

Brief analysis of the innovation work in civil engineering technology

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Abstract. Under the new situation, the development process of urbanization is accelerating, the construction industry is developing well, the number and scale of civil engineering projects are gradually expanding, and the construction technology, as the core of the project construction, has always been the focus of people's attention. Because the construction quality will directly affect the safety of personnel, it is necessary to clarify the characteristics of construction technology and improve the existing civil engineering construction technology. Realize the technical innovation of foundation pit construction, prestressed construction, reinforced concrete construction and other links, improve the technical content of engineering construction under the premise of ensuring the construction quality, and extend the service life of the building as far as possible.

Keywords: civil engineering, building construction, construction technology innovation, foundation construction.

1. Introduction

Civil engineering construction involves many projects, the construction period is long, and the construction requirements of different positions are obviously different. Therefore, it is necessary to strengthen the application of different construction technologies to reduce the difficulty of construction by comprehensively considering the differences. Follow the principle of the development of modern construction industry, the civil engineering construction technology optimization innovation, fully embodies the connotation of construction innovation, the development of civil engineering contribution is very big, it can support the public opinion system of civil engineering construction, in addition, we should also in this respect to continuously improve these contents and update, strengthen the effectiveness, can ensure the stability of civil engineering construction application more perfect, applied to the present project. Catering to the pace of the development of The Times, improve the quality of construction.

2. Civil engineering construction requirements

During the construction of civil engineering construction, the following requirements should be clearly considered: [1] According to the construction scale and building space planning, the construction scheme is reasonably optimized, and the construction unit is required to carry out the construction according to the scheme, so as to prevent the construction from being disturbed by external factors again,

so as to ensure the construction quality. [2] For construction materials and mechanical equipment, make preparations in advance, beware of the problem of construction delay during the construction. Improve the utilization rate of materials to avoid insufficient material preparation or excessive waste. Strengthen the maintenance of the equipment, prevent the equipment failure, and ensure the effective application of the equipment in the construction. [3] Follow the development needs of the construction industry, optimize and innovate the construction technology methods and engineering management mode, improve the use effect of technology, and ensure the safety of engineering construction. [4] Strengthen the regular training of construction and management personnel, so that they always have innovative thinking, and launch the civil engineering construction under the guidance of safety awareness, prevent subjective factors from interfering with the construction, improve the control level of the whole process of construction.

3. Technical characteristics of civil engineering construction

Difference and gradual ution. The construction requirements of different construction projects are different, so that the choice of construction technology should fully consider the actual requirements of the project, and carry out the construction according to the site construction conditions, so as to ensure the smooth progress of the project.[5] The development of science and technology promotes the continuous improvement of construction standards in the construction industry, and the construction field makes technical adjustments along with the changes of The Times, so that the construction technical function is constantly improved and improves the utilization rate of technology.

Holdness and complexity. In order to ensure the integrity of the building appearance and building function, most enterprises put forward unified requirements for the delivery of the project on time, and the construction personnel must complete all operations in accordance with the requirements. The connection between engineering construction and construction technology is close, so the connection between the two should be further played to highlight the application role of construction technology, and maintain the integrity of the project. Before using the mechanical equipment, the operators should understand the matters needing attention in the use of the equipment, clarify the operation mechanism of the equipment, and master the operation steps before starting the construction, so as to prevent the too complex equipment from affecting the operation of the project. [6]Construction enterprises should organize personnel to participate in the training and learn the relevant knowledge of equipment use in detail.

Liquidity and fixability. The mobility of civil engineering construction is mainly reflected in the construction period of the project. No matter the construction personnel or the construction codes, there may be flow factors, which is related to the scale of the project. Due to the influence of uncontrollable factors, the construction may change, resulting in the number of construction personnel need to be adjusted. [7]The fixability of engineering construction means that no matter how the construction content changes, the professional and technology involved will not change, especially some advanced green technology, the application of this kind of technology has a strong fixability.

