

Relations of Buildings Materials and Shape

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Abstract. With the new materials, new technology are being widely applied in the construction, the requirements has been further, such as how to enrich and expand knowledge and improve their professional qualities. To learn to master modern technology and materials from practice is an effective way. The trend of modern architectural engineering design is becoming more and more obvious. Architectural designer is the original designer, but can not do without the deepening design of the professional manufacturers. The relationship between architectural designers and professional manufacturers should be an interactive relationship. In communicating with the technical personnel of the professional material manufacturer, the architect can not give up the opportunity of his own responsibility and study. Only the improvement of these professional qualities can help designers from planning to design to the construction plan and then to the construction cooperation, and coordinate all professional and construction units and professional manufacturers in a comprehensive and effective way, and to improve the level of architectural design.

Introduction

Construction is the unity of technology and art, the progress of the construction is mainly reflected in the form and function of the building, the development of construction technology and art performance in how to use the building materials. So the progress and development of the building and the use of innovation and application of construction materials and are inseparable. From the architectural point of view, different building materials express different architectural language. Stone represents the dignified, wood represents warm, glass represents simple changes, steel represents solid. Through the research on the building and building materials can found that development and application of building materials to promote the development of construction technology and improve the level of design. At the same time, the progress of the design performance is conducive to innovation and development of building materials.

Building Materials and Architectural Design Style

In the long history, the development of architecture is often accompanied by the development of social productive forces. The architectural style, form goes with the different material, technology has a different characteristic, western classical stone is mainly granite or marble.

Stone as the oldest building materials, has been throughout the history of the whole classical architecture in the west, it is a load bearing member of the building, and it is a cultural integration with the western classical architecture. Its various architectural forms and structures express the cultural and artistic features and the aesthetic taste of the western classical architecture. The cultural and artistic style of stone reflects the changes of the western classical society. Pyramid and Temple is the manifestation of ancient Egyptian culture and art. Ancient Egyptian architecture gives characteristics of the culture and art of the stone is a huge and vast, shigemi and great, solid quality

and eternal, roughness and strength. Ancient Greece is the cradle of European culture, is the pioneer of European architecture. The ancient Greek architecture gives characteristics of the culture and art of the stone is the beauty of human body scale, give the Doric, ionic, Doric column cultural and artistic beauty. The ancient Rome architecture inherits and develops the technology of combining the pillars with the stone arch structure, forming the stone arch crown. In addition to the three column of ancient Greece, but also the development of the tower, column, ticket. Stone carving more frequent rich, even let the colonnade to enhance the sense of rhythm, so as to give stone new forms of culture and art.

Western traditional architectural art performance form is represented by stone, the traditional architecture of the East is represented by a wooden building. Timber is given the cultural and artistic characteristics of the oriental charm. Where we can find a better structure of the old wooden building to purify and the intellect of the order. And the wisdom that has been stored for ages. These words of modern master fully make sure the traditional wooden architecture art form China. In Chinese classical gardens, the pavilion, pavilion bridge, etc. most of all pieces are the wooden building. In particular, the combination of private gardens and natural landscapes, and fully express the natural properties of wood, forming a wonderful art form. Chinese traditional timber buildings are endowed with wood to fully express their natural attributes, and to combine with the natural landscape, to express their lightweight linear structural features, form a unique cultural and artistic symbols by brackets. Because of the Chinese traditional culture and art history, resulting in the construction design of wood is widely used in the construction.

Building Materials and the Development of Modern Architectural Design

From the perspective of the segmentation and the application of materials, the form of architecture is more attention to the external changes, and pursuit the beauty on form. The application of materials is an indispensable condition. The application of the material determines the shape, color, muscle and its strength and processing performance of the building. Building is inseparable from the material. With the development of modern science and industry, the kinds of materials become more and more, modern materials science has developed into a multidisciplinary intersecting subject which are widely involved in the field of physics, chemistry, thermodynamics, crystallography. Many materials in the field of metal materials are often used in the construction of materials, such as copper, iron, tin, etc..

In architectural aesthetic expression elements, the relationship between architectural form and structure is the most direct. Architectural beauty is mainly reflected in the modeling, and the essence of the beauty of the shape is the structural beauty. In the steel structure building, because the steel is completely different from other materials, which make it be more stronger, lighter and more flexible modeling ability than other materials. The architectural modeling can be well designed by the structural analysis. In contrast, coordination and the performance of the ultra - scale approach, the steel structure has the superiority that the other materials can not match.

