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Based on Road Building Constructions Used on Roads in Selected Cities and Districts

Qo'ysinaliyev Nuriddin Zafarali o'g'li
Teacher (Namangan Engineering and Construction Institute, Uzbekistan)

Jo‘rabayev Oybek G‘aybullo og‘li
Master student (Namangan Engineering and Construction Institute,Uzbekistan)

Meliqo’ziyev Akramjon Hakimjon o’g’li
Master student (Namangan Engineering and Construction Institute,Uzbekistan)

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ABSTRACT

In this article, we can take into account the methods used in the construction of the base coverings of our roads that are being built and used in the city of Namangan and our districts, and as a result, it is aimed to extend the service life of our roads and increase the coefficient of use when in use.

The climatic conditions of Uzbekistan, the construction and use of asphalt-concrete pavements on highways require an approach in accordance with the requirements of SHNQ 2.05.02-07 and QMQ 3.06.03-96. Asphalt-concrete coating is negatively affected by sunlight, high temperature, wind, rain, snow, and days of temperature passing through °C. First of all, this causes changes in the chemical composition, viscosity and brittleness of the organic binder under the influence of oxygen appearing in the upper layer of the asphalt concrete coating.

The long-term experience of using such coatings shows that in some cases they do not reach the service life specified in the project, because the changes due to deformation in dry and hot climates are not well studied and they are not treated separately due to the local climate. Also, the coefficient of linear temperature expansion of organic binders and mineral fillers in asphalt concrete is a factor that leads to pavement damage.

Two structural solutions are offered to maximize the effectiveness of geogrid layers as a widely used road material:

- geogrid laying solution (against temperature) between upper and lower asphalt concrete layers;
- Laying a geogrid between the block base and the layers (layer) of asphalt concrete lying above - (structural solution).

Asphalt-concrete reinforced concrete road surface is calculated according to MQN 46-2008. The resistance to stretching of the asphalt concrete layers on the block base when bending due to the additional traffic load is checked.

Advantages of geogrid:

- Reducing the formation of pits, pits, ridges, shears and other deformations of the road by increasing the traction force of the asphalt pavement and ensuring the uniform distribution of stress over a larger area.
- Prevention of recurrence of fatigue cracks reflected from old layers of asphalt concrete pavement to new layers
- Reducing the thickness of the asphalt concrete coating layer

The geoset has one or two axes depending on its preparation. Therefore, these types of fences are rarely used. However, they are very important in piled (sand soil base) layers.

Geogrids of arbitrary structure differ from each other according to the level of voltage acceptance and operational properties.

The following main strengthening methods are used to restore smoothness and increase the load-carrying capacity of asphalt-concrete pavements with geogrid materials:

- to build a reinforced layer of asphalt concrete mixture on top of the geogrid material lying on its surface without destroying the integrity of the old asphalt concrete coating;
- Laying the reinforcing layer of the asphalt concrete mixture on the leveling layer and the geogrid. The leveling layer can be laid on the old asphalt concrete pavement or on the milled pavement.

Working properties. For laying the geogrid material, the surface of the asphalt concrete pavement must be flat, clean and dry. Cracks larger than 3 mm should be sealed. If there are a large number of pits and fractures, a leveling layer is laid on the surface of the coating or irregularities are eliminated by milling. After milling the paving from asphalt concrete, the possibility of laying the geogrid directly on the milled surface or the need to lay an additional leveling layer of asphalt concrete is determined. The necessary depth of milling and the transverse slope are taken depending on the average depth of the damaged part of the surface of asphalt concrete. All geonets have a special protective layer, which improves their physical and mechanical properties. As a result, the material is resistant to deformation and increases its strength. Pre-cleaning of the entire surface of the mesh to be repaired, if the thermal cracks, which are common in old pavement, are 4 m or less, and the surface of the mesh of the cracks is up to 20% of the section to be repaired. (Cleaning from dust and oil, filling pits and cracks larger than 3 m) and the binder is laid after pouring. When there are cracks caused by temperature, caused by the transport load, located at a distance of more than 8 m, it is advisable to lay nets in the places where the cracks are located, and especially on it. The width of the created layer cannot be less than 1.5-2.0 m, and it is implemented after filling the cracks. Geonet is highly resistant to environmental influences, especially moisture and ultra-light of the sun. When preparing the repaired pavement, it is cleaned of mud and dust, all pits and wheel marks are removed, and large cracks (wider than 3 mm) are closed. If these works are not carried out, the layers of asphalt concrete will not firmly connect with each other and with the geogrid, the desired effect will not be obtained from the introduction of the geogrid into the road structure.

