

Analysis on Construction Technology of Bored Piles for Highway Bridge Construction

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Abstract: Highways can be said to be an important link to the national economy, and bridges are a very important joint hub of highways. In the actual construction of highway bridges, the basic problems contained in them must be fully resolved. This paper first introduces the problems existing in the application process of bored piles in highway bridges, and then analyzes the practical application of bored pile technology in highway bridges.

1. Problems in the Construction of Highway Bridges by Bored Pile Technology

The so-called bored pile technology mainly refers to a construction technique that uses drilling equipment to carry out drilling activities while hoisting the steel cage. This technology can help the construction quality of the project and the sustainable development of the project in the process of building the highway bridge project. However, in the actual construction process, it can be found that there are many relatively significant deficiencies in the practical application of the bored pile technology, which has caused relatively serious adverse effects on the development of the project. The main performance is mainly in the following aspects:

First of all, in the process of applying the technology, due to insufficient preparation in the early stage, the project often has a pause in the development process. The lack of continuity of technology has led to a significant adverse impact on the overall effectiveness of construction technology. Secondly, if the actual inclination of the bored hole is relatively large, it will gradually exceed the relevant requirements of the construction standard. In this case, if the construction is still mandatory, the quality and safety of the project will be under great adverse effects. In the specific process of construction, if the mechanical equipment used lacks relatively adequate preparation, it will cause serious adverse effects on the equipment, such as aging of all aspects of the equipment. Finally, in the construction process of roads and bridges, problems related to construction materials will inevitably occur, and this is also a problem that often occurs when the bored pile technology is applied to roads and bridges. If the quality of the materials used is not up to standard, or the actual specifications of the steel cages are seriously inconsistent, etc., it will have a very serious adverse effect on the overall quality of the highway bridge.

2. Application Analysis of Bored Pile Technology in Highway Bridges

(1) Pay Attention to the Work Preparation before Construction

Bored pile technology plays an important role in promoting the actual construction of highway bridges. Based on this, in order to fully guarantee that this technology can be smoothly carried out and implemented, it is necessary to prepare for the pre-construction work before using this technology. In the practical application process, the construction materials and types involved in the bored pile technology are relatively rich and complicated, and any one of these materials will cause a serious potential hazard to the overall quality of the highway bridge. Therefore, it is only sufficient to ensure that the work preparation before the construction is sufficiently complete to ensure that the technology can be carried out smoothly. Specifically, it can be done from the following aspects:

1) Prepare Construction Materials

The construction materials mentioned here mainly refer to materials such as cement, sand and

admixtures. At the same time, the source of materials must be reliable and regular. It must be purchased from regular manufacturers. In the process of procurement, The quality inspection of various raw materials is carried out, and the quality of the materials is fully guaranteed to meet the relevant standards before being transported to the construction site. Finally, the construction work of the highway bridges can be carried out smoothly.

(2) Pay Attention to the Preparation of Construction Machinery and Equipment

When using bored pile technology, there are bound to be a lot of related equipment, so it is necessary to accurately calibrate them before putting them into use, and also to test and maintain them. The reliability of the lifting equipment reduces the probability that equipment problems may adversely affect the bored pile technology.

1) Reasonable Planning and Design

When applying this technology to highway and bridge related projects, it is necessary to carefully consider the actual implementation requirements of the technology and the relevant requirements of highway and bridge construction, rationally plan and design the construction technology, and also conform to the construction site. The actual situation, as far as possible to ensure the feasibility and rationality of the work related to the construction planning. All in all, it is necessary to fully ensure that the bored pile technology can be carried out in an orderly manner in the design and construction of highway bridges.

(3) Buried Cover

In the related engineering development of bored piles, the work of burying the casing can be said to be very important. The reason for this is that the casing can play a role of prevention and fixation. In addition, in the actual construction process, it must be carried out in strict accordance with the actual operational procedures. First, you should stake out the coordinates to ensure that the position of the sample is very accurate. On the other hand, to ensure the accuracy of the position, it can also be realized by the total station, which can fully guarantee that the coordinates will not be seriously deviated. Not only that, but also pay attention to the confirmation of the position of the bored pile, and reduce the probability of error as much as possible. After the above conditions are realized, the casing is buried to ensure the between the packaging machine and the casing. The center line achieves a comprehensive coincidence, and ultimately achieves the purpose of ensuring the quality of the project.

