Technical analysis of subgrade and pavement in settlement section of road and bridge engineering

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Abstract: With the expansion of the scale of road and bridge engineering, the technical level of subgrade and pavement construction in the settlement section is becoming more and more mature, which has an important impact on road and bridge engineering projects, including construction quality, construction process and the level of engineering projects. In this regard, it is necessary to fully improve the subgrade and pavement construction technology and project process, introduce new engineering construction technology, and make diversified technological innovation. This paper mainly analyzes the construction technology of subgrade and pavement in the settlement section of road and bridge engineering, and puts forward reasonable suggestions.

1. Introduction

Road and bridge engineering will be affected by multiple factors in actual construction and traffic. In recent years, with the rapid development of the overall domestic economy, the traffic flow and transportation load have increased significantly, and the subgrade and pavement of many highways have a certain level of settlement. If there is no immediate and rapid repair, it will not only affect the traffic of vehicles, but also damage the overall structure of the road and bridge and reduce the service life of the road and bridge. Vehicle jumping at bridge head is the most prominent problem in highway pavement and bridge engineering. If the long-term uneven stress of the subgrade is affected by the long-term longitudinal operation of high load road and bridge, it will directly cause the deformation of the pavement, and the pavement depression will be formed after a long time, resulting in the bump at the bridge head when driving. In view of this, this paper analyzes the relevant causes of settlement in road and bridge construction, and discusses various construction and paving technologies in road and bridge construction sections, in order to further improve the practical application effect of highway pavement construction technology in settlement sections. In the process of road and bridge construction, there are many bridge engineering tasks, objectives and quantity requirements. Therefore, in the construction, the subgrade and pavement construction technology in the settlement section can be reasonably applied in the construction process of the project. A stable system can be used to guide the manufacturers and processors, distribute the tasks and responsibilities evenly, and meet the performance requirements of the organization or enterprise. This reflects the common problems in the field of road and Bridge Engineering: the utilization time ratio of manpower and equipment increases too fast, and the growth rate of economic benefits of engineering production is low. Therefore, the division of labor is an indispensable framework in the engineering technology management system, which is of great help to promote the development of enterprise road and bridge management. From the perspective of road and bridge engineering system, engineers assigned to specific posts should deal with various engineering practices according to their own responsibilities and professional standards, correctly record the original road and bridge information, and understand the design drawings and bill of materials. In terms of the control of road and Bridge Engineering on construction technology, the implementation process of the Staff Department and relevant professional departments of the organization must be approved by the professional approval personnel of the enterprise before it can take effect, so as to ensure the minimum operation efficiency of management, make the horizontal development of its framework structure, and put the technical process into the project process, so as to achieve the effective supervision of project management.

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Firstly, the deformation of bridge structure and foundation is very common in road and bridge construction. The soil porosity of the section in the gully section is generally large. When the local foundation is loose, these pores will increase the water content of the section and cause expansion. After it is subjected to large pressure, it will lose water and the overall structure will be damaged, resulting in deformation. Compared with other sections, the embankment at the bridgehead of roads and bridges is generally higher. Although the safety is increased, the drainage capacity is also weakened. The abutment back foundation is easy to cause settlement, and the increase of filling height intensifies the settlement of the foundation. Secondly, cohesive soil is the main filling material in road and bridge construction, but its structure is unstable. If it is affected by other factors in construction, the material will change. When the backfill of abutment back fails to meet the requirements of compaction density, it will increase the water content of earthwork and bury the hidden danger of foundation settlement. The foundation deformation and settlement will also be affected by climatic factors such as rainfall, flood and temperature difference. Density determines the service life and quality of roads. In the vertical position, roads and bridges bear the traffic pressure of traffic vehicles, and are also affected by the engineering machinery and maintenance of the quality of the embankment itself. After being put into use, the subgrade density will gradually increase under rolling, resulting in a certain degree of settlement. In order to reduce the maintenance cost, it is better to fill and tamp the terrain for many times before handover, so as to enhance the compressive capacity of the pavement and reduce the deformation caused by subsequent traffic pressure.

