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# On Construction Engineering Technology and Safety Management

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**Abstract:** The quality of housing construction not only relates to the safety of people's lives and property, but also has a great impact on the development of the construction industry. Therefore, construction enterprises must effectively improve the construction technology to ensure the quality of construction. And we should attach great importance to the safety in the construction process, strengthen the safety production management, so that the housing construction can be carried out smoothly. This article is aimed at the construction technology, new material application and safety production management measures in the housing construction project.

**Keywords:** Construction technology; Safety production management; Housing construction engineering

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## 1. Construction technology of building engineering

### 1.1 Anti-crack construction technology of concrete

In the construction of housing projects, concrete cracks are more common. The main factors are the change of humidity and temperature of concrete, the disorder of concrete structure, the brittleness and imbalance of concrete, and the unsatisfactory quality of raw materials and the uneven settlement of formwork. Cracks usually occur during the hardening of concrete. Because the cement will release the heat of effluent water, the temperature of the concrete will increase gradually, which will produce tensile stress on the surface of the concrete. However, the tensile stress will be produced in the concrete because of the gradual cooling in the later period. In addition, the decrease of temperature will also lead to the increase of tensile stress, when the total tensile stress is gathered, and exceeds the acceptable limit, cracks will appear. Therefore, according to the actual situation and the temperature stress calculation, to decide whether to use the whole pouring or the sectional pouring way. At the same time strictly in accordance with the construction scheme to arrange the concrete pouring equipment, tamping machinery and construction personnel number, maintenance time and so on. Concrete pump pouring and tower crane pouring are commonly used pouring methods at present. In the process of pouring concrete, we should pay attention to the scientific and reasonable subsection and layer, make the concrete rise along the height evenly, the concrete temperature should not be lower than 5°C, and should not be higher than 35°C. Effective construction measures should be taken when the average temperature of the day reaches 30 degrees or more or the average temperature of the fifth consecutive day is lower than 5°C, so as to guarantee the construction quality of concrete. For example, pouring large volume of concrete, after the initial coagulation of concrete, the use of waste materials on the surface of the concrete to set up barriers, the introduction of foundation pit precipitation and recycling, so that the hydration heat dissipated by the temperature difference, specific reference to Beijing Haidian Zhongguancun No.1 project. In addition, before the concrete initial coagulation, it should be a vibration or surface plastering, in order to exclude water. With the wood beat to continue to apply pressure, can effectively remove the earliest surface cracks. If the construction is carried out in winter, after the concrete is compacted, it should be covered with plastic film in time, and covered with straw curtains, quilts and other insulation materials.

### 1.2 Anti-seepage technology for housing construction projects

Because of the cracks in the secondary wall structure, the deviation of the size of the doors and windows and the secondary structure installation cracks easy to cause leakage at the joint of the house, not only affect the function and service life of the house, but also cause damage to the appearance of the building, and also increase the difficulty of maintenance work. The main reason for this phenomenon is that the construction process, there is no strict control of the external wall leakage control quality. Before construction, the quality of raw materials must be strictly controlled, for cracks caused by secondary structure, follow the relevant provisions of "Masonry Engineering Construction Quality Acceptance Code", the general concrete block should choose the compressive strength of more than 5MPa, dry shrinkage value of less than 0.5mm/m, 28 days after the kettle curing period; the water content of the aerated concrete block construction is best below 15% (for

fly ash aerated concrete block is best below 20%), which can effectively avoid the cracks caused by the shrinkage of the block itself. When the building blocks enter the construction site, it must follow the construction specifications to reasonable placement. In order to prevent rain casting in advance to do a good response measures, at the same time, scientific layout of structural columns, beams, wall reinforcement and other structural measures, in accordance with the relevant provisions of the construction before the construction should be fully wetted in advance. In the process of masonry, the aerated concrete blocks with different dry density and strength grade can not be mixed together to build, and also can not be mixed with other types of blocks. During the construction, the height of the masonry frame structure wall should be kept below 1.40m every day, and the masonry should be stagnated for 7 days when the beam bottom is about 200mm. After the deformation of the masonry body is stable, the small masonry blocks with solid materials are used to form a 60°-75° angle to be tightly pressed; the top bricks must be fully tight and the seams must be tight.

