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Brief introduction to the research status of recycling technology of asphalt pavement at home and abroad

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Abstract
The recycling of old asphalt pavement is a new asphalt pavement construction technology, which has the function of saving material, reducing the cost of asphalt pavement, saving engineering cost and protecting resources. At present, all countries in the world attach great importance to this technology are of the old asphalt pavement recycling technology in China has just started, and there are a lot of places to study.

Keywords: Asphalt Pavement, Recycling Technology.

1. Introduction

With the passage of time and the continuous increase of highway mileage, the early completion of the asphalt pavement in our country has entered a large, medium repair, maintenance, renovation and reconstruction of the task is more and more heavy. China's highway has started from the original construction of the stage of development into the stage of development and construction, construction, maintenance, reconstruction and upgrading of the task intertwined.

In highway asphalt pavement rehabilitation project, the traditional construction method has two kinds: one is to cover the new pavement material on the old pavement; another is the destruction of the surface layer removed. The former method while the cost is low, construction is simple and no pollution, but with the blanket layers is bound to increase in the cause of pavement elevation influence on surrounding environment; after a processing method although can achieve good effect of transformation, but high cost (petroleum asphalt as a non-renewable resource cost more and more high, aggregate materials cost also in gradually increased). A large number of turning and milling down the old material is abandoned, on the one hand, causing environmental pollution, on the other hand, this kind of high quality asphalt is very scarce in our country is a waste of resources. And a large number of ore mining will lead to a reduction in forest vegetation, soil erosion and other serious damage to the ecological environment of the phenomenon.

Highway asphalt pavement recycling technology, by reusing old pavement materials in asphalt and sand and gravel materials, can maximum circulation use resources and protect the ecological environment, is a very modern environmental protection technology of economic value and social benefits. The development and utilization of recycled asphalt, not only can effectively deal with maintenance of asphalt pavement generated when the old material, but also can reduce environmental pollution, reduce production costs, generate economic benefits, save resources and protect the environment as a basic national policy in the highway construction and maintenance of the embodiment. So whether from the point of view of energy or from the perspective of environmental protection, asphalt pavement recycling technology in our country should be fully paid attention to and development.

Domestic research and application of asphalt pavement recycling technology started late, the recycling of old asphalt pavement materials is generally low. In order to meet the requirements of building a resource conserving and environment friendly society, the disposal of old asphalt pavement materials has become a problem that we must face and deal with.

2. Research status and development tendency of other country

At present, the technology of the asphalt pavement recycled in Europe and the United States and other developed countries have been such as to a wide range of applications. Traced back to the United States began as early as 1915 on the recycle of waste asphalt mixture is studied, but it was not until 1973 years before the outbreak of the oil crisis makes the regeneration technology and cause the attention of the United States, and can be used widely in the United States. In 1980, 25 states used 2 million tons of hot mix recycled asphalt mixture, in 1981, the United States to 40 states, with 3.5 million metric tons of recycled asphalt mixture, the U.S. the amount of recycled asphalt mixture is almost half of all road asphalt mixture, by recycling waste asphalt mixture is 80%, and has formulated the corresponding technical standards and specifications.

Japan in 1974 to asphalt pavement recycling technology research, to 1980, up to 50 million tons of hot mix recycling mixture for engineering construction, and in 1984, Japan Road Association published the "road recycling technology guide".

The former Soviet Union on the old asphalt pavement recycling technology research is also relatively early. In 1966, the proposal of recycling technology of asphalt concrete waste was published, but it was not used in practice. In 1979, a variety of regeneration methods were introduced in the old asphalt concrete recycled mixture technology standard, and the recycled mixture can be used only for the surface layer of the base layer and the lower layer of the high grade pavement. In 1984, he published a Book of "recycled asphalt concrete", and elaborated on the methods of in situ regeneration and plant regeneration.

In Europe, the 70's in the last century, the Federal Republic of Germany, Finland, Holland and other countries have started to

carry out small-scale recycling of waste asphalt concrete experiment, and to promote. Relatively German regeneration utilization technology is developing rapidly, it is the first regenerated asphalt mixture used in pavement maintenance of expressway, has also developed a specialized technical specifications, of waste asphalt concrete recycling method, a system of classification, to 1978 have all waste asphalt concrete materials be recycled.

