ADDING ADDITIONAL MATERIALS TO ASPHALT-CONCRETE MIXTURES TO INCREASE ITS STRENGTH

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Abstract. This article talks about adding additional materials to asphalt-concrete mixtures and increasing its strength. Asphalt concrete is one of the construction materials with a complex structure. Its complexity lies in the fact that its properties depend on various factors and undergo drastic changes as a result of the temperature of the weather. These properties of asphalt concrete are unique from other building materials used in road construction.

Key words: asphalt concrete, mineral powder, strength visco-plastic state, deformation properties of asphalt concrete.

Annotatsiya. Ushbu maqolada asfaltobeton qorishmalariga qo‘shimcha materiallar qo‘shib uning mustahkamligini oshirish haqida so`z yuritilgan. Asfaltobeton strukturasi murakkab bo‘lgan qurilish materiallari sarasiga kiradi. Uning murakkabligi shundan iboratki, uning xususiyatlari rangbarang faktorlarga bog‘liq bo‘lib ob-havoning xarorati natijasida keskin o‘zgarishlarga molik bo‘ladi. Asfaltobetonning bu xususiyatlari yo‘l qurilishida qo‘llaniladigan boshqa qurilish materiallaridan o‘ziga xosligi bilan alohida ajralib turadi.

Kalit so‘zlar: asfaltbeton, mineral kukun, mustahkamlik qovushqoq - plastik holatini, asfaltbetonning deformatsion xususiyati.

Аннотатция. В данной статье рассказывается о добавлении в асфальтобетонные смеси дополнительных материалов и повышении их прочности. Асфальтобетон относится к строительным материалам со сложной структурой. Его сложность заключается в том, что его свойства зависят от различных факторов и претерпевают резкие изменения в результате температуры погоды. Эти свойства асфальтобетона уникальны по сравнению с другими строительными материалами, используемыми в дорожном строительстве.

Ключевые слова: асфальтобетон, минеральный порошок, прочностное вязкопластическое состояние, деформационные свойства асфальтобетона.

Road construction materials are selected before the construction of highways and road structures. When choosing road construction materials, it is necessary to take into account the conditions under which highways and structures will operate and how they can withstand external forces. It is impossible to choose materials for road construction without knowing in advance the deformations that occur in the road surface due to traffic, that is, the geometric changes and the relationship between these changes and stresses. Therefore, it is necessary to know in advance the indicators that represent the composition, structure, chemical, physical and mechanical properties, technology and usage characteristics of the materials necessary for the construction and repair of highways and structures.

Asphalt concrete is one of the construction materials with a complex structure. Its complexity lies in the fact that its properties depend on various factors and undergo drastic changes as a result of the temperature of the weather. These properties of asphalt concrete are unique from other building materials used in road construction. Asphaltoconcrete is characterized by its visco-plastic state at positive weather temperatures and vice versa at negative temperatures.

Asphaltobeton has useful and negative properties. The useful properties of asphalt concrete are as follows: it is very strong at its elastic limit, it is resistant to bending and deformation and it has the ability to absorb vibration forces generated by transport. Asphalt-concrete road can be put into use in a short time, repair works are carried out quickly and simply. The negative properties of asphalt concrete are as follows: as a result of the erosion of organic binding materials in asphalt concrete, asphalt concrete is also eroded.

Under the influence of the external environment, asphalt concrete changes its elastic properties, and as a result, cracks appear on the surface of the road.

Construction work depends on the weather and the mentioned shortcomings lead to high cost of construction work.

The classification of asphalt concrete is as follows:

1. During the laying of hot asphalt-concrete joints, the temperature is 120-1600, the compaction temperature is 90-1600C. Bitumens with high adhesive properties - BND 40/60, BND 60/90, BND-90/130 - are used for hot asphalt-concrete surfaces.

2. The temperature during the preparation of warm asphalt concrete mixtures is 90-1400C, the temperature during laying is 70-1000C. the condensation temperature should not be less than 60-800C. Bitumens with medium viscosity (BND 130/200, BND 200/300, SG 130/200) are used in the preparation of warm asphalt-concrete mixture.

3. The temperature during the preparation of cold asphalt concrete is 80-1000C. the temperature during laying and densification should be 5-400 C. Cold asphalt concrete pavements are made by using liquid bitumen (MG 70/130 or SG 70/130) belonging to medium-absorbing or slow-absorbing (ST or MG) classes according to GOST 11955-74.

Mixed classification. Such materials are classified according to several main parameters that are directly related to the composition of the mixture and the properties of its components. First, they are classified by the types of mineral components:

• Type A. This letter symbol indicates that the percentage of crushed stone in this type of material is from 50 to 60%.

• Type B. In this form, the percentage of crushed stone is already reduced and varies from 40 to 50%.The further away from the beginning of the alphabet, the smaller the proportion of the mineral component. In this type, it varies around 30-40%.

• Type G. This material, unlike all of the above, does not contain crushed stone, but sand. Usually this is sand obtained during grinding or a mixture with natural sand. But in any case, the share of natural sand does not exceed 30 percent.

• Type D. This material is based on natural sands and a mixture of natural sands with crushing screening, provided that the mass fraction of natural products does not exceed 70%. [2]

Asphalt concrete has typical differences in fractional aggregates. They are shown in the table below. In this case, the cold varieties of the material are only fine-grained or sandy. Hot mixes are divided into categories based on the degree of residual porosity. This indicator shows the percentage of the number of pores in the coating. This is shown in the table below.

