

# Research on the Application of Integrated Design of Residential Buildings and Landscapes

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**Abstract:** The return of modern humanism provides a sufficient driving force for the development of human settlements and environment science, as well as a good opportunity for the construction of the overall thinking of architectural landscape design. In this paper, residential building design as a starting point. Based on the theory of integrated design of architecture and landscape, the essence of integrated design of architecture and landscape in residential area is analyzed. Combining with the specific case of integrated design of architecture and landscape in residential area, this paper explores the application of the concept of integrated design of architecture and landscape in residential area design, with a view to providing some reference for the integrated design of architecture and landscape in the process of residential area landscape design.

## 1. Introduction

In the process of the development of commodity economy in China, people's living standards have been constantly improving, and the residents in cities have put forward higher requirements for the quality of living environment and the aesthetics of landscape [1-2]. As people pay more attention to the environmental Quality of the external residential areas, the drawbacks of planning, architecture and landscape design in the environmental construction of urban residential areas in China are gradually highlighted. Meet the multi-level needs of contemporary residents., it is of great significance to properly analyze the application of integrated design of architecture and landscape in urban residential areas.

## 2. Residential Building and Landscape Integration Design Essence

In essence, the urban residential environment is the place where people live. According to this, in the design process of building and landscape integration in residential areas, designers need to gradually shift from the individual perspective to the overall human perspective, and use any living area as a target to create a living space environment [3]. That is, in the urban residential area, designers need to regard the residential area as a whole. Break through the professional boundaries and design and create an integrated environment for architecture and landscape from both internal and external perspectives.

## 3. Integrative Design Theory of Residential Buildings and Landscapes

The integrated design of residential buildings and landscape is mainly based on landscape/landscape architecture theory and overall design theory. Landscape/Landscape Architecture theory is mainly the art of visual things and events that can be perceived by people in a certain range. It objectively expounds the relationship of the surrounding space organization, and also expresses people's subjective consciousness. In Landscape/Landscape Architecture, there is a coordination relationship and certain culture between each building, which reflects the development of the times [4-5]. Through natural and man-made analysis, utilization, transformation, management, protection, design, layout and restoration, sustainable utilization and scientific development can be achieved.

The theory of holistic design is a kind of physical environment art, which pays attention to the

closed relationship between material and energy movement. A balanced, stable, complete and multi-level system can be formed by obtaining energy and material from the surrounding environment and feeding back to the environment after building utilization [6].

#### **4. Case Study on the Application of Integrated Design of Residential Buildings and Landscapes**

##### **4.1 Overview of the case of integrative design of building and landscape in residential areas**

The core residential area of Taihu New Town in Wuxi is located in Wuxi City, Jiangsu Province. It is the main module of Wuxi's five famous cities. This area is mainly divided by Hongli Road and Jinqiao Road in Wuxi, forming a public area which integrates comprehensive office area, cultural and entertainment area and residential area. In the process of regional planning, designers set up different residential communities along the main axis of the city. And draw lessons from the concept of American RTKL scheme. Around the main space development sequence, Cultural Park space, office space around the lake, central square waterscape space, business office space and other areas are set up [7]. Among them, the Central Plaza waterscape space is the core of the overall project, and there is a landscape river in the residential area of the planning area; the commercial office space is the main carrier of the headquarters economic and innovative industry development; the cultural park space and the office space around the lake are the main residential areas.

In the specific design process, the designers are based on the concept of integration of residential architecture and landscape design. Based on the principle of density, orderliness and intensive efficiency, the waterscape space of the Central Plaza is taken as the core. The comprehensive planning of residential activity center and cultural park space has created a dynamic and efficient landscape layout. At the same time, using Jiangnan gardening techniques, combined with the landscape personality of the park, small-scale gardening buildings and landscape space are reasonably set up, effectively promoting the local traditional culture [8].

##### **4.2 Principles of integrated design of building and landscape in residential areas**

Drawing lessons from the design experience of the residential core area of Taihu New Town, Wuxi, in the process of integrated design of residential buildings and landscape, designers should design reasonably according to the principles of landscape integrity, multiple symbiosis and ecological continuity. Landscape integrity requires designers to start with urban scale, human scale and social scale. According to the regional development and the urban order pattern, the spatial shape, atmosphere, structure and size are coordinated and integrated; the main reason for the pluralistic symbiosis is that the urban residential environment landscape space essentially serves the main body of the spatial system, and there are people with different personalities, different social experiences and different cultural backgrounds in the city [9]. According to the diversity of the main characteristics of the space system, designers also need to make diversified adjustments to the style characteristics and space forms in the architectural environment landscape design. Ecological continuity involves two aspects: material continuity and social continuity. Designers need to follow the new concept of urbanization. From the macro and micro levels, the landscape ecology and unit environment of urban buildings are organically linked in series to ensure the continuity of the organizational structure of the whole urban residential area.

##### **4.3 Integration of building and landscape design in residential areas**

According to the design experience of the residential core area of Taihu New Town, Wuxi, first of all, the designers should make clear the goal of the integration of architecture and landscape design of the residential area [10]. That is, the ideal residential area is not only the material space, but also the ideal expression of human life and spiritual sustenance. Accordingly, through material space planning and design, architects should build a sustainable development of social space, stable geographic relationship, perfect community neighborhood network, and truly implement the goal of multiple symbiosis, ecological continuity and landscape integrity.