3.1. Analysis of civil engineering construction technology

In the construction of foundation technology, We classify it as the main content, Because the quality of the entire project operation needs to be maintained during the construction process, Ensure good quality in the construction process, To prevent engineering problems, Further improve the stability of the project in the construction process, [8] Extend the life of engineering construction, In conducting engineering planning, We should timely deal with some possible problems in the construction process, So as to prevent the occurrence of these security risks, Can timely adjust and solve some engineering planning problems, Improve the quality of engineering construction, Increase the intensity of testing, Make sure that every project meets the requirements. Before the construction, we also want to survey the soil in the location of the project to investigate whether it meets the requirements, so as to adjust the land to ensure the safety of the building and the safety of the staff in the construction process. These steps are all indispensable.

Prestressed construction technology. During the construction, prestressed technology can be used to ensure the stability of the quality of the foundation structure, prevent the interference of the building by external forces, and highlight the construction advantages of civil engineering construction. In order to give full play to the role of prestressed construction technology,[9] relevant personnel are required to do a good job in adjusting the position of external prestressed reinforcement according to the actual situation of the project, and strengthen the effect of anchor rod and prestressed reinforcement. Optimize the design of prestressed structure, according to the use of technology, the use of concrete to do a good job of pouring treatment, concrete paving times should reach 3 times, the paving thickness should be kept at about 25cm, the interval time is controlled within 15 minutes, the depth of vibrating rod insertion should be within 10cm. Through the effective application of prestressed construction technology, reduce the possibility of building infrastructure damage in the later construction period.[10]

Structural waterproof technology. During the construction of civil engineering, the application of waterproof technology should be increased to prevent the leakage of all parts of the building and give full play to the application effect of waterproof technology. There are obvious differences between different building parts, waterproof technology, should be according to the specific location of the leakage performance, reasonable analysis of the cause of leakage, take targeted waterproof technology, strengthen the effect of leakage problems. For example, in the roof waterproof treatment work, the modified asphalt waterproof coil is used for construction. The conventional thickness of the coil is 5mm, and the waterproof life can reach up to 20 years. It requires the material to be applied to the room temperature environment to solve the leakage problem efficiently.(4) Green and environmental protection technology. At present, the environmental protection level of the construction industry is constantly improving, and various green construction technologies have been applied to civil engineering. While reducing the consumption of energy and materials in construction, the amount of waste is reduced, and the advantages of energy conservation and environmental protection of civil engineering construction are highlighted. Combined with the concept of construction environmental protection, the introduction of green environmental protection technology, strengthen the combination between technology and construction, improve the air quality of construction, implement the construction goals of energy saving and consumption reduction and low carbon environmental protection, and improve people's satisfaction with the building space.

4. Civil engineering construction technology innovation

4.1. Innovation of civil engineering construction concept

Innovate the engineering construction concept, follow the innovative concept to carry out construction, so that the new concept can keep up with the pace of industry development, to meet the requirements of construction. With the improvement of the material conditions of the public, people have put forward higher requirements for the ideology and culture. In order to improve the market competitiveness, the construction enterprises should strengthen the innovation of the construction concept, optimize the technology with innovative thinking, and make it better used in the construction link.

4.2. Innovate engineering construction technology

Innovate the deep foundation pit technology. In civil engineering construction, the application of deep foundation pit technology directly determines the building quality, which can enhance the stability of the foundation and improve the seismic capacity of the building. Strengthen the innovation of deep foundation pit construction technology, help the building to resist natural earthquake disasters, and improve the building quality on the premise of environmental protection. In the past, people used deep foundation pit technology in the construction of residential projects, but the stability effect of the technology could not be the best, and the houses would still be damaged and collapsed. Innovative deep foundation pit technology can be combined with the pile anchor and support file system to make it better applied to underground building construction. In the construction environment with low safety factor, the deep foundation pit technology under the pile anchor and support system can effectively avoid risks.

At the same time, combining the cast-in-place pile and prestressed technology to comprehensively improve the construction quality. The construction of deep foundation pit should strengthen the creation of foundation pit envelope structure system, including pile wall, enclosure purlin and other components. In the process of construction, the pile wall can bear the effect of pressure, so the pressure is transmitted to the supporting part, which can stabilize the retaining wall structure in the foundation pit, so we arranged different types of foundation pit surrounding furnace structure. In order to achieve technological innovation, we have conducted multiple applications, by changing the structure to achieve innovation, and to build more innovative buildings.

