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Application Analysis of Reinforced Soil Technology in Highway Subgrade Engineering

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Abstract: ***In recent years, the construction scale of highway engineering in China has been continuously expanding, and there are many types of technologies applied in the construction of highway subgrade engineering. Construction units need to use professional technical methods to meet the relevant construction requirements. Reinforced soil technology, as a common technical method in highway subgrade construction, can effectively improve the quality of road structures, maintain significant stability, and meet the basic needs of traffic operation. The article mainly analyzes the application significance of reinforced soil technology and the preparatory work that needs to be done in the early stage, briefly discusses the practical application forms of the technology, and is committed to optimizing the comprehensive construction effectiveness of engineering, laying a good foundation for the development of the transportation field.***

Keywords: reinforced soil technology; Highway engineering; Roadbed construction.

1. INTRODUCTION

The application of reinforced soil technology in highway roadbed construction can reflect a high tensile capacity. When using reinforced soil technology to carry out highway roadbed construction operations, construction personnel can improve the stability of the roadbed through anti slip force and friction formed by reinforced materials, which has a positive and positive impact on highway roadbed construction. Therefore, when organizing the construction team to implement relevant technical operations, the construction unit should clarify the application points of reinforced soil technology to promote the overall performance of the roadbed structure to be improved. Contemporary book circles began to develop under the impetus of the mighty national exhibitions and exhibitions at all levels. Of course, the importance of exhibitions can not be ignored. Exhibitions also greatly affect the calligrapher's creative direction and the aesthetic taste of viewers, and so does the creative background of official calligraphy works in national exhibitions. The creator is too eager for quick success and instant benefit, and all the contributors want to be on the list, which forces the contributors to change their aesthetic vision from the in-depth excavation of the classic Han tablet to the pursuit of the style of works that are easy to enter the exhibition, making it difficult for contemporary calligraphers to calm down and trace back to the source. If we pay too much attention to the contemporary era, it is inevitable to follow the trend. At the creative level, it is mainly manifested in copying and even copying the form, text content and composition of the works, and the national exhibition has become a contemporary "pavilion style". Judging from the development of official script, Han tablet, Tang tablet and Qing official script are diverse and colorful. Various forms, such as temple tablet, cliff, stone carving style, epitaph cover, brick inscription tile, silk script ink, etc., can provide various styles for contemporary official script writers. Contemporary calligraphers have much richer information and materials than the ancients, and have enough conditions to discover the huge artistic space left by the ancients and write what the ancients did not write.

2. THE APPLICATION SIGNIFICANCE OF REINFORCED SOIL TECHNOLOGY IN ROADBED CONSTRUCTION

In the process of comprehensive development of modern society, the development speed of the highway transportation industry is constantly accelerating. Although China vigorously advocates joint transportation, the number of private cars in use is constantly increasing, causing significant pressure on highways. Under the increasing load, the roadbed structure of highways is prone to damage. As an important transportation facility, highways have made great progress in the development of various fields at present. In order to improve their own economic efficiency, construction units will continuously optimize their construction technology, committed to using advanced technological means to improve the stability of various structures in highway engineering, and create safe transportation conditions for people. The application of reinforced soil technology in the construction of highway subgrade engineering can play this role, preventing the poor stability of the subgrade structure from causing damage such as road settlement or fracture, and avoiding economic losses caused by construction units during construction and development.

2.1 How beautiful it is to follow the ancient law in the early days

For example, the works of Wang Weiming, Gao Xiaoyan and Fang Chuanxin, this kind of official script is dedicated to deepening ancient posts, strictly following the brushwork of the ancients, with solid basic skills and following the rules. In the early "National Exhibition", there were a relatively large number of official script works of this style.

2.2 The middle period is simple and simple

During this period, the official script works mostly showed a sense of simplicity and simplicity. For example, Wang Weilin adopted the couplets of Ode to Shimen, Li Gangtian adopted the bamboo slips, and the works of Liu Wenhua, Guan Jun, Li Shouyin, Zhang Jianhui and Wu Jian. It can be seen that the works of this period have improved a lot in terms of the method and style compared with the works of the early national exhibitions.

2.3 The styles in the later period are diverse and unpretentious

The works of official script in this period either reflected the integration of steles and bamboo slips, or enriched the brushwork of official script by combining cursive and Wei Bei brushwork, such as the works of Li Shouyin, Shi Zhiwei, Wang Yong, Du Pengfei and Luo Xiaoping, and began to consciously pursue the vastness and flying of lines, and subjectively pursued the appearance of the exhibited works.