Where are structural beauty and aesthetic performance of steel materials mainly reflected in? The steel structure has the exact beauty of smooth and flat, and the texture of the material itself, and

realize the ideal combination of technology and time. Steel structure has the possibility of having a structure, through the structure of the main and the main components of the joint, make use of the structure of the beam column element, steel structure is an ideal material for building. It can really achieve the main design concept of modern architecture, which is clear structure, free plane. In architectural aesthetic expression elements, the relationship between architectural form and structure is the most direct. Architectural beauty is mainly reflected in the modeling, and the essence of the beauty of the shape is the structural beauty.

In the steel structure building, because the steel has a stronger, more flexible and more flexible than other materials. Therefore, the steel structure can perfect show the combination of technology and art. In order to show the structural beauty of steel structure, the key is reasonable collocation in the structure. This is the the task for structural engineer to choose the reasonable structure, but also the basis of building modeling. After the structure is stressed, the transfer of force is in a certain order. This is actually show that how to arrange the structure, and decide the force and shape of steel structure. There is a clear tendency of rational expression of the architectural language expressed in the architectural steel structure. High mast, streamlined space structure, a steel node with mechanical art, full of tension, and other technology, wonderful large span free space, which give people an artistic appeal and a certain degree of technical mystery.

Typical Application of Building Materials in Architectural Design

Usually, for a large architectural modeling, people's visual range is limited, so it is often seen from one point of view. In addition to the overall effect of the complete, beautiful, in all aspects of the local side, buildings should also give people a visual sense of beauty. It can be said that it is a large three-dimensional shape. Each structural system has its own different structure, and the structure is dominated by the mechanical principle. The reasonable structure form is the true reflection of the mechanics law. Choosing the structure is an important part of architectural design according to the space requirement and the environment condition. It is one of the important means of architectural form to fully excavate the aesthetic potential of structural form, and to make the aesthetic expression of the specific structure.

Our country built the National Stadium, and the Stadium is to use the large amount of steel structure material and modern composite materials to build, give people a new visual aesthetic feeling and rich flavor of modern architectural style, from every point of view is very perfect.

This is a building called the bird's nest by people, which is content with a series of radiation portal type frame around and rotate, which has simple structure of science, unique and novel design. It has become a giant building in the world. From bird's nest, it can be seen that the National Stadium is designed by using the technology and concept of bionics. Bionics architectural concept reflects the regression and innovation of human construction thought. However, the architectural bionics design needs designers have profound understanding to shape and structure, but also a clear understanding of all the building materials. The bird's nest project structure and other all blend into one harmonious whole, it is indivisible. The structure is complex, but it is very reasonable. In fact, the structure can also be used to replace the surface structure, but that structure will make the

construction of the image is greatly inferior. In order to achieve the bird's nest, high strength steel must be used to reflect the structure and image of the building.

At present, the most representative of the building is the 2008 Beijing Olympic Games natatorium water cube. The overall area of water cube is 10 thousands kilometers. It is an innovative building from the building to the structure, containing a high scientific and technological content. The project occupies two of the world's first, it is the world's first polyhedron space steel structure and the size of the world is maximum. Its outer wall and roof enclosure structure adopt a new type of steel structure and membrane structure system. The system consists of a series of similar in cells, crystalline polyhedron space steel frame unit and ETFE inflatable together. After completion, the water cube is filled with the feeling of water drops. The structure design of water cube faces many domestic unknown issues. Such as overall analysis and ductility and seismic design of a new type of space structure system. The stress performance and practical analysis method for all kinds of connection joints. Large rectangular structure experimental study for snow hole. Because these venues embody the most avant-garde design concept, in the construction, the project focused on the most cutting-edge domestic innovation and technological strength, and solve problems in time. This project has accumulated valuable experience for the improvement of the overall level of the construction industry.

The design inspiration of water cube comes from organic cells and the formation of soap bubbles. The structure of wall design is based on the bubble theory. In architectural aesthetics, the Water Cube will first attract the attention to the rational thinking of the designer. For example, how are the bubbles combined? How about the lighting and the hardness? And so the problem will gradually lead to a sense of identity. This kind of identity is mainly based on the appreciation, which is also a major feature of modern architectural design idea. Secondly, the Water Cube cannot be reduced to a lap, otherwise its value is equivalent to the factory. It makes a distinction between the construction and construction, construction is based on the structural mechanics and add the selection and processing of materials. This is usually what engineers think about it. And construction is the problem that the architect considers, construction can be said to be poetic creation. The construction of the Water Cube is obviously reflected the characteristics, designer itself has a poetic and romantic in the starting point, the simple form of respect the environment, and building has its own theme. Designers try to find the crystal clear water, makes the nature of the water of the natural pure feeling in the foam body perfectly expressed. The designer's clear and poetic expression is expressed in this new type of material, which makes the beautiful blueprint of design be realized.

References

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