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### **The Corporate Scientific and Technical Complex of Town-Planning Power Reconstruction: architectural and historical development of Odessa in the 19th and beginning of the 20th centuries**

*Abstract:* Cities as a generation of human society have several millennia of their existence. Destinies cities are various and instructive: one has ceased to exist for a long time, others have grown till the huge sizes; one stay in oblivion, other steels world famous. The ancient history the majority cities clearly appears in character their lay-out and a silhouette. Each epoch and each society spontaneously or meaningfully transformed and adapted those cities which received in the inheritance from previous epoch for the requirements. The authors offer an analysis of Odessa “CSTC T-PPR”, as innovative organizational structure for reconstruction of buildings of historical building of Odessa under standards power efficiency. It is executed researches of historically-style development. Superstructures were carried out in a city practically during all history its development. The mansard floor is an effective variant a superstructure buildings of background building.

*Keywords:* corporate scientific and technical complex, town-planning power reconstruction, architectural styles, buildings of historical building.



## **Introduction**

Cities as a generation of human society have several millennia of their existence. Destinies cities are various and instructive: one has ceased to exist for a long time, others have grown till the huge sizes; one stay in oblivion, other steels world famous. The ancient history the majority cities clearly appears in character their lay-out and a silhouette. Each epoch and each society spontaneously or meaningfully transformed and adapted those cities, which received in the inheritance from previous epoch for the requirements.

The concept covers “the town-planning inheritance” both separate houses, and the big quarters, zones the historical centers and a city as a whole; which, today representing the big art

value, is frequent in “a pure kind” is functionally a little suitable for use (*Posternak & Posterna, 2016a; Posternak & Posternak, 2017; Posternak & Posternak, 2016b; Posternak & Posternak, 2016c*).

*The review of last sources of researches and publications.* Value of a historical architecturally-town-planning heritage is defined by following positions: architectural and town-planning achievements of last epoch are one of the major components of a historical and cultural heritage; history and culture monuments, the historical architecturally-spatial environment enriches shape of modern cities; presence of the developed ensembles causes aspiration to harmony with surrounding context.

According to varying social and economic conditions of a life in a city organism naturally die off old fabrics and are born new, therefore updating of cities occurs consistently, by replacement of an out-of-date supply available and gradual transformation by this basis planned structures in whole or its separate elements. The purpose of reconstruction and restoration of an architecturally-town-planning heritage is preservation of composite and aesthetic features of the historical city environment. Town-planning reconstruction is a purposeful activity on change before the generated town-planning structure, caused by requirements of development and perfection. The concept reconstruction of cities has double sense. On the first, it reflects development of the occupied places, improvement of their spatial organisation, proceeding long time. On the second, it is material result, a building condition at present. Only having understood these parties of reconstruction in their interrelation, it is possible to approach correctly to an estimation of problems and to establish methods of a reorganization of cities. Reconstruction – the continuous process which is passing in each city differently depending on the previous growth and modern requirements. It predetermines value of a city as historical phenomenon in which various epoch intertwine. And in a modern city organism its components continuously change (*Posternak & Posterna, 2016a; Posternak & Posternak, 2017; Posternak & Posternak, 2016b; Posternak & Posternak, 2016c*).

*Allocation unresolved before parts of the general problem.* In town-planning is shown the tendency to integration, both in sphere of production of goods, and in management sphere; the expanded reproduction demands the further increase of level a division of labor, concentration and specialization of building manufacture, an intensification of an exchange of results is industrial-economic activities.

*Problem statement in a general view.* As one of perspective forms of integration various complexes act in town-planning structure; in the course of formation of plans of social and economic development of large cities even more often there is a situation when for increase of efficiency used financial, material and a manpower concentration of efforts, but also new progressive forms of the organisation of building manufacture – corporate, scientific and technical is necessary not simply, power efficiency.

*Research objective.* To offer the organizational structure using in practice the saved-up scientific and technical potential for reconstruction of buildings of historical building of 1820-1920 Odessa under standards power efficiency and execute research historically-style development of Odessa of the 19th and beginning of the 20th centuries.