The development of any art category is a process of innovation and betrayal, overthrow and re- establishment. The artistic style of each era is influenced by the social, economic and political factors of its era. In an environment with developed economy and relaxed political environment, people's minds are open and the audience is highly tolerant, which makes it easier to breed some bold, avant-garde and forward-looking exploratory works. At present, the writing techniques of official script are more abundant, such as "virtual in reality, virtual in reality", and on the basis of absorbing the ancients, they learn from nature. At the same time, after nearly forty years of development, contemporary calligraphy is closely related to the active participation of writers with the promotion of China Calligraphy Association. Among them, there is also the process of "time". With the continuation of nearly forty years, the creation and style of official script have been constantly transformed, constantly improved and constantly grown.

3. PREPARATION BEFORE REINFORCED SOIL CONSTRUCTION

The preliminary preparation for the construction of highway subgrade engineering can effectively improve the orderliness of subsequent construction operations and prevent unnecessary problems caused by construction personnel in practical operations. Before using reinforced soil technology to carry out highway roadbed construction operations, construction personnel need to prepare well before construction based on technical characteristics and project construction requirements, so that the staff can clarify the key construction work content and ensure the smooth progress of project construction. Therefore, in the preliminary preparation, the construction personnel should draw the centerline and sidelines of the roadbed, measure the elevation position of the foundation, and clearly draw the boundary line of the wall panel to ensure that the fixed structural devices of the roadbed project can be embedded in the roadbed baseline. The construction of highway subgrade engineering is influenced by the natural environment and is also related to the professional abilities of construction personnel. In the preliminary preparation, construction personnel need to investigate the construction conditions and environment on site, master the soil conditions, and develop reliable construction plans for different soil conditions to improve the effectiveness of foundation treatment. There are still many weeds and corrosive soil in many foundation structures, and construction personnel need to treat them in advance and drain the surface water. After meeting the requirements of engineering construction, subsequent work can be carried out to improve the scientific nature of the design plan. After completing the foundation treatment work, it is also necessary to organize professional training for staff to understand the application forms of reinforced soil construction technology, learn new theoretical knowledge in combination with the development requirements of highway transportation in the new era, and improve the application effect of reinforced soil technology based on their own work experience.

3.1 Ignoring the importance of seal script

The late Ma Shida, a famous contemporary calligrapher and seal engraver, once said: "The writing of official script must be done in full accordance with the writing method of seal script. Since official script evolved from seal script,

although it is a modern script, its artistic information must be very quaint. Quaint is the basic calligraphy spirit of Lishu. " Many contemporary calligraphers of official script do not pay enough attention to seal script, and ignore the principle of "taking the method is almost on the top", which leads to the fact that the line quality of official script in some national exhibitions is not up to standard, and it is basically normal that the word method is full of mistakes. The two key spirits in official script are seal script lines and the weather of Han stele. Official script also enriches the pen used by the center, and decorative strokes appear, which makes the expression of stroke lines stronger and has a relaxed and lively atmosphere in the quiet and solemn atmosphere. If this era lacks visual impact and is not exaggerated enough, it is difficult to attract people. Therefore, contemporary official script creation should not only have the visual impact of the exhibition hall, but also pay more attention to the inclusiveness of seal script.

3.2 The cognition of official script style is gradually improved

In the process of learning official script, the author insists on taking the Han tablet as the Sect and upholding the integrity, but has not paid enough attention to the official script of the Tang Dynasty, and even despised the official script after the Han Dynasty, thinking that the official script has completed its maturity and style in the Han Dynasty, and there is nothing in the official script after the Han Dynasty. In fact, the research field of a book style and style should be broader, and each era has excellent genes worth digging and advocating and inheriting by future generations. For example, Mr. Lin Sanzhi, who is famous for his cursive script, doesn't stand on the official script, but Mr. Lin Sanzhi insists on studying the Han tablet all the year round, and occasionally his official script works are shocking, and the "astringency" of official script writing and the thickness of lines are also nourishing his cursive script. The gradual improvement of the writing style of official script is due to the richness of the calligraphy style brought by the increasing richness of visible materials. From the rare excellent works at the beginning of the national exhibition to the works with pure calligraphy style and the combination of steles and slips, to the works with different styles, large and small characters and many words and few words after the eighth national exhibition, the style has also changed from the original style of free-style calligraphy, vulgar official script and Jianghu-style calligraphy, which shows that under the leadership of the national exhibition, contemporary official script has become more and more popular.

