

CLUSTER MOBILE DWELLING

Maslov Farkhat Borisovich*Farxad.maslov@bk.ru*

Eurasian National University name L.N. Gumileva, Faculty of Architecture and Civil Engineering, Department of Engineering Graphics, undergraduate student, Astana, Kazakhstan
Supervisor: Doctor of Pedagogical Sciences., Ass. Professor, Samuratova T.K.

Modern architecture is increasingly moving away from the notion of the tectonicity of its image, which gave it centuries-old firmness. In her striving to catch up with the constantly changing realities and the always hurrying and searching for a new person, she (the architecture) is also becoming more and more mobile: changing, adaptable, interactive, moving, finally.

In earlier publications [1-4], the question of the essence of the notion “Mobility” in the modern world and the main characteristics of a possible modern mobile self-adaptive housing has already been considered. In this article I would like to dwell on such a single moment as a human dwelling in the context of this concept.

Each time and each new generation of architects and engineers, at any stage of the accomplishment of the new scientific and technological revolution, offered their own unimaginable concepts of human dwelling for an alternative present and possible future. Here it is necessary to mention such theorists of mobile and futurological architecture as: I. Fridman, P. Maimon, group "7" consisting of K. Kikutake, N. Kurokawa, F. Maki, M. Otaka, N. Kavadzoe and K. Tanga, ARCHIGRAM group, Guy Gautier, D. Riedelbach, G. Krutikov, N. Ladovsky, K. Melnikov, N. Saprykina, E. Izrailev, L. Neyfakh, K. Kartashova, S. Pamorova and others, this sphere is human activity remained almost at the level of theory. In modern life, of the entire set of possibilities laid down in the concepts of the aforementioned authors and opened up by mobility, almost one hundredth of them are used.

This project, being the development of the author's concept “Guest City” [5] as an element of a residential unit, as well as an independent object, is based on the principles characteristic of the whole community of modern mobile architecture. The project was based on the following initial tasks defining its typological matrix:

1. Versatility. The projected object must be able to be used in various climatic and socio-cultural conditions, while the self-adaptive properties of the object are expanded by applying various additional structural or auxiliary elements that are part of the general production system and either supplied as standard under certain conditions or purchased separately as specific needs arise.

2. Transformability. The projected object must have the ability to transform at several levels: volume, planning, functional.

3. Planning flexibility. The projected object must have the originally incorporated possibility of a quick change of the planning solution, which does not require additional costs and the use of special heavy or high-tech mechanisms.

4. Transportability. Given the inherent possibility of transformation, the designed object should have minimum transport dimensions, allowing at the same time to obtain the maximum operating volume. At the same time, the structure of transformation should take into account the possibility of the functional use of free internal space in the transport position.

5. Polyfunctionality. The projected object should not have severe restrictions on the functional use (operation) of its elements.

6. Adaptability. The designed object should have the possibility of flexible configuration: configuration changes, overall dimensions, functional diagram, etc. depending on the needs of the owner. The operation process is controlled by a predetermined program (user interface) or mechanically.

On this paradigm, the Cluster Home project is based - a mobile transformable precast residential cluster-type cell. A mobile transformable precast residential cluster-type cell consists of a system of mono-or multi-functional blocks of an unclosed type, endowed with the possibility of transformation during the dislocation process and a set of intermediate separation elements. Having overall dimensions in the transport state of 1.6x1.6x0.8m, it makes it easy to carry out work on dislocation and assembly-disassembly at the home site without the use of heavy machinery and is easily assembled into sets of two (and multiple) elements. In the operating mode, the block size increases to 3.2x3.2x0.8m.

It should be noted separately that the overall width is equal to 0.8m, adopted on the basis of the provisions on ensuring comfort in accordance with modern requirements for ergonomic space. In this concept, this value is considered as a kind of universal Module, giving the initial (single) frame of reference measures. So the dimension in the transport state 1.6x1.6m is a two-time Module, which allows, firstly, to assemble the house-kits in a free order, regardless of their position in the volume of the means of transportation, and secondly, to use double-width cells to accommodate a larger internal equipment or the creation of larger free (universal) spaces. The concept also provides for the possibility of using smaller modules 0.4m wide for narrower technical equipment, 0.2m for distributing additional communications, and 0.1m for technological partitions and end faces.

