

Research on Soft Foundation Reinforcement Technology in Municipal Road Construction

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Keywords: Municipal road construction, Soft foundation reinforcement technology, Dynamic reinforcement technology, Rotary jet grouting pile reinforcement technology

Abstract: Soft foundation reinforcement technology is an important part of municipal road construction, its application effect is more significant, has been widely concerned by the society. This paper will focus on the key points and principles of soft foundation construction in municipal roads, and analyze the specific application of soft foundation reinforcement technology in detail, in order to lay a foundation for future research work.

1. Introduction

The soft foundation reinforcement technology in municipal road construction is the key to improve the construction quality. In the preparatory stage of the early construction, it is necessary to clarify the specific characteristics of the soft foundation, carry out the construction strictly according to the principles of the soft foundation construction, integrate the soft foundation construction technology organically, pay attention to improving the professional and technical level of the construction technicians, and apply the theoretical knowledge to the actual operation link so as to meet the actual needs of the current soft foundation construction.

2. Key Points and Principles of Soft Foundation Construction in Municipal Roads

The construction of soft foundation is affected by the regional difference. In the way of its treatment, it also has the diversity, the physical property is more obvious, and the mishandling will have an impact on the whole municipal road construction. To this end, it is necessary to master the strength and the bearing capacity of the soft foundation so as to meet the requirements of the design specifications and to carry out the reinforcement treatment. The instability of soft foundation is outstanding, and it is against the occurrence of sliding failure. The shear force is not in conformity with the shear strength. With the change of the climate, the hot and humid in the summer and the cold and dry in winter, the performance of the soft foundation is seriously reduced, and the stability of the soft foundation is poor. The actual situation on the construction site is required The best soft foundation treatment technology is selected, and the system analysis is carried out by the professional technical personnel, and the grade of the building is classified, and the concrete construction process is mastered to ensure the smooth construction of the construction[1].

Always adhere to the principle of comprehensive and overall treatment, we should fully consider the construction cost and geological conditions, integrate the construction treatment factors, reduce the consumption of resources in the construction link as much as possible, and reduce the pollution to the environment. Adhere to the basic treatment principles of economic, safety and environmental protection, do a good job in judging the feasibility of soft foundation engineering, integrate the construction conditions and parameter information, allocate the construction resources reasonably according to the occurrence law of geological disasters between regions, master the distribution of geological structure, and carry on the quantitative analysis to it by sampling method, which is helpful to ensure the safety of construction.

3. Analysis of Soft Foundation Reinforcement Technology in Municipal Road Construction

3.1 Concrete Pipe Pile Technology

Concrete pipe pile reinforcement technology in soft foundation reinforcement technology in municipal road construction is widely used. The advantages of concrete pipe pile reinforcement technology are remarkable. This technology effectively combines impervious wall with vibrating pipe sinking pile technology, which has strong practical value. The reinforcement technology has the advantages of simple operation, low professional requirements for construction technicians, monitoring the actual state of soft foundation, finding out the specific position to be strengthened, reasonably configuring concrete, and pouring concrete accurately by professional construction technicians. The key to give full play to the advantages of concrete pipe pile technology is the strength of concrete pouring pile body, and in the concrete reinforcement link. According to the actual situation of the construction site, the diameter and depth of the pile body are accurately mastered, generally about 1.5 m, about 25 m. Controlling the distance between concrete pipe piles is the foundation of construction, which is helpful to reduce the conflict problems in construction to a certain extent. For example, the technical technology of concrete pipe pile is more perfect, which can reduce the consumption of resources in the actual construction link, monitor the state of pipe string in real time, control the proportion of concrete mortar, and ensure that the mortar is in the state of complete solidification. In this link, it can be strengthened with the advantage of sand and stone, which is helpful to improve the stability of pipe pile structure [2].