### **1.3 Energy-saving technology for housing construction projects**

The energy-saving technologies of housing construction mainly include heating, solar energy and wall insulation. First of all, the water source heat pump system in heating energy-saving technology has been widely used in housing construction projects. The working principle of the water source heat pump is a heating and air conditioning system that uses the solar energy resources stored in the earth's water as the heat source, and uses the low-temperature water after natural heat dissipation as the cold source to carry out energy conversion. This technology is fully computer-controlled and has a high degree of automation. Due to the simple operation of the system, few components of the unit, and stable operation, the maintenance cost is low and the service life is long. Secondly, solar energy-saving technology, as the cleanest and most abundant energy source, has been widely used in the construction industry. The energy-saving and environmental protection function of solar energy is reflected in many aspects, such as installing the solar cell power generation system on the roof or the wall facing the sun, obtaining heat energy through solar radiation, and then converting it into electrical energy, and storing it through the battery pack, connecting the corresponding lines on the power supply equipment, you can basically supply the power and lighting system in the building. In addition, solar energy technology can effectively control the lighting of buildings, which is conducive to energy conservation in daily life. It can be seen that the use of solar technology has many advantages such as safety, no pollution, and easy installation. In addition, in the construction of housing, the outer parapet wall of the building can choose to add autoclaved fly ash to add gas concrete into blocks to build the wall. This is a new type of wall material processed by advanced production technology, which can effectively ensure the thermal insulation and energy-saving effect of the building. The advantage of using such materials is that it can reduce the reduction of construction waste, avoid the waste of building resources, and conform to the current green building concept.

## **2. Measures for the management of safety production in the construction of housing construction projects**

### **2.1 Improve the safety management mechanism**

In order to ensure the construction safety of housing construction projects, it is necessary to continuously improve the relevant mechanisms of construction safety management. The construction unit shall formulate corresponding safety construction and production regulations in combination with the actual construction situation. Management personnel should strictly abide by and implement the regulations on safe construction and production, and effectively implement the relevant safety management rules and regulations. Make emergency plans for possible safety problems in order to deal with emergencies in a timely manner. Strengthen the safety responsibility system, clarify the responsibilities and division of labor of various departments and positions, and strictly investigate the relevant responsible persons if problems are found. Improve the reward and punishment and assessment system, mobilize the enthusiasm of the staff, improve work efficiency at the same time, but also to achieve fairness and justice, and severely punish the person responsible for safety accidents, so that all personnel can improve their safety awareness and more standardized construction.

### **2.2 Improve the safety supervision mechanism**

Establish a special supervision and inspection leading group to clarify their respective responsibilities. The supervision work must be carried out in strict accordance with the relevant construction safety requirements of our country and localities, to guide the construction personnel to carry out correct operations, and strictly control the technical disclosure and safe construction of each project link. Carry out supervision and inspection work on a regular or irregular basis, implement safety supervision on the construction site, especially strengthen safety management in key and key links in the construction, so as to make the construction of housing projects more safe.

### **2.3 Strengthen safety ideological education to improve safety awareness**

Most of the on-site workers in housing construction projects generally have low technical level and safety awareness, especially for high-tech and high-risk operations. This not only makes it difficult to ensure the quality of construction, but also poses a threat to the safety of

construction personnel. Therefore, we must intensify efforts to carry out safety production education, training, examination and assessment, disclosure and other work, so that on-site operators can improve safety awareness and avoid quality and safety accidents. Construction management personnel must strictly abide by safety protection measures, hold certificates, wear corresponding safety equipment, set up warning signs and safety facilities in dangerous areas, and effectively improve the safety of the construction site.

### 3. Conclusion

In short, in order to ensure the construction quality and safety of housing construction projects, it is necessary to improve the level of construction technology and safety production management. Therefore, it is necessary for us to strengthen the application of various construction technologies and new materials in the construction process of housing construction projects, and strictly control the quality of each link. At the same time, it is also necessary to continuously improve the relevant measures of safety production management, so as to effectively ensure the quality and safety of construction.

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