Transformation of the blocks: the transition from the transport position to the operational position and vice versa, can occur both with the use of mechanical and electrical impulses. The connection of the blocks with each other is carried out through an electromagnetic lock.

Each unit can be made both in monofunctional and universal configuration. A monofunctional unit is understood as such equipment, when all the necessary equipment is built into the space of the unit or is attached with a separate set.

Polyfunctional unit can be performed in two versions. First, in the form of an empty circuit to install the necessary equipment, regardless of the block space itself. Secondly, in the form of a unit supplied with a set of universal or specialized pre-installed equipment or a unit with the properties of a mobile interior. Consumer is offered on the basis of their own wishes to form a necessary set of blocks.

All communications are bundled and equipped with contact elements. Given the ease of assembly / disassembly of such a mobile home, the owner at any time can change the planning configuration of his home by changing the relative position of the individual blocks, by purchasing additional ones or replacing them with new ones. The project also provides for the possibility of combining residential cells with each other, as well as the possibility of manufacturing enlarged or reduced blocks.

The block sizes used make it possible with equal opportunity to use both specially developed elements of interior design and furniture equipment, as well as standard furniture and interior items. The design of the cluster dwelling unit is designed for the fact that the pre-installed equipment and internal systems (screens, partitions, furniture, etc.) do not require dismantling during transportation, but fit into the dimensions of the internal space of the cell in its transport position. Thus, it can also be ensured and its partial functioning during the deployment.

The package can also include full-length autonomous life support modules (3.2x3.2x0.4-0.8-1.6m) designed for a specific time period. The module can have a standardized configuration or be formed using internal cluster installation of equipment (capacity, battery, filtration system etc.).

Internal functional modules can also be used, built-in or installed on the system additionally: solar panels on the roof and side walls, leveling panels with heating function in the floor space, equipment built into the wall: screens, folding equipment and furniture. A variant of an even more adaptive transformation of the interior of a cluster dwelling is being considered, when the main furniture will be formed from the elements included in the interior decoration of the premises.

Additional characteristics that are attractive for a potential buyer are: the choice of color for the whole house as well as for its individual blocks; rotate it both horizontally and vertically. Additionally, the necessary internal equipment and functional equipment are selected.

Subject to a detailed calculation of the carrier and protective functions of enclosing structures, as well as applying sealing rates, this system can be used in extreme conditions, including space research.

References

1. Panfilov A.V. Place of mobile home in the global structure of settlement. // Volga Scientific Journal, ed. Doctor of Technical Sciences, prof. E.V. Kuposova - NNGASU, N. Novgorod, 4/2008. - 270s. - p. 133-137
2. Panfilov A.V. classification model of a mobile home for temporary residence [Electronic resource] / A.V. Panfilov // Architecton: news of universities. - 2011. - № 34 Appendix. - Access mode: http://archvuz.ru/numbers/2011_22/017
3. Panfilov A.V. Evolution, features of development and classification basis for the formation of a mobile home for a temporary stay // Electronic Journal AMIT-№ 4 (17), 2011. (State registration number 0421100089).
4. Panfilov A.V. Mobile home: on the way from mobile to self-adaptive // Collection of scientific works of SWorld. Proceedings of the international scientific-practical conference "Modern directions of theoretical and applied research 2013". - Issue 1. Volume 43 - Odessa: KUPRIENKO, 2013 - 134 p. CIT: 113-0683 - p. 81-93
5. Panfilov A.V. Guest City. On the issue of introducing a mobile home system in the structure of the modern city. Sat mater All-Russian Scientific Industrial Corporation "Actual Problems of Construction, Ecology and Energy Saving in the Conditions of Western Siberia" - Publishing House TGSKA, Tyumen, 2009. - 280s. - p. 161-163