Secondly, the designer can design the concept of place + landscape and abandon the previously solidified concept of landscape greening. It is the rational use of landscape elements to shape the human communication space form. Through the construction of different types of open outdoor space, such as community public space and unit, garden formation, community sequence communication space, it can provide residents with a more beautiful, healthy, vibrant and dynamic community landscape environment.

Finally, in the design of architectural landscape structure, designers can start from the macro-view of the city, and integrate architecture and environment, architecture and landscape organically. After forming different types of landscape modules, they are connected in series to form an integrated landscape sequence. At the same time, the main and secondary axes of landscape are constructed based on the natural landscape pattern. That is, along the city square around the cultural park. From indoor to outdoor, gradually improve the quality of surrounding landscape environment, build a musical jump of the spatial rhythm sequence, to promote different architectural space, landscape space to form a whole.

#### **4.4 Key Points of Integrated Design of Building and Landscape in Residential Areas**

In the design process of multi-level sequential communication space, designers can take property management as the core. Strengthen the publicity and privacy of social public space sequence, and form a space system combining private and semi-private, public and semi-public. At the same time, on the basis of previous residential area roads, residential area roads and residential space levels, according to the survey results of residents' age and residential nature in residential area, the construction of open space semi-closed space residential interior closed space layer by layer enriches space places. For the middle-aged and old-aged residential areas, the staggered design of different buildings can be carried out in conjunction with the natural landscape configuration. At the same time, on the basis of the entrance design of the north and south, the enclosure design of residential communication space - courtyard space is carried out to promote the sense of psychological belonging of middle-aged and elderly groups, while for young groups, the design of "active" community public space can be the core. Instead of the constraints of distance and orientation on architectural layout, the road system (such as pedestrian road + greening + landscape sketch + paving) or more flexible spatial layout of building groups are used to integrate transportation, greening and activities, and to build a good rest and activity area. In order to increase the enthusiasm of young people to participate in community outdoor activities, activities and public facilities should be allocated. On the basis of a certain form of guarantee, designers can also construct public space in residential areas with various connotations from the aspects of local space and landscape sketch facilities. For example, when dealing with the elevation difference of the outer edge of residential garden, the architects can use the way of multi-level plant planting in graded gardens to weaken the sense of the height of the courtyard walls in residential areas to a certain extent. At the same time, the height of the back garden is adjusted and the indoor floor is close to each other. And the use of glass brick partition wall to isolate line of sight, with the setting of permeable railings and hedges, can effectively reduce the sense of closure of residential courtyards.

Secondly, the relevant personnel should adhere to the principle of good environment and ecology, under the same conditions, take into account the requirements of each house and household, and allocate a relatively close green space and a good lighting, ventilation, orientation, sunshine and sound insulation environment. While guaranteeing the reasonable structure of the integrated architectural and landscape design results, it can also combine the local human tradition, living style and geographic meteorology to continue the diversified forms of residential buildings. For example, in the planning process of industrial residential parks, according to the traditional characteristics of industrial residential parks, designers can continue the enclosed form of industrial building blocks and construct three-dimensional, individualized and marked space on the basis of satisfying the basic applicable functions of design and shape. That is, on the basis of setting up two oblique cross-shaped spatial landscape axes in east, West and north, according to the characteristics of regional natural vegetation. The finger-shaped green vegetation can be used to interpose flexibly in

the common road system, multi-functional green landscape visual corridor and other residential functional areas. Combining with the traffic organization of end-to-end pedestrian-vehicle common road, the whole regional architecture and landscape can be formed as a whole.

Finally, the planning structure of residential area is closely related to the functional requirements of residential area, which can integrate residential and public service facilities, roads and green space. According to the overall design theory, designers can collect the main elements of land use, space, facilities and landscape organizing committee in residential areas. Then, according to the principle of overlapping modules from simple to complex, from low level to high level, a semi-network structure system is constructed. At the same time, walking and green open space are regarded as the main corridors of landscape, and greening or water body are the main elements. Cooperate with the planning of road axis, sightseeing axis, communication axis and other landscape axis, in order to effectively link up the external order of the city and stabilize the internal environment of the residential area. For example, in the process of mixed residential community design, in the face of many restrictive factors such as volume ratio, local sunshine requirement, building density and so on, designers can give priority to a large number of determinant layout forms in the overall layout. In addition, a certain area of central green space is set up at the central position, with the central green space landscape axis as the main body of the planning structure. Through the intersection and coordination of plant oasis and pedestrian roads, different types of architectural landscape sites with relaxation degree can be formed. At each road intersection, designers can also set up fitness squares, children's paradise, entrance space and other modules to build more abundant landscape space sites.

## **5. Conclusion**

To sum up, according to the development characteristics of modern human settlements environment, designers should base themselves on the integration foundation of multi-groups and multi-disciplines. The organic integration of architecture and landscape specialties, the core of which is the external space form design of urban residential areas, breaks through the previous design principles of separate administration of architecture and landscape, and constructs a systematic and efficient overall residential area design mechanism. Really realize the human-centered residential area planning and design, ensure that the new era of urban residential area interior environment is expected to adapt to the external space landscape design.

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