3.2 Dynamic Reinforcement Technology

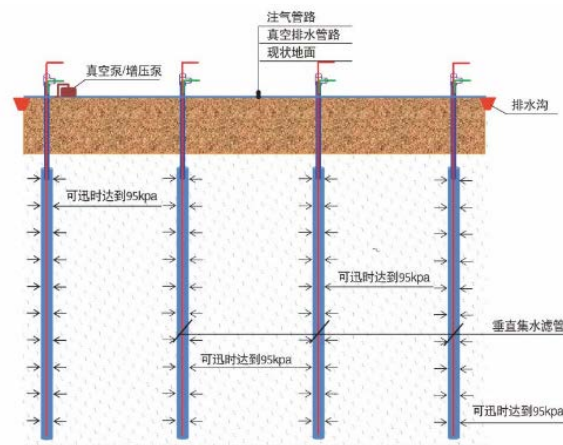


Fig.1 Flow Chart of Dynamic Reinforcement Technology for Soft Foundation

The dynamic reinforcement technology in the construction of municipal road is more complicated. According to the actual situation of the construction project, in order to ensure the stability of the soft foundation, the structure of the soft foundation is destroyed properly with the help of the dynamic reinforcement technology. First of all, the dynamic reinforcement technology needs to be replaced in real time, and the replacement methods are classified accurately, including the whole type and the pile type. Secondly, to strengthen the dynamic consolidation. In this link, it is necessary to do a good job of dynamic compaction, and control the shock wave in the process of dynamic compaction, monitor the state of the land structure in real time, and then destroy it with the help of the advantages of shock wave to ensure the relationship between the land structures. crevice in the optimal interval, for the subsequent construction of drainage facilities to lay the foundation, help to improve the consolidation rate of soft foundation. Finally, continue to strengthen the dynamic compaction treatment, under the influence of shock wave, cause certain damage to the land structure, its impact load gradually rises, aiming at the gap existing in the impact process to carry out effective compaction to a certain extent, it's help to improve the consolidation rate of soft foundation. Dynamic reinforcement technology can effectively reduce the waste of working materials in the actual reinforcement link, but there are some limitations, and the shock wave produced by it will affect the surrounding environment. Therefore, in the process of application of

reinforcement technology, it is necessary to analyze the surrounding buildings, and try to avoid using the technology in more buildings (as shown in Figure 1).

3.3 Reinforcement Technology of Fly Ash Gravel Pile

Fly ash gravel reinforcement technology is an important part of soft foundation reinforcement technology in municipal road construction. In the process of construction, in order to improve the adhesion of the mixed materials, it is necessary to stir the fly ash gravel and accurately master the distance between the soft soil pile and the bottom cushion, which is helpful to improve the stability of the soft foundation project. The application mode of fly ash gravel pile reinforcement technology is relatively simple and the operation flow is clear. This technology can also reduce the working materials in construction. Different from the dynamic reinforcement technology, it has little impact on the surrounding environment and helps to achieve social efficiency, but it still exists some of the shortcomings in the actual operation. For example, in the concrete construction process, in the process of pouring the mixture, the phenomenon of pipe blockage often occurs, and the lifting of the construction pressure is related to the pumping of concrete. When the pressure generated is large, the explosion of the tube will occur, and the safety of the personal property of the construction personnel will be affected. At the same time, the crushing speed of the fly ash macadam shall be controlled to ensure that the concrete is fully discharged in the specified time. In which the influence of the radius of the concrete is easily influenced during the pumping of the hose, and the work ability of the concrete will be reduced when the radius is small.

3.4 Reinforcement Technology of Cement Slurry Mixing Pile

In the actual construction, the cement slurry mixing pile reinforcement technology is mainly operated by means of the advantages of the mixer, the soft soil is reinforced and treated, and combined with the curing agent, the strength of the soft foundation can be improved to a certain extent, which is the key to ensure the integrity of the construction of the municipal road. In the early stage of construction, the flow of the cement stirring and strengthening treatment is optimized, and the running state of the stirring equipment shall be monitored in real time to ensure that the actual needs of the construction are met, and the parameter information of the equipment is integrated, and the performance of the equipment is ensured to be compatible with the reinforcement technology of the stirring pile. In the process of applying the stirring pile, the pile position shall be accurately positioned. at the same time In the actual construction, the segregation of the slurry often occurs, which has a certain effect on the stability of the municipal road construction. For this purpose, in order to ensure the stability of the construction, it can be carried out by means of conveying the cement slurry, and the specific conveying speed of the cement slurry can be controlled, so as to ensure the continuity of the transportation. There are some limitations in the application process of the technology, the specific process is more complex, the professional technical level of construction technicians is required to be higher, which will cause a large number of human, material and financial resources consumption, and is not conducive to the realization of the unity of economic and social benefits.

3.5 Reinforcement Technology of Rotary Jet Pile.

The reinforcement technology of rotary jet grouting pile needs to take full account of the geological conditions in the construction area and to operate with the help of the advantages of rotary jet grouting rig, which is helpful to improve the stability of municipal road engineering. It is necessary to accurately grasp the nozzle position of the grouting pipe, control the depth of the soil layer, spray it with high pressure equipment, crush the soft soil particles under the influence of impact energy, effectively discharge the particles, monitor the slurry and the arrangement mode of the particles, solidify the slurry gradually under the action of centrifugal force, and improve the stability of the soft foundation engineering. At the same time, the scientific principle should be adhered to in the selection of drilling rig models to ensure the high pressure equipment. The stability of internal structure, timely replacement of high pressure equipment that does not meet the standard, familiar with the operation principle of high pressure equipment, and maintenance of it is

helpful to improve the quality of slurry injection. Among them, slurry mixing is the key, which requires the mixing quality of slurry to meet the requirements of the index, and to master the mixing sequence of slurry and control the mixing rate, which is helpful to improve the construction quality of road engineering.

4. Conclusion

The soft foundation reinforcement technology in municipal road construction is diverse, including concrete pipe pile reinforcement technology, dynamic reinforcement technology, fly ash gravel pile reinforcement technology and strengthening technology of prestressed pile. In the actual construction link, the construction should be carried out step by step according to the actual characteristics of the construction site, which is helpful to ensure the integrity of municipal road construction.

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