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Analysis of Art Museum Design under the Concept of Sustainable Development

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ABSTRACT

With the rapid growth of economy and urbanization, the development of cities has gradually focused on promoting the culture and image of cities and meeting the spiritual needs of the people. Therefore, cultural public buildings play an important role in urban development. However, the process of urbanization has led to the gradual saturation of urban architectural space. Cultural public buildings must not only meet the development requirements of cities, but also have the sustainability of development advocated by society and the diversity of use functions. On this basis, this article takes spatialism as a design approach and urban art gallery space as a design carrier to summarize the characteristics of green, low-carbon and sustainable development pursued by urban development under the spatialism design idea. This article discusses the overall situation from large to small, from far to near, summarizes the corresponding design ideas, and uses a large number of cases to support the relevant design ideas, aiming to explore the research on the architectural space design of art galleries that is both in line with the sustainability of urban development and in line with the aesthetics of modern people in architectural space.

INTRODUCTION

In recent years, with the rapid development of social economy and science and technology, and the successful transformation of my country's modern society, social needs have changed. The development needs of cities are not just the pursuit of economic development, but the need to promote the image and culture of the city has increased. People Life is more about improving the quality of life and satisfying the spiritual level. However, due to the rapid development of the Internet and the "Internet of Things", the advantages and disadvantages have gradually emerged. The transmission and acquisition of information have become faster and more convenient, and the number of ways to promote the city's image and culture has increased. However, its disadvantages have also caused people's actual exchanges and cooperation to become more scarce. With Guandan, the subject becomes self-enclosed. Therefore, the city currently needs a place that can promote the city's culture and image, and it also needs a building public space that can meet people's spiritual needs and promote making friends, exchanges and gatherings.

The rapid development of the economy has made the demand for various resources become faster, which inevitably leads to the shortage and waste of some resources. Therefore, our country has customized corresponding strategies to improve the situation, and the overall development has become more focused on the rationality of resources. Utilization and protection gradually focus more on sustainable development and the use of renewable resources. Spatialism has the characteristics of extreme simplicity. By removing complicated decorative factors, the spatial structure becomes purer, which expands the usability of the space.

For public cultural spaces, it gives the space a special spatial atmosphere and also makes it suitable for all kinds of art. The elements are more expressive, and spatialism has become a design form that is in line with the green, low-carbon and sustainable development pursued by urban development.

LITERATURE REVIEW

Spatialism at home and abroad can be roughly divided into two aspects, one is about the field of spatialism art, and the other is about the field of architecture. In comparison, the former's research and analysis on the field of art is earlier and more in-depth. In the field of architecture, there are certain differences at home and abroad. There are many research documents in the West. In 1999, the magazine of the Federal Institute of Technology in Zurich (ETH) published the work "After Spatialism"; and the West published a large number of related works. Academic papers and books, 2002 "Spatialist Interior Design N.1" by Aurora Quint and "Spatialist Interior Design NO.2" by Asensio, taking residences, public spaces and commercial spaces as examples to change architecture. The repetitive development of the ontology affirms the idea of purification and reduction of spatialism, designing and hiding the structure of the building in the simplest way, and obtaining a concise and clear space in the building ontology, making it popular in the architectural world. "Sensory Spatialism" written by Wei Ni Alice was also released in the same year. It takes the design works of the famous contemporary European architect Juhani Pallasma as its theme, emphasizing the architect's desire to experience a clear and concise integration of sensory thinking. architecture. In recent years, "Cohen and Partners Regional Spatialism

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Landscape and Urban Design” written by Cohen and Partners (translated by Zhang Yu, 2020) is mainly based on the design cases of Cohen Partners, explaining the relationship between rationality and artistic conception. combined design concepts, there is a wealth of research literature on spatialism in China, which is mainly focused on the design of spatialist interior space and architectural space. The first journals to discuss spatialism were well - known journals such as “World Architecture”, “Architect”, and “Time Architecture”. Tongji University’s (Kang Xuhan , 2006) article “Characteristics and Details of Contemporary Spatialist Architecture” explains spatialist architecture from a more detailed perspective of the building’s environment, form, space, material, surface and light , and uses examples to support its arguments. These two articles have provided a rich theoretical and design foundation for subsequent research.