3.3 The influence of teaching institutions

Contemporary calligraphy education, with the systematic teaching in colleges and the participation of many training institutions, has intensified the form of exhibition works, and a large number of young authors have begun to emerge. They have one common feature: they have skilled and superb skills and techniques, can obtain a lot of information through various channels, and improve their exhibition skills and aesthetics by observing and analyzing national exhibition works, and their creative techniques are bolder than those of the older generation of calligraphers. Dare to make all kinds of attempts in the effect of calligraphy works, so that the Lishu works break the situation of single variety and single style, which is very in line with the characteristics of the times. Although there are also some problems, such as some so-called "writers" and "typists", for example, the individual's cognition of aesthetics comes from the design concept and book style orientation of "tutors", which leads to the popularity of "exhibition style", it is undeniable that this is still an exhibition style.

3.4 The influence of famous calligraphy

Calligraphy is classical, calligraphy is conservative, calligraphy needs to seek inward, and kung fu is also outside the word. Even if contemporary calligraphy works hard to create some external exaggeration and express some modern people's pursuit, it is difficult to make a breakthrough in the traditional constraints, that is, to find oneself and form one's pen and ink language. Because the famous calligraphy has a certain degree of recognition, it is widely known and accepted by the industry, and a certain degree of "face familiarity" with some famous calligraphy in the exhibition evaluation will bring a higher "hit rate", so the phenomenon of "inbreeding" is inevitable for contemporary calligraphers. Contemporary mainstream official script masters rely on seal script and Han tablet, closely surrounding han li's aesthetic source, and through years of exploration and improvement, constant transformation, they finally build their own pen and ink world. When asking for something from contemporary masters, they should stick to the concept of "learning from their heart without learning from their traces". Mr. Qi Baishi said: "The beauty of painting is between likeness and dissimilarity, too like kitsch, not like deceiving the world". We believe in classics, and we should also respect the contemporary. Calligraphy is ultimately going to the realm of independent creation of inner emotional expression. We can't simply "take it" for famous calligraphy, or we need to be guided by the concept, so that it can be "made of steel" and finally it needs to

be able to melt and flow in our own pen.

4. THE PRACTICAL APPLICATION OF REINFORCED SOIL TECHNOLOGY IN HIGHWAY ROADBED CONSTRUCTION

We can find that in the past forty years, the official script of the National Exhibition has been growing and progressing, the number of participants is increasing, and the style evolution tends to be mature. It has gradually become the aesthetic consensus of the official script writers, from beautiful to simple, and then to the pale and muddy beauty of the current official script works. In the 12th National Exhibition, works with imperial edict style appeared, which is also the practice of the concept of "rooting in tradition, encouraging innovation, diversity and tolerance" of China Book Association. It is worth thinking about how to grasp a certain style tone, what style is the main one, how to handle it well, and how to make your writing half a step away from most contemporary calligraphers. You should strive to become a calligrapher with independent thinking, instead of becoming a writer of national exhibitions, so as to avoid homogenization of works and lack of classics and style. Because the greatest charm of art is not a thousand people, it should be beautiful. Writing and style can exist as an independent existence, not a conformity. Personal style is a broad concept, and styles are a collision and fusion between intention and intention that can be changed at any time, rather than a simple presentation.

4.1 Measurement and setting out

The accuracy of measurement and setting out will affect the application effect of reinforced soil technology in highway roadbed construction. In the process of practical operation, construction personnel need to pay attention to the implementation of this operation to reduce problems generated in project construction. Once the accuracy of measurement and setting out is affected, the stability of the highway roadbed structure cannot be effectively controlled. When using reinforced soil technology for surveying and setting out work, construction personnel need to set a pile position at the load curve position based on the construction situation of the highway subgrade project site. Generally, the spacing should be controlled at around 5m, and cross piles should be set at the corner position to maintain a distance of about 15m. The implementation of measurement and setting out work may be affected by the on-site construction environment, which may not meet the accuracy requirements. When highlighting the practical value of technology, construction personnel need to collect documents and materials related to the construction of highway subgrade engineering projects, fully combining the on-site construction environment to improve the practicality of reinforced soil technology. Designers also need to participate in the surveying and setting out work, communicate and communicate with construction personnel, and develop construction plans and plans that meet the requirements of scientific construction. They also need to use surveying and setting out equipment reasonably to ensure the reinforcement of soil.