Innovative prestressed technology. This technology is a very common technology in the field of construction in China today, The technology can improve the quality of buildings, Enterprises should analyze the civil engineering of the construction site, Next to the innovation, Deepen your own memory, Applying it to some big projects, Able to stabilize these functions, Actively apply these building materials, Ensure the stability of the concrete structure, Maintain the tension of the reinforced structure, Thus, it can make it more stably attached to the corresponding interface, But the traditional technology still has some shortcomings, Is the steel bar in the process of use, Insufficient tension, So it's not good, either, There are some deviations. Therefore, the design of the follow-up technology, generally focus on the design of some tension is enough, the adhesion road is strong, and the friction is relatively small direction design. Only by doing these, can we improve the quality of concrete in the pouring process, and apply the optical fiber technology to measure the tension and optical fiber of steel bars. The scattered light is analyzed to compare the changes, observe the strain degree of the steel bar, and observe the corresponding optical fiber embedded in the steel bar, so as to ensure that the implementation effect of prestress technology can meet certain requirements.

Innovative perfusion technology. In the construction of civil engineering, we should pay attention to the technology, the wisdom application, and according to the focus of perfusion link to improve the stability of the project, in addition, before construction, must survey the technology, to ensure that the field environment can achieve certain technical standards, using the latest measuring tools to determine the relevant location, and can complete the specific operation according to the standard, application, should use a more scientific way to adjust the corresponding equipment, if the equipment stuck phenomenon, should immediately stop change operation to do a good job of fault maintenance work. In the application of the construction technology of bored pile, the production requirements of steel cylinder should be strictly grasped, the thickness should be accurate to about eight centimeters, and two overflow holes should be added in the upper position of the cylinder to ensure the normal operation of the equipment. When using rotary drill drilling hole, should increase in length of 20 cm, using impact drill drilling, should be increased to 30 cm to tube buried, should pay attention to the application of various methods, reasonable digging buried hammer vibration and pressure, and to control the depth, around 2 to 4 meters, on the top level, must reach the position of the water level in the hole. In the drilling operation, the positive circulation of drilling construction technology should be used, that is to say, in the operation of the mud pump through a certain role, from the bottom, and then through the action of the mud suspension, with the rise of the mud and overflow, this technology is generally used in the relatively small aperture drilling. In pile diameter is ambassador to the drilling hole and hole wall section will increase, at this time we should improve the density of the mud and viscosity, thus facilitate the operation of the project, the mud from the ring gap into the hole, because the inner wall section area is small, therefore, mud on return speed will increase, every second can even back to three meters, this is very advanced a drilling process, also, in the process of engineering now, also got widespread application.

Innovate the leakage prevention technology. Leakage is a common problem in construction. In order to avoid the impact of the quality of the project, it is necessary to strengthen the innovation of waterproof and leakage prevention technology. Building materials with strong waterproof performance, such as PVC materials and APP modified asphalt materials, are used to optimize the leakage prevention operation through the efficient integration of the operation links. APP this kind of waterproof rolled in use is a kind of non-curing rubber asphalt waterproof coating, therefore, in the construction, need to use,

according to the instructions to basic processor and rolled, the material dilution, mixing on the surface of the base, after four hours can be rolled, finally adopts the hot melting method to construction, using the shape of waterproof mortar anise for construction. When paving APP waterproof coil, use flame spray gun to heat the base, so that the coil surface can be firmly spread at the same time.

Innovate the use of reinforced concrete technology. In civil engineering, the utilization rate of reinforced concrete materials is high, and the application range is wide. The corresponding construction technology is optimized and upgraded, so that the reinforced concrete structure is more stable and the overall quality of the building is improved. In terms of new technology, steel connection technology is one of the main way, steel connection technology is mainly divided into extrusion sleeve construction technology and thread occlusion construction technology of these two types, for example, steel sleeve cold extrusion connection technology application is holding related instructions, and the size of the surface and mechanical performance can meet certain requirements, will be tested before construction. This kind of material can be used suitable for some seamless steel pipe to make, gian equipment with crimp gas, ultra-high pressure oil pump and the corresponding pipe press pressure, sometimes can reach 100 MPA, the corresponding pressure membrane and steel sleeve need to use, should be assembled during construction, using the side ruler to mark. Check the distance between signs and positioning mark, are generally around 15 mm, this is the prescribed interval, with this distance to comment on whether installed in place, should keep the distance between the steel end and the sleeve length, not more than five mm, to ensure that the connection reinforcement and sleeve center position is consistent, to reduce the error caused by measurement error, ensure the accuracy of the data.

