

# A Study on the Campus Landscape Design of the National University of Singapore

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**Abstract.** In this paper, we analyzed the functions, structure, layout, landscape and engineering measure of the campus of NUS by the way of such research methods as present situation research, interview and comparative study. And we get the spatial characteristics of landscape environment affected by political economy, human geography, geographical conditions which will provide a new perspective for building international, modern, high-level research universities.

**Keywords:** Landscape design; Human geography; Place spirit; Campus.

## 1. Introduction

Building a modern university is very important for regional competitiveness. It works in two ways: one is hardware, such as environment and infrastructure; the other is software, such as teaching, the capacity for scientific research and influence.

Academician Yunhe Pan of Chinese Academy of science says regional universities like America's community colleges give rise to local employment and manufacturing industry. If we say that a good university like BU can promote cultural industry and the quality of a city. Research universities like Stanford university and Silicon Valley will bring durative innovation ability even wealth Effect [1].

Yingyi Qian, a professor at China's Tsinghua university, has an essay named "problems with Chinese education", in which he said education may not be conclusive relative to environment for personal training in allusion to "Qian's question" - why can't our schools produce outstanding talents[2]?

The construction of software and hardware is very important to colleges and universities when environment are treated as basic condition. Therefore, building landscape that allows for diversified values and fits in its self-positioning is really important for High-quality universities.

The NUS has appreciated and constructed by Singapore government, this makes NUS stay ahead internationally, ranking around 25-29 in world university Rankings [5].

## 2. Two Kinds Analysis of Landscape Cases of Universities in Abroad

The first layout is planning of Stanford university. Stanford university established in 1891, the area is 35 square kilometers (originally built on the farm which has 8180 acres), it is the second largest university in America. In 1886—1887, Stanford entrusted Olmsted, the man planned New York Central park and called father of modern American landscape planning to plan the campus layout and land area, in the meantime, entrusted SRC building design office proceed building design. Olmsted said Stanford want build a World-class University ... any world can't express his great idea." Olmsted planned large areas of grass, palm, elegant botanical garden and substance space to show the world-famous campus



flavor, the difference is Stanford University built on the formed land, many space appear regular layout [3].

The second layout is planning of Princeton University, the planning of graduate school was designed by Farrand. These are very simple, the campus is a world with plants. In the master plan, winding road is metaphor the tortuous in the process which scholar pursuing the trues. Unpredictable line and inclination let people slacken the pace, enjoy the beautiful scenery. The poly tropic degree and sight make the man intoxicate. Grove and bush by no means make the room congestion or cover the building outline. On the contrary, make the sight form plants focusing on the buildings [4]. When arrive at the mountain, the road turn into smooth. Landscape Architect Beyatia Farrand described his design concept.

The analysis suggests that National University of Singapore assimilates the landscape design essence form the tow universities: large areas of grass, local reveal building, winding road, clever decorated wood, suddenly see the light mountaintop happen to coincide these elements, landscape design concept perfect combination with Western civilization, culture value. This is showing the high level and internationalization research university construction idea.

National University of Singapore's new campus locates Lower Kent Ridge Road in southwest Singapore. From far downtown 12 kilometers. Campus northern neighbor is Ayer Rajah Expressway, southern neighbor is Pasir Panjang Rd, western neighbor is Clementi Rd and eastern neighbor is South Buona Vista Rd (Fig 1). Campus covering 150 ha, the predecessor is the UK forces in Singapore Pasir Panjang base air depot in the colonial period [5]. Campus is split in forth and back tow parts by Kent Ridge Road, the forth include teaching building, administrative building and recreational amenities; the back mainly include research institution and student dormitory. Singapore Science Park and National University Hospital close to the campus, research conditions are very convenience. Campus southern neighbour Pasir Panjang container port where is behind the Malacca. This university built on Kent Ridge Road, he overlook the Malacca and port scenery, annotation his responsibility. The Campus located mountain land where is beautiful scenery, he become wonderful landscape because predominant geographical conditions. The article choose the college of the design and environment and the college of the social sciences, analyze their site, by the way ,analyze and research the project of road slope and pavement drainage around the museum.

### 3. Location and Environment

National University of Singapore's new campus locates Kent Ridge in southwest Singapore(Figure 1).Campus covering 150 ha, is split in forth and back tow parts by Kent Ridge Road, the forth include teaching building, administrative building and recreational amenities; the back mainly include research institution and student dormitory. Campus close to many science parks, such as Singapore science park I and II.Qi Ao bio medicine research park combination with Qi hui multimedia information park, every park have unobstructed for each other, only have varied functional space form landscape and road segmentation. National University of Singapore sufficiency show the quality of internationalization and high level research university because the characteristics of history and geographical location. There are many science parks, campus has wonderful landscape and pretty architecture. Those landscape elements stimulate students' creative thinking. The large areas of grass show there are many Terra incognito need people to fill up, keep the natural form manifests the mystery need to issue reasonable excuse. When "blank" grass landscape make researcher express emotion to stop a gap, the ideology movement urges the power of creativity and probe become infinite. Campus free-type layout fully displays the significant mind of academic freedom, functional zoning planning specific and systematic structure reflect the character of academic autonomy. The campus and society, science and technology and culture, those elements interaction formed democratic aura of campus of autonomy.....

