

Construction Technology of Concrete Structure in Civil Engineering Construction

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Abstract: Recently, in the implementation of modern construction, the civil engineering buildings in various areas have gradually increased, concrete is this type of building more commonly used construction materials, in essence to ensure the quality of the project, it is necessary to use construction technology effectively. Based on the new, this article first for the use of concrete in civil engineering on the structural characteristics of a brief description of the use of concrete structures in civil engineering construction of the main construction technology.

Keywords: Civil engineering building; Concrete Structures; Construction techniques.

1. Introduction

The construction industry has a long history of development, in the course of the development of architecture, the concept of development of architecture, domain category, these aspects have a certain improvement, which is an indispensable part of the construction industry, with the continuous improvement of people's quality of life, People's demand for the quality of civil engineering buildings has become higher. Nowadays, if we want to ensure the quality of engineering, it is necessary to control the quality of concrete structure, however, concrete construction is easy to be affected by many factors, resulting in related quality problems, as long as there are

problems in the concrete structure, the service life of engineering buildings will be greatly reduced ^[1] . From the construction experience of many civil engineering buildings, increasing the control of civil engineering buildings during the construction, can substantially improve the quality of the project, it is of great significance for the comprehensive development of the field of civil engineering.

2. The Concept and Characteristics of Concrete Structure

The concrete used in the construction of civil engineering buildings is concrete. Concrete structure is a



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new type of structure that takes concrete as the main material and combines it with various other materials, it includes concrete structure, prestressed concrete structure and reinforced concrete structure, now concrete has become the field of civil engineering construction as a common building materials [2]. Nowadays, concrete structure has been widely used in most civil engineering buildings:

(1) The Related Process of Concrete Structure is Simple and Practical.

(2) As Building Material, the Concrete is at Low Cost.

(3) The Concrete Structure has Strong Fire Resistance and Durability in Most Projects.

(4) It has Strong Resistance to Natural Disasters.

(5) Adjustable, Concrete Meets the Needs of All Kinds of Engineering Construction.

(6) Using Industrial Wastes to Make Concrete Structures, such as Coal Ash or Slag, has Certain Environmental Properties.

3. The Reason Concrete Structure Produces Cracks

During the construction of civil engineering buildings, a lot of problems often occur, which will seriously affect the safety and reliability of the building during the use of the building, so much so that it will have a great threat to people's own life and property safety, so it is necessary to carry out further analysis on the causes of concrete cracks [3].

3.1 The Change of External Temperature Causes the Crack

During the construction of relevant engineering buildings, the temperature of concrete is easily affected by the outside temperature. In the process of construction, if the outside temperature drops, the temperature gap between the surface and the interior of the concrete becomes larger, which in turn produces thermal stress [4]. The temperature stress will change along with the change of the external and internal temperature of concrete, and the temperature difference

stress is the key to the concrete crack. In the construction of related engineering buildings, large-scale concrete pouring is generally required, however, in the recent situation, large-scale concrete pouring is generally heavier, will have a large binding force on the concrete, which is the cause of concrete cracks, but also the main cause of problems in the concrete structure.

3.2 The Heat of Hydration in the Concrete Causes Cracks

The concrete releases some heat when it is mixed, and the thickness of the concrete section becomes very thick when the area of the project is large, which greatly affects the coefficient of the concrete surface, in general, the surface coefficient of concrete will become very small at this time, directly affecting the heat release of the cement itself, and eventually causing a lot of heat to accumulate in the concrete, causing the heat in the concrete structure can not be released, this directly increases the temperature difference between the inside and the outside, in which case the inside of the concrete will produce large cracks, which directly affects whether the construction of civil engineering buildings can be carried out smoothly [5]. As shown in Figure 1.



Fig. 1 heat of hydration leads to cracks

3.3 Concrete Self-shrinkage Causes Cracks

During the production of concrete, some silica fume is usually added to the concrete to improve the quality of the project. However, on the one hand, the addition of silica fume increases the self-shrinkage value of the concrete, is also a major factor in the occur-

rence of cracks in practice ^[6]. It's not just the production of concrete that is prone to problems. During the hardening of concrete, most of the water is released, and the water that evaporates contains a self-shrinking value, this can lead to many types of cracks.

4. Major Construction Techniques for Concrete Structures

The construction tools of concrete structure are very technical and professional, which involve too much in practice, such as Geological Survey, facility inspection and supervision of construction process. The design of concrete structure in civil engineering construction involves the selection of construction facilities, the selection of concrete materials and the maintenance of concrete, it may lead to unsafe factors in the construction of concrete structure ^[7]. Therefore, it is important to use the construction technique of concrete structure reasonably during construction.

