

# The research on vegetation layout of urban wetland park revetment-Take the Tangshan Nanhu wetland park as an example

Wendi Tan<sup>1, a</sup>, Li Zhu<sup>1, b</sup>

<sup>1</sup> North China university of science and technology, Tangshan, Hebei, 063009, China

<sup>a</sup>114619052@qq.com, <sup>b</sup>8498350@qq.com

**Keywords:** urban wetland park; Vegetation; plane layout; Vertical layout

**Abstract.** This article takes Tangshan Urban Wetland Park as an example, conducts the research to the Urban Wetland Park revetment vegetation layout mode, the study is carried out from two aspects, one is the plane layout of the vegetation, the other is a vertical layout of vegetation, this study summarizes the measures and methods of vegetation layout and vertical layout.

## Introduction

Tangshan Nanhu wetland park is the site of the coal mining subsidence area, distributed in the region has a larger area of the surface of the water, the land part is much used for living and production waste dumping site. Nanhu Wetland Park construction is carried out on the basis of this, during the challenges and many problems. Today have achieved remarkable results, park beautiful scenery, good ecological effects, loved by the public. Waterfront environment is a transitional zone of wetland system and other environmental, revetment within species is very rich, and because the area are water transition area, the public is also very fond of playing in the bulkhead parts. Revetment in vegetation is an important factor in the environment impact of revetment, and the layout of vegetation on the landscape effect is obvious, the article researches the layout of revetment vegetation.

## Plane layout of vegetation

**The overall changes in plane bulkhead.** Revetment vegetation layout first need to consider the overall level changes of revetment, only on the revetment foundation conditions are analyzed deeply, can reasonably vegetation configuration, eventually achieve a harmonious landscape effect. Bulkhead flat form has a great influence on the embankment of the overall image, if the shoreline twists and turns, the vegetation configuration is easily formed beautiful art effect, if the shore line straight, monotonous, the vegetation elements configuration is very difficult to form a varied and rich landscape effects.

The research found that there are three main problems in the form of revetment shoreline of South Lake Park. The first is located in the region of large South Lake revetment, because fewer visitors, most of the region's bulk head forms difficult meticulous design, but the fine design in some key areas still need to adjust the shape of the coastline, so as to improve the sense of monotony (Figure 1); the second is on the main tour area, there are also part of revetment linear monotonous shortcomings, but I also found that, during the research, the South Lake Park management departments are reconstructing revetment, enhance the aesthetic form of coastline (Figure 2); the third is located on the main tour some non route revetment, early in the planning is not as the main tour routes in the revetment environment construction, the shoreline forms the lack of change but because the region with high vegetation cover, species rich vegetation, and make it become the visitors want to visit the destination, so the shoreline still needs to be rebuilt according to the characteristics of tourist activities.



Fig1.The twists and turns of the revetment



Fig2.The transformation of

**Vegetation layout form.** According to the overall effect of the formation of vegetation after the configuration, layout of the vegetation can be divided into three modes: point, linear, planar layout. We need to use a combination of three kinds of mode, setting off each other, can eventually form a rich landscape effects.

The first way is point layout of vegetation. Point layout, refers to the individual tree, or a group of planting on the shore of the bushes and flowers plexus. The characteristics of this arrangement is the scenery and the environment around the difference was significant, easily become the visual focus, therefore, the vegetation itself will be more beautiful, also set in quantitative terms can not be too much. Research found that, when the layout of Point vegetation in relatively open revetment environment, vegetation has obvious difference with the surrounding environment in the shape, color, height, and can achieve good visual effect.

