govern the existing various pollution, but also change the way of resources utilization fundamentally, change effectively the resources into products as far as possible and make cyclic utilization to thoroughly reduce and get rid of the pollution of waste so as to intrinsically unify economical benefit, ecological benefit and social benefit. We take Yantai Longkou Nanshan tourism resort landscape design as an example to discuss how to embody the ecological maintenance in landscape plan. The establishment of ECO-PARK with ecological features will relieve the pressure on the environment to a certain extent and satisfy people's yearning for nature, further to truly realize the harmony between people and the nature through the combination of ecology and country life.

Keywords—*tourism resort; landscape design; ecological maintenance*

I. ECOLOGICAL MAINTENANCE AND LANDSCAPE DESIGN

A. *Ecological Principle Followed in Landscape Design*

The new industries such as electronic industry and genetic engineering bring the society into the information age. The utilization of system science, computer technology and biological engineering technology and new energy development makes human forcefully deal with the landscape problems caused by the past industry and agriculture from the theory and technology. Under this background, the landscape ecology is developed and it takes the lithosphere, biosphere and intelligence sphere in human living space as organic components of total human ecosystem to study the relationship between structure and function among various landscape elements, so that the space-time structure, energy logistics and information of the human ecological system can be in the best state through human design and management. Landscape ecology is the guiding theory of landscape ecological design. If we say the landscape design in agrarian age is human's antagonistic process against natural landscape, the landscape design in

industrial age is human's passive aggressive process against the industry landscape created by human themselves. The ecological landscape design under the background of information society is to make people regard each element of the whole landscape (including the natural and the cultural) as design variables and objectives and eventually make landscape system structure and function achieve the overall optimization. Then the landscape designer is no longer a professional designer, but the coordinator of many departments and multi-discipline and the brainpower of decision-making body.

Compared with the landscape design in the past periods, the ecological design of landscape has a few basic principles as follows: (1) the natural priority principle: the protection of natural capital and the maintenance of natural process is the premises to utilize and change nature. (2) Overall design principle: ecological landscape design is a comprehensive design of the overall human system, but not an isolated design of a certain landscape element. It is a kind of multi-objective design, for human needs and animals needs, for high output and beauty, and the purpose of design is the overall optimization. (3) Design adaptability principle: natural landscape has its harmonious and stable structure and function. Artificial design must adapt to the original "design" of natural landscape and minimize the side effect brought by artificial landscape elements to ensure the integrity of overall landscape structure and function. (4) Multidisciplinary integration principle: the landscape elements are research objects of multiple disciplines of nature and social sciences. Only the joint work on multi-disciplines can make us realize the ideal ecological landscape design and ensure the harmony and stability of overall ecology.

B. *Ecological Design Methods of Landscape Design*

1) *Retention and recycle—the landscape design reflecting context and saving resources*

The ecological landscape design method retains the original elements in the site and recycles the original materials, which has been popular with the designer since 1970s. After the 1970s, with the transition from industrial era to post-industrial era, a large number of industrial wastelands appear. In face of the industrial elements that have had

glorious history once, and the spots of trace left by the industry, landscape designers didn't cover or remove them but think highly of the current situation of the site, retain them and make art processing. The ecological design method is adopted for the reconstruction of many industrial wastelands in German Ruhr Industrial Region, of which Duisburg Northern Landscape Park and Nordstem Park are typical relatively.

2) Ecology in priority—landscape design reducing the original ecological system interference

To make design based on ecological principle to protect the natural environment from destruction or interference of human beings, every designers should protect the original ecological environment of the site. For the most typical Zhongshan Qijiang Park, facing the double challenges of protecting ancient banyan trees and preventing flood, Professor Yu dug channel and built island according to river dynamics principle, to protect the original ancient banyan trees at the site and to meet the requirement of flood control.

3) Turning waste into wealth—landscape design recycling material and resources

The advocacy of energy and material cyclic utilization runs through the modern landscape design. The ecological landscape design should use the materials made of renewable raw materials and recycle the materials and resources on the site as much as possible and maximize the potential of materials.

4) By dint of science and technology—landscape design of high technology

The development of science has promoted the progress of the technology. It has been one of the important methods for today's ecological design to use high-tech technology and materials to reduce the use of non-renewable resources. With the purpose of intercepting solar and escaping from the sunlight, the shot shutter type window in the Arab World Institute, Pairs is the embodiment of the combination of high technology and modern form. No matter whether the design is successful, the design concept embodied by it presents people's concern on natural energy.

