Chapter 4 Colored pavement

Colored pavements are mainly asphalt mixture pavements that are colored to improve the appearance of the pavement.

Colored asphalt mixture pavements include those that add pigments to heated asphalt mixtures, those that apply colored aggregates and resin-based binders, and those that color the permeable cement milk of semi-flexible pavements.

1) Applicable areas

① To improve the street scenery

② Areas that contribute to safe and smooth traffic by dividing lanes by color, such as school routes, intersections, and bus lanes

2) Colored pavement construction method

① A method of adding pigment to heated asphalt mixture: This is a brown pavement made by mixing the pigment red ochre into a regular asphalt mixture.

② Method of adding pigments and aggregate to heated asphalt mixture: This method creates colored pavement by mixing pigments and aggregate into a decolorized asphalt mixture, and can be installed in the same way as regular asphalt pavement.

③ Method using resin-based binder

1) Acrylic resin

1. ハケ塗り1層目

2. ハケ塗り２層目

3. 完成

2) Epoxy resin

This is permeable pavement made from a mixture of natural stone and resin.

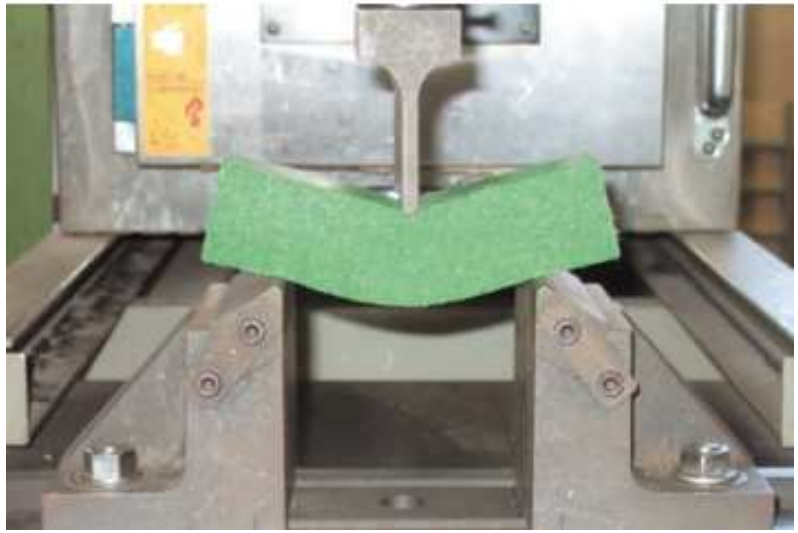
淡五色

大磯

庵治

3) Epoxy resin mortar

A flexible material that is used as a mortar made of epoxy resin and silica sand to finish asphalt or concrete pavement in a thin layer.



4) Urethane resin

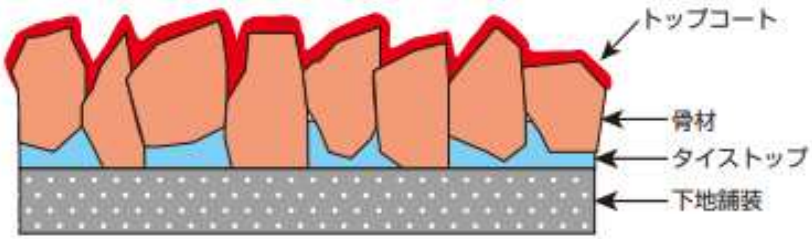
It is a mixture that uses rubber chips as aggregate and urethane resin as a binder, and is applied on-site. It has been used in everyday places such as walkways, footbridges, and parks, as well as sports facilities.





5) Anti-slip pavement

A method of bonding hard aggregate to the road surface using resin-based materials: Coloring is gaining attention as a road safety measure.



1. 清掃

2. マスキング

3. 樹脂塗布・骨材散布

4. 余剰骨材回収

5. トップコート塗布（注 2）

6. 交通開放


施工中止


大阪方面
大阪方面

④ A method of infiltrating colored cement milk into semi-flexible pavements

Semi-flexible pavement is a pavement in which the voids of the porous asphalt mixture are infiltrated with special cement milk, which combines the deflection of asphalt pavement with the rigidity of concrete pavement. The typical curing time is about three days for the normal type, one day for the early-strength type, and about three hours for the ultra-fast-hard type.