Innovate environmental protection technology. In today's era, more and more people begin to pay attention to environmental protection, and generally advocate the concept of healthy development of green environmental protection, and civil engineering construction technology also moving forward in the direction of green development, in order to implement the development concept, we made a variety of green environmental protection construction plan, this not only can reduce the use of energy green, also can protect the environment, to complete their work tasks. From this point of view, the application of green construction technology is a very reasonable embodiment. We should reduce it to the minimum of carbon environmental protection standards, and some pollution should be cleaned up in time to reduce some unnecessary pollution phenomena. The dust height in the operation area must be less than 1.5 meters, and the dust height of the building structure and decoration during the period must not exceed 0.5 meters, which is a requirement that must be followed in the construction process.

4.3. Improving the innovation mechanism

In order to fully mobilize the enthusiasm of the construction personnel, so that they constantly produce innovation consciousness, the construction enterprise should establish an innovation mechanism, create a relaxed and harmonious work link in the construction site, so that the construction personnel dare to innovate. Draw lessons from the innovative methods of western developed countries, improve the innovation system of construction technology innovation, cultivate innovative talents, and formulate the innovation system according to the actual situation of the project. Build the innovation team, provide enough talent guarantee for the innovation of construction technology, pay attention to the training and introduction of talents, improve the comprehensive ability of the team, so that the innovation of construction technology can be carried out smoothly. Establish an incentive system in the enterprise, and give material rewards to innovative talents. Strengthen the training of personnel, avoid brain drain, provide opportunities for technical discussion and exchange, and subtly improve the innovation ability of personnel.

4.4. Consciousness of innovative personnel

Civil engineering construction is easy to the influence of human factors, in order to achieve construction technology innovation, it is necessary to train personnel, so that they can carry out various work in accordance with the requirements of technical innovation, to beware of the lack of personnel construction and management awareness. Form a sense of cooperation between the construction

personnel and the management personnel, through mutual cooperation to carry out the project construction, strengthen the project construction management, so as to make effective control of various problems, highlight the connotation of construction innovation.

5. Research significance of construction technology and innovation in civil engineering

In the process of civil engineering construction, the construction unit has always been attached great importance to a technology, and will to a certain extent, determine the quality of the construction units, and safety degree, these are the construction unit is more and more attention to technical elements, do the comprehensive management in the construction process, make full use of the conditions, within the scope of acceptable range, can be the lowest risk reduction. In addition, in the process of construction, the technology of each project and each stage should be improved, which is helpful to solve and deal with the problem, and can also improve the quality of the project, speed up the progress of the project construction, and improve the safety of the project. This has a certain role in promoting the research and development of civil engineering construction technology, and is also an innovative construction activity with innovative significance.

5.1. The current situation of civil engineering construction technology and innovation

In today's development process, civil engineering construction has become a construction unit attaches great importance to a technology, because it plays a very important role, can determine the construction of a unit, to grasp the quality of the construction, to the construction technology innovation research, we should adjust the direction of the construction, to discuss some relatively weak link, so as to keep their own construction technology, promote the better development of civil engineering. We have summarized the construction technology and innovative research in civil engineering. The following summary can better help us to complete the construction, including the following aspects:

- (1) In the process of civil engineering construction, there are more technologies, more complex, and not easy to control.
- (2) In the process of civil engineering construction, the research process of innovation is relatively slow, and cannot reach a certain speed.
- (3) Civil engineering construction, the combination of theory and practice is not closely enough.

5.2. Suggestions on civil engineering construction technology and innovation

In the process of civil engineering construction, technology is very important, also occupy the main position, we should to carry out the construction technology, has been perfect, to apply these technologies, to our daily life, the civil engineering construction technology seriously summary, and put forward their own Suggestions. This is also conducive to the development of civil engineering later. Therefore, in the development process of civil engineering technology, we can put forward some good suggestions for it.

