

Discussion on the construction technology of waterproofing roadbed on road and bridge construction

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Abstract: At present, with the policy support of the state in the coordinated development of the region, the modernization of the city is vigorously promoted and the level of the national urbanization is promoted rapidly and continuously. As a project of urban infrastructure construction, road and bridge plays a vital role in the construction of the whole urban road network system. Throughout the construction process of every subsystem of road and bridge, the main influence on the later period of road and bridge is waterproof pavement. The level of construction of waterproof subgrade is closely related to the construction quality and construction level of the entire project. The two are coordinated and mutually unified, and how to further improve the waterproof road surface construction technology, construction technology and construction quality, has become a major research topic for each road and bridge construction company^[1]. From the technical point of view, the paper actively excavates potential security hidden dangers and threats hidden in the construction of road and bridge, and makes a comprehensive analysis of some of the most prominent problems, and explores an effective way to effectively solve the problem.

Keywords: Road and bridge engineering; engineering construction; waterproofing road surface; construction technology

1. Purpose and significance of roadbed construction for waterproofing and construction of roads and bridges

1.1 Helps to increase the bond strength of bridge waterproof layer and bridge roadbed

Usually, the effective improvement of the cohesive force between the road and bridge waterproof layer and the pavement surface is mainly achieved through two aspects: On the one hand, combined with the actual situation of the project, the overall roughness of road and bridge bases should be appropriately increased. On the other hand, it is mainly aimed at timely clearing the laitance that has long been stranded on the cement concrete surface of roads and bridges. In addition, taking the increase of roughness as an example, the appropriate roughness should be chosen according to the actual requirements of various materials in actual treatment. Contrary to the traditional concept, that's not the case that the higher the roughness, the higher the cohesive force of road and bridge. In the process of floating slurry removal, the floating pulp is a relatively weak system, which virtually increases the difficulty and complexity of the removal. If the floating slurry is excessively removed, the stone aggregate in the concrete will be exposed to the concrete surface,

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and the strength of the road base will be increased to a certain extent, which will help to improve the construction quality of the road and bridge^[2].

1.2 It helps to improve the waterproof effect

Concrete construction is an important part of the whole road and bridge construction process, and also a key construction project. When the concrete is poured, it will gradually solidify and stabilize after meeting certain time conditions. However, in the process of fixed concrete, it is vulnerable to changes in temperature, its own internal stress conditions, foundation structure, etc., resulting in different degrees of crack problems. In response to this problem, it is possible to effectively apply related waterproofing techniques, such as a hair-proofing technique, by which an adhesive is used to fill and seal the cracks that are exposed to the coagulation and the surface. If the corresponding waterproof technology is not taken in time, the floating slurry on the surface of the concrete will automatically fall off or break up, providing a opportunity for the infiltration of surface water and rain. When the road and bridge construction is subjected to water corrosion for a long time, it will greatly weaken the actual service life of the project, and increase the probability of the difference in safety accidents during the late operation of the project.

2. Problems and causes analysis of waterproofing road surface for road and bridge project construction

2.1 The problem of material use and analysis of its causes

The quality control of construction materials plays a very important role in road and bridge construction, which directly relates to the final quality and safety and stability of the project. However, from the current perspective, the material use of most road and bridge construction enterprises in China has not yet reached the relevant departmental standards, especially the lack of strict control over the quality of materials procurement, in order to reduce the cost of investment, some companies shoddy or reduce the total amount of material applications^[3]. In addition, in the course of road and bridge construction, the lack of the addition of anti-seepage materials leads to the quality of the whole project, which may even threaten the waterproof performance of the project, resulting in the cracking of the road base surface or other related safety and quality problems.

2.2 Main design causes of damage to the base surface of waterproofing road

Generally speaking, the construction of road and bridge foundation is easy to be influenced by various factors, such as construction experience, design requirement and so on. If lack of sufficient construction experience or lack of design demand, it will have a direct impact on the overall waterproofing of road base construction, damage the structure of road and bridge waterproofing road base structure, increase the possibility of crack problems and lead to the final formation of leakage phenomenon. It not only hinders the realization of waterproofing function of roads and bridges, but also is not conducive to prolonging the service life of roads.

2.3 Construction technical problems and causes analysis

If the construction process fails to strictly comply with the specific construction standards in the relevant road and bridge construction, even if the construction of the road base surface is completed according to the stipulated schedule, the overall construction effect cannot be fundamentally guaranteed, in particular, problems such as insufficient stability of construction coatings are prominent^[4]. For the application of lapping processing technology in the coagulation construction, due to the lack of a unified normative and standard, there is a big difference between the actual construction effect and the expected construction effect of the waterproof subgrade. In addition, the influence of climate factors on engineering construction can not be ignored. After the continuous change of climate conditions, the performance of the waterproof layer is not up to the standard after the construction of the project, and the quality of the road base surface is seriously damaged.

