Analysis on Construction Technology of Super-Thin Asphalt Concrete Deck Paving

Qiuyun Wang

Chongqing Vocational College of Transportation, Chongqing 404100, China

Keywords: Ultra-thin asphalt, Concrete deck pavement, Construction technology

Abstract: The construction of ultra-thin asphalt concrete bridge deck pavement is the focus of current bridge deck pavement construction. This paper will focus on the problems existing in the construction of ultra-thin asphalt concrete bridge deck pavement, analyze the current situation of the construction technology of bridge deck pavement in detail, study the construction technology of concrete bridge deck pavement in detail, adhere to the principle of integrating theory with practice, and aim to lay the foundation for the smooth progress of construction technology research in the future.

1. Introduction

The importance of the construction technology of ultra-thin asphalt concrete bridge deck pavement is remarkable, but there are still some obvious problems in the actual operation. In the process of asphalt concrete bridge deck pavement construction, it is necessary to clarify the relevant construction process, gradually improve the professional knowledge and skills of the relevant staff, and construct a perfect supervision operation guarantee mechanism to meet the actual needs of the current bridge deck pavement project.

2. Problems of Super-thin Asphalt Concrete Deck Pavement Construction

There are some outstanding problems in the construction of ultra-thin asphalt concrete bridge deck pavement, which need to be paid attention to, which has the advantage of simple construction process in the actual construction link, and plays a role in highway construction. Ultra-thin asphalt concrete bridge deck pavement construction is easy to be affected by external and internal factors, mainly in line with the driving conditions in the area and the actual climate conditions, there are often many types of diseases, which have a certain impact on the construction quality of asphalt concrete bridge deck pavement. The main diseases include rutting, loose and cracks. In the actual construction process, there are a variety of failure types, which will cause certain damage to the stability of load high temperature, among which mainly low temperature damage and water damage, the early failure phenomenon is more significant. In the study of the damage existing in the construction process of ultra-thin asphalt concrete bridge deck pavement, it can be found that the former pays more attention to the pavement construction, the former is deeper than the latter, and the factors that produce the asphalt concrete bridge deck construction damage are diverse.

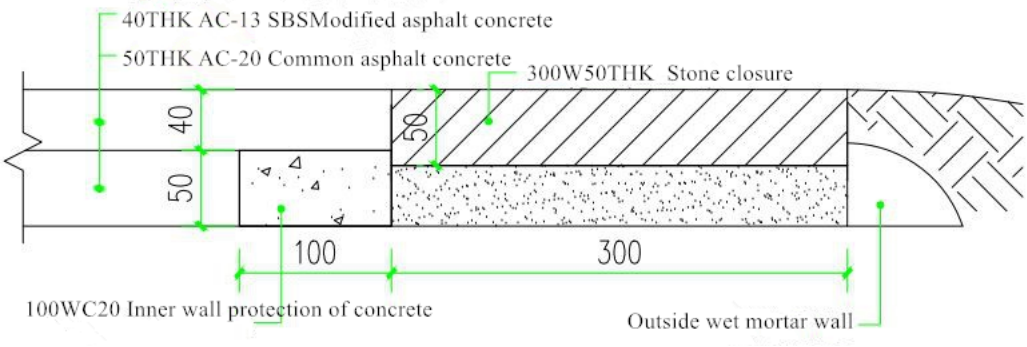

Fig.1 Technical Key Points of Ultra-Thin Asphalt Concrete Deck Paving

  DOI: 10.25236/ic3ec.2020.007

3. Development of 2. Super-thin Asphalt Concrete Deck Paving Technology

The construction technology of ultra-thin asphalt concrete bridge deck pavement is more mature, but there are still some problems in the practical application process, and the bridge deck is easy to be affected by the vacuum suction of the driving vehicle wheel to a certain extent in the running link. At the same time, the water permeability of asphalt concrete pavement is better, the problem of falling off will appear when it acts on asphalt concrete soil layer, and the phenomenon of pit damage will appear if it is not treated in time. When comparing the compaction density of asphalt concrete on bridge deck and pavement, the former is larger than the latter, and the porosity of compaction degree of asphalt concrete on bridge deck is larger, so it is easy to appear the problem of seepage in the process of application. In the process of leveling, cement mortar is the main raw material for leveling. In the long run, the construction strength will be reduced.