5) Utilization of nature—landscape design of optimizing ecosystem by natural law

Nature has its own evolution and updating rule, meanwhile, it has strong self-sustaining and self recovery ability. Using the power of nature to realize restoration and regeneration of ecosystem can greatly save resources and reduce the generation of wastes. Huoshui Park near the Funan River in Chengdu, Sichuan has used artificial wetlands system to dispose sewage. First extract water from Funan River, power it into water purification systems such as anaerobic tank with the volume of 400 m³, the plant pond, plant bed, fishpond and oxidation ditch, etc, make it from muddy water to clear water, eventually return it to the Funan River. It has become another model to integrate with ecological concept in contemporary landscape design to respect the natural development process, strengthen self-maintenance of the site and develop sustainable treatment technology.

II. THE DESIGN AND ECOLOGICAL MAINTENANCE OF YANTAI LONGKOU NANSHAN TOURISM RESORT LANDSCAPE

A. Ecological Methods of Landscape and Architecture Design

The main body design of the building of Yantai Longkou Nanshan tourism resort landscape is based on the following principles, namely, "respect the environment" and integrates with environmental landscape as a whole. Meanwhile, it echoes with the surrounding landscape. The designing scheme of this building is based on detailed research and analysis on the original building and landform, consisted in the form that a few building blocks do alternately. Construction materials mainly use the woods and stones in the original region, use the sense of strewn at random of the building to reflect and stress the integral feeling of building horizontal extension to form a perfect integration with the environment. Local building materials can use local materials, with no need for long-distance transportation, which can reduce energy consumption as well as integrate with local plants landscape. Local building materials also have the advantage of convenient construction, with no need for the involvement of large machinery, which reduce the consumption of the construction and comply with the principles of ecological design. Minimize the earthwork quantity in the design and the destruction of the original mountain. The plane layout of the newly-built lobby building is designed according to the trend of the mountain, hugging the contour, making the best use of the circumstances, to let the building build around the mountain on the basis of not destroying the original mountain. The design of the villa adopts the method of stilt building so that the mountain will not be destroyed. Make the building and natural environment form perfect integration.

B. The Design of Landform

In the various elements of landscape design, landform is one of the most important. Landform is the carrier of landscape design elements, providing a dependent platform for the existence of the rest various elements such as water body, plants and structures. The landform is just like animals' skeleton. Without landform, there is no standing room for other landscape elements. Without ideal landscape landform, other landscape design elements won't play their roles very well. The landform in Yantai Longkou Nanshan tourism resort is complicated. In the resort, the chain of mountains appears ups and downs; ravines are criss-cross; the canyon is deep and serene. With big ground elevation difference, it is typical mountainous area. Complex landform restricts the change of climatic elements such as light, heat and water, etc. In the design, we minimize the damage to the original mountain. In the process of handling the river channel, we minimize the damage to the original river channel and furthest preserve the original landform. The villa area and the original ecological recreational area water system in the designing scheme don't build hard artificial canal and adopt regular form and hard revetment to build; the water surface shape uses natural style, breaks single linear structure and uses the way of combining point, line and plane to form natural, ecological and changeable wetland

landscapes such as winding streams, cascading waterfalls, shallow, wet land and lake surface, etc. Choose low-lying areas to dig lake to store water and form artificial lake of diversified functions and unequal scales.

C. Greening System Design

As tourism resort landscape, greenery landscape design is particularly important. In the resort landscape, comparable to respiratory system, greening has the effect of air purification and shielding. Reasonable tourism resort greening design considers building, greening and tourist activities as a whole, forms the resort environment ecological mechanism of organic operation that tourists can integrate in it to realize the "coexistence of human and nature". While at present, many resorts exist the phenomenon that when designers do planting composition, they firstly talk about the color zone and parquet; everywhere is hedges and shrubs ball cut by them or empty lawn connects large areas of pavement. Such a design not only cannot create a comfortable landscape effect, on the contrary, it seems to be scattered, tedious, combining Chinese style and western style together that make people feel uncomfortable. It should be advocated that the plant configuration in the resort tries to keep the original tree species. We should use local tree species reasonably instead of blindly using tree species in other regions.