### **The basic material and results of researches**

As leading sign expediency application coordination principles of management and the generality, the economic purposes and the problems demand on industrial cooperation acts.

From positions methodology management, CSTC T-PPR is the economic object the new class, which has received the name integration. Its specificity follows from its integrated approach.

Such are the most general features, testifying that at the organisation management CSTC T-PPR, it is impossible to adapt only an operating economic mechanism, search of new forms and methods is necessary. In effect, the main problem is today maintenance coordination in activity of the controls concerning various links and levels building branch. Suggest them to unite “under the general roof” more often. But such structures are too bulky, unhandy, and are not always realized in practice, especially in building. It is necessary to organize thus participants CSTC T-PPR that they, realizing own purposes, would reach also the general results – we will tell, with partners in building of those or other building objects or with accessory manufacturers, though and not participating directly in works, but providing them, etc. Such mechanism is a coordination. Integrity CSTC T-PPR is given by not so much spatial organisation, how many that end result – a product of manufacture of reconstruction which and is created by builders. Now, when the emphasis becomes on economic control levers, neglect lessons coordination management in relation to primary economic cells are necessary for considering.

At the legislative level in Odessa in recent years have acted and operate: Programmes to support investment activities in the city of 2016-2021 Odessa (*Decision of the Odessa City Council No. 4206-VII; Decision of the Odessa City Council No. 438-VII*), the adoption of which is due to the need to create conditions for intensifying investment activities aimed at improving the business environment business and economic activity, improvement of the general macroeconomic indicators, as a consequence of maintenance of constant social and economic development of the city of Odessa; and Comprehensive Programmes for construction and development of social and engineering infrastructure of the city of 2017-2023 Odessa (*Decision of the Odessa City Council No. 1338-VII; Decision of the Odessa City Council No. 5644-VII*), aimed at solving such major problems of the urban sphere of the city of Odessa, as the development of housing, as well as the restoration of the technical condition of social facilities and engineering and transport infrastructure.

In order to successfully develop the CSTC T-PPR, it is necessary to take into account changes in the system of urban management and radical changes in the economy. This is especially true of the problem of accelerating the technical recovery of construction materials.

Reconstruction of historic buildings is of great social and economical importance. Its main tasks are not only to extend the life of buildings, but also to eliminate physical and moral wear and tear, improve living conditions, equip residential buildings with modern engineering equipment, improve performance and architectural expressiveness. In Odessa, in the context of international integration into the standards of energy efficient buildings, the City Comprehensive Energy Efficiency Programme in 2017-2021 Odessa (*Decision of the Odessa City Council No. 2449-VII*).

Analysis of the urban environment of the historic city center in its current state shows a high degree of preservation of historic living environment, good preservation of urban

dominants, architectural accents, public buildings. However, the long-term operation of municipal infrastructure and the lack of an integrated approach to its maintenance over the past decades have led to unsatisfactory condition of buildings, facilities and elements located in the central part of the city, which in turn led to loss of integrity of perception cities. The cultural heritage of the city of Odessa is an integral part of the cultural heritage of Ukraine and the world. Prerequisite for solving problems of preservation and protection of cultural heritage, as well as the development of the historic area of the city is the implementation of local programmes in recent years: Programmes for preservation and development of the historic center of 2013-2021 Odessa (*Decision of the Odessa City Council No. 4199-VII*; *Decision of the Odessa City Council No. 776-VII*; *Decision of the Odessa City Council No. 3313-VI*).

Builders and architects face a difficult task, because the reconstruction and adaptation of such facilities to the new functions must be realised basing on all requirements and standards for architectural heritage protection and be comprehensive, the prospects of the city, quarter, and facility. When carrying out reconstruction, it is extremely important to preserve the aesthetic and architectural qualities of historic buildings, especially their facades. Therefore, much attention should be paid to the reconstruction of fencing structures.

