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## Methods of Reconstruction of Standard Five-storey Built-up Areas

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### Summary

The report describes a complex approach of reconstructing standard five-storey urban housing built in Ukraine in the 50-ies and 70-ies. This housing is noted for relatively low dwelling density as well as satisfactory environment in terms of ecology together with developed infra-structure and closeness of labour and recreation zones. The methods of both inventory-making of the existing dwelling built-up area and its complex reconstruction have been worked out. They give an opportunity taking into account for all peculiarities of built-up area under reconstruction including social and other problems to create highly comfortable up-to-date housing and to give 30-45 % increase in the housing space.

Reconstruction of the 5-storey standard dwelling built-up areas constructed in the 50-ies and 70-ies comes out as a most important problems of modernization and improvement of the existing housing in Ukraine. Such problem can be solved only provided a complex approach is applied with municipal engineering, ecological, spatial-planning, structural, architectural design, economical, social, organizational, technical, managerial and other tasks.

Many former outskirts of cities generally represented by standard five-storey dwelling built-up have acquired enormous urban value due to the fact that most of them are characterized by relatively normal ecological conditions, adequate network of urban transport system including underground communication, social commercial and public service, closeness of labour and recreation zones and, which is especially important, have a relatively low density of dwelling built-up area. All of these provide highly efficiently updating and reconstructing the existing built-up area. The complex method of five-storey building concentration developed by our organization will allow to increase the existing dwelling area in the above-mentioned territories which in many cases adjoin historical or planed centres of cities or centres of large planed or existing residential areas by 30-45 % without any practical need of demolition of the existing buildings and withdrawal of agricultural, recreation and other areas.



In particular, the complex method implies erection of tower and other buildings ranging from 2 to 16 floors in height on vacant plots of land or on grounds previously occupied by shabby dwelling buildings or other yard installations. The residents of surrounding five-storey dwelling buildings could be fully or partially moved to these new buildings. The vacated five-storey dwelling buildings could be heightened by 1-2 or 4-10 floors depending on their physical wear, normative requirements, structural concepts and a number of other factors. In the former case, the method of heightening being now referred to as the "attic heightening" implies resting of the heightened portion on the bearing structures of the building, while in the latter case the heightened portion is intended to be rested on the sub-frame (supporting structure beneath the superstructure). The latter method is based on the idea according to which the frame studs or other bearing structures are arranged on independent foundations (e.g. bored foundations) along the walls of buildings being heightened with the superstructure bearing components resting on the above studs above the level of the roof of the building. The structural concepts pertaining to the sub-frame and superstructure may vary depending on numerous factors.

It is also implied that in the process of superstructure erection the overhaul repair of the existing building will be carried out with the purpose of removal of moral and physical wear which would include modernization of the spatial-planning structure of the building, warmth-keeping jacketing, reconstruction of utilities, millwork, provision of water, gas, electricity meters in each apartment.

The experience concerning the development of design proposals for five-storey built-up area reconstruction has revealed a great variety of potential approaches to provision of highly comfortable dwelling conditions (one-, two- and even three-level apartments, large balconies, loggias, galleries, greenhouses, arts and other workshops, etc.).

Thus, in addition to mansard-type building-on, erecting a multi-storey one on independent foundations is proposed. It will widen the range of means which affect the formation of the most rational environment. In particular, variable-storey building-on will allow not only to improve architectural expressiveness of the five-storey dwelling built-up area but also to increase its density. All these promote reliable basis for most efficiently using space in the most prestigious city areas.

Today it is difficult to evaluate general efficiency resulted from reconstructing five-storey dwelling built-up areas, whose space is about 6,8 billion square metres only in Kharkov. However, according to our draft feasibility study, densening five-storey built-up areas via the proposed approach will bring about an increase in the existing housing of about 30-45%. Thus, it will yield some 3 billion square metres of total dwelling space what will save over 700 hectares of both rural land and expensive urban areas.

The value of additional areas gained by the method of heightening and annexing new dwelling spaces does not exceed 80 % of the cost of dwelling in newly-constructed buildings.

To manage the reconstruction, one should accomplish a complex inventorying of all the standard five-storey housing in the area according to the proposed approach. It will allow to work out zoning for every bunch of buildings being reconstructed.

Now measures to solve social problems resulting from the reconstruction are being considered what is of key importance in implementing any reconstruction project.