With the development, the concept of sustainable development has become an important reference element of modern design in architectural design. In recent years, there are still a large number of articles on sustainable development and architectural design. Between spatialism and the concept of sustainable development, most domestic articles focus on the sustainable design of indoor space, while foreign countries are more based on further research under the local ecological environment. In 2016, Wuhan University of Technology held a meeting on “Discussion on the Development of Ecological Design in the Context of Low-Carbon Economy”. It was proposed that design needs to focus on ecological benefits, attach importance to the development of new processes, formulate new plans and put them into practice, pay attention to the use of energy and materials faced by products in subsequent use, and try to simplify them. The simplification proposed is not a reduction, but a rich unity . From this, we can see that in modern architectural design, we should pay attention to simple design, which uses the most clear techniques, streamlined materials and less energy to create the most simple beauty. In “Minimalist Architecture; Discussion of Its Sustainability in Indonesia” by Silfia Mona Aryani , 2011, the article explores the spatialist architectural design suitable for sustainability in the tropical rainforest climate of Indonesia; in “Theories of minimalism in architecture: When prologue becomes palimpsest” by Stevanovic Vladimir, 2014, the article discusses the connection between spatialism and its corresponding minimal art by analyzing the composition and establishment of spatialism , and uses this as a reference to discuss the status and significance of spatialism in architecture; and in the domestic article “Application of Spatialist Spatial Form in Renovation Design” by Peng Shukun, 2019, the author uses the design method of spatialism to renovate the teaching building space from three aspects: spatial organization, interface processing, and furniture design. The concise spatial structure, clear spatial layout and good spatial sequence of spatialism have become a powerful means to solve the current teaching building problems

in the future. The spatialist transformation of space not only conforms to the aesthetic conception of modern teaching space, but also achieves the conservation and full utilization of educational resources, and enhances the consideration of sustainable development and economy of public space. (Qin Jia , 2020) ‘ s “Research on Spatialism Interior Design Based on the Concept of Sustainable Development “, both of which use spatialism design techniques to show the concept of sustainable development in interior space , and give the concept of sustainable development to the minimalist trend of interior space design at home and abroad, which is conducive to creating a good ecological environment, living environment, and a “people-oriented” humanistic design trend. Based on the above research status, this paper combines spatialism with the design of cultural public building space, and further improves the summary of spatialism and sustainable development concepts from the outside to the inside in the architectural design process from the perspective of architectural form design and interior space atmosphere shaping under the ecological environment.

MATERIALS AND METHODS

Sustainable Design of Spatialist Art Museums under the Influence of Regional Factors

Tang Keyang’s point of view in “Ten Lectures on Art Museums” shows that art museums and the development of cities are complementary to each other. As a concrete and concrete point, the art museum can affect the entire surrounding area and city. In the early days of Western art museums, Most of them are located in the center of the city. Cultural public buildings such as art museums are enough to bring a certain sense of quality and connotation to an unfamiliar city: most of the art museums built later are located on the edge of the central city, but even so, The establishment of these art museums is still an important means of urban revitalization and gentrification in the future. From the perspective of art museum design alone, as a carrier of cultural and artistic activities, the art museum’s special spiritual qualities bring emotions and experiences to the crowd, and bring social influence to the city. The two require holistic thinking. When designing, we analyze the regional environment, urban environment and the building itself. The design of the art museum must conform to the unique spirit of the city and satisfy the city residents’ sense of identity with the building.

Sustainable Design of Spatialist Art Museums under the Influence of Regional Factors

The induction and unification of local materials under geographical factors ; the cave dwellings represented by the north, because it is located in the northwest, mainly on the Loess Plateau, rely on the terrain to form cave dwellings, the special geographical environment formed by the thick loess layer and a large number of loess hills on the Loess Plateau, and these regional residential

buildings are built according to the terrain and use local materials, forming natural green buildings in the north, namely earth-damaged buildings. For example: Shanyue Qianshan Art Museum (Figures 1 and 2), built in the remnant of Taihang Mountain, is attached to the Huangshi Hills, and the hills are surrounded by curved gullies, among which there are traditional cave dwellings. The building materials are taken from the local loess, and red clay is combined with rammed earth to form a distinct texture of the earth unique to the loess hills. The designer adopts a combination of modern and traditional masonry methods, integrates loess and stone into the building, and gives contemporary art architecture the characteristics of natural simplicity and infinite wildness.