For all enclosing structures of the building as a whole, first of all, it is necessary to develop a concept of thermal insulation and make a comprehensive list of measures. It will help to make the decision on calculation of parameters of thermal insulation, the choice of the sizes and carrying out separate actions for thermal insulation. There are different thermal insulation options for each structural element, and our task is to choose the most practical one. When making a decision, the assessment is based on the following criteria:

- energy efficiency and significance within the whole set of reconstruction measures;
- practical feasibility of the existing building and the risks of side effects;
- improvement of thermal characteristics, increase of comfort and improvement of appearance of the building;
- cost and evaluation of the total quality improvement.

*Thermal insulation concept* for the enclosing structures of the building is important no less than a list of wishes or exceptions when choosing a thermal insulation material. This is important because when using environmentally friendly materials, maximum values can be achieved only at higher design costs, more attention to detail and the overall higher cost of all work.

Before planning energy reconstruction, it is necessary to determine the amount of energy consumption to be sought. In its original form, it is recommended to dwell on an intermediate version somewhere between an improved building and a “passive house”. Exact values will be determined in further planning. In principle, you can choose both the maximum insulation thickness and the minimum. The fact is that in parallel with thermal insulation measures, other measures are planned to reduce energy consumption, including hot water supply, household appliances and equipment and other needs. The fundamental question that needs to be answered is: what are the costs of implementing a measure, and what energy savings will it achieve?

Not all buildings of historic buildings can achieve optimal insulation, keeping within adequate costs. For example, restrictions may be imposed by existing design or, say, legislation on the protection of architectural heritage. These limitations can be offset by the use of an

improved heating system, which will significantly reduce primary energy consumption. It is very important at the earliest stages of planning to consider all available energy-saving technologies and compare them with their cost, resulting in savings and reduction of CO<sub>2</sub> emissions. This often requires a non-standard and even creative approach.

Development and implementation of new and improvement of existing technologies in capital construction is determined by the need to reduce material and labor costs for their implementation, as well as the need to reduce the investment cycle of construction of buildings and structures.

Within the limits of these programmes (*Decision of the Odessa City Council No. 1338-VII; Decision of the Odessa City Council No. 5644-VII; Decision of the Odessa City Council No. 2449-VII; Decision of the Odessa City Council No. 4199-VII; Decision of the Odessa City Council No. 776-VII; Decision of the Odessa City Council No. 3313-VI; Decision of the Odessa City Council No. 4206-VII; Decision of the Odessa City Council No. 438-VII*), it is necessary to execute reconstruction of buildings historical building of 1820-1920 Odessa under standards power efficiency.

For reception of these data in operational subsections CSTC T-PPR the scientifically-proved gathering the information on buildings of historical building city of Odessa should be adjusted.

Within the limits of this research, it is defined:

*Formation of Odessa on border XVIII and XIX centuries.* The order on formation Odessa by empress Ekaterina has been signed April 27, 1794. The influence on the scheme the future city has imposed local climatic features, a lay land, receptions local architecture the people which occupied Northern Black Sea Coast (Ukrainians, Russians, Greeks, Moldovans, Tatars and others). Let about itself know remoteness Odessa from industrial and raw bases – at first to a city brought all: from nails and building wood to paints, wall-paper and furniture. On a birch of Black Sea experts-foreigners started build a new city. The domestic qualified masters did not suffice. To the first masters belong: P. Dzhenari, A. Zheleznyakov, P. Ivashev, L. Kruthover, G. Pitstsamano and others.

*Classicism epoch in Odessa – 19th and first half of 20th centuries.* Opening in Odessa, Porto Franco became a push for strengthening role of a city, as southern gate of Russian empire. To the mid-19th century, Odessa, which totaled 32,000 people of the population in 1817, became a hundred-thousandth city. In 1823, prince M.S. Vorontsov became the Governor general of Novorossisk edge. Time of its board was marked by wide scope of building and gardening. Undivided rule in architecture stylistics was got by mature classicism. Up to the end 1820s, the city housing estate has sharply changed. On change to one-storied small houses send two-both three-storied imposing palaces and nobility private residences, profitable houses – the new type of habitation dictated genesis capitalist relations. Open galleries on all floors, turned into a court yard – a tribute to a southern climate city became an obligatory element both the first, and the second. The getting stronger class of the Odessa financial oligarchy and prosperous merchant class, under the influence of increasing communications with the countries of Europe and strengthening of architectural tendencies eclecticism, wished transferring these “new” forms to building practice of Odessa. In parallel with it, mastery traditions of the epoch of classicism remained thanks to positive conservatism of Building Committee under control of G.S. Morozova. The city Building Committee organized still in February, 1804, was engaged not only