5.3. Suggestions on innovation of basic technology of civil engineering construction technology

In the process of civil engineering construction, may occur some quality problems, after the quality of the problem, may cause some risk, that we need to do is to achieve the overall effect of the corresponding index, or requirements, ensure that the contents of civil engineering can conform to the progress of the construction, so as to improve the social benefits in the construction process and economic benefits, improve the overall image of the enterprise, the basis of the construction technology is more perfect application, improve the work efficiency of employees. So that employees can more efficiently complete the corresponding construction tasks, combine the construction technology, and better promote the completion of the construction. In terms of the construction cost and all kinds of progress, we should strengthen the research, refine the process in the construction process, strictly grasp the construction expenditure and the application technology, improve the life of the construction project, and can better serve the enterprise. In the process of construction, it is very effective to improve the construction

technology and put forward some more innovative suggestions, which also has great results in the civil engineering construction.

5.4. Suggestions on the practical innovation and application of civil engineering construction technology

Only on the basis of the application of the existing civil engineering construction technology, the bottleneck problems of some key technologies, continuous experiment and exploration, and promote the combination of theory and practice, can we really promote the development of civil engineering construction technology. For example, in the application of architectural identification and structural reinforcement technology in construction engineering, we will find that it will have a certain conflict with the application of other building construction technology, leading to the certain detailed adjustment of civil engineering construction technology, so as to ensure the perfect application combination of all construction technology. Civil engineering construction technology is the core content of the work of the construction unit, is also a key index that the construction unit attaches more importance to, will determine the overall construction effect of the civil engineering construction structure. As a construction unit, we should take the civil engineering construction technology as the main work guidance content, so as to better promote the long-term development of civil engineering. Civil engineering construction technology in the practice of many problems, can timely feedback to the technical leadership to discuss summary, and timely find out solutions, solve practical problems and problems and solutions timely summary, for the construction site of similar construction problems to provide certain theoretical support.

5.5. Suggestions on the theoretical innovation of civil engineering construction technology

In terms of the overall design of civil engineering, some cases may face some harsh environment, in the environment, also more improve the requirements for construction technology, therefore, during construction, we should consider these theories, and to organize the construction members more seriously to complete the task, promote the construction progress of the construction project. Drive the project more effectively, In improving the construction technology of civil engineering, And we can make some innovative suggestions on this, To promote a boom in building technology, In this theoretical study on the construction of engineering buildings, As we can see, It contains a very important meaning, in addition, We should focus on innovative theoretical research, A strict grasp of some of the details, So as to promote the construction progress, Make the construction unit pay more attention to the whole process of construction, Can ensure the life cycle of the construction project, Can further strengthen the concrete structure construction technology in the process of input, A lot of resources or funds to promote the construction process. Therefore, it is necessary for us to strengthen the application of different construction technologies and reduce the difficulty of construction when comprehensively considering the differences. Following the development principle of modern construction industry, we will promote the optimization and innovation of civil engineering construction technology, fully reflect the connotation of construction innovation, cater to the pace of the development of The Times, and improve the construction quality. In terms of construction, for the development of civil engineering contribution is very big, he can support the public opinion system of civil engineering construction, in addition, we should also in this respect to continuously improve these contents and update, strengthen the effectiveness, can ensure the stability of civil engineering construction application more perfect, applied to the present engineering.

6. Summary

Civil engineering construction involves many projects, the construction period is long, and the construction requirements of different positions are obviously different. Therefore, it is necessary to strengthen the application of different construction technologies to reduce the difficulty of construction by comprehensively considering the differences. Follow the principle of the development of modern construction industry, the civil engineering construction technology optimization innovation, fully

embodies the connotation of construction innovation, to cater to the era of development, improve the construction quality in short, in order to further ensure the civil engineering construction effect, in strengthening the construction technology application degree at the same time, also should follow the requirements of modern building development, continuously optimize construction technology innovation. Starting from the foundation pit construction, prestressed construction, concrete construction, leakage prevention construction and other aspects, flexible application of technology, using technical innovation measures to improve the construction quality.

Civil engineering construction process, is inseparable from the attention of the corresponding construction units, and also cannot leave their research, therefore, the corresponding construction units should be the content of the tomb soil engineering technology do innovation, reduce the difficulty of the construction, which can improve the competitiveness of the construction process, ensure the construction progress, reduce the possible risks in the construction process.

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