The end of last century, asphalt pavement regeneration technology has entered a new era. 1997 international oecd renewable utilization of 14 countries of pavement material, issued a "strategic road engineering utilization" white paper; The federal highway bureau put forward the concept of "green road" in 1997, the United States congress in 1998 traffic balance method, to determine in hampshire college set up renewable raw materials center, to reduce the use of renewable raw materials research and difficult. In 1999 the United States federal highway officials, experts and entrepreneurs to the five European countries, published "the application research and development of highway environment and material regeneration," white paper; In October 2000, was held in Houston road material recycling and environmental problems of international conference; Countries such as America, Germany, Japan, the UK has issued a series of asphalt pavement regeneration technical manuals, technical guidance and application of the specification.

3. Domestic research status and development trends

Technology of asphalt pavement in our country in the true sense of research comes from the early 80 s. In 1983, the ministry of construction issued the "recycling of waste asphalt mixture" research projects, through the existing simple mixing plant transformation, in the old residue road to join the appropriate light oil instead of traditional asphalt mixture paving in the test road of the layer below. Road performance observation results show that the use of renewable pavement performance is not lower than the traditional hot mix asphalt pavement. In the 1990 s, enter the height of the highway construction in our country, research and popularization of the technology of asphalt pavement regeneration basic ground to a halt. Since the 21st century, the early built many entered the stage of large-scale renovation and maintenance of asphalt pavement and asphalt pavement regeneration technology for its environmental protection, economy advantage again caused the road wide attention of researchers.

In 2002, the first successful use of geothermal regeneration technology in Beijing, Tianjin and the Beijing Tianjin Tong expressway. By the end of 2001, Beijing Municipal Corporation introduced the plant mix asphalt thermal regeneration equipment, began the test research and recycling technology of the application, but not yet in the highway pavement. In 2003, Guang dong Provincial Department of communications and transportation group, combined with the Guang fo Expressway overhaul engineering, carried out a comprehensive study of hot mix asphalt pavement plant regeneration technology, successfully used recycled asphalt mixture paving highway pavement (domestic first will be aged mixture content from 20 to 30% of the recycled asphalt mixture, shop built at the bottom of the the Guangfo Expressway Asphalt pavement surface layer).

In 2005, XiBao highway pavement overhaul engineering of using foam asphalt as a binder for plant mixed cold regeneration, achieved 100% recycling old asphalt pavement materials, paving test section 1.6 Km and successfully. In 2007, west highway, west yan highway, nutrient-laden Tong accumulates promotion application in the highway pavement overhaul engineering such as foam asphalt recycled mixture. That same year, shaanxi highway mechanical engineering co., LTD and changan university study of emulsified asphalt regeneration technology, and in the west door paved highway pavement overhaul engineering test section 800 m emulsified asphalt cold regeneration. Both foamed asphalt cold regeneration and emulsified asphalt cold regeneration, the application in shaanxi province highway overhaul project has achieved very good results, and in 2009, continue to promote the use in shaanxi province highway overhaul.

To further standardize the asphalt pavement recycling technology application and ensure engineering quality of asphalt pavement regeneration, the Ministry of communications in 2006 issued a "highway asphalt pavement regeneration technology standard" preparation tasks, by the Ministry of Transportation Highway Research Institute of the units lasted half a year co-edited out. In April 2008, the Ministry of Communications issued "highway asphalt pavement recycling technology standards", in July 1, 2008, the implementation of.

4. Summary of research status at home and abroad

At present, although there are domestic many entity engineering into practice, there are also some units to carry out the related research, but after all, a late start, on the asphalt pavement recycling technology lack of systematic theories and mature experience in construction. Under the current strategy of sustainable development, it is necessary to study the technical feasibility of asphalt pavement recycling technology, and provide effective technical support for the application of asphalt pavement recycling technology in China.

5. Reference

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