

ANALYSIS OF HIGH-GRADE ASPHALT PAVEMENT MAINTENANCE CONSTRUCTION TECHNOLOGY

Serdyuk V.R., *Doctor of Technical Sciences*, **Mingjun Guo**, *Ph.D.*,
Kovalskiy V. P., *Ph.D. Associate Professor*, **Lyubarsky V.S.**, *Magister*
(*Vinnytsia National Technical University*)

Asphalt pavement is mainly used in the construction of high-grade roads, and in the process of asphalt pavement maintenance, the quality and overall performance of the pavement [1-3] are enhanced through scientific and reasonable maintenance methods, so as to improve the service life of the pavement [4-6].

The use of high-quality asphalt pavement construction technology can reduce the negative impact of de-icing agents on its basic properties and durability [7-10].

Asphalt pavement chip seal maintenance techniques are usually classified into two types, namely asynchronous chip seal and synchronized chip seal. Among them, asynchronous chip sealing is the method of laying gravel and asphalt separately and using rollers for rolling; synchronous chip sealing is to lay gravel and modified asphalt on the pavement at the same time by special vehicles, and then use rollers for rolling. This maintenance construction technology is one of the core measures to improve the cracking problem of high-grade asphalt pavement, and reduce the pavement moisture into the inner layer of its structure, enhance the skid resistance of the pavement, and alleviate the aging and hardening problem of high-grade asphalt pavement. Synchronized chip sealing has good skid resistance, water seepage resistance, can effectively prevent all kinds of pavement diseases, such as falling grain, rutting, subsidence, etc., applied to high-grade asphalt pavement, to enhance the anti-skid performance of the pavement.

Asphalt pavement thin slurry sealing technology, through the relevant mechanical equipment, construction materials for mixing and blending, such as emulsified asphalt, filler materials and additives, in strict accordance with the relevant requirements for the proportion, and then the mixture is evenly spread on the asphalt pavement, and ultimately in the surface of the road to form a layer of film. Slurry sealing technology is practically applied in asphalt pavement maintenance, which can properly deal with potholes, aging and cracks, and enhance the waterproofing and abrasion resistance of asphalt pavement. The generated film layer can be solidified in a short period of time without affecting the normal traffic order, and the spraying and crushing operations are more convenient and can be carried out

continuously with mechanical equipment. Special attention should be paid to the slurry sealing technology construction has good application advantages, but for the deeper cracks or deformation of the situation, can not apply the slurry sealing technology, due to the technology of the pavement bearing capacity is relatively weak, and the deformation of the pavement is difficult to repair, only its pavement aging, wear and tear and other advantages of the more prominent.

Asphalt pavement micro-surfacing maintenance technology, mainly by the evolution of slurry sealing technology, is the upgraded version of its technology, is the more frequently used maintenance technology of asphalt pavement at this stage. Micro-surfacing technology uses professional mechanized equipment to mix the aggregates, fillers, and polymer modified emulsified asphalt, additives, and other materials used in the construction, then uniformly paved on the pavement, forming a thin layer in a short period of time, to enhance the skid resistance and durability of the pavement. The application of micro-surfacing technology in asphalt pavement maintenance can enhance the anti-skid effect of the pavement, and compared with the slurry sealing technology, it is more advantageous, not only better durability, and superior economy. The advantages of this maintenance technology include the following aspects: 1. add a corresponding waterproof layer for the entire pavement, preventing water from soaking into the pavement structure; 2. enhance the friction of the pavement to improve the anti-skid performance; 3. after the completion of the construction of a short period of time can be opened up to traffic, will not affect the traffic; 4. can be constructed at room temperature, will not cause dust, noise and other pollution.

Fog seal mainly refers to the dilution of emulsified asphalt, which is uniformly sprayed to the asphalt pavement, in order to build a complete waterproof layer, which has a certain protective effect on the pavement, minimize the water damage to the pavement, enhance the adhesion between the aggregates, and improve the actual use of the pavement time. The advantages of this technology includes the following: 1. good waterproofing and water penetration, reducing water damage to the pavement, as well as filling the fine cracks on the pavement; 2. extending the service life of the road, as well as reducing the cost of pavement maintenance; 3. increasing the adhesion between the aggregates, effectively protecting the old asphalt pavement. This technique is not suitable if the structural strength of the pavement is poor, so it is important to ensure that the structural performance of the pavement is in good condition if the technique is to be used effectively. Asphalt pavement in the use of 2-4 years after the aging rate is faster, the surface layer of the road surface brittleness increased, causing

various types of adverse phenomena, mainly in the early cracks, loose, etc., so the asphalt pavement after the opening of the vehicle for 2-4 years, is the best time to maintain the fog seal layer, at the same time should be based on the typical structure of the pavement, the relevant indicators, the wear and tear conditions, etc. to determine.

