A Case Study on Landscape Design of Campus in University of Technology

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***Abstract*—The character of a campus is a spirit of place that cannot be touched. Design practice is a project that is implemented. How to make the campus landscape with "ideal" meaning and the design practice with "realistic" meaning influence the campus users through the means of landscape design is the research goal of this paper. The author will discuss the project location and background, site characteristics, design objectives and design strategies. We design many places for user to stay in the site, such as the large steps on the surface of the structure and the viewing platform, the display space inside the structure and the large steps in the sunken courtyard, the small private space outside the structure and the desks and chairs under the shade of trees, etc., which meet the functional requirements of campus users for staying and resting in the site.**

Keywords- Landscape Design of Campus; the Character of a campus; University of Technology

I. PROJECT LOCATION AND BACKGROUND

This project is about the design of campus landscape. It is located in south campus of South China University of Technology, Panyu District, Guangzhou, Guangdong Province. Around the base, there are a gymnasium and teaching buildings in the north, a library in the east, a football field and a basketball court in the west, and Spike stone village not far away. Therefore, it is located in an area with dense public places and large pedestrian flow. The total design area is about 2700 square meters in Figure 1. Guangzhou is located in the south of China and its climate is a typical monsoon marine climate in the south subtropics.

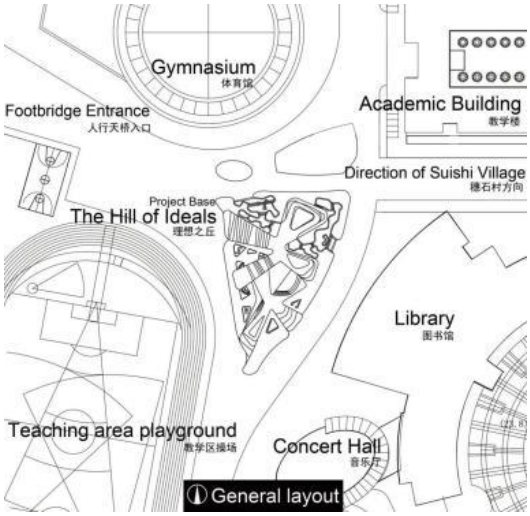

Figure 1. General layout

II. SITE CHARACTERISTICS

The base has the following major features, which provide challenges and opportunities for design:

a) Large demand for use.There is almost no sheltered outdoor space for user to stay on campus. According to interviews and surveys, more than half of the user hope that the base can provide user with the function of staying and resting, and many users also hope that it can take less time to get to the library from the footbridge. The base is located in an area with dense public places and large population flow. If outdoor activity space is added here, it will certainly attract a large number of users and bring rich space experience to campus users.

b) Reachability is not enough. Although the site is located on the side of the main road of the school, it is difficult for user to enter the site due to its high terrain in the north and low terrain in the south, and the edge of the site presents a steep slope with a height of 1 meter at the lowest point and 2 meters at the highest point. There is no hard floor inside the site, and it is even more difficult to walk. The poor accessibility and usability of the site also hinder the connection between other surrounding sites to a certain extent in Figure 2.

c) Good natural conditions. The existing plants in the site include *Mangifera indica., Rhododendron simsii Planch., Syzygium samarangense*（*Bl.*）*Merr. et Perry, Cassia surattensis Burm., Lagerstroemia indica L., Ficus virens Ait. var. sublanceolata (Miq.) Corner* and *Ficus microcarpa Linn. f.. Mangifera indica* are neatly arranged in the northwest area of the site, with a large amount of *Syzygium samarangense*（*Bl.*）*Merr. et Perry*. Three large *Cassia surattensis Burm.* and seven *Ficus virens Ait. var. sublanceolata (Miq.) Corner* are scattered on the site in Figure 2.

Figure 2. Poor reachability and many trees

III. DESIGN GOALS

Based on the above analysis of the location background and site characteristics, it is found that how to meet the functional needs of campus users to stay and rest, and how to activate the connections between the surrounding sites, while minimizing the damage to the

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original plants, are the three key issues to be solved in this design and also the main objectives of the design.

IV. DESIGN STRATEGY

A. Setting of Entrances and Exits

The main entrance is located at the northernmost end of the site near the basketball court. Considering the buffer space required for the main entrance, if the main entrance is located on the east-west main road with the largest human flow, chaos may be caused. There are two main exits. One is located at the southernmost end of the site near the library side, to facilitate pedestrians to reach the library through the garden and strengthen the connection between the site and the library. The other one is located at the southernmost end of the field near the football field to strengthen the connection between the field and the football field. The opening degree of the whole garden boundary is relatively high, which makes the communication freedom between inside space and outside space relatively high.

B. Spiritual Guidance and Spatial Design of the Project

The name of the project is *The Hill of Ideals*. Its spiritual connotation are influenced by Plato's thought.The change of sound intensity around the site is the logical basis for space design.

