

Relationship between Museum Light Environment and Cultural Relics Protection and Its Guiding Role

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Abstract: With the continuous improvement of people's living standards, people's quality of life and quality of life are also improved accordingly. At the present stage, the main task of the museum is how to better design the interior display and how to attract more visitors. The lighting environment design of the museum occupies an important position in the whole interior display design of the museum. This paper mainly analyzes and discusses the development, function and application of the lighting environment design of the museum.

1. Introduction

At present, the light environment design requirements of museums are higher and higher, and they are relatively more and more mature. It requires that the lighting design can better attract the attention of the audience, and it also requires that the lighting design play a role in protecting the cultural relics displayed in the museum, so that the products displayed can not be radiated by the light. In the design of museum lighting, we need to carry out scientific design. As the main content of museum display design, lighting is of great significance.

2. Light Environment Design Concept of Museum

Lighting in museums generally refers to natural lighting and artificial lighting. Generally, natural lighting is used in the interior. We often hear the word "daylighting", which refers to natural light. Natural light is not particularly strong, and it makes people feel more comfortable. Artificial lighting generally refers to the light emitted by all kinds of lighting lamps and lanterns. At ordinary times, the downlights and spotlights that we often see belong to the category of artificial lighting. Artificial lighting lighting lighting to a certain location will present a more artistic effect, can have a better visual effect, attract the audience's attention^[1].

3. Light Environment Design Principle of Museum

3.1 Lighting with Natural Light

In modern museum architecture design, natural lighting is widely used. It has many advantages that artificial light does not have: it has a wider beam, which can fully show the three-dimensional sense of exhibits; it is the light source with the best color rendering performance; it can save energy; it can save costs for the non-profit building like the museum; it can bring natural intimacy to

visitors' psychology. Natural light can be divided into sunlight and sky light, sunlight is the direct light of the sun; sky light is the refraction of sunlight in the sky. The introduction of natural light into museum exhibition hall should be considered from three aspects: the protection of exhibits to prevent the damage of light to the exhibits; the prevention of indoor overheating caused by direct sunlight; and the visual damage and interference caused by glare. Therefore, it is necessary to introduce natural light source^[2].

3.2 Lighting with Artificial Light

Compared with natural light, artificial lighting has the characteristics of more flexible light distribution and more stable light source. It is easy to control and is the main light source of museum lighting. Museum is a space for collecting, displaying and publicizing all kinds of precious cultural relics. The quantity and related characteristics of artificial light should be paid attention to, such as illumination, color rendering, spectrum, glare, etc. artificial light should also have adjustable function when necessary. The artificial lighting sources in the museum mainly include incandescent lamp, metal halide lamp, LED lamp, optical fiber, etc. Artificial lighting can be divided into embedded lighting, light-emitting ceiling, suspension type, reflection type and guide rail transmission type. According to the light distribution form, artificial lighting can be divided into direct lighting, indirect lighting, semi direct lighting and semi indirect lighting^[3].

3.3 Lighting Design Method of Exhibits

In the museum display lighting system, the integral lighting and the local key lighting need to be balanced. The integrated lighting and local key lighting are for different objects - the whole exhibition area, key exhibits, general exhibits and exhibition area background. The visitors' judgment on the exhibits comes from the illumination of the lighting system. The illumination should be suitable, too low to watch and time consuming, too high and glare. At the same time, the color of the background of the exhibits is closely related to the recognition of the exhibits. The background and the color of the exhibits are close, which is not conducive to the transmission of the information on the exhibits. The color rendering of light source is also the factor that affects the viewing effect of the exhibits. For the lighting of exhibits in museums, it is an important principle to restore the color of the exhibits. Generally speaking, the higher the color index of the light source, the better the color performance. If the color index is more than 90, it shows that the color performance is excellent. Light sources with a color index of less than 80 are not usually used for museum lighting. Especially for museums and art museums with high requirements for color, natural light should be used as much as possible for display lighting. Because the traditional painting works are mostly created under natural light, the color index of these light sources is 100. 18~19 for some outstanding exhibits that need to be highlighted, in order to attract the attention and reflect the essence of exhibits, we often use point light sources. The key factors to be considered are to master the "structure" of the beam, especially the size and shape of the beam, as well as the amount of light spilled and the intensity of the light. The size of the beam has a decisive effect on the range of the object to be irradiated. Most of the beams are conical, the closer the light source is from the object, the smaller the coverage is, and the larger the other is^[4].