Cold varieties of mixtures have a residual porosity of 6 to 10%. According to the mass composition of gravel or gravel, hot mixtures are divided into the following types.

type a - 50/60%;

type b - 40/50%;

type c - 30/40%;

Cold analogues in gravel or rubble are divided into Bx and Bx types according to this indicator. According to the type of sand used, hot and cold asphalt concrete is divided into the following categories. Write G or Gx. Used crushing screening or its mixture with natural sand (not more than 30 percent). Enter D or Dx.

Use natural sand or its mixture with screening grinding (less than 70 percent). Depending on the raw materials used, as well as physical and mechanical qualities, hot road airfield asphalt mixtures and asphalt concrete are divided into the types shown in the table. Cold mixtures are divided into the following categories.

• Bx and Bx types - enabled brands m-I and M-II;

• Gx turi - for M-I and M-II brands;

• Type Dx may be labeled M-II

One of the main properties of asphalt concrete is its mechanical properties (shrinkage, creep, bending, sliding, abrasion), the long-term durability of the material, the size of the deformation property should be taken into account. Water resistance of asphalt concrete: long-term wetting of asphalt-concrete pavements weakens their bonding, causes mineral particles to crumble, reduce the strength of the pavement and cause the pavement to crumble.

Frost resistance: in winter, water in asphalt concrete pores turns into ice, its volume expands by 8-9%, as a result, the pressure increases by 20 MPa. During autumn and spring, the asphalt concrete pavement is often frozen and thawed, resulting in deterioration of the asphalt concrete.

Granite and dolomite are water-resistant rocks, so it is suitable for use in asphalt-concrete mixture. [3] Frictional strength. As a result of car movement, asphalt concrete pavement wears under the influence of friction.

Corrosion is caused mainly by the friction of the filling elements, that is, by the strengthening of sand and pebbles. The higher the density of the coating, the higher its abrasion resistance. The unevenness of the surface of the asphalt-concrete pavements makes it easier for cars to move, makes it easier to brake, increases safety and also depends on the coefficient of friction.

If the friction (coefficient) is less than 0.4, the risk of an accident increases, if it is higher than 0.4-0.5, safety action is ensured. Increasing the coefficient of friction is divided into 2 depending on the temperature level and brand.

• Hot

• Cold.

It is divided into 3 depending on the porosity.

• dense pore-residue 2-7%

• pore-residue 7-12%

• high residual pore 12-18%

Asphalt-concrete mixtures are gravel and sand, divided into 3 depending on the size of mineral materials.

• Large particles size - up to 40 mm

• Small particles size - up to 20 mm

• Sand particles size - up to 5 mm.

Asphalt mixtures are divided into types. The product depends on the strength of the stone material used in it. There are 2 brands in total: Second. 800-1000 rubble is used for this product.

The first. For the first stamp, 1000-1200 crushed stones are used. The following classification refers to the mineral composition. Depending on the material used, mixtures are divided into: Sandy. Gravel. The mixture can also be classified according to the temperature at which it is laid. Depending on the temperature regime, the following 2 types are distinguished:

Cold. When laying such a mixture, its temperature should not be lower than five degrees.

Hot. The temperature of such a mixture during installation should not be lower than 120 degrees.

In the production of asphalt concrete, waste from pebbles obtained by crushing natural stone materials (fraction from 0 to 5 mm) is used as fine-grained sand.

GOST 12801-98 «материалы на основе органических вяжущих для дорожного и аэродромного строительства» after checking and studying the variety of materials used in the calculation of the composition of asphalt concrete, the composition of grains, the brand of strength according to the degree of crushing, quality and all physical and mechanical properties The amount of inert materials for 1000 kg of hot asphalt concrete is calculated according to the requirements specified in the publication document.

In order to choose the composition of the asphalt-concrete mixture and use it, it is necessary to pay attention to the following:

1) Each mixture should have some binder in its composition,

2) Asphalt concrete with small particles should contain 25-30% of particles with a size of 1-5 mm, because the displacement of asphalt concrete increases in hot days.

In order to increase the shear strength of the asphalt-concrete mixture, it is possible to use hard-to-grind artificial sand-stone instead of large-scale use of crushed stone. When asphaltic concrete contains an excessive amount of binder, cracks appear on the surface of the pavement. It is necessary to pay special attention to the design, that is, to the calculation of the amount of materials included in the mixture and to the determination of the quality of asphalt concrete. Accordingly, the composition of asphalt concrete is determined.

Asphaltoconcrete fillers under design must satisfy not only the technical conditions, but also the conditions set in the projects. Also, the most necessary one is selected from several materials with standard sizes. Binders are selected based on their adhesive properties. After determining the quantities of mineral mixtures and binders, a mixture that fully meets all construction and technical conditions is obtained.[5]

Many years of experience in the construction of asphalt concrete pavements show that if the technological process of preparing a hot asphalt concrete mixture from selected materials is carried out correctly, that is, if the production technology is carried out at the required level, it will be durable for a long time, regular traffic there is a coating that insists on the speed of movement.

The design of the asphalt concrete composition is carried out based on the technical assignment, in which the type of asphalt concrete, the conditions of use and application, the characteristics of mineral powder and binders are studied, and according to the results obtained, the current GOST 12801-98 “материалы на

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