

Renewal Design of the Public Space in the Urban Open Community-Taking the Dongshan District, Jinpu New Area, Dalian City as an example

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Abstract: *The open community public space is very close to the public daily lives. However, it is easily ignored in the planning and always stays at the stage of external facade retrofit and renovation which never consider from the view of the residents. This paper contrary to the problems that exist in public spaces in open community, view from the perspective of the living environment, go through case studies regarding the investigation of open community, meets the users' requirements of public space in the urban open community, in order to solve the existing problems brought by the public space in the urban open community and provide instructable updated design strategies respectively.*

Keywords: *Open Community; Public Space; Renewal Design; Space Optimization*

1. Open Community

In 2014, the Standard of sustainable residential areas” was announced by the Chinese government. In the standard it clearly states that the open community should be “Realizing the sharing of urban public resources, organically combining with urban functional space, creating a vibrant urban atmosphere and improving urban functions of residential areas. The handling of the traditional closed residential areas is different in nature”. Therefore, the main difference of the space form of the open community when compared to the traditional closed residential area is the openness. The features like free accessibility, resource intercommunication and multi-function are the most important. The main streets inside the residential area are associated with the outside metropolitan streets and share public service facilities with the city. This not only meets the living necessities of the residents in the residential area, but also accomplishes the purpose of connecting and integrating with the city. It gives an excellent establishment and conditions for the research on the renewal and design for the public space in the urban open community.

2. Research Overview and Research Methods

The Huanghai West Road, Dongshan North Road, Wutong Street and the intersection of Gangxi West Street of the Dongshan District, Jinpu New Area, Dalian City were founded in the 1990s. It has a huge volume but relatively more unify, is one of the representative open communities in Jinpu New Area, Dalian City.

The residential areas are mostly multi-storey buildings with simple shapes and a certain sense of age. The exterior facades of the buildings have been maintained with complementary color and thermal insulation treatment. From the district current environment, the plot ratio and greening ratio are not ideal, car parking space is inefficient, the district has its own kindergarten, primary school, health clinics and various small shops. The resident open module is “open road network - residential unit”. The residential area is divided by the open road network to form multiple residential groups, lacking corresponding public facilities and residents' activity space, and lacking vitality.

This research takes the public space of Dongshan Community and the users in the space as the survey objects and perform an objective investigation of the physical environment of the public space, records the user's behaviour through the combination of field observation, questionnaire survey and field counting method. The survey contents of the space physical environment include classification of public space types in Dongshan Community; public space scale measurement; public space comprehensive

quality questionnaire evaluation; space environment connection evaluation. The behaviour and activity records of users include: the characteristics of the crowd in the space; the time of activity and activity volume of the passing, sitting and resting activities in the space; the current status and attributes of activities in various types of public spaces.

3. Investigation results and problem analysis

3.1. Space physical environment and public space scale

According to the practical investigation situation, the research has divided the Dongshan District into four main categories, which are street space, green space, public parking spaces and frontage spaces. It can be seen from the fundamental study that there is an absence of rest and recreational space in Dongshan Community. Individuals most of the time have conversations and communicate at the corners of the streets and alleys. Also, there are no shared public facilities. The space in front of the house is all the time used by the parking space that were arranged later. The green space is mainly small green spots on the street and down the stairs of the residential spot in front of the house, with a solitary scene, withered plants and with the absence of a day-to-day upkeep. The spatial scale is the ratio of the relative relationship between the material elements and the space. The best scale can allow people the good sense of space comfort. This relies on the proportional relationship between the construction's height (H) and the distance between nearby buildings (D). Different D/H values give people different mental sentiments. Yoshinobu Ashihara has pointed out in "External Space Design" that when $D/H > 1$, it shows a cordial and alienated space feeling, giving people a feeling of distance. When $D/H < 1$, it shows an introverted and tense sense of space feeling, showing a sense of urgency. When $D/H = 1$, the proportional relationship is symmetrical, and the space feels comfortable^[1]. By choosing hubs for on-site measurement, the D/H value of the public space scale of Dongshan Community is between 0.8 and 1.1. The spatial scale is moderately reasonable, and it doesn't bring individuals a feeling of extroversion and distance.