4.1 Design Principles of Concrete-related Construction Schemes

There are many reasons for concrete cracks, concrete temperature stress is not in place, concrete in the mix caused by self-shrinkage value will affect the quality of concrete during construction. Concrete-related construction plans must pay attention to these aspects in design, implement scientific construction organization, and should also pay attention to the temperature change of concrete in construction design, in particular, the temperature stress and self-shrinkage value, so as to effectively reduce the probability of concrete cracks ^[8]. In addition, the reasonable selection of materials during the construction of concrete is essential, it is necessary to select the quality of materials, usually choose some compensating shrinkage of concrete ZY expansion agent as the basic materials, in order to enhance the continuity and reliability of the post-cast concrete structure.

4.2 Control of Concrete Temperature Stress

4.2.1. Control the quantity of cement used

During the hydration of cement, some of the heat will be released, which can not be removed in time, will cause the internal temperature of concrete gradually rise, and the external temperature deviation, finally, the thermal stress appears in the concrete material, which seriously affects the quality of the concrete structure. Controlling the amount of cement used can effectively prevent this phenomenon.

4.2.2 Effective control of the amount of cement can avoid the heat released during hydration of cement ^[9]

During the production of concrete, water-reducing agents are added as appropriate. And also need to effectively use concrete mixing technology to ensure the uniformity of concrete mixing, so that the internal heat can be released.

4.2.3 Temperature Control in Concrete Construction

During the period of concrete construction, it is easy to be affected by the outside temperature and environment, and then form the temperature stress. Therefore, during the practice of pouring construction, should not be in the outside temperature of the construction, or timely cooling or cooling methods for pouring the temperature of effective control, to ensure the quality of the concrete structure.

4.2.4 Mandatory cooling of concrete

The use of mandatory cooling for concrete can not only ensure the quality of concrete structure, but also help to improve the quality of related engineering buildings. In practice, the concrete structure should be installed in advance in the internal water pipes, while pouring cold water into the pipes, the internal implementation of concrete cooling.

4.3 Reduce the Restriction of Foundation to Concrete

4.3.1 Reduce the inherent constraints of concrete as a material

If the temperature stress increases in the concrete structure, it will also increase the binding force inside the concrete, so, increasing the temperature stress at the time of the control force can reduce the binding

force inside the concrete material to a certain extent, to ensure that the value of the binding force in the concrete material is within a reasonable range. During the period of controlling the temperature stress, the construction personnel should reasonably use various heat preservation measures, such as covering method and warm shed method, to keep the external temperature of the concrete structure in a stable state, then, the temperature difference between the inner and outer of concrete is shortened, and the inner temperature stress of concrete material suitable for engineering is created.

4.3.2 Reduce the binding force that the external foundation should bear

It is very difficult to control the pouring thickness of concrete during pouring, if there is too much thickness, the binding force from the foundation will become bigger, has a great impact on the quality of concrete construction. Therefore, the thickness of concrete should be reduced as much as possible when the concrete is poured, and the slip layer can be set to reduce the binding force of the foundation to the concrete. As shown in Figure 2.



Fig. 2 Concrete Foundation

4.3.3 The application of concrete pouring technology

In the construction of civil engineering buildings, the wall, foundation slab and building structure involved in the construction of concrete need special attention during the construction of wall, whether the composition of the concrete used is consistent, there are certain requirements for the height of pouring, in general, the height of pouring needs to reach 40cm;

The main problem of foundation slab during construction is the heat dissipation of concrete material. From this point of view, not only the temperature stress of concrete should be strictly controlled, in order to ensure the continuity of concrete pouring, more attention should be paid to the selection of materials and equipment. As far as the current situation is concerned, most of the pouring patterns are used in the construction process, different methods play a different role, there are some differences in the applicable environment, so it's important to choose a reasonable pouring method based on the actual situation. See Figure 3.



Fig. 3 concrete pouring

5. Conclusion

Recently, the concrete structure of civil engineering construction during the construction of the widespread popularity of the overall quality of the project has a significant impact. So it is essential that the constructors have a good grasp of the characteristics of concrete structures, at the same time by the concrete temperature stress control, reduce the restriction of concrete to concrete and increase the crack resistance of concrete these angles as a breakthrough construction, for the construction of social and economic benefits to create a solid foundation.

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