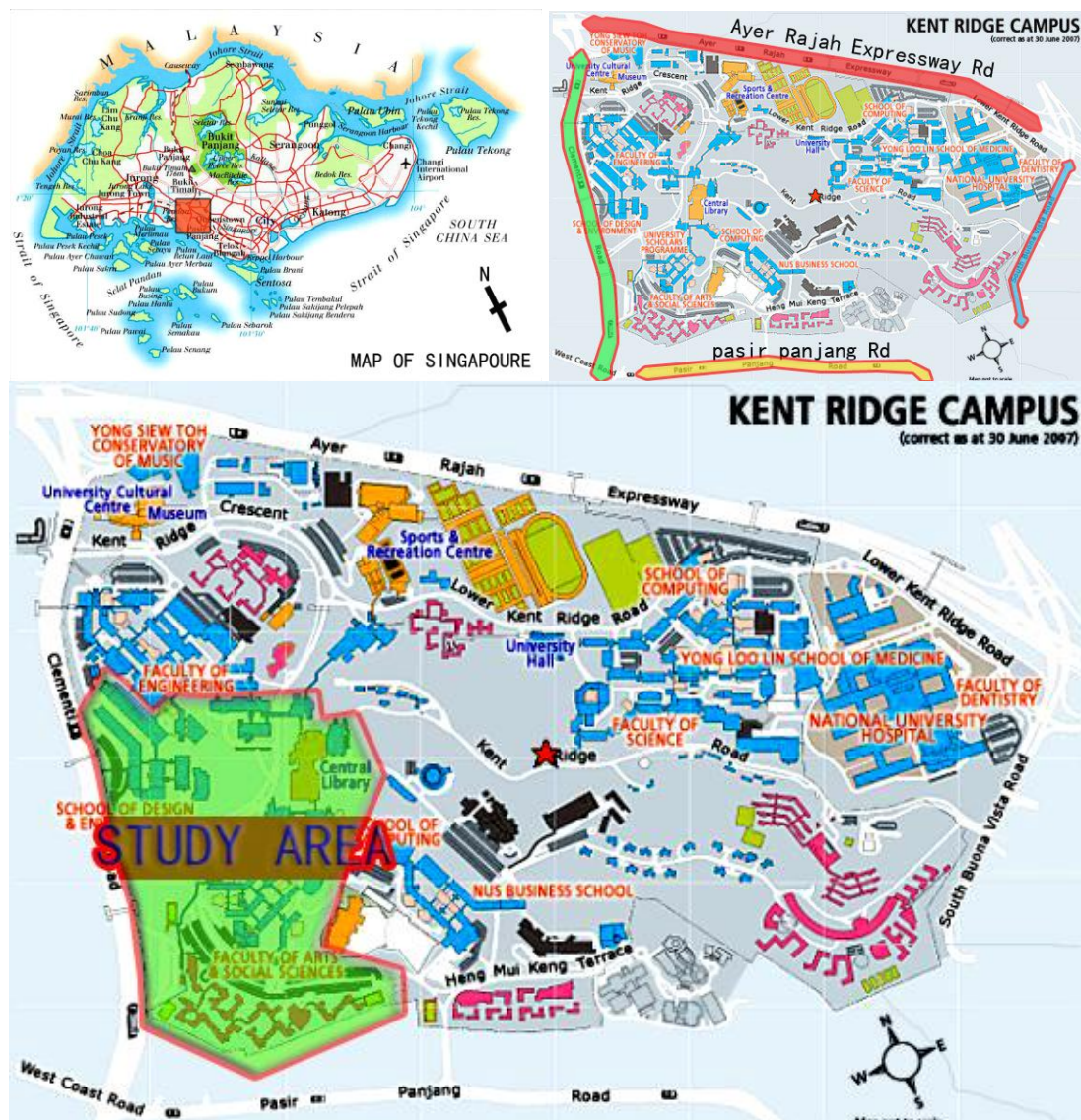


Figure 1. The national university of Singapore location and study area (self PS)

#### 4. General Landscape Layout

Campus landscape layout: campus Landscape axis the Kent Ridge-Kent Ridge Road- hall as the core, along the arrangement hospital, medical college, Sciences College, culture center, stadium, engineering college, design and Environment College, humanity and Society College, Business College, living quarters and so on. General layout include tow parts, these are teaching quarters and living quarters. Every college formed independent courtyard landscape (The third part will take the design and environment college for ulteriorly analyze) General landscape layout as follows:

##### 4.1. Free-type

General landscape build with mountain as the main part, the road as the context, the building as point, show the free-type layout (Figure2).





