

**Ecopolis**  
**Development of technologies in**  
**road construction**  
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# Development of technologies in road construction

The roads are more and more considered as indicators of the development status of countries or regions. Besides the dry figures show the density of roads per 100 km<sup>2</sup> of territory or of its expansion, calculated at 1000 persons of the population, are becoming increasingly important and the convenience of the road for those who use them.

The presence of gas stations, parking lots, service, motels and emergency as well as communication and information services and especially the quality and condition of the road surface, is now more and more often the "business card" of a country.

The condition of the roads is a priority for the road construction organizations. Not in time eliminated roadway damages are not only the result of further destruction of the coating but also to a greater risk of accidents. Nowadays, two methods are used in road construction which are considered high-tech technologies, namely the construction with asphalt and cement that each of them having technical advantages and disadvantages. In Russia as well as in other industrial countries new roads mostly are built with asphalt coatings. The main reasons for this technology are simple renovation, recycling of asphalt, the pavement laid in a relatively short time and a number of other factors including economic ones. Repeated attempts in declaring one of the two types of road surfaces as only the correct one and to explain the construction of other type of coatings to break down will not include the full complexity of the problem as entirely based on a local analysis.

Before deciding on the type of covering important data on traffic density, composition of traffic, weather and groundwater conditions, availability of raw materials and the possibility of using the necessary technical equipment are to be considered.

It should not be forgotten to discuss the likely hood of significant changes in the prices of bitumen and cement, which can bring a change of priorities in the road surface depending on the conditions of profitability for a particular region. The increasing and changing traffic flows always require unwavering new types of asphalt for the outer layers in road constructions. There must be more attention in the implementation of specific technologies that are given in the construction phase. It is impossible to achieve high-quality coatings with a random set of mobile machines, if they are also contemporary and highly technological.

The basis for a sustainable high quality of the road network is the application of modern technologies and appropriate materials, in some cases, with specific characteristics.

# Modern Technologies in Road Construction

The technology that we offer do include not only technical but also cost-effective solutions and they ensure a more reliable and continuous use of the roads. She is quick and good ecological solution in the field of construction and repair of highways and of dirt roads, playgrounds, parking areas, airports, flood embankments, cycling, forest and country paths and of paths in the recreation areas etc.

## The stabilizer

The stabilizer is a chemical solution soil with good mixing of the saturated surface layer and improves the physical and chemical properties of the soil there. Its density and durability is much higher than before the treatment with this solution. This is mainly done by long-term changes in the compounds in the colloidal particles after the treatment of the ground. Capillary penetration of moisture is prevented in many applications. In the treated soil, the resistance increases to the pressures, wear of the surface area increases by at least  $E > 120 \text{ MPa}$  and  $E_2 > 200 \text{ MPa}$  to  $> 450 \text{ MPa}$  to  $E_2$ .

# Technology

Soil stabilization and processing of the surface layer of the soil to a depth of 35 to 40 cm is performed with recyclers. In applying the stabilizer for the soil stabilization by forming a monolithic surface is added which has the following characteristics:

- water and cold resistance;
- Resistance to deformation;
- Resistant to cracking.

The consumption of the stabilizer is - 1L for 7.5 m<sup>3</sup> paved floor or 20L on 1000m<sup>2</sup> of the structural surface of the coating (h = 0.15 m). Usance of the substance is carried out in a liquid solution. As catalysts various types of inorganic binders are used, such as: 1-5% 8-15% cement, ash and slag, waste and gravel, etc.

This method has the following advantages:

The possibility to build a durable, dust free and resistant formation of ruts in the roads, the construction is the removal of unstable ground, machined surface with gravel, cement and stabilizer has elastic properties.

There is a way to track the performance of the work to strengthen weak on unstable surfaces and it helps to ensure avoiding the construction of alternative roads. The stabilizer is a surfactant. Its effect is to create a permanent chemical mineral from the skeleton, available in the soil elements.

Powerful catalytic - binding - process that occur as a result of redox reactions in the soil under the physical and chemical processes of soil stabilization and the formation of rocky deposits in the crust, but with a significant time difference.

Advantages of using this technology:

Up to 50-60% lower costs for the construction of roads,  
up to 40-70% increase of wear resistance of the road surface,  
up to 20-50% lower costs for road maintenance.