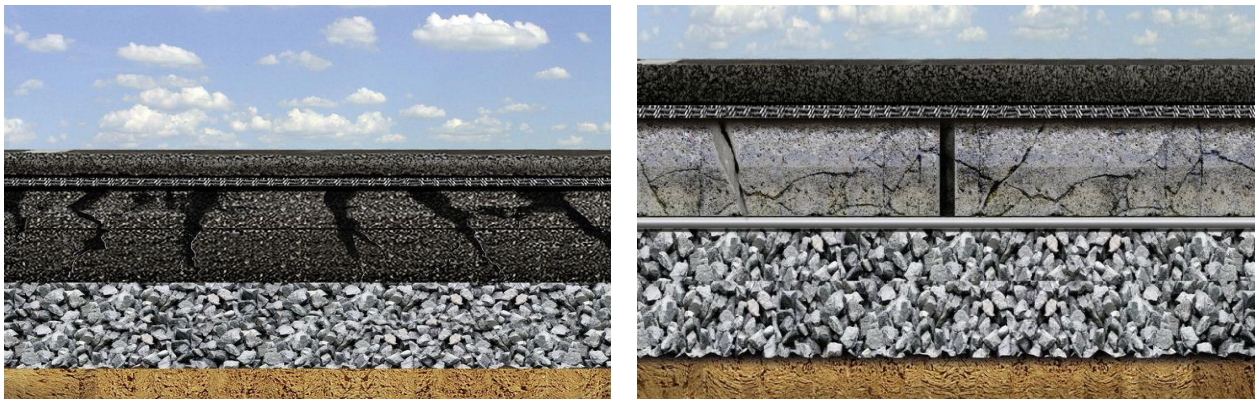

Figure 1. Acceptance of geogrid loading

Traditional flexible roads are built using bituminous materials and granular materials in the upper part of the soil layer. Generally, four types of failure can occur in flexible coating: surface deformation, cracking, spalling and surface defects, where surface rutting or permanent deformation and fatigue cracking are the two main structural failures. A weak subgrade and subgrade is usually the cause of surface cracking when concentrated loads are applied. A number of reasons, such as drainage problems, subgrade weakness, and poor subgrade stiffness, can lead to pavement failure, resulting in uneven load distribution across the subgrade. All of these road disturbances reduce pavement performance and shorten pavement life. Designing and constructing a road on weak and wet subsoil that cannot provide strength is always a great challenge for the pavement geotechnical engineer. One cost-effective way to solve the problem and improve the performance of flexible pavement is to use geogrid reinforcement. In addition, geogrid is an environmentally friendly material that has been studied and widely used as reinforcement for the past two decades. Geogrids not only provide reinforcement to road structures, but also have benefits including reduced crack damage, increased modulus of elasticity, and improved road drainage. Using geogrids, the thickness of the base layer can be reduced and the service life of the coating can be extended. However, while geogrids may be beneficial for flexible roads, there is currently no clear analysis of the factors affecting geogrid performance. These factors may include geogrid stiffness, geogrid opening and rib shape, diaphragm and rib dimensions, geogrid placement depth, hot mix asphalt thickness, base aggregate quality, stiffness thickness, and subgrade stiffness. A popular and widely used material in road construction

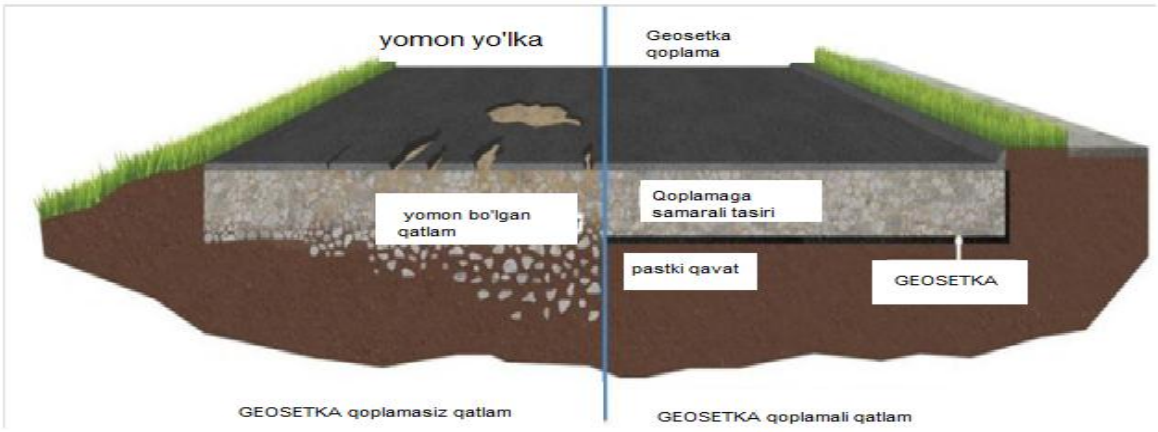

Figure 2. Comparison of pavement with and without geogrid

Geogrids only allow liquid flow to pass through their plane and prevent soil particles from moving to other layers. Helps prevent water remaining in the coating system. This hydraulic and

gas barrier can restrict and minimize flow and movement in the horizontal direction. The last main function of the geogrid is strengthening. Geogrids provide the ability to stabilize the soil-geogrid composition through enhanced compressive forces.