The logical basis of the space design is the change of the surrounding sound intensity, which makes the site divided into two major areas of static and dynamic, belonging to north district and south district respectively. The dynamic performance of the north district is shown as follows: a) It is close to the main road with large and noisy traffic, so user can hear loud voices in the site. Therefore, a place for user to gather is set up in the north district, where user move with loud voices, making the north district dynamic; b) There are three entrances and exits in the north district. There are many paths. Frequent user move means that user are active in space, which makes the north district dynamic. On the contrary,the static performance of the south district is shown as follows: a) The surrounding environment in the southern district is relatively quiet, so user can hear less sound in the site. Therefore, a place suitable for a few users to chat and rest is set up in the southern district, and users's activities are relatively quiet, making the southern district quiet; b) There are many trees in the southern district, and the roads are often hidden, which gives the southern district a sense of quiet because of the winding path leading to a secluded spot, and the traces of users hidden in the trees.

There are three theories worth describing about this book: idea theory, soul theory and memory theory. Among them, idea theory is the core of Plato's philosophy. What is the relationship between the ideal world and the real world is an important issue that Plato explored all his life: The idea of permanence is primary, while the things of birth, death and change are secondary. Although the book is idealism, there are many reasonable factors. When idea theory is placed in the site, hard structures and paths are primary. The birth and death of changing plants, light, insects and chirping birds are secondary.

The spatial sequence of the whole garden starts from the North District. The North District, which is close to the main road with heavy traffic, is the "moving" part of the garden and tells the soul theory that overlaps desire, reason and passion.The alliance of rationality and passion and desire are a pair of contradictions. The freely extending big steps in the field represent passion. The trees blocking progress are rationality. The combination of big steps and trees is the alliance of rationality and passion. They divide the space while the remaining empty part is desire. At the main entrance, the structure passes through mango trees to form a large step that rises slowly from the ground. At this time, users's sight is blocked by the large step and trees in Figure 3. When you walk up the steps, you will come to the viewing platform composed of two triangles, where you can not only look inward at the trees that pass through the first floor of the structure, but also look outward at the overpass, the teaching building, the gymnasium and the users coming and going in Figure 4. In the southwest, there is the highest point of the space：the gazebo, which can be seen to the stadium in Figure 5.

Figure 3. Large staircase

Figure 4. Platform

Figure 5. Gazebo

Users can also enter the park through two secondary entrances located on the north and northeast sides, and enter the interior of the structure through mango trees in Figure 6. Due to the triangular geometry of the structure, this space is very flexible and can accommodate various layouts. Enclosing the space in the form of rods does not hinder the circulation of air. The rods spaced 30 cm apart can also be set up as exhibition walls and make this space become the exhibition space, which can also be used as meeting places. Sitting places are set up inside and outside this enclosed space, where users can rest and enjoy the scenery in Figure 7. After walking out of the enclosed space, users meet the first road node in Figure 8. As the steps descend layer by layer, the line of sight through the south forest becomes clearer and clearer, and the winding and overlapping paths in the northeast can also be faintly

seen. At the end of the transition zone is a semi-enclosed space formed by the bending of the second floor of the structure to the ground, with landscape sketches inside to signal the viewer to move towards the bright spot in the southern region.

Figure 6. Entrance

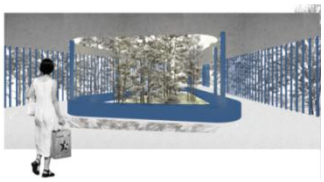

Figure 7. Exhibition Space

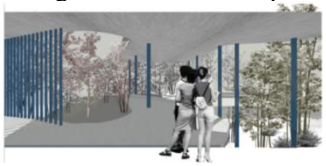

Figure 8.&9. The First Road Node

Leave the transition zone, the line of sight will be suddenly enlightened.

The road around the southern part of the garden has a small traffic flow and quieter than that in the northern part. It is the "quiet" part of the site and tells the memory theory that advocates rational thinking, analogy and introspection.With the opening of the second part of the garden, users went to the lowest point of the garden:the sunken garden. Here, you can feel the most abundant spatial levels in the whole garden: sinking, gentle slope, steps, and high. Curved plates and trees are used to connect these spaces vertically, skillfully defining the spaces on the north and south sides of the courtyard, making the courtyard more visible and distinguishable, with a higher sense of enclosure. After taking a nap in front of the tall trees in the sinking courtyard, you can feel the inner peace in Figure 9.