Construction status

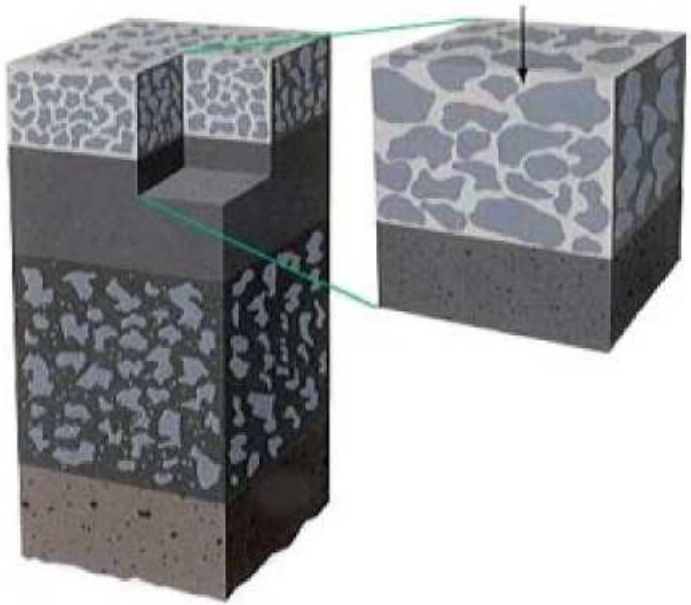


Diagram of semi-flexible method

【Features】

① Excellent plastic deformation resistance

② Excellent oil resistance and flame retardancy

③ Easy colorization of pavement

【Application and location】

① Near intersection, bus terminal, tollbooth

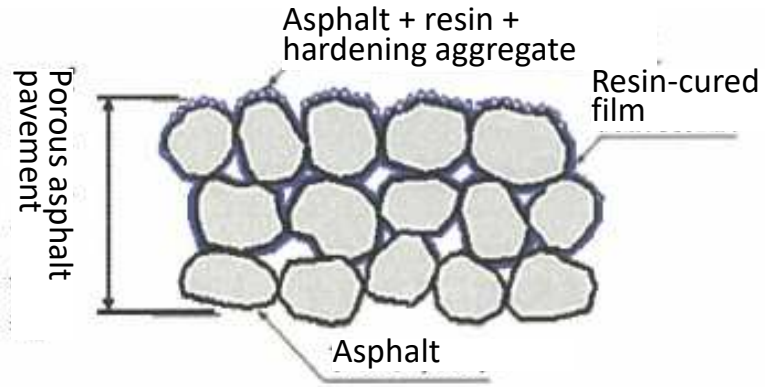
② Places where plastic deformation resistance and coloration are required, such as bus lanes

③ Areas of concern where steps due to flow near the bridge expansion and contraction devices are found.

Example of Colored Semi-Flexible Pavement Construction

⑤ Topcoat method

Topcoat method is a technology developed for the purpose of improving the durability of porous asphalt pavement and water-permeable pavement, as well as the resistance to the flying of aggregates. By spraying and infiltrating special acrylic resin, epoxy resin, emulsified resin, etc. onto the surface of porous asphalt pavement, the surface area is strengthened.

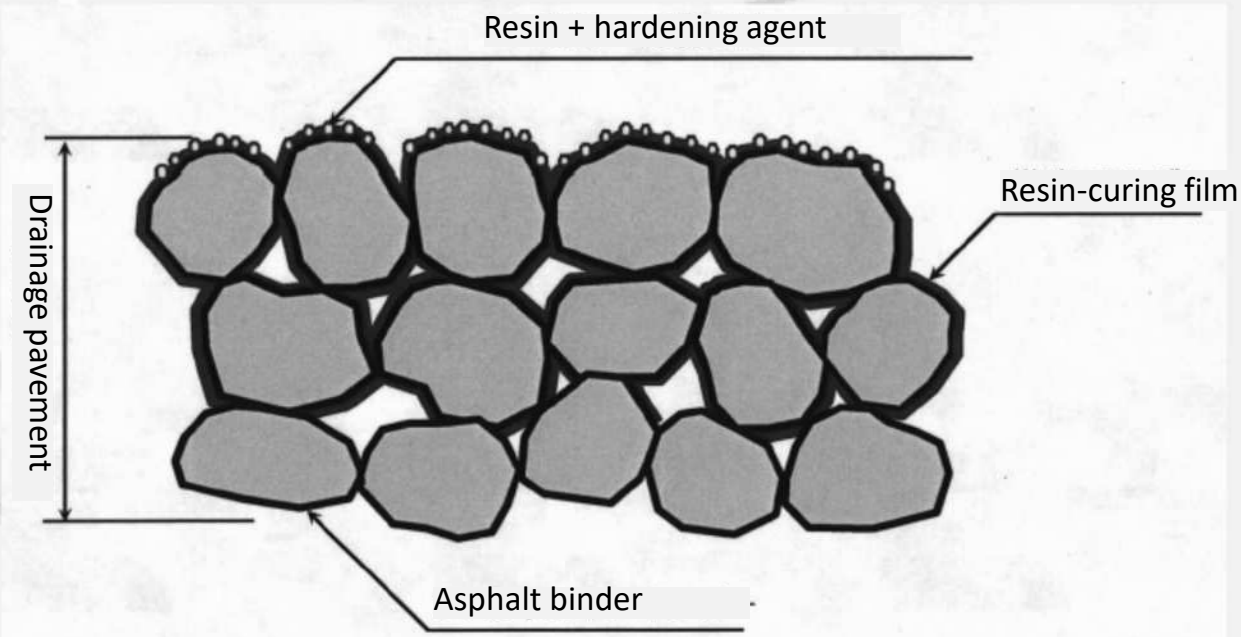


Outline of topcoat method

Construction status

Topcoat method

- A special resin is sprayed on the surface of porous asphalt to improve wear resistance and resistance to flying aggregates.
- Drainage function is not impaired.
- Colorization is also possible by coloring the resin.
- Applicable places
  - Routes with harsh traffic conditions, intersections / vehicle tops
  - SA・PA



