

Design and application of soundscape in urban park

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Abstract. Based on the modern city is full of noisy sound, people lack inner peace. This paper intends to explore the design elements and methods of sound landscape, introduce the concept of sound landscape in urban park design, and expounds and analyzes the characteristics of sound landscape design. In order to make the landscape design of modern city park more humanized, the author puts forward that the sound landscape can relieve the psychological pressure of modern people.

Keywords: City Park; Soundscape Group; Soundscape; Design.

1. Introduce

For a long time, in the research and design of urban and landscape, with a strong focus on color, form, texture visual factors such as construction, leading to "visual" tend to ignore the perception of landscape such as hearing, smell, touch and experience, single sensory experiences will be affected by external interference, make people for environmental information extraction and moving range is affected. At the same time, for the construction of urban parks, the problem of noise is also becoming more and more serious. In the city, the natural sounds such as the song of insects and birds, the falling water of streams and rivers, the cultural and historical sounds such as the ringing of bells in ancient temples and traditional ceremonies, and the vivid sounds of life such as children's play and playfulness gradually lose or lose their vitality. Therefore, with the needs of social civilization and the construction of public environment, creating a good sound landscape should become the direction of our research

2. Acoustic landscape

In 1929, Finnish geographer Granoe proposed "Soundscape", whose initial research scope was the audier-centered acoustic environment [1]. Soundscape is derived from Landscape change. Soundscape is translated as Soundscape, Soundscape, Soundscape. The author prefers to translate Soundscape into auditory landscape to clarify its position in landscape design relative to visual landscape. Auditory landscape is different from auditory environment. Auditory landscape emphasizes the image formation of landscape and experiences the beauty of artistic conception of landscape. Auditory environment refers to the influence of sound sources in people's living and working space on people's hearing. The research scope of auditory landscape involves the function and influence of auditory perception when people make visual aesthetics to the environment, the coordination and coordination between visual landscape and auditory landscape, and the auditory design of landscape with acoustic elements as the main research object.

3. Development of soundscape

At the beginning of the 20th century, soundscape began to develop, and the research system has been formed in foreign countries, gradually expanding from traditional acoustics to architecture, ecology, environmental psychology and other fields. The research content is subdivided into different fields of space soundscape description, evaluation methods and soundscape design.

Research sound for modern landscape design in China started relatively late, the first modern acoustic landscape studies of tsinghua university doctoral guo-qi li, after the returned students from Japan guo-qi li in the "journal of Beijing union university published" Soundscape notice ", calls on

the research of acoustic landscape design world attention, the study points out the difference between the acoustic landscape and traditional landscape, It makes up for the deficiency that traditional landscape science only takes visual landscape as the focus and core of landscape making and establishes the position of soundscape science as a basic subject in human settlement environment science. But in fact, the ancient Chinese garden architects pay much attention to the auditory feeling, the artistic conception of the combination of hearing and vision. The gardener uses the sound of wind, rain and bamboo forest, banana, lotus leaf to create the mood. Among the classical Chinese gardens, the "Eight-sound Stream" in the Xuchang Garden in Wuxi, the "Listen to the Rain" and "Leave to Listen to the Pavilion" in the Humble Administrator's Garden in Suzhou, and the "Willow Waves Singing Warblers" in the West Lake in Hangzhou all have beautiful artistic mood of sound [2].



Figure 1. Humble Administrator's Garden (photo source: author)

3.1 Conversion from single to whole

In the traditional concept, for the cognition and grasp of sound, it is often the sound separated from the environment, or the sound of the same kind. From the perspective of soundscape design, the overall sound environment formed by the combination of these individual sounds is studied [3]. For example, when people walk in the campus in the morning, they hear the bird song, which is related to the sound of reading, the rustle of leaves, the sound of people's morning exercise, and all kinds of sounds on the campus. As shown in Figure 1, the elements of acoustic environment include natural sound, human voice, artificial voice, and inner memory associative sound, etc.

3.2 From simple physical phenomena to landscape aesthetics

In the past, the study of sound phenomena is mainly based on quantitative analysis of the physical characteristics of sound, such as sound pressure level, spectrum analysis, reverberation and so on. From the perspective of soundscape, sound not only has its own physical characteristics, but also has added social, historical and humanistic significance [6], and has added different values and cultural meanings according to individual differences. From the perspective of humanities, sound is not only a physical quantity that can be derived by acoustic measurement and spectrum analysis, but also a cultural and social existence with human emotions. The same voice, depending on the audience, its meaning may be completely different. According to experiments, people are selective in their reception of various elements of sound in the environment. In addition, as an important manifestation of this feature, soundscape includes not only physical sounds, but also non-real sounds, such as remembered sounds and associative sounds, etc. These aspects are related to psychological content and are also one of the focuses of psychological research [3]. The above content is not seen in the traditional research methods of acoustic environment.