Figure 1: UCCA Dune Art Museum - Appearance

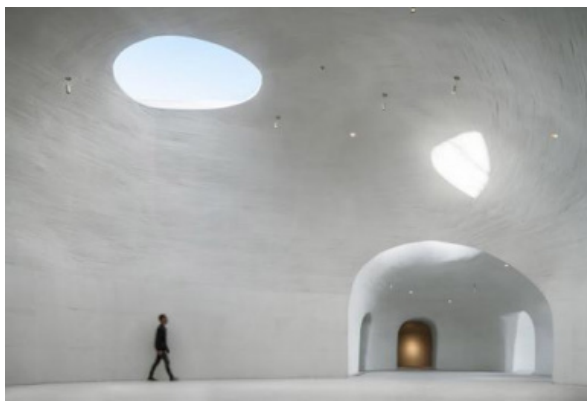


Figure 2: UCCA Dune Art Museum - Interior

Collaborative Design Integration of External Public Spaces of Art Museums

The natural ecology in cities is mainly divided into innate ecological environments, such as rivers, lakes, etc., and artificial ecological environments designed to meet the needs of the built environment. The former is a condition that should be considered at the beginning of architectural design. Based on the concept of sustainable development, architectural design here should follow the laws of nature and comply with it, and play a role in protecting and improving the environment. Artificial

landscapes serve buildings or outdoor public spaces in buildings, and the environment adapts to the needs of the building.

Water, as an important carrier of cultural nurturing, is also an important means of promoting economic development. At this stage, with the transformation of my country's urban economic structure, the improvement and creation of the environment in urban planning have been rapidly developed. Building a livable and tourist-friendly city is the future development. direction, so the waterfront art museum design will play a more important role in the future city. As a public space, the waterfront area needs to consider its practical function and value. The art museum is located here, which will attract a large number of people to gather here. Therefore, the design needs to consider the following points: The unity of public space style between the waterfront landscape and the art museum. integrated design; the integrated design of the functional space between the two; the public space is mainly to provide people with functions such as gathering, staying, and resting, all for human comfort and serving multiple landscapes. Secondly, this space should be in line with the design style of the art museum space. , and should also coexist harmoniously with the planning of the waterfront environment. The design of public space should be built according to the trend of the waterfront coastline. Not only does the form need to conform to the style of the art museum, but it must also complement the waterfront coastline to form a consistent spatial order and play a role in connecting the water body with the building, such as transportation. The road should be designed to be parallel to the waterfront shoreline or designed to coincide with the waterfront shoreline. The latter needs to pay attention to the safety of future use, and more attention should be paid to the design of the revetment to prevent the land from being flooded or the water bank from collapsing. For example: Shanghai Yicang Art Museum is located on the east bank of the Huangpu River (Figures 3 and 4). The overall building is a staggered stack of cubes. It was a coal storage plant in Shanghai in history. The landscape square next to the building is in the form of a corridor, integrating water, trees, Flowers and plants are integrated into the plan in a staggered arrangement of different rectangular plates.



Figure 3: Shanghai Yicang Art Museum



Figure 4: Shanghai Yicang Art Museum-Viewing Platform

The flower belt on the side facing the river is also designed in a rectangular staggered manner. On the other side is filled with trees and lawns. The square style is consistent with the design of the building. This design not only contributes to the design of the art museum. It can also be used as a pavement and a viewing platform for people who appreciate the scenery of Huangpu River.