3. Construction technology of waterproof subgrade and pavement in road and bridge construction

3.1 Strengthening the preparatory work before the construction of the road and bridge waterproofing roadbed

On the one hand, the design of the road and bridge waterproof base surface before construction. In a broad sense, the essence of the road and bridge waterproofing road base is through the planning and design of the whole project, and through the concrete engineering construction, the goal of the pavement waterproof is realized. The development of any project needs the specific design plan as the main precondition. The perfect design standard can not only provide an important reference for the construction of the waterproofing road base, but also can standardize the construction process and order to ensure the rationality and scientificity of the construction. From the construction and application of the drainage system, the drainage system, which is an important guarantee for the base surface quality of the road and bridge waterproofing road, is an important part of the whole road and bridge waterproofing road base surface engineering. In order to achieve the standard of pavement waterproof, the comprehensive consideration and planning of the road and bridge drainage system should be taken into consideration in combination with many factors, so as to realize the double harvest of the overall economic and environmental benefits of the drainage system^[5].

On the other hand, the selection of construction materials for road bridges and waterproof road bases. The impervious capability and waterproof ability of waterproof layer directly affect the overall waterproofing performance of road and bridge waterproof pavement. In structure, the waterproof layer in the pavement of road and bridge waterproof road is mainly distributed between concrete and bituminous concrete. Therefore, the waterproof performance of the road and bridge waterproof road is easily influenced by the concrete layer, the asphalt concrete layer and the waterproof layer. Usually, the waterproof material used in the construction of road and bridge waterproofing road must have the following three characteristics: the strength and tensile elasticity of the material, the bonding force of waterproof material, and the waterproof property of the material, among which the most important is the seamless waterproof ability. The waterproof performance of road and bridge base surface is easily affected by the three characteristics of the waterproof material itself. Therefore, the adhesive force, strength, tensile elasticity, and seamless waterproof capacity of the waterproof material should be considered in the selection process of the construction material^[6].

3.2 Analysis of the method of choosing waterproof material

Reasonable selection of roadbed and bridge waterproof material. The material is the basis of the base surface of the road bridge waterproofing road. In order to ensure the function of the pavement base of the road bridge, the waterproof function material should be selected in the construction of the pavement of the road and bridge waterproof road. The selection of materials should start with three characteristics: first, we should select materials with seamless waterproofing function. Second, we should select materials with strong tensile strength and single line restoring force. Third, it is necessary to select materials with strong adhesion so as to ensure that they are strongly adsorbed on the base surface of the bridge road and the construction is convenient. In the waterproof construction of bridges, the depth and roughness of the subgrade are not as large as possible. The key is the waterproof material chosen, different waterproof rolls and waterproofing coatings have different requirements for depth and roughness, not to mention the different types, different standards of waterproof rolls and waterproof coatings, and the depth and roughness of the road surface can not be the same. For example, the requirements for the depth and roughness of the waterproofing membrane of the bridge in the regulation are 1 to 1.5 mm, and the requirements for the depth and roughness of the bridge waterproof coating are 0.5 to 1.5 mm^[7].

3.3 To improve the road bridge construction enterprise in waterproof subgrade and technical specification

① During the completion of concrete pouring and solidification and hardening, the physical principles are effectively used, and the crack treatment of the solidified cement is achieved through the effective use of the roughening treatment method. In the process of specific operation, first, the builders should ensure the smoothness and cleanliness of the cement surface, remove the debris, litter and gravel that attach to the cement surface in time, and further enhance the roughness of the cement surface by this way, so as to fundamentally improve the cement adhesion function. Secondly, at present, a variety of new types of chemical waterproof materials are constantly emerging on the market, and the different types and types of production have been made, so that the actual waterproof performance of the materials is not the same, and the new chemical waterproof supply has a great difference to the demand of the cement apparent. In some degree, it decides the requirements of technical specifications, technical application conditions, construction standards and construction experience of the construction workers. Through the combination of the above conditions, a more scientific, more reasonable, and more convenient operation method is formulated to fully meet the quality requirements for the waterproof subgrade during the construction process^[8]. ② In the construction of roads and bridges, under normal circumstances, transport vehicles can not run on the surface of the concrete after roughing, but if there are some special situations that must be passed on the concrete surface, effective protection measures must be made. ③ After the completion of the waterproof layer, before the asphalt concrete pavement has no operation, it is necessary to pay attention to the protection of the asphalt concrete, and it is forbidden to reversing or braking on the asphalt, in addition, during the process of spraying the bridge surface waterproof coating, the collision wall should be sheltered, and the waterproof layer at the bottom of the collision wall should be painted manually^[9].

4. Conclusion

To sum up, the waterproofing road base project in the road and bridge is an important project involving the national economy and the people's livelihood and the strategic development. The quality of the construction is not only related to the security and stability after the project is put into use later, but also is closely related to the safety of people's life and property and the development of society^[10]. Therefore, in the future road and bridge waterproof road base construction, we should further strengthen the preparation work before construction of road and bridge waterproof road base, choose suitable waterproof material, improve the standard and technical nature of waterproofing Subgrade in road and bridge construction enterprises, then build high-quality municipal road infrastructure to ensure the smoothness of road and bridge construction.

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