Users walk out of the sunken courtyard and come to the second road node: stay or leave in Figure 10. If you choose to stay, you can walk to small private spaces one by one through the gentle slope in the northwest. The setting of curved seats and semi-circular tables provides viewers with freedom to sit and lie down, and the quiet space provides a place for users to think. If you choose to leave, you can leave through the southeast exit to the library.The southern part of the site buffers users's emotions by sinking and gentle slopes, giving them space to think and reflect. Private small space provides a place for users to think rationally.

At this point, the entire site tour is finished.

Figure 10. Sinking Courtyard

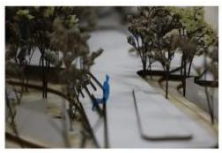

Figure 11. the Second Road Node

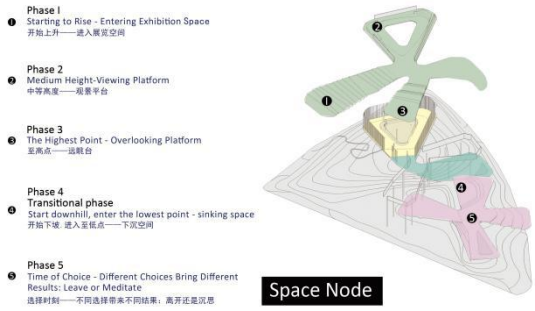

Figure 12. Space Node

C. Landscape Design

As a positive space, the structure divides the negative space outside the structure into 7 small courtyards, and at the same time closely connects the whole garden.There are three courtyards in the north and four in the south.

In the northern part of the site, in order to minimize the damage to plants caused by transplantation, rows of *Mangifera indica* remained in place, and structures directly passed through *Mangifera indica* as if they were growing from the ground. In the planting area in the exhibition space, one *Cassia surattensis Burm.*, one *Ficus virens Ait. var. sublanceolata (Miq.) Corner* and three *Syzygium samarangense （Bl. ）Merr. et Perry* are planted respectively. Standing on the second floor of the exhibition hall during the flower season, you can see yellow and purple flowers. Inside the exhibition hall, you can enjoy the shadow of the tree whirling and the petals falling with the wind. The tall trunk also extends the viewer's longitudinal sight. On both sides of the structure, *Ficus microcarpa Linn. f.* and *Syzygium samarangense（Bl. ）Merr. et Perry* are mainly planted, with azaleas interspersed among them, making the planting of plants rich in layers.

On the south side of the site， there are four small courtyards. The sunken courtyard is planted with *Cassia surattensis Burm.*, *Ficus virens Ait. var. sublanceolata (Miq.) Corner* , *Syzygium samarangense（Bl. ）Merr. et Perry*, *Mangifera indica* and *Rhododendron simsii Planch.*. The plant species are the most abundant and the scenery is the most exquisite. At the same time, semi-enclosed steps are set up to allow the spectator to stop for a while. The other three courtyards are respectively provided with small spaces with different enclosing degrees and shapes: some contain trees in the small spaces, and tables and chairs are arranged around the trees; some trees are outside the small space and divide the inner space of the small space with shade.

D. Material Selection

The roof of the structure is mainly made of white rigid polyurethane foam plastic, which has good thermal insulation effect, light weight, large specific strength, convenient construction and other excellent characteristics. At the same time, this material can reduce the sense of structure volume.

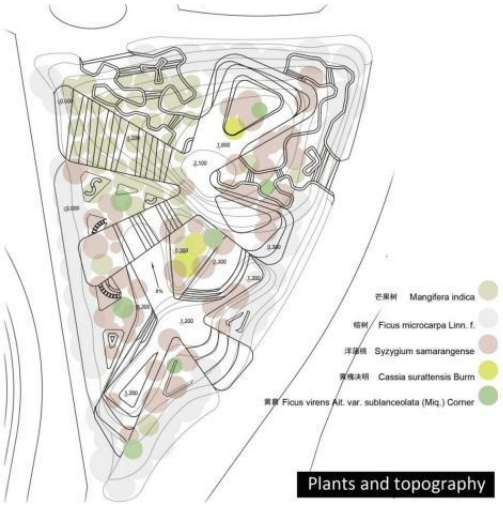

Figure 13. Plants and Topography

White pavement mainly adopts common permeable material: concrete terrace. The dark gray pavement adopts concrete permeable bricks, which have good permeability and low cost. There are many interweaves of different materials, which collide with plants to form soft and hard texture.

V. CONCLUSION

a)We design many places for user to stay in the site, such as the large steps on the surface of the structure and the viewing platform, the display space inside the structure and the large steps in the sunken courtyard, the small private space outside the structure and the desks and chairs under the shade of trees, etc., which meet the functional requirements of campus users for staying and resting in the site.

b) The destruction of original plants is greatly reduced by allowing structures to pass through trees, setting small private spaces and sinking courtyards according to the positions of trees.

c) Laying hard floors and opening multiple entrances and exits facilitate users to walk into the site from all sides and activate the connection between public spaces around the site.

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