Thin overlay technology is a common type of preventive maintenance technology for the original road to provide a brand new road surface, can effectively improve the original road surface to form a small number of cracks and other diseases, and can enhance the smoothness of the road surface, enhance the life of asphalt pavement. Depending on the actual application of the construction process, it can be categorized into three types, namely cold thin overlay, hot thin overlay and warm thin overlay. Among them, hot thin overlay is the traditional preventive maintenance technology, the material will be heated, and according to the type of grading into thin overlay, which has a good economy, the effectiveness of the treatment of asphalt pavement is better, and lasts for a long time, but the maintenance cost is relatively high, and the hot mixing process has a certain impact on the environment. Cold thin overlay is usually constructed at room temperature without heating the material. Compared with hot thin overlay, it is not only convenient, economical and environmentally friendly, but also the most widely used maintenance technology. Warm thin overlay mainly resides between hot and cold, which not only has the excellent performance of hot thin overlay, but also embodies the advantages of cold thin overlay in terms of environmental protection and short construction period.

Cracks in asphalt pavement is the most significant manifestation of road damage, cracks broken area and the direction of the cracks, in addition to reflecting the existing cracks in the pavement disease condition, but also side reaction to the pavement in the future the trend of the occurrence of the pavement. At this stage, asphalt pavement crack treatment is mainly ordinary asphalt grouting and potting adhesive repair cracks. Ordinary asphalt grouting is the use of asphalt material itself, to ensure that the cracks are blocked to avoid moisture immersion, specific construction is mainly through compressed air from one end of the cracks blowing to the other end, the need for continuity of the blowing of two times in order to ensure that the cracks in the removal of foreign objects, and at the same time in strict accordance with the relevant requirements of the asphalt heated, the temperature is usually controlled in the 150°C-160°C, and then the use of containers will be asphalt grouting in the cracks. Potting adhesive repair cracks need to be strictly in accordance with the relevant requirements of the implementation of the groove work, and will be cleaned up the trench, to be filled with filler in the trench, it will be heated to perfectly cover the

filling of the trench.

Pavement pothole repair method mainly contains two ways, namely, hot mix material repair method, cold patch material repair method. Hot-mix material repair method belongs to the conventional means of repair, mostly used in summer and fall, after the pavement damage parts are determined, the pavement will be cleaned, and then the edges and inner walls will be coated with the corresponding adhesive asphalt, after which the asphalt mixture will be poured into the pothole and leveled, and then the roller will be used for rolling. Cold patch repair method, mainly for emergency maintenance and repair, mostly used in rainy days and winter, this method is mainly to avoid pavement damage and affect the normal passage of vehicles, a short period of time to complete the pavement maintenance.

Uneven settlement of asphalt pavement, thus causing damage to the pavement, if the pavement foundation is more solid, and will not reoccur settlement, only need to repair the opposite layer, and in accordance with the actual damage to the pavement, to take targeted maintenance measures, generally on the settlement part of the filling of the asphalt mixture, and will be compacted. If the uneven settlement is due to the foundation structure, when the surface layer is repaired, it is also necessary to treat its soil and foundation.

With the increasing total number of vehicles, as well as affected by natural factors, the road appeared all kinds of lesions, such as cracks, rutting, etc., affecting the smoothness of the road, skid resistance, etc., to shorten the life of the asphalt road, these problems are on the highway maintenance of the new challenges and requirements of the traditional corrective maintenance model, it is difficult to meet the requirements of the era of development. In view of this situation, the road preventive maintenance method by virtue of its own advantages, favored by the road maintenance department, become one of the core ways to alleviate the pressure of road maintenance. With the continuous iteration of technology, strengthening the preventive maintenance of asphalt pavement can effectively alleviate the wear and tear pressure on the pavement, extend the service life of the pavement, as well as enhance the driving rate of the pavement. Systematic asphalt pavement maintenance work can effectively reduce maintenance costs, improve road operation efficiency, and then bring good economic benefits.

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