Figure 1 Subgrade and pavement of settlement section in road and Bridge Engineering

If the design of the bridge head position is unreasonable, it will lead to foundation settlement and vehicle jumping at the bridge head. The reasons for this phenomenon are: the foundation treatment is not designed in combination with the specific situation, which is a little out of thin air. The operation of construction personnel is unqualified, such as wrong drilling method and unequal drilling quantity. The field investigation was not rigorous, the soft soil foundation was not analyzed, and even the location of the soft soil foundation was not determined. The analysis is not in-depth, and the calculation model and prevention scheme are not established. There is a serious discrepancy between the design and the actual situation. The above reasons can be controlled artificially. If the frame is strictly supervised by relevant departments during and before construction, the probability of settlement can be reduced. In addition, long-term traffic and rain erosion will also aggravate the ring breaking of the subgrade at the bridge head, resulting in settlement and deformation during use.

Figure 2 Deformation of roads and bridges

2. Precautions for Subgrade and pavement construction in settlement section

2.1 Capital and resource control

In the process of subgrade and pavement construction in the settlement section, the fund manager should always bear in mind his own responsibilities, and must not use his position to cause impact and losses to the organization and enterprises. In addition, for materials and amounts reaching a certain amount, the auditor should timely check and make up for deficiencies in resources, organize regular spot checks and replenish inventory, etc. On the premise of ensuring sufficient resources, the inspection department and personnel shall ensure high-quality verification of resources and funds, take the verification of revenue and expenditure seriously, and the main person in charge of the unit shall organize the inspection of the accounts and check the accounts within a certain period of time to ensure the normal flow of funds. The project enterprise is responsible for the recording of engineering data, commodity market, material procurement and other links, and let the professional departments in the road and Bridge conduct audit and supervision, so as to achieve the replacement of resources on the same day, and there are replacement records on the same day. The balance of inventory should be checked and proportional to the cash held by itself, and the number of account checks should be increased to ensure that there is no error.

2.2 Exploration of road and bridge projects

On the road of development in the field of road and bridge, the theoretical work of subgrade and pavement construction in the settlement section is an important part, but the design of road and bridge still focuses on the original design and planning. In this way, the efficiency is too low and does not have any substantive value. It is necessary to reform the management level and hardware facilities. There are two requirements for engineering projects: tool processing and subgrade and pavement exploration. They should be used to solve similar problems in different engineering projects, increase the time available to solve other engineering projects, actively explore the settlement section, make it convenient for project development, and submit drawings to road and Bridge Engineering in time. With reference to the future development status and current development status of the field of roads and bridges, customize the composition of the large framework dedicated to road and bridge enterprises. In the process of forming the framework, we should not aim at appropriateness, but at Appropriateness. At the same time, in the circulation of capital revenue and expenditure, we should quickly transfer all kinds of funds to the hands of the cash management personnel of the unit. In order to avoid stagnation and instability of revenue and expenditure.

2.3 Understand the settlement requirements of roads and bridges in the construction area

The subgrade construction in the settlement section of roads and bridges occupies a very important position in the whole construction project, and also puts forward new requirements for the reasonable and safe construction of roads and bridges. For the settlement construction of roads and bridges, it is necessary to reasonably avoid the current potential safety hazards during construction to ensure the quality of road and bridge construction. Before construction, construction analysis shall be done to ensure that engineering personnel follow the construction guidelines and requirements, start from the actual situation of construction, ensure the construction quality and construction efficiency, ensure the normal progress of construction in the settlement stage of roads and bridges, and meet the requirements of project construction. In addition, it is also necessary to ensure the structural stability of the approach slab during construction and avoid excessive damage. Support shall be set at the lower part of the approach slab structure to avoid efficient support of the approach slab structure. There are three main subgrade treatment methods used in road or bridge construction, namely coarse-grained material filling method, approach slab method and reinforcement method. This kind of method can further reduce the stiffness difference or uneven settlement of roads or bridges, so as to improve the stiffness of subgrade and avoid vehicle jumping