4. Ultra-thin Asphalt Concrete Deck Paving Technology

4.1 Preparation of Super-thin Asphalt Concrete Bridge

To prepare the construction technology of ultra-thin asphalt concrete bridge deck pavement, to a certain extent, lay the foundation for the smooth progress of subsequent construction. First, we should pay attention to optimizing the traffic control flow, divide the bridge deck pavement construction into different stages according to the actual situation of the bridge deck construction site, do a good job in the follow-up construction, scientifically calculate the amount of construction raw materials, load the materials, monitor the operation of other vehicles in real time, and dredge them. Second, to test the construction quality of the super thin asphalt concrete bridge deck adhesive layer, the relevant construction personnel should spray according to the actual situation of the adhesive layer, in this link need to ensure the uniformity of spraying, when the problem of leakage should be dealt with in time, the excess asphalt inside the slot should be removed in time, the relevant technicians should check the rainwater outlet of the bridge deck, fill the existing rainwater outlet position, and ensure the smooth follow-up construction. Third, do a good job of equipment quality inspection, in the early stage of construction, the performance of mechanical equipment should be tested to ensure that the performance of mechanical equipment meets the actual needs of construction.

4.2 Mixing of Ultra-thin Asphalt Concrete Deck Pavement

The mixing technology of ultra-thin asphalt concrete bridge deck pavement first needs to ensure the mechanical integrity of mixer equipment. In the actual mixing process, the measuring accuracy of mixing equipment is measured in real time with the advantage of intermittent equipment, and compared with the actual situation of construction site to ensure that it meets the actual needs of construction. First, do a good job in the preparation of the early stage of construction, according to the actual situation of the site to screen the gravel treatment, control the thickness of the gravel, generally around 5-10 mm, will not meet the construction site of super-particle gravel timely screening. During the process of mixing by mixing machine, the performance of asphalt mixing machine is tested in real time, and the running state above the feed hopper can be monitored. The thickness of sieve is about 15 mm. In the process of measuring cement, the advantages of cold storage bin should be used to measure cement. In order to accurately grasp the heating temperature of asphalt according to the actual situation of the construction site, it is usually necessary to monitor the factory temperature of asphalt mixture in real time at 175 degrees Celsius, generally at 180 degrees Celsius as the best.

4.3 Super-thin Asphalt Concrete Bridge Deck Paving

It is necessary to select the construction equipment correctly during the paving process of ultra-thin asphalt concrete bridge deck paving, and to set two mechanical equipment into ladder formation for one-time spreading according to the actual situation of the site. In the actual spreading link, the location of the spreading joint is detected in real time, and compared with the upper and

lower spreading track of the cement concrete bridge deck, so that the two are in a consistent state, so as to ensure the smooth progress of the subsequent construction. At the same time, in the process of spreading construction, we should pay attention to the analysis and comparison of the thickness of asphalt concrete, and need to ensure the uniformity of thickness, which is helpful to improve the quality of subsequent construction quality to a certain extent. In the process of spreading construction, it is necessary to analyze the performance and quality of the device, and generally to operate with the help of the contactless leveling device, which has the advantage of high sensitivity in the process of operation, which is helpful to ensure the accuracy of the thickness. The distance between spreading machinery and equipment is controlled in the best range, generally in 5 m is the best, the speed of spreading construction is controlled in real time, usually 4 per minute m, in which the thickness of adjacent spreading overlap is also the key.

4.4 Rolling Construction of Ultra-thin Asphalt Concrete Bridge Deck Pavement

The construction of ultra-thin asphalt concrete bridge deck pavement is the key, and the stage of rolling is studied and analyzed in real time, including three parts: initial pressure, repressing and final pressure. And with the help of professional machinery and equipment for practical testing to achieve combined compaction. In the initial pressure stage, the distance between spreaders is controlled in the best range, mainly using drive wheel facing spreader to master the speed of advance, generally to travel 1.5-2.0 km per hour, in the actual return process mainly to vibration compaction, in the process of re-compression to control the temperature of mixture, need to control the temperature of re-compression at about 100 degrees Celsius, so as to ensure the accuracy of re-compression, will pay attention to increase compaction, help to ensure smoothness. Minimize the interval between processes and improve the service life of the bridge during spreading.

5. Conclusion

The construction technology of ultra-thin asphalt concrete bridge deck pavement is the key to improve the bridge quality, so it is necessary to do the preparatory work in the early stage of construction. According to the actual situation of the construction site, the internal and external factors will be effectively combined to ensure the smooth progress of the construction to a certain extent.

References

[1] Lianfeng Zhang. A Study on Construction Technology of Pouring Asphalt Concrete in Steel Deck Pavement. Building Materials and Decoration. Health, no.26, pp.249-250, 2019.

[2] Jiming. Construction Technology of Improved Epoxy Asphalt Concrete Steel Deck Paving at Low Temperature. Road Construction Machinery and Construction Mechanization. Health, no.36, pp.86-89, 2018.