4.2 Construction of retaining walls

The application of reinforced soil technology in highway roadbed construction requires construction personnel to improve the construction of retaining walls. For projects that include retaining walls, this part of the work needs to be done well before embankment filling can be carried out to enhance the quality of roadbed construction. When implementing the construction operation of retaining walls, it is necessary to do a good job in panel production, prefabricate panels according to the construction conditions and environment on site, and make corresponding preparations in the preliminary work to transport construction materials to the construction site. The surface of concrete is prone to damage, and it needs to be handled with care during on-site construction. After completing the panel construction work, leveling treatment should be carried out through the use of concrete mortar. Afterwards, it is necessary to carry out masonry construction, set up pile markers vertically according to the dense panel, control the distance between adjacent parts, and achieve the goal of quality control for retaining wall construction.

4.3 Geogrid laying

The construction of reinforced soil in highway roadbed construction requires the reasonable laying of geogrids to improve the overall construction quality of the project. In the actual laying process, construction personnel should pay attention to the overlapping construction of adjacent parts, and provide guarantee for the optimization of roadbed construction quality on the premise of meeting technical standards. When the geogrid is in a tensioned state, attention should be paid to avoiding wrinkles. Therefore, construction personnel need to use steel

reinforcement materials as reinforcement components to prevent problems such as wrinkling or rolling up. The laying of geogrids requires high technical proficiency from construction personnel. In practical operations, construction personnel need to reserve a certain length according to the design drawings for bending treatment, so that it can naturally be perpendicular to the roadbed slope. When implementing soil filling construction operations, the layered construction method can be used to optimize the construction effect, attach importance to thickness control at all levels, and also use materials that meet the construction requirements to focus on controlling the quality of the roadbed structure. It should be noted that loaders cannot enter the construction site to prevent material damage. When using loaders to transport construction materials, there should also be no phenomenon of speeding or sudden braking.

4.4 Filling and Rolling

Many materials used in the construction of highway roadbed projects are mixtures, and some roadbed structures have relatively weak properties. Therefore, it is necessary to use fillers to replace the weak foundation soil, and carry out rolling construction operations to achieve the fundamental requirements of reinforced soil construction. In the construction of highway roadbed engineering, for some roadbed structures that require the use of a mixture of fill and soil, reinforced soil technology can be used to increase the strength of the structure. Construction personnel should conduct reinforced soil test analysis and use roadbed fillers that meet quality standards as the main material. They also need to select sand and gravel with relatively good grading and performance to meet the particle size requirements of engineering construction, so that the embedding performance of the grid filler can be strengthened. In the process of filling, the construction personnel should choose the rolling fill method to strengthen the filling construction effect, and also need to use the Dump truck for unloading, combined with the bulldozer to carry out bulldozing treatment, so that the thickness of each layer can meet the requirements.

During rolling construction, it is necessary to perform two operations on each layer of steps to avoid grid deviation through reliable rolling treatment. After completing the rolling construction operation, the construction personnel also need to reserve grids for anti burlap bags, and also carry out soil filling and leveling operations. In response to the actual operation form of reinforced soil construction technology, construction personnel need to record the settlement parameters of the grid, detect cracks generated during construction, and promptly handle any problems found.

4.5 Roadbed filling construction

Filling construction is the core of highway roadbed construction. When implementing reinforced soil technology, the construction unit should increase its control efforts and improve the quality of the roadbed structure through professional filling construction methods. When implementing the construction technology and methods of roadbed filling, it is first necessary to determine the thickness data and number of layers of filling. After completing one layer of thickness, a layer of reinforcement strip needs to be laid to meet the construction standards of the foundation. During construction, it is necessary to choose a layered paving method and ensure that the thickness of each layer does not exceed the expected target. When implementing filling construction operations, it is also necessary to correctly select construction fillers and select construction materials with high applicability according to the specific conditions of the filling area. They can prioritize the use of sand and gravel to meet the construction requirements of the foundation. If it is determined that the roadbed construction is carried out with reinforced soil soaked in water, it is necessary to select permeable materials with water stability to prevent impurities from being mixed in the construction materials. The particle size of the filling material also affects the quality of the reinforced soil roadbed filling construction. Therefore, it is necessary to effectively control its particle size during the construction process to ensure that its grading parameters can meet the corresponding quality requirements. In addition, it is also necessary to control the moisture content of construction materials, so that they can be controlled below 3% for a long time. Paving and leveling is also a key link in the construction of reinforced soil roadbed filling. When paving to the middle of the road surface, construction personnel need to use bulldozers for unloading operations, and can also use pavers to pave simultaneously. In subsequent work, a combination of manual paving and mechanical paving can be used to ensure the uniformity and smoothness of the road structure. In the process of compaction, a layer of material can be filled and then refined by manual or Grader, followed by rolling construction operation, and combined with manual compaction to enhance the compactness of subgrade structure.