3.2. Evaluation of the relationship between the comprehensive quality of public space and the environment

The integrated quality of the public space is mainly based on the Jan Gale's team "12 keywords" on assessment standards regarding the integrated quality of the open community where user questionnaires were used. The questionnaire mainly involves in the public space's safety, comfortability, happiness, and usage rate as the four rating standards^[2]. Pinpointing the different age, gender and occupation living inside the district and work on the questionnaire investigation accordingly. The statistics that are worked from the results of the questionnaire shown that the street space safety rating is general, the distance between the residents and city's traffic roads is too short. More and more roads in residential areas have become the clear choice for private cars during morning and evening rush hours. Loud noise from the traffic has a huge impact on the residents' normal lives. For now, the Dongshan community has not enough car parks available and takes up a lot of space in front of the house. Not only in the morning and the evening the lower levels' residents have to suffer from the car induced noise and the noise of closing doors, but also to some extent damage the privacy of the residents living at the lower levels. The lack of recreational and leisure facilities also makes occupants' pleasure markers very low. The steadily shrinking greening rate and the long-term shrivelled plants make the green space unfit to present the aesthetic atmosphere in general and the happiness index very general.

The assessment of spatial environment connection comes from the practical examination and investigation. As per the survey statistics, the Dongshan Community is right next to the traffic street in the city in the north and there are many bus stops nearby, which is highly accessible and convenient. Because it is an open residential area, it is closely connected with the surrounding habitat. There are different kinds of commercial shops, kindergartens, primary schools and other educational resources to meet the day-to-day traffic and living requirements. Due to the open streets, Dongshan Community is closely connected with various communities, and shares the resources of sanitation facilities with other surrounding communities, streets, etc. The living of the residents there are relatively more convenient.

4. The Renewal Strategy and the Design Updates in the Dongshan District

4.1. Street Space Close to Life

Jane Jacobs in “The Life and Death of Great American Cities” criticized the industrialization which leads the street space function changed to solely for passage of people. The city has become monotonous and without sense of human touch, not to mention the huge amount of public transportation causing air pollution. Residents’ living quality is having a linear decrease. Since the main street space in Dongshan Community runs through the entire residential area, it can take advantage of its high degree of openness to improve the vitality of the street space and form a network system so the essential focal point of the residential area will be linked to the inner living space and the metropolitan public space that setting off the interaction between the residents’ lives and the city. Regarding the lack of recreational and leisure area in the residential area, renovation of the façade along the street of the roads inside, embedding more relaxation works and connecting it with the greening construction can make people stop and watch. At the time to enlarge the space’s usage age also provide multi-purpose life service facilities for the residents, improve the quality of the overall street space inside the residential area^[3].

4.2. Expansion of the Leisure Experience

The space for relaxation facilities in the residential area and the space in front of the house are significant spots to meet the day-to-day recreation exercises of the occupants in the residential area. Hence, it is critical to make an agreeable and comfortable space atmosphere which fully reflects the quality of the living environment in the residential area. Considering the problem of the space in front of the house is occupied by parking sports and the irregular parking in the residential area, it is important to re-coordinate and rationally plan the parking spots as per the existing situation to guarantee the privacy of low level residents and re-establish the original space for relaxation in front of the house. On the other hand, Plants can be designed sensibly as indicated by environment and occasional changes. Public facilities such as the sketches can be added to improve the spatial details and create a leisure and comfortable front space. The space can likewise be separated among dynamic and static, fully considering the impact of noise on low level residents, the problems on terrain and landform, and various requirements of different age groups, reasonably allocate limited space resources with more possibilities for space.

4.3. Integration of public facilities

In the old days, the conventional practice of the public facilities in the residential areas was fundamentally to set up leisure seats with a solitary structure and capability, straightforward wellness gear and slides for children to climb. The majority of the users were the elderly and preschool children. Partially it addressed part of the needs of the residents in the district. However, it has killed the idea of realising more living functions. As the nucleic acid testing has become a routine procedure after the breakout, convenient nucleic acid testing can help to save the residents tons of time, and it will also be helpful in terms of gathering or travel. Therefore, normalized nucleic acid testing self-testing spots can be set up in neighbourhoods, along with other public offices with a safe distance. The coordinated plan works with the occupants can also improve productivity. On the other hand, online shopping and contactless delivery seems to be convenient, but at the same time the queueing at the parcel collection point and large surface area of the parcel also increases the contact risks. The temporary parcel storage spot located in front of the residential area can solve this problem. Residents going downstairs for parcel pickup and proceed with disinfection can further avoid second contamination and spread of virus. In this special period fulfil more specific functions, maximizes the space efficiency.

4. Conclusion

This research paper takes the starting point of people’s needs and their behaviours, taking the Dongshan community as the research object to conduct field research and analysis on their public space, to give a logical analysis foundation for the updated design of public spaces in open community. In addition, this paper provide a instructable updated design strategies on the existing open community, aiming to provide a safe and comfortable living environment for the residents, stimulate the liveliness of residential public space and improve the quality of public space in residential neighbourhoods.

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