4. Composition and internal relationship of soundscape

The soundscape of the urban landscape is mainly composed of the sound, the audience and the environmental sound, as the basis of the soundscape as the basis of the soundscape, it generates the soundscape atmosphere through itself and the objective physical landscape space. Through itself and the objective physical landscape space to generate the soundscape atmosphere and influence the

audience in the environment. The impact of environment. The audience is the main participant in the soundscape. The quality of the soundscape experience is closely related to the physical, psychological and social characteristics of the audience. At the same time, the listener has the creative ability to change the soundscape. Environment is an objective carrier of soundscape. The spatial attributes of spatial landscape, sound transmission medium and other physical elements have important effects on the quality of sound transmission. It has an important impact on the quality of sound transmission. In the urban landscape, according to the difference of sound and the physical characteristics of landscape space, the sound can be divided into keynote sound, signal sound and sign sound. (Figure 2)

Elements of the acoustic environment				
Heartfelt wishes	voices	Artificial acoustic	Natural sound	Quietness
Memory sound Lenovo sound	Song Noise Active acoustic	Musical Instruments sound The stereo sound Mechanical sound Traffic noise	Biological sound Sound of natural phenomena	

Figure 2. Elements of acoustic environment (photo credit: author)

4.1 Tone of voice

The keynote sound can also be called the background sound, which exists as the background of other sounds and depicts the basic sound characteristics in the living space. In a certain natural and social environment, can be heard frequently sound, such as wind, water, the sound of the wilderness, birds and traffic noise. As the background of other sounds, highlighting the presence of other sounds, the keynote tone is indispensable. At the same time, it is also an important factor representing the characteristics of the region or times. At the seaside, for example, the tone is the sound of the waves of the sea; In urban areas, the keynote tone is the noise of the city.

4.2 Signal

Signal tone, also known as information tone, has the function of signal and uses its auditory cue function to attract people's attention, such as bell, whistle, horn, siren, etc. Although the signal tone varies from region to region according to its content, it does not have the function of representing the characteristics of region and time like the keynote tone. In addition, in order to strengthen the signal function of the signal tone, often use loudspeaker and other equipment, so the signal tone also has the tendency of noise. For example, the railway side of the train when the alarm bell, disaster prediction broadcast, and so on.

4.3 Mark the sound

In soundscape design, logo sounds, also called performance sounds, are the sounds with unique place characteristics, including natural sounds and artificial sounds, such as intermittent fountains and waterfalls, bells and traditional activity sounds, etc. People in the region have an affinity for the sound. Different from the survey and excavation of landscape signs, which can be obtained by field investigation, the sign sounds in soundscape must be obtained by visiting the local residents or workers for a long time. This symbol sound is the most representative sound that symbolizes the characteristics of a certain region or era, and it is also an important object that must be preserved and revived in urban planning and architectural design.

5. Key points of soundscape planning and design

The design of soundscape includes three methods, namely "additive" design, "subtraction" design and zero design. "Additive" design refers to the creative addition of new sound elements into the original soundscape to improve the entire soundscape environment. "Subtraction" design refers to the

elimination of the original sound landscape and the environment is not in harmony, not particularly important sound elements, to achieve the overall sound environment harmony; Zero design refers to the preservation of the original soundscape without any addition or subtraction [5].

5.1 Addition design--Bray's BayForeshore Park

Bays Foreshore Park in Bray, Australia, was designed by landscape architects Pittendrigh Shinkfield, Bruce and acoustic engineer Shane Fahey. An auditory landscape design approach was adopted to add to the design. The original shipyard was used to play the sound of WW2 Shipyard pier in the area representing the hull of the ship (figure2). In addition, the launch of the three ships was simulated from under the iron cover to reflect the vivid historical environment.



Figure 3. Bray's BayForeshore Park



Figure 4. Acoustic Wall

5.2 Subtraction design--Acoustic Wall

Built on the northern edge of Miami International Airport, the 1.6-km wall is designed by Martha Schwartz and runs along 36th Street [10]. Schwartz adopts the negative design of auditory design, designed a colorful and interesting sound absorption wall, which has the function of blocking noise while having visual beauty (figure3).

5.3 Zero design--Shiru- ku RoadPocket Park

The “Shiro-ku Road” park features many sound listening installations designed by KuoRokkaku Architect & Associate. This park embodies the auditory design method of zero design. The original natural sounds of the park are not changed, and some sound devices are designed to collect the natural sounds. These installations have different shapes, which appeal to many children and enhance their experience of being close to nature. These devices enable us to hear sounds that we would not normally hear. Some sound devices can collect sounds from very high places, as if you have two long ears, and can hear the leaves quivering in the air. Other sound devices require you to lie on your stomach and listen. They collect surface sounds for you.



Figure 5. Shiru- ku RoadPocket Park

6. Conclusion

The design of soundscape is a kind of concept and thought design, which is multi-disciplinary integration Design. Sound natural landscape in the city park construction need to experience as the core, sound as the medium, supported by design, perfect space feeling, reach the harmony of the auditory and visual, raise awareness about multivariate perception of the environment, to better serve all kinds of people, all have important significance to the development of landscape and social.

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