Integrated Design of Architectural Boundary Space of Art Museum

In today's society, the architectural design styles of art museums are diverse. As public places where people gather, they are often pursuing architectural forms to give people the first impression and achieve better results. Therefore, more and more art museums are designed with transparent boundary spaces or semi-arrangements. Transparent boundary space gives people a sense of visual transparency (Figure 5). It shows the public space in the museum to visitors from outside the building, attracting them to explore the indoor space. The transparent boundary can give the building a sense of transparency. The interior brings better lighting, and the indoor space of the building can also use the landscape of the external public space to enhance the atmosphere of the space; the translucent boundary space mostly refers to the building skin or decorative wall with a hollow effect, which plays a certain role in the indoor space. It has a blocking effect, but it can also enhance the mystery of the indoor space. These two forms of design expand the boundaries of space at the visual level, but also limit the main body of the space at the physical level. They mainly promote invisible interactions between people or objects in indoor and outdoor spaces, thereby attracting tourists and integrating internal and external spaces. Effect.

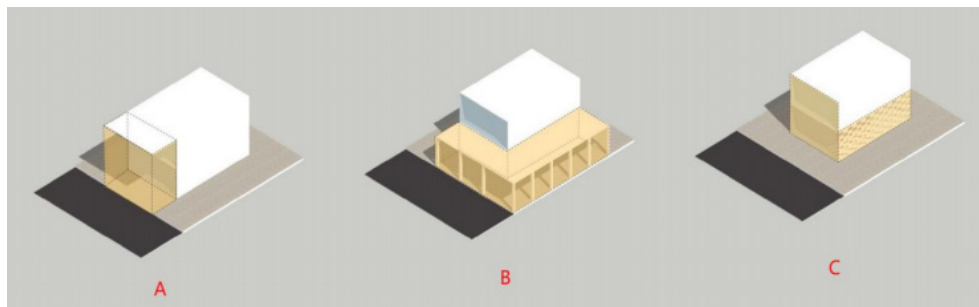


Figure 5: Building boundary extension and boundary space



Figure 6: Wulong·Lanba Art Museum—Exterior



Figure 7: Wulong·Lanba Art Museum—Interior

The representative of transparent boundary space design is Chongqing Wulong Lanba Art Museum (Figures 6 and 7). Its architectural design is similar to that of Fujian Hakka earth building. It is located on a hillside and surrounded by vegetation and mountains. The building

form adopts a two-layer ring stacking. The inner and outer boundaries of the upper ring are enclosed by glass, so that the exhibition space has abundant natural lighting and a broad field of vision, and the building boundary is hidden in nature to the maximum extent. The glass boundary of

the outer ring can appreciate the natural scenery under the hillside, so that you can appreciate the works of art close to nature in the building; and the representative of translucent is Jianwu's China Academy of Art Folk Art Museum, whose representative translucent exterior wall skin composed of tiles not only combines the elements of local traditional houses, but also integrates the building into the local natural environment. The design of the tile wall makes this modern style building show the charm of traditional Chinese architecture.

RESULTS AND DISCUSSION

Research on Spatialism Ideas in Art Museum Architectural Design under the Concept of Sustainable Development
“The art museum is a building with spiritual and cultural properties and a cultural space with spiritual guidance. The art museum is not only a kind of building that exists, but also a guidance and functional embodiment of people's hearts and spirits. Therefore, the art museum not only needs to meet The function of collection and exhibition must also take into account the function of spiritual shaping.” “At the design level of the art museum, the spatial artistic conception and atmosphere creation shape the “spirit” of the art museum from the physical form level, while the blank space and simplicity of spatialism What the design pursues is the expression of artistic conception in space, so as to achieve the presentation of the “spiritual” level of architecture. In addition, today's society's pursuit and popularization of the concept of sustainable development has made the aesthetics of architecture in modern cities focus on the pursuit of simple but not simple design methods. , this section uses the design ideas of spatialism to further discuss and improve the role of spatialism style in the design of art museums under the concept of sustainability, and to explain the shaping of the spatial artistic conception of art museums in line with the spiritual level of urban people and the development of public buildings in the city. pursue the concept of sustainability.

