

PROBLEMS OF DRAINAGE OF STORM WATER IN URBAN CONDITIONS

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Abstract: the article deals with the current problems of developing a stormwater management system for large cities. The characteristic features of storm water management systems proposed by western urban planners are considered. These include: the use of green infrastructure; collection and treatment of storm water within the city; use of green roofing and porous coatings in infrastructure facilities. The factors influencing the choice of one or another stormwater management system for the entire city or a specific location are presented.

Keywords: storm water, drainage, road construction, urban planning, waste water.

ПРОБЛЕМЫ ОТВОДА ЛИВНЕВЫХ ВОД В ГОРОДСКИХ УСЛОВИЯХ

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Аннотация: в статье рассматриваются актуальные проблемы разработки системы управления ливневыми водами для крупных городов. Рассмотрены характерные особенности систем управления ливневыми водами, предлагаемых западными градостроителями. В их числе: использование зеленой инфраструктуры; сбор и очистка ливневой воды в пределах города; использование зеленых кровельных и пористых покрытий на инфраструктурных объектах. Приведены факторы, влияющие на выбор той или иной системы управления ливневыми водами для всего города или определенной локации.

Ключевые слова: ливневые воды, водоотведение, строительство автомобильных дорог, градостроительство, сточные воды.

Active urban construction leads to a rapid increase in the number and area of asphalted objects (roadways, sidewalks, parking lots, pedestrian areas) that do not have drainage properties. During heavy rains, this situation leads to floods. At the same time, in suburban conditions, there is no such problem due to the insignificant amount of waterproof surfaces. Flooding during the rainy season in large cities leads to disruptions in the operation of infrastructure facilities, accidents, and traffic difficulties. Negative consequences could be avoided in the presence of a well-designed storm flow control system and limitation of the area of waterproof surfaces [1]. Such systems require significant financial investments, but their effectiveness in combating possible floods is undeniable.

A study of the current situation with stormwater management in Tashkent shows that the current urban stormwater drainage system is ineffective, since it does not provide an opportunity to adequately manage wastewater, remove it and discharge it into the natural environment with a large amount of precipitation [2]. When planning and constructing road networks, it is necessary to provide for the presence of drainage systems. But in reality, this requirement is often ignored. This is explained by the economy of financial resources, insufficient attention to this problem on the part of the city authorities, as well as the use of only the traditional approach to waste disposal (that is, only outside the city). In Western countries, alternative methods of solving the issue of storm water drainage are being actively introduced. Here are just a few effective directions:

- use of green infrastructure;
- collection and treatment of storm water within the city;
- the use of green roofing and porous coatings in infrastructure facilities.

The variety of ways of organizing the storm water management system must obey the procedure for finding the optimal solution [3]. At the initial stage, it is necessary to formulate the factors influencing the choice of the most effective solution. First of all, when choosing a design, one proceeds from an economic criterion. In addition, operational, hydraulic, social, technical, aesthetic, geographic and environmental criteria must be considered, each of which is broken down into subcriteria. Such factors are determined in the course of a detailed study and generalization of information on the principles of waste management in megalopolises. On the

one hand, information can be obtained from literary sources, on the other, it is necessary to take into account the proposals of specialists working in the field of water supply and sewerage. It will be useful to listen to the opinions of people whose interests may be affected by the implementation of the decision. The priority should be the vision of the problem by the residents of the city and the operators of the storm water management system, and in some cases the point of view of tourists and ecologists will be useful.

Since the problem of storm water drainage is quite difficult to solve, and the number of ways of its possible solution is large, it is advisable that those options, the introduction of which is unjustified from a technical and financial point of view, are excluded from the analysis in advance. This will significantly reduce the number of structures under consideration. Implementation of this approach to planning future drainage infrastructure will help to reduce the number of pairwise comparisons of important structural elements required. This, in turn, will help significantly save time when searching for the optimal stormwater management system. As for the design of the structure, when choosing it, one can proceed from the peculiarities of its location. For example, it is recommended to study the soil and water characteristics of the area, take into account the area that the future drainage facility will occupy, consider the method of storm runoff management and the total catchment area.

References / Список литературы

1. *Adujna D. et al.* Evaluating the hydraulic capacity of existing drain systems and the management challenges of stormwater in Addis Ababa, Ethiopia // *Journal of Hydrology: Regional Studies*, 2019. T. 25. P. 100626.
2. *Salimova B.D., Makhkamov B.R.* On improving the system for collecting and removing storm water from highways in Tashkent [O sovershenstvovanii sistemy sbora i otvoda livnevnyh stokov s avtomobil'nyh dorog v Tashkente] // *Universum: technical sciences [Universum: tekhnicheskije nauki]*, 2020. № 1 (70).
3. *Kordana S., Słyś D.* Decision Criteria for the Development of Stormwater Management Systems in Poland // *Resources*, 2020. T. 9. № 2. P. 20.