Topcoat method

Construction procedures and conditions

Porous asphalt mixture paving

↓ Curing surface temperature ≦ 50℃

Resin : 0.5~0.7kg/m²
Hard aggregate : 0.25kg/m²

↓ Curing (about 30 minutes)

Resin : 0.3~0.5kg/m²
Hard aggregate : 0.25kg/m²

↓ Curing (about 30 minutes)

Traffic opening

Topcoat method - Example -

Topcoat method - Example -

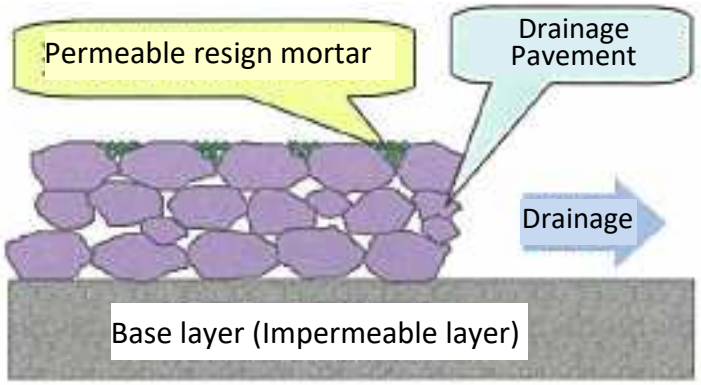
↓ From technical data of Top Coat Method Study Group

Photo 6 Lane guidance construction example

The color of the arrow on the sign corresponds to that of the road surface, realizing smooth traffic guidance. It is used in front of intersections where accidents occur frequently.

⑥ Permeable resin mortar filling method

The water-permeable resin mortar filling method is a technology developed to strengthen the road surface of porous asphalt pavement, maintain and prolong the functions such as drainage and low noise. This is a method of filling the gaps between the surface aggregates of porous asphalt pavement with a water-permeable resin mortar with high durability, quick curing and fine aggregates with special particle sizes.

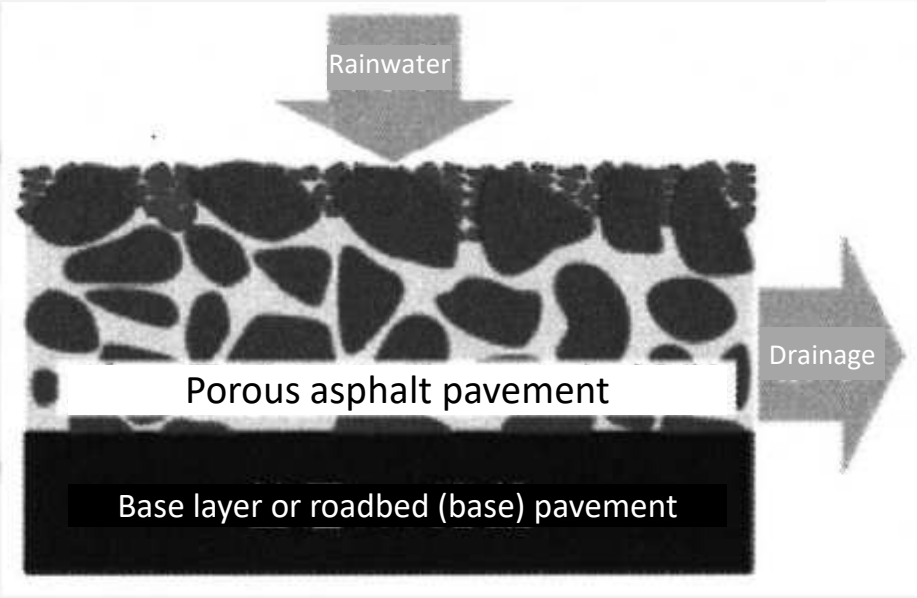


Outline of permeable resin mortar filling fethod

Construction of permeable resin mortar filling method

Permeable Resin Mortar System Method (PRMS)

- A special resin is sprayed on the surface of porous asphalt to improve wear resistance and resistance to flying aggregates.
- Drainage function is not impaired.
- Colorization is also possible by color aggregates.
- Applicable places: same by top coat method.



PRMS Method (How to Prepare Mortar)

Put aggregate into mixer and knead it without mixing

↓

Measure main and curing agents

↓

Mixture epoxy resin

↓

Put epoxy resin into mixer and mix about 1 min.

↓

Discharge

PRMS Method (Construction Procedure)

Leveling of resin mortal

↓

Imprinting of resin mortar

↓

Compacting by roller

↓

Curing and traffic opening

PRMS Method　ETC Lane Construction Example

PRMS Method (Shared Use)

Shared Use

Left (before filling) Right (after filling)