3.4 Illumination and Cultural Relic Protection

The influence of light on cultural relics is also an important part of the museum's light environment design. The influence of light on cultural relics is different. Some exhibits need no special treatment under the illumination of light. However, most of the exhibits will be affected in

color and quality after being exposed to light, so special protection is needed. Generally speaking, painting works are greatly affected by light. To avoid long-time and high brightness illumination, painted pottery works are also vulnerable. Bronze, stone carvings and jade articles are not affected by light. China has a splendid history, and Chinese museums play an important role in showing the national culture and spirit to domestic and foreign audiences. Nowadays, the museum design in China has been improved a lot, but there is still a lot of room for development, so we need to make joint efforts^[5].

4. Analysis of the Current Situation of Light Environment in Museums

4.1 Selection of Natural Lighting Mode in Museum Lighting Environment

According to the characteristics of the building, such as the skylight and side window of the museum to achieve natural lighting, natural lighting will be softer.

4.2 Selection of Artificial Lighting in Museums

Artificial lighting in Museum mainly refers to the lighting of display cabinet position and reflection lighting of specific area. The direction of lighting reflection is generally adjusted according to the light, season and the location of exhibits. The selection of lighting lamps is mainly led lamp, fluorescent lamp, incandescent lamp and so on. However, at present, due to the poor lighting blocking effect and insufficient anti ultraviolet measures, the museum needs to constantly update the lights and make efforts in the selection of lamps and lanterns^[6].

5. Application of Lighting in Museum Display Design

5.1 Basic Requirements of Light Environment in Museum Display Design

There are also certain requirements for the light in museum display design in the design of museum architecture. It is required to select light reasonably according to the characteristics of the exhibits in museum exhibitions, not direct display and protect the exhibits; in addition, environmental protection lamps must be selected in the selection of lighting to reduce the damage caused by light to the exhibits. All lighting must be selected on the premise of protecting the exhibits. The design requirements of the lighting in the lighting environment of museum should not be too bright, and the effect of the audience watching the exhibits cannot be affected. It is necessary to let the audience see the exhibits clearly. The selection of the lighting in the museum should have a certain rhythm sense, such as the reasonable use of warm and cold light in artificial lighting, and a certain level transition to avoid the fatigue of the audience watching the exhibits. The lighting design should be scientific and present the aesthetic feeling of the exhibits to the audience.

5.2 The Artistic Effect of Lighting in Museum

In the lighting design of Museum, the lighting presents different artistic effects according to the direction of light, the cold and warm light, the color of light and the location of objects, so as to make the exhibits or exhibition hall more beautiful. Museum lighting can not be too strong, too strong light will make it difficult for the audience to see the exhibits clearly, and it is easy to damage the exhibits to varying degrees. Of course, there are certain requirements for the direction in which the light hits the exhibits. When illuminating the exhibits from the front, it is easy to produce a halo on the back of the exhibits. When illuminating the exhibits from the side, the texture

of the objects will be more clear, and there will be shadows. When illuminating the exhibits from the top, the overall effect of the exhibits can be reflected. If the light is too strong, it will show the cold side of the exhibits, and the weak light can show the soft side of the exhibits. The museum should adjust the lighting reasonably according to the situation of the exhibits^[7].

6. Application of Lighting Design in Museum Exhibition Space

6.1 The Way of Natural Lighting

Natural lighting we have mentioned in the previous article, mainly refers to a way of lighting with the help of natural light. The light is relatively soft and gives people a very comfortable feeling. However, due to the spatial location of the museum and the influence of weather changes, there is no way to control the natural light, which will affect the exhibition effect of museum exhibits.

6.2 The Way of Artificial Lighting

Artificial lighting is more common in museum lighting design. Artificial lighting mainly uses lighting lamps to realize the utilization of light. Compared with natural light, artificial lighting can control the intensity of light and the range of light irradiation, and is widely used in Museum room design.

6.3 Combination of Natural Lighting and Artificial Lighting

In museums, the combination of natural lighting and artificial lighting is widely used, which can present better artistic effect and set off the atmosphere of the exhibition hall. Museum designers should scientifically use the combination of natural lighting and artificial lighting, so that the exhibits can be displayed in front of the audience in a better way, showing the unique charm of exhibits. Special attention should be paid to the combination of natural lighting and artificial lighting. The alternating transition of lights should be slow, not direct. If the direct transition is made, the audience will feel dizzy, and the actual effect of lighting will not be achieved^[8].

7. Conclusion

The design of light environment in the museum plays a very important role in the overall display design of the museum. The selection of lighting needs scientific research and continuous practice. The quality of the light environment in the museum directly affects the attitude of the audience towards the exhibits or the exhibition hall. The high-quality and scientific lighting design can improve the visitors' enthusiasm and attract the attention of the audience. The museum can also show the atmosphere of the age of the exhibits through lighting, so that the audience can experience the significance of the exhibits. In the light environment design of museums in the future, more modern and new technologies need to be better integrated into the light environment design of museums, so as to create a more vigorous and infectious light environment, to better display the charm of exhibits, and to create a better viewing atmosphere for the audience.

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