realization a town-planning policy in a city, the control over work contractors and quality buildings. It also was border on a way of penetration local original architecture the deprived taste of influences. That diligence with which contributes to itself office-work of Building Committee, fixing each new building in Odessa, was conducted. For convenience the control, according to the administrative division, all territory city shared on four areas – parts each of which was headed by the city architect appointed Building Committee. On a first line of an architectural life there are new masters – I.O. Dallakva, F.K. Boffo, I.S. Kozlov, N.N. Cherkunov.

*Architecture of second half 19th century.* After Petersburg and Moscow, Odessa received privileges in self-management. Population growth, basically at the expense of immigration, proceeded. A special role intensifications development city and port were played by input of a railway branch Odessa-Balta in 1865. On it the raw materials for the enterprises, grain for export – the main goods which involved both domestic, and foreign merchants have smoothly begun to flow from “remote places”. In 1864, in a life of architectural Odessa two events, which have affected building stylistics, took place – the Building Committee was abolished and the Society of engineers and architects was created. The protest concerning the academic classicism was splashed out on facades buildings diverse and different style motives. As base for a composite variety new types successes archeology and architecture history served; the new building machinery and new building materials, designs from pig-iron, a steel and concrete. So, creativity the Odessa masters of second half 19th century, however, as well as all the epoch, was original and inconsistent.

*The architecture ways of the beginning the 20th century.* The European architecture of the 19th and the beginnings of the 20th centuries absorbed all the progressive achievements of science and technology as the sponge. The assortment building materials has considerably extended – metal bearing elements, glass, reinforced-concrete became usual. There were first electric elevator and lifts. The newest building materials, wide-span constructive schemes buildings were not put any more in eclecticism borders. Diligence of masters the new architecture which tries to tear with the past – architecture modernist style painfully was born. The term “modernist style” is defined as the phenomenon, which is conscious and sharp against inheritance, the phenomenon time the big social shocks – thresholds of revolutions. To a decor the role “pure” and even the refined ornament though, it is not obligatory for a composition new style is taken away. Penetration new theories and building receptions into Odessa was accompanied by the further development industry of building materials – manufacture brick of different marks, metal structures which supersede traditional limestone-shell rock and a tree has essentially increased, use of reinforced-concrete for erection the bases and hydraulic engineering constructions, materials for paving roads was adjusted. By the end of 19th century, Odessa had firmly taken the third place in an economic life of empire, conceding only to Moscow and Petersburg. Large businessmen and industrialists became the basic customers in building.

*Role background building in town-planning integrity the historical environment a city.* There are more than 1,000 monuments of architecture in Odessa. On modern concepts, is inadmissible consider unique and outstanding constructions out context of its environment from which, its perception appreciably depends. Its environment is one criterion “the test for authenticity” a monument (developed by the International Convention on Protection of the World Cultural Heritage). For this reason, for safety city context separate monuments architecture the great value has the fair

approach to background building surrounding them and town-planning integrity. The historical city centre is presented mainly by buildings of the 19th and the beginnings of the 20th centuries the different town-planning importance. In such areas shortage platforms for new building and growth of cost the earth is felt. The arrangement of the new house in a dense row of historical buildings is forbidden or does not give possibility for its further development. The superstructure buildings in new volume will be an exit from such situation. Superstructures have been realised in a city practically during all history its development. The mansard floor is an effective variant a superstructure buildings of background building.

### Conclusions

It is offered to create in the city Odessa “the Corporate scientific and technical complex town-planning power reconstruction “CSTC T-PPR”, as the innovative organizational structure using in practice the saved up scientific and technical potential for reconstruction buildings historical building of 1820-1920 Odessa under standards power efficiency. In 19th and the beginning of the 20th centuries, historically-style development city of Odessa is characterized by the big scope civil work and presence various styles (classicism, baroque, romanticism, constructivism).



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