

Pothole repair master – Construction method of pothole milling with asphalt concrete brick

Water damage constitutes a common damage to pavements made of hot-mix asphalt concrete. Excessive moisture leads to cracks and potholes, thus endangering the safety of drivers. Accordingly, from 2014 to 2018, the world's first "Construction Method with Asphalt Concrete Brick(or ACB)" had been developed by the engineers and professionals of the Materials Testing Laboratory (MTL) of the Directorate General of Highways (DGH) of the Ministry of Transportation and Communications (MOTC). After laboratory and field testing and research, a standardized method for the production of ACB was formulated, so as the construction method for field installation. Since 2019, another world's first advanced "Construction Method of Pothole Milling with ACB " have been developed by the same team, including two types of equipment, namely vehicle-mounted pothole milling machine and multisize ACB making machine. Additionally, quick-setting cement is used as a tamping and leveling material, which allows ACB to be used more commonly in repairing potholes on damaged pavements, thus improving repair efficiency, simplifying manpower and automation, and improving pavement quality.

First of all, the standardized process for the production of ACB entails putting an appropriate amount of hot-mix asphalt concrete into a designated mold, compacting the one side of the asphalt concrete at a fixed pressing rate of 50mm/min till its compaction, and finally repeating the same pressing step on the other side. This standardized process ensures the round ACB produced by the laboratory are consistent in high quality and size of 100mm~300mm.

Second, the standardized process for the installation of ACB on-site entails the steps of pothole core boring sampling, pothole wall drying, pothole bottom leveling, emulsified asphalt coating, and trial ACB placing and leveling.

Third, in order to make asphalt bricks used more commonly in repairing potholes on damaged pavements, "construction method of pothole milling with ACB" has been developed under intensive research. Among all the research results, an vehicle-mounted pothole milling machine can repair a pothole in 8 minutes, making the pothole repair with ACB durable, budget-saving, reducing carbon emission, and improving drivers' safety. During the process pothole repair, the pothole is milled with a pothole milling machine, and placed with suitable amount of aggregates which are picked up with a vacuum cleaner, mixed with quick-setting cement, and put in ACB

Along with this construction method, a multisize ACB automatic-making machine has been developed, which can produce round ACB with a diameter of 40cm and square ACB with a lateral length of 40cm without manual turning. According to on-site brick laying examples, it is confirmed that such machine of advanced model further improves the repair efficiency and approach, making ACB easier for use in pothole repair of the pavement.

To sum up, the use of ACB makes an innovative way to repair potholes and cracks on the pavement. In addition to being awarded with three patents, this innovation not only improves the comfortability of drivers and passengers, but also enhances road safety, thereby improving the service quality offered by the pavement.