In the plant greening design of Yantai Longkou Nanshan tourism resort, in order to make tourism resort form distinctive features on plant configuration, we consider the following several aspects on the greening landscape system design: firstly, the level of the plants should be emphasized and they are turf, ground cover, shrubs, small arbors and big arbors respectively from high to low, cooperating with the landform to surround a rich green space; secondly, on the plant species selection, use the local native plants, avoid using excessive introduced plants to form the phenomenon of plant "false-growth"; furthermore, advocate participation and ecology, plant more arbors with longitudinal growth, control the lawn area that cannot be trod; finally, advocate planting more perfuming plants, which have beneficial effect on human physical and psychological health and make tourists sound in body and mind. The thought of ecological design should run through the whole process of environment design all the time. It is human nature to return to nature and get close to nature. We should make the resort landscape environment ecological and let people feel the beauty of natural ecology. Just as Symond, an American landscape scholar, says, "we should bring nature into the concentrated planning field, carefully and systematically place buildings in mountains, near the river valleys and in the scenery".

D. Ecological Design of Water Body

In landscape design, when we design waterscape, we should also comprehensively consider the relationship between waterscape and the whole environment as well as the whole small ecosystem that has relationship with it. When designing waterscape, we should make the waterscape integrate in the local ecosystem. Besides, we should consider water reach the purification by itself in this ecological chain. Many living creatures live in normal water and they can

from a harmonious food chain. Because this food chain can automatically adjust the number of various creatures, they can maintain harmony of biological structure without the participation and management of human beings. Such water body design is ecological and sustainable design. Beautiful, energy-saving and environmental, it will not cause damage to the local biodiversity; on the contrary, it can provide conditions for local natural and harmonious development and keep the local biodiversity and improve the quality of people's living environment.

In the landscape design of Yantai Longkou Nanshan resort, we should minimize the damage to the original natural water system and make water system of the river channel more fluent through handling the revetment. In original ecological stacking water area, dig depth the original swag, thus can increase the water accumulating volume of the swag and make the microorganism in the swag more diversity, so that we can build up a harmonious food chain. As a ponding originally, the low-lying land hasn't been filled, instead, we dig depth it. Water in the river channel will gather in here to form an ecological artificial lake. In this way, it provides survival place for animals that live on pool. With larger living places, it will form a harmonious food chain.

E. Outdoor Pavement Design

In the design of outdoor pavement of Yantai Longkou Nanshan tourism resort, local stones, blue bricks, cobblestones and woods are used as the main pavement materials. On the roadway, we use local blue bricks as paving material. On the footpath, we use local cobblestones as paving materials, which can reduce the cost of transportation. We use antiseptic woods on the gallery road and trestle work, ecological and environmental. In this way, with the principle of using local materials to do the pavement design, we can combine hard landscape and soft landscape together.

F. Landscape Facilities

The road in Yantai Longkou Nanshan tourism resort is ghaut and bluestone slab road. There are facilities such as stone table, air corridor, trestle road along cliff, Shelter Bridge, stone arch bridge, water wagon, swing and hammock, etc. Most of the materials of landscape facilities use local stones and woods in Nanshan. Designing with the principle of using local materials, we make the construction simple and reduce the transportation materials.

III. CONCLUSION

In 21st century, it is our inevitable choice to go the way of "sustainable development", maintain ecological balance and create green ecological environment. In order to meet the needs of the development of times, we should change traditional tourism landscape planning values, systematically study a series of questions such as the theory of ecological design principles and its planning design methods, means and technology. To solve the contradiction between environment and development and make it naturalization, economization and social ecologicalization, we must

thoroughly change traditional pattern of industrial development and resource utilization pattern and adopt the pattern of cleaner production to ecological industry and to recycling economy, to realize the target of low or zero emission, which is the certainty of tourism landscape ecology. In the process of tourism resort construction and use, we should effectively use natural resources and efficient energy-saving materials to minimize the resource consumption of buildings and their pollution to the environment, and to make human living environment reflect the integration effect of multiple environments, such as space environment, ecological environment, cultural environment, landscape environment, social environment and fitness environment, thus to make human living environment more comfortable, more beautiful and cleaner and let human beings have a better tomorrow.

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