The second way is linear distribution of vegetation. The linear layout refers to the vegetation elements are arranged along the profile, showing a significant linear. This layout is the most common mode of the revetment vegetation configuration, in the Wetland Park, away from the water's edge side often arranged revetment Road, along the road of planting trees, trees become landscape corridors, the green landscape corridor artistic effect is restricted by the road form, if the road is tortuous change, then green corridor also twists and turns; if the road forms lack change, it will appear dull and monotonous green corridor. In addition, the linear layout brush can also be regarded as zonal landscape, setting should pay attention to the linear change of itself, make the distance water suddenly near or far, avoid the sense of monotony. Research found that, in the main viewing area road winds extended, extremely rich change, planting willow trees on both sides of a road, the formation of the green corridor full of movement, is very beautiful. The author also found, in part of the park revetment environment, in order to stop the visitors arrived at the water's edge and set the bushes are separated, and the Bush is in the form of linear shaped mostly, shrub belt had helped to hinder the people established role, but its beauty is reflected in the insufficient, therefore, we need to rebuild the bushes.

The third way is planar layout of vegetation. Wetland vegetation sheet layout reed, calamus, Imperata, Setaria etc. not only has the revetment dike, the role of purifying the water quality, and strong ornamental value. Designed according to characteristics of the vegetation itself, can form the theme, make it become the park landscape in the

destination. Tangshan South Lake Park Lotus Pond with lotus as the theme, when the lotus in full bloom, attract a lot of people come to visit. The most suitable for the planar arrangement of vegetation in open water turning point, here is the most open field of vision, visual experience is very rich. If in the vegetation leaves layout path, can make people feel close to vegetation. The author found that, in the small South Lake scenic area, there are plots arranged in the south south entrance and lotus Scenic Park waters, but in other areas of the main tour routes pass by, is the lack of the planar layout of aquatic vegetation. Due to the vast waters of South Lake Park, in the premise of the partition sets, ecological protection, increase the surface vegetation landscape configuration, can improve the public satisfaction to the wetland park.

### The vertical distribution of vegetation

**The overall change in the vertical revetment.** The vertical change refers to the bulkhead bulkhead slope, slope and water soil depth contour. The effective use of slope gradient and slope revetment can guide the rational flow to rain, runoff regulation speed function. Revetment local slope should not be too large, otherwise easily lead to rain and surface water too fast and soil erosion. Research found that the South Lake Park in the adjacent parts of the same water slope is consistent, and the slope is relatively large, is not conducive to water and soil conservation on the one hand, on the other hand, is not conducive to the growth of vegetation, therefore need to transform the slope, it can be part of the shoreline soil push to the water, thereby forming a rugged terrain. At the same time revetment area increase.

**The formation of revetment vegetation vertical image.** Different kinds of vegetation height is different, for example, sink below the surface of submerged plants, floating plants float on the surface of the water above the emergent plant most pretty on the waters, ground cover plants growing in the soil surface layer, shrub height of about half a meter or so, tree height is very high. Therefore, the different species of vegetation are combined, can form a vertical image scattered high and low, rich and varied.



Fig3. The trees form the skyline



Fig4. Emergent plants form the skyline

Vertical changes in topography smaller revetment, terrestrial and aquatic plant trees form the skyline is more prominent in the field of vertical variation (Figure 3, 4). The survey found

that from South Lake Park to main ornamental route look on the other side, tree canopy forming undulating skyline, very beautiful.

## Conclusions

This paper focuses on the research of revetment vegetation layout method, conducts the research from two aspects: the plane layout and vertical layout. However, revetment vegetation layout is not limited to only two aspects of plane and vertical consideration, vegetation species selection, collocation aspects will affect the final image of the revetment. Therefore, we still need to do further research from multi angle.

## Acknowledgements

This work is the Tangshan City Bureau of science and technology project (13120202a).

## Reference

- [1] Jing Li, Gennian Sun et al:Vegetation on summer line temperature / humidity regulating effects of experimental and ecological value, submitted to Land resources and environment, Vol.16 (2002),p.102-105 (in Chinese)
- [2] Xiaonan Wang, Guangtao Meng:Mechanism of plant measures in key soil and water conservation, submitted to Soil and water conservation application technology, Vol.4 (2008),p.25-26 (in Chinese)
- [3] Zhenbin Wu, Dongru Qiu: Effect of aquatic plants to purify eutrophicwater, submitted to Wuhan Botanical Research, Vol.19 (2001),p.299-303 (in Chinese)