**Figure 2.** The free-style layout space of the campus in the shape of mountain form creates a free academic atmosphere (self photo)

#### 4.2. Open-type

The landscape accessibility and scape penetrability make the scape connect into one piece; the communication of the scape will get optimum state. The road, grass slope and bush division the landscape boundary, natural and clear.

#### 4.3. Publicity

The large mountain, meadow and plant sight form meadow publicity space, penetration and foil each other.

#### 4.4. Stereoscopic feeling

As the mountainous terrain falls considerably, and the landscape layout form inner court to outer court, form mountainous to building, form road to plant, all the elements form multidimensional and panoramic changing stereoscopic space (Figure 3).

#### 4.5. Place feeling

Campus construction takes history, injection the modern elements; track the landscape context of first-class university in the world, lapping the internationalization idea. Ideas combination with site, form the campus landscape with characteristic of internationalization and modernization.



**Figure 3.** Shows the layered nature of the ore-making landscape (self photo)

### 5. Conclusions

The research chooses the college of the design and environment and the college of the social sciences as sample plots. The research show the around environment and huge tree are retained. The terrain as the grass predominates, emphasize landscape accessibility. The campus landscape shows the terrain charm. The campus landscape provides the good space for forming build security (Fig.4).

Regarding the landscape boundary as sensory organs, form the landscape function space without the fence. Thus, making campus, science and technology parks, museum, administrative area, living quarters, mutual utilization, strengthen the tie, form the industrial community (Fig.5).



**Figure 4.** highway boundary - office area - science park (self photo)

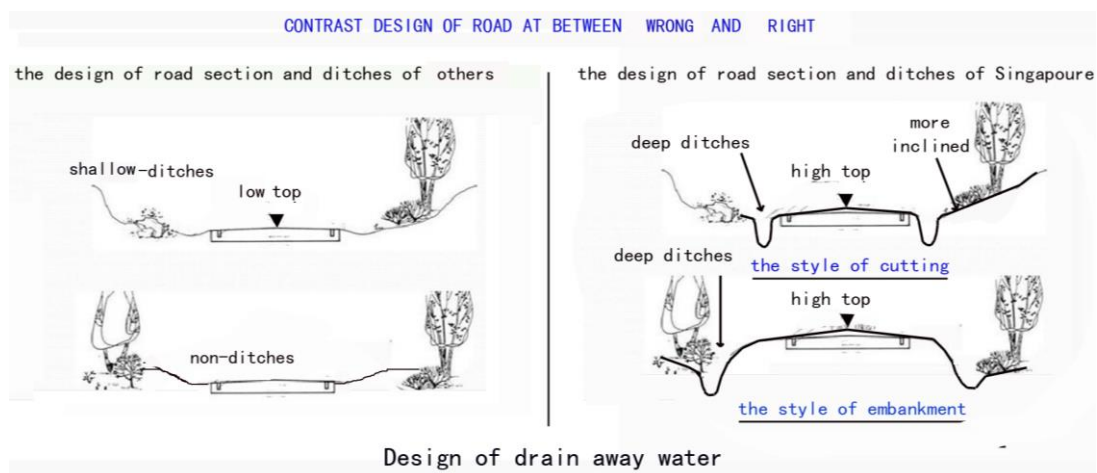


**Figure 5.** The landscape of the institute of design and environment (self-image)

Build Small and clever inner court, be able to increase the belongings and sense of identity (Fig.5).

Keeping the great tree, transplant and cultivation new varieties increase the diversification of great plant, assisted short Ground-covering plants (Fig.5).

Instead of campus road system and college road and in the garden was perfect docking, according to the characteristics of the wet climate environment, give full consideration to the requirement of road landscape slope drainage, form a complete and effective drainage system (Fig.6-7).



**Figure 6.** Singapore designed road drain



**Figure 7.** The lower slope and higher slope of the road (self-image)

The campus has various plants, such as natural tropical plant park. There are *Samanea saman*, *Ficus altissima*, *Cocos nucifera* L. *Ravenala madagascariensis* Sonn., *Strelitzia alba* (L. f.) H. C. Skeels, *Palmae* and so on. The representative plant is *Vanda* that was chosen as the national flower of Singapore by the government in 1981.

## 6. Acknowledgement

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