4.6 Detection and monitoring

The detection of roadbed structure and monitoring of engineering construction are important work contents in reinforced soil construction. Although the use of reinforced soil technology can greatly enhance the comprehensive construction effect and meet the strength and stability requirements of roadbed structure. However, it is still difficult to meet the basic requirements of construction quality control when construction quality inspection and monitoring cannot meet the requirements. When inspecting the construction of highway subgrade engineering, compaction detection is the core, and construction personnel can use the sand filling method as the main compaction detection method. Additionally, three detection positions need to be set within a range of 1 meter from the ground. At the same time, it is necessary to test the stability and safety of the roadbed structure, and conduct scientific testing in a similar way to improve the effectiveness of construction quality management in highway roadbed engineering. When monitoring the construction operation of engineering projects, it is necessary to monitor the road surface engineering. The levelness and verticality of construction also require analysis of settlement data, the use of inclinometers to monitor the displacement generated at various base positions, and the understanding of more engineering construction content to prevent deformation of the roadbed structure.

5. MEASURES FOR OPTIMIZING THE CONSTRUCTION QUALITY OF REINFORCED SOIL

5.1 Control slope surface and slope drainage

The application of reinforced soil construction technology in highway roadbed construction requires ensuring that the roadbed structure is in a stable state. However, many existing highway embankments in China contain a lot of water, forming a soft soil foundation, which hinders the application of reinforced soil technology. When optimizing the quality control effect of construction, construction personnel need to strengthen the drainage control of the slope surface and slope body, set up a drainage system on the embankment slope surface to discharge excess water from the roadbed, increase the compactness of the roadbed structure, and ensure the safety of highway roadbed construction. When controlling drainage, necessary measures need to be taken to completely drain the moisture in the roadbed. Construction personnel can directly introduce the horizontal water into the normal roadbed section, reflecting the fundamental role of the drainage system.

5.2 Storage of reinforcement materials

Reinforcement material is the key point of reinforced soil construction in highway subgrade engineering. When the quality of reinforcement material is poor, it will directly affect the comprehensive construction quality of the project, which is not conducive to the stable operation and development of the construction unit. When optimizing the quality control effect of construction, construction personnel should pay more attention to the storage of reinforcement materials, so that they can meet the requirements of engineering construction in terms of performance and prevent unnecessary problems in actual construction. When storing reinforcement materials, management personnel should place them in a cool and shaded warehouse, and the storage period should not exceed 3 months. Once the storage period exceeds the limit, the quality of the reinforcement materials needs to be tested again to avoid quality loss after the use period. Therefore, it is necessary to ensure that all indicators meet the requirements of engineering construction before applying them to reinforced soil construction. When transporting and storing reinforcement materials, they should not be exposed to direct sunlight. Therefore, it is necessary to minimize the transportation time of reinforcement materials and take fire prevention measures to prevent fires from affecting construction quality and safety.

5.3 Transitional connection

Some engineering construction units will a transition section of the roadbed increases the difficulty of construction, and once errors occur, it can also affect the stability of the highway pavement structure. When controlling the quality of construction, it is necessary to do a good job in transition and connection operations. If there are steep slope sections during construction, it is necessary to reduce the difference in slope rates between adjacent sections, provide basic guarantees for the utilization of transition and connection construction operations, and take relevant measures to slow down slope changes. It should be noted that the length of the transition stage needs to be more than 5m before the reinforced soil transition connection operation method can be implemented. It is also necessary to ensure the smoothness of the connection and prevent drastic changes.

6. CONCLUSION

The application of reinforced soil technology in the construction of highway subgrade engineering can effectively improve the comprehensive performance of the subgrade structure, meet the quality control requirements of construction projects in the new era, and play a role in improving the structural application effect. In the process of practical operation, the construction unit should clarify the actual conditions of different construction areas on site, and optimize the application effect of technology based on the possible natural environmental changes that may occur. The application of reinforced soil technology in the construction of highway subgrade engineering requires construction personnel to adopt scientific and reasonable methods to solve sudden problems, and to provide professional training and education for personnel, in order to enhance the construction quality of highway subgrade engineering. In the later stage of construction and development, it is necessary to increase the research and development efforts of reinforced soil technology, increase quality control efforts according to corresponding standards, and improve the operation of each link by combining professional technical methods to comprehensively improve the construction technology level.

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