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Zones of multifunctional public underground space in the new master plan of Moscow

Olga Glozman [a,*]

[a] *RAACS, Moscow, Russia*

Abstract

The article features scientific research work conducted by the author aimed at creating methodology of functional zoning of the underground spaces of the cities. Implementing of this methodology into the process of drafting town planning documentation on Moscow allowed defining the zones of underground spaces on the territory of Moscow which should be reserved in advance in order to be used later for municipal functions. In the course of the academic research work 41 zones were defined by analyzing the entire territory of the city. The methodology of identifying underground territories of the city which can be reserved in the town planning documentation for municipal functions implies consequential comparison of preconditions and restrictions of various levels. All preconditions and restrictions (factors) are differentiated depending on the scale of researched territory and demanded division into three groups. The methodology was fully applied on the territory of Moscow, the analysis becomes more detailed on each stage of the process and new factors were added. Each factor if graphically represented on the map of a city at an appropriate scale: 1:10000, 1:5000, 1:2000. The catalogue featuring the addresses of the zones where it is planned to place multifunctional municipal underground objects was prepared on the grounds of the conducted analysis. 11 zones were defined as suitable for top priority reclamation. Architectural and planning concepts were worked out for these zoned, technical and economic indexes were defined and the engineering workload was calculated. As a result of the conducted research work long range territories for utilizing the underground space were defined and detailed conceptions were prepared for the investors. The results of the research work will be applied to the methodology of developing urban planning documentation. The new master plan for Moscow is being worked out at the moment. For the first time in history the master plan features zones of multifunctional municipal underground spaces.

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* Corresponding author. Tel.: +7-495-629-50-54.
E-mail address: olgasemenova77@mail.ru

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1. Introduction

The research problem is the absence of a stated theory of urban use and development of underground spaces. At least 60 % of the underground space of Moscow is utilized and there are not many free areas left. In order to be able to use some of the underground territories for municipal needs in the future we should define the borders of the new underground territories and impose town-planning restrictions on them. The only town-planning restriction for the construction of underground space is represented by the red lines, but this limitation is relative since it doesn't preclude the laying of communications.

Restrictions on the use of territories are defined by town planning regulations in the town planning documentation of Russian Federation. According to the town planning code of Russian Federation, town planning regulation determines the legal status of land plots as well as the legal status of everything that is on and under those land plots and is being used in the process of site development and the following exploitation of the objects of capital construction. In order to define the zone and apply town planning regulation to it, we need to carry out functional zoning of the entire territory of the city. At the moment there is no methodology of functional zoning of the underground spaces in the world town planning theory and practice.

The methodology of the conducted study is described below. In the course of the academic research work conducted under my guidance a methodology that is aimed at defining the underground territories of the city which are fit to be reserved in the town planning documentation for the future municipal use was enunciated. This methodology allows identifying the demand and defining the underground space aimed at multifunctional municipal use at any stage of town planning process from master plan to the draft area plan. The methodology was described in detail in a separate research paper [1].

According to the proprietary methodology in order to draw out the zones of the city where there is demand and the possibility of placing objects of multifunctional municipal underground space we need to conduct comprehensive assessment of the socioeconomic, transport, economical, architectural, town planning, engineering-geological, ecological and natural environment and climatic factor. The factors that represent preconditions and/or restrictions are subject to the comprehensice assessment. These factors must be differentiated in accordance with the scale of the researched territory and necessary specification.

The assessment is conducted on a stage-by-stage basis. Each further stage several the factors are added the territory is studied in a more detailed manner. The first stage implies analyzing the entire territory of the city, the nest stage only a certain part of the city is subject to analyze and the third stage reduces the researched territory to a few blocks. Preconditions and restrictions are graphically featured on the maps of appropriate scales. Each factor is graphically represented on the map of a city at an appropriate scale: 1:10000, 1:5000, 1:2000.

2. Introduction

Architectural and town planning factors are researched in a more detailed manner on the third and on the fourth stage. The borders of placing the object are defined which depend on the existing underground engineering communications and the stations of the underground railway system. These stages feature the research into whether it is possible to combine the planned objects with the existing objects of the underground space and with the objects that are being designed at the moment. At this stage the special aspects of the development of the aboveground territories and objects. The possibility of connecting the underground objects with the above-ground territory is also studied.

The research was conducted on the territory of Moscow and was based on the developed methodology. The research is aimed at forming functional zones of the underground space on the map of functional zones of the site plan of Moscow. The research process is described below. The catalogue featuring the addresses of the zones where it is planned to place multifunctional municipal underground objects was prepared on the grounds of the conducted analysis. By analyzing the entire territory of the city we defined 41 zones and each of them was added to the master plan of Moscow and represented in the rules of the land use and development.