(4) Preparing Mud and Wall

For the relevant configuration of the mud for the filling pile, it is necessary to fully consider the actual construction site of the road bridge to carry out relatively scientific and reasonable deployment. First of all, it is necessary to survey the environment around the construction site, especially the reasonable ratio of drawings, mud and slurry. In the actual configuration process, it is necessary to use a relatively scientific way to complete the proportioning process. At the same time, it should be noted that the formulated mud must be relatively uniform, not too thin or too thick, and the actual viscosity of the mud must be Kept within the range of 25 to 30. In addition, in the preparation process of the mud, it should be noted that only qualified mud can play a role in ensuring the overall quality of the construction, and those relatively unreasonable muds will have a very serious adverse effect on the actual quality and safety performance of the project. In severe cases, the actual service life of the bridge may even be reduced. After the configuration work is completed, the actual configuration process of the mud is also fully confirmed.

(5) Drilling

In the bored pile technology, the drilling step is the most critical step. The reason for this is that the quality of the hole directly affects the overall quality of the project and the actual process. Based on this, the drilling work is carried out. Before, we must ensure that the position of the hole is very accurate, and its specifications and drill bit are also fully in line with the construction requirements. The related projects of highway bridges will involve a very rich geological environment in the actual development process, and the soil conditions contained in them are also very different. Based on this, in order to fully guarantee the overall quality of the drilling, it can not be affected by the relatively uniform drill bit. It is necessary to flexibly select the most suitable drill bit according to

the construction soil condition of each road section. For example, if the soil quality of the construction site is relatively hard, it is necessary to use a drill with a relatively strong impact force, and at the same time strengthen the actual speed of the impact. For those construction sites where the geology is relatively soft, a small and medium stroke drilling method can be selected. If the construction process encounters rocks, it must be carried out by means of blasting. In the face of some relatively high water level, the drilling quality can be used to ensure the construction quality and the construction speed. All in all, it is relatively flexible to deal with the various problems that may be encountered during the construction process, to comprehensively understand and master the geological conditions in the construction environment, so as to select the appropriate drill bit and drilling speed.

(6) Clearing Holes

Clearing the hole is the last key step in the construction technology of the bored pile. Its main purpose is to ensure that the sediment of the hole can be cleaned by technology. In this way, the probability of adverse effects due to the quality of the bridge is reduced. Before the hole is cleaned, the hole depth and the hole diameter should be inspected in depth, and the hole clearing work can be performed after the regulations are met. In addition, the density and viscosity of the mud should be ensured, and the next step should be made after the mud index meets the standard.

(7) Pouring Concrete

At the time of carrying out this process, the infusion process is first performed after the second cleaning of the cavity. Another point to note is that the viscosity of the mud and the actual thickness of the deposit are adequately checked to ensure that they are all up to standard before the infusion process. The actual height of the conduit is also flexibly adjusted during the infusion process and the conduit is not buried by the concrete.

3. Conclusion

In summary, in the construction process of highway bridges, the construction technology of bored piles must be fully combined with the actual requirements of road bridges and specific construction links, and actively and flexibly adopt reasonable and effective application control to promote bored piles. The actual construction quality of the technology is guaranteed.

References

- [1] Zhou Jiandong. Application of Bored Pile Construction Technology in Road and Bridge Construction[J]. *Jushe*, 2019(26):51.
- [2] Wang Wenzhao. Application of Bored Pile Construction Technology in Highway Bridge Construction [J]. *China Standardization*, 2019(16):130-131.
- [3] Huang Hualong. Analysis of Construction Technology of Bored Piles for Expressway Bridges [J]. *Building Materials & Decoration*, 2019(22): 288-289.