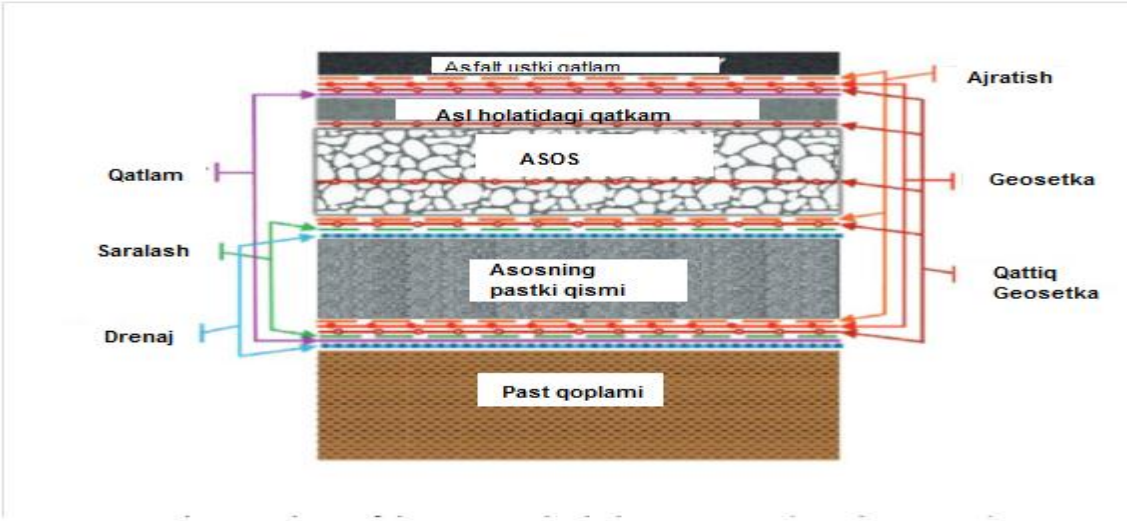

Figure 3. Application of geogrid by layers

Introduction of geogrid Geogrids made of polypropylene or polyethylene are one of the most widely used geogrids, mainly used as reinforcement in geotechnical construction. Most geogrid materials are two-dimensional and can provide reinforcement on one surface. They, in turn, give power in two directions and three directions. Diaphragms of different shapes cause differences in their properties. Double-sided geogrids have a rectangular opening. Due to its high resistance to short-term and moderate dynamic loads and long service life, it is popular all over the world. The force is not the same in both directions, because the length of the ribs of the geonet is not equal in the two directions. The shape of the diaphragm for the geonet is triangular, which is the most stable and widely used shape in construction.

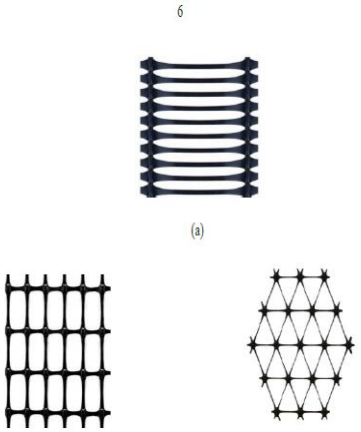

Figure 4. Three types of geogrid: (a) unidirectional geogrid; b) two-way geogrid; (c) three-way geogrid

Conclusion: In addition to reinforcement, geogrid materials can also provide a boundary between soil layers and the base layer and geogrid. In addition to reinforcement, geogrid materials can also provide a boundary between soil layers and the base layer and geogrid. Microcracks in the asphalt pavement are not treated in time, and water quickly penetrates into the microwave pavement layer, damaging the asphalt pavement and posing a hidden danger to

the roadbed .In a sense, asphalt pavement is a solution to the problem of water drainage and waterproofing, so the use of fiberglass mesh is very important.

Conclusion: When reinforcing cement concrete coatings with asphalt concrete layers, the reinforcing layer device is made of "Armdor" Geosetka). The geogrid absorbs some of the compressive stresses caused by temperature and traffic loads and slows the development of cracks reflected in the upper asphalt reinforcement layer in the expansion joint zone. The technology for strengthening cement concrete pavement with asphalt concrete reinforced with "Armdor" geogrids includes the following operations:

- cleaning the coating from pollution;
- elimination of defects in cement concrete coating (leveling of the surface, replacement of damaged parts of slabs, repair of edges and corners of slabs and expansion joints, sealing of joints and maintenance of cracks);
- Pouring binder on the surface of cement concrete coating in places where geogrids are planned to be laid;
- delivery, cutting, laying, tensioning and fastening of the geogrid;
- repeated pouring of binder on the geogrid laid on the pavement;
- Distribution and compaction of the asphalt-concrete mixture into layers of the required thickness.

The used cement concrete coating is cleaned of dust and dirt using mechanical brushes, compressed air from compressors, watering machines and, if necessary, dried. The surface is leveled in places where there are holes, voids, significant cleaning and other defects of the cement concrete coating, which prevents tight contact with the geogrid and adhesion to the asphalt concrete reinforcing layer.

Depending on the condition of the coating, there are different methods of its preparation: elimination of irregularities by milling the coating. In this case, it is preferable to use milling machines that cut irregularities with a set of diamond discs without destroying the microstructure of cement concrete prepared for reinforcement. When using machines with cutting tools made of hard metal alloys, the quality of the prepared surface is significantly lower;

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