Art Museum Architectural Form Design Based on Spatialism

With the development and change of construction technology and aesthetic pursuit in modern society, the extremely simple design form has gradually penetrated into the architectural design of different concepts. Although the form of modern architecture is no longer simply confined to the extremely simple “square box” building, but presents a form that conforms to today's trend and emerging cultural characteristics, and has a more futuristic architectural form, the extremely simple style is still displayed in the architectural design itself. It can be seen that the spatialist style still has an important influence on the development of architectural design. Pure spatialist architecture, in terms of formal design, will not blindly seek the integration of other elements for the sake of innovation and development, forming a chaotic architectural form, but should use the ultimate

induction and summary of unified elements in the form of architecture, and always explore the functionality of architectural space.

In the development of today's society, the concept of sustainable development has become an important prerequisite for architectural design. Green building design standards must be followed, especially in public buildings in urban environments where land is at a premium. Mexican spatialist architect (Luis Barragan, 2021) said “We found that if we wanted to reduce the damage to the beautiful landscape and create good architectural forms to fit in with it, we had to choose minimal forms, abstract features, extremely straight lines, flat surfaces, “Commonly used geometric shapes are used to design buildings.” The architectural form of art museums under the influence of spatialism pursues the extremely simple geometric single block shape, or a group building formed by stacking, staggering, and intersecting single block elements. Although The architectural form becomes visually extremely simple, but the spatialist design method can further explore the functional potential in the architectural space, thereby improving the building's utilization rate in many aspects and further expanding the functional attributes of the art museum in the social environment. The stacking of different architectural forms under geometric forms often produces gray spaces with the same effect, which can not only coordinate the architectural levels, but also increase the richness of indoor and outdoor spaces. In this way, the design of the architectural form not only further completes the image of the art museum as a spiritual place, but also meets the demands of the concept of sustainable development.

Design of Light Elements and Color Elements in Space under the Idea of Spatialism

Spatialism is the most prominent in the design of interior space. In the space creation, the extreme design ideas are often reflected in its pursuit of spatial artistic conception. Spatialism abandons overly complex decorations. Therefore, in the creation of spatial artistic conception, it has extremely strict requirements for the control of light elements and color elements in the space. The qualified space foundation is matched with matching soft furnishings to further improve the design of the art gallery. Therefore, under the idea of spatialism, the application of light and color in space is explored on the basis of the extreme space structure. The integration of sustainable concepts makes the research on these three aspects more targeted. The interior space of the art gallery building is often pure and has a clear structure due to its display attributes. Spatialism simplifies the design in the space, making the division and utilization of the space, and the design and control of node details more reasonable. Due to the extreme simplicity and purity of the space, the light element in the space design further enriches people's sensory experience in the space. In addition to satisfying its most basic lighting functionality, the light element also plays an important role in shaping the space atmosphere,

improving the space aesthetics, and enhancing the space interactivity. These are all manifestations of the spatialist designer's application of light artistry. Light elements can be divided into two categories: artificial light sources and natural light sources. The former is mainly to meet the light needs of specific enclosed spaces, while the latter is a design display based on architectural form and is also the key to the linkage between indoor and outdoor spaces. The design of color elements in space is mainly reflected in the colors brought by the characteristics of building materials and the colors brought by different light sources. Color in the design of space is the expression of space emotions. The pure use of color will guide people's sense of space. Feeling, color under spatialist aesthetics is mainly affected by two aspects. First, spatialist design is a display of the properties of the material itself. The color of the material itself is an important consideration in space design. Therefore, designers will mostly use pure colors, Simple native materials, such as concrete, wood, metal, pure color glass, etc.: The second is the impact of space light sources on space color. The warmth, coldness, strength, and concentration of light sources are all important prerequisites for color expression. Spatialism mainly uses white. Lighting or natural light is the first choice for lighting. These two will not only reduce the color impact on the original space, but are also the most widely used and will not require too many adjustments depending on the display content. In the space design of art museums, most spatialist designers will use the most basic three colors of black, white and gray. Because of their high tolerance for other colors and their strong purity, they can meet different display needs and create a spatial atmosphere. It is also easier and more prominent.