3. Application measures of subgrade and pavement construction technology in road and Bridge settlement section

The management of road and bridge engineering system and the control of construction technology are the key elements of analyzing the framework structure, improving the management system and mastering field activities. Therefore, it is inevitable to encounter many problems, such as uneven distribution of grass-roots posts, different strength of work authority and different number of tasks, except for relevant personnel of the Department, Hierarchical treatment and control is the main source of management theory that road and bridge enterprises should follow in the construction process. There are many fields and disciplines involved in subgrade and pavement construction technology in settlement section, including basic theory of automatic exploration, knowledge of construction industry and so on. Due to the uncertainty of subgrade and pavement construction technology in the settlement section of road and bridge engineering, including uncertainty in materials and function use, a large number of basic materials and human resources are required in the engineering process of actual road and bridge projects.

3.1 Control the resources and funds of roads and bridges

Only when the funds and resources of road and bridge engineering have efficient and rapid flow and turnover capacity, can we give full play to the practical economic value and actual benefits of working funds and effective resources, maintain and increase the value of funds, and reasonably replace and utilize resources. To control the liquidity of funds of road and bridge enterprises is to control the development speed of funds of road and bridge enterprises. Therefore, to control the flow of funds and improve the utilization rate of resources, we must start with the "three rates" of management system and control, namely "stable rate, effective rate and time rate". Among them, the uncontrollable factor index of stable ratio is not only the key but also the difficulty. It can directly reflect the recent projects invested by road and bridge industry and related enterprises, the effective ratio of resource replacement, etc.

3.2 Build a perfect application system of subgrade and pavement construction technology in settlement section

The application system of subgrade and pavement construction technology in the settlement section realizes the virtual inspection design for the control road and Bridge on the basis of theoretical knowledge and practice, which is an absolutely effective method to reduce the traditional inspection. However, due to the color diversity of the control road and bridge, whether it is the primary or secondary use of the control road and bridge, in the environment, sunshine Under the influence of uncontrollable factors such as pollution. The conditions of control roads and bridges will be affected more or less, which will deteriorate the materials of control roads and bridges and change the color. Therefore, in recent years, it is also affected by the improvement requirements of control road and Bridge standards. The relevant technologies in the field of subgrade and pavement construction technology application system in settlement section have attracted much attention from the state and society. This also shows that it is also very important to control the quality assurance rate of roads and bridges. If the application system technology of subgrade and pavement construction technology in settlement section is compared with the traditional field, the inspection and field treatment of roads and bridges are more accurate and shorter than the traditional field.

3.3 Do a good job in the supervision and management of construction technology

The basic requirements for construction technology management are the premise to ensure the project management system. At the initial stage of establishment, the road and bridge engineering shall have a specific supervision scope for the construction, and the projects within the supervision scope shall be fully covered. And implement supervision on the original basis. When implementing supervision, we should grasp the direction of supervision. That is, the inventory and inventory restrictions related to construction and project business must be supervised at the same time. The

purpose is to ensure the safety of funds and assets. Finally, the operation mode of fund management must be legal. Performance needs the support of technology, and technology needs the perfection of process application. Through the combination of basic standards and rich design directions, the audience of the control system can feel the infinite possibilities brought by scientific and technological innovation to the application technology. As a comprehensive technology for roads and bridges, subgrade and pavement construction technology in settlement section has both independence and interaction. As a modern technology completely different from the traditional field theory, dynamic emergence has the characteristics of rapid transmission of information and cultural spirit of the times because of the standard requirements and efficiency of its control system.

4. Conclusion

In road and bridge engineering, the construction and paving technology of subgrade and pavement in settlement section has a vital impact on the overall construction quality of road and bridge engineering. The research and analysis of pavement reinforcement construction technology is helpful to improve the safety and stability of roads and bridges. In view of this, this paper analyzes the relevant causes of settlement in road and bridge construction, and discusses various construction technologies in road and bridge construction sections, in order to further improve its practical application effect in settlement sections.

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