Spatialism Design Principles of Art Museum Space Form under the Concept of Sustainable Development

Emphasis is placed on the principle of spatial coordination; the principle of coordinated design of architectural space refers to the common planning, design and interaction between indoor and outdoor spaces of buildings and urban spaces. "Co-action" is to make indoor and outdoor spaces interact and influence each other through coordinated design, which helps to unify spatial forms and elements and make the space more reasonable. At the beginning of the design, the design form of the indoor space should be considered at the same time to achieve consistency between the inside and outside of the architectural design. This will help to make the connection and interaction between indoor and outdoor spaces more harmonious and meet the requirements of spatialism for the purity and unity of space. It will also help to create a landscape by borrowing scenery from the outdoors in the indoor space, so that the design of a landscape not only meets the needs of creating space outside the building, but also provides a positive effect for the indoor space. Focus on the functional principle of the skin; the design of the building skin should first consider its use function, and then consider the design of the decorative function

under the spatialist idea. The functionality of the skin form is an important manifestation of the concept of sustainable development of the building. Under the spatialist concept, the skin often plays an important function of simplifying the architectural form. However, in order to conform to the development form of contemporary society, it is in line with the development requirements to put the functionality of the skin before the decorative function, and this does not affect the pure design of the skin form.

Pay attention to the principle of quiet atmosphere; the art gallery space is a public space design that serves art and people, so the quietness of the space should be followed in the creation of the space. Quietness is the expression of a good spatial atmosphere, which provides a good environment for the display of art and people's appreciation. The creation of spatial atmosphere is often inseparable from the influence of materials and light. For works of art, the spatial color often chooses similar colors, and then adjusts the saturation and warmth of the color according to the type of art, and light is the key to adjustment. This often cannot destroy the atmosphere and artistic conception of the artwork. For people, the main perceiver of the artistic atmosphere, modern people's pursuit of a simple lifestyle makes them extremely sensitive to the atmosphere of simple space. The quiet atmosphere can calm the visitors' restless emotions, thereby enhancing their ability to perceive works of art. Therefore, quietness should be used as a criterion for judging the creation of the spatial atmosphere of the art gallery.

CONCLUSION

In this chapter, the author starts from the design of the building body and explains the embodiment of the concept of sustainable development in the architectural design of the museum under the spatialist design idea. The geometric architectural form is the improvement of the spatial function, and the spatialism is the ultimate conclusion of the space. It is for The greatest display of space use functions: Unifying the building skin is the most important improvement in its use function. The unification of the building skin decoration is an important display of spatialism aesthetics, and its main functional role is an important display of the concept of sustainable development. : The refined architectural structure improves the spatial organization relationship. The organization of space is a display of spatial rhythm. It is an important means of grasping people's emotions in space. It is also the main design method of space interest and hierarchy. Through three principles, the spatial design of the art museum is required, so that the spatialist design ideas can provide inspiration for the sustainable development of the art museum, further supporting the practicality of the ideas proposed in this chapter. The unique spiritual connotation of cultural public buildings satisfies people's spiritual needs beyond material needs. The implementation of a large number

of contemporary public cultural buildings and people's pursuit of minimalist lifestyles make the observation of things gradually become more rational. , and rational thinking gradually makes the design form further develop on the road of extreme simplification, which further proves that extremely simplified design ideas are the development trend of modern architecture. The unique atmosphere of spatialism is the need for cultural buildings in the city . The purity of space is the most rational functional expression after condensing and simplifying complex things. This also conforms to the essential needs of the concept of sustainable development in architectural space. Therefore, at the beginning of the design of the art museum, it is necessary to consider the natural environment and urban environment. Considered under the premise, the premise of sustainable development is based on respect and protection of the environment, and then the integration and promotion of the urban public environment. Only in this way can we achieve both sustainability and development. Then this article starts from the natural environment and public environment in the city. Starting from the connection space between the building itself and the city, we propose a collaborative and integrated design of the external public space of the museum and urban space. We start with the link space between the square space and block space in the city and the museum, and integrate the design and integration of the boundary space of the museum respectively . , discussed from three aspects: transparent

boundary space, architectural boundary extension space and transparent boundary space.

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