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NEW BUILDINGS IN THE HISTORICAL URBAN ENVIRONMENT

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Abstract. This article highlights the contextual approach to the renewal of the historical urban environment as the most complete and delicate one, which allows to comprehensively analyze the historically formed urban situation and to take into account all of its nuances in order to harmoniously add the new building to it. The article shows the principles and techniques, which are used to harmoniously combine the new buildings with the historically formed urban environment. The proposed theoretical statements are examined in detail on the example of the project of renewal and harmonizing the new and old buildings in the historic street ensemble in Chernivtsi (Ukraine).

Key words: renewal, historical urban environment, new house-insertion.

1. Introduction

New buildings and historic urban environment. At first glance, these are diametrically opposed concepts. But this is an erroneous judgment, because these are interdependent and mutually complementary concepts. New buildings become the continuation and revitalization of the old urban buildings and environment, and historical buildings always remain its foundation and wealth. They have formed this environment and now it depends on them what additions can be made to this environment, that is, what new buildings can be in it.

There are different approaches to renewing the historical urban environment [1, 2, 3, 4, 5, 6]. The most complete and delicate is the contextual approach. It allows doing the comprehensive analysis of the existing urban environment, to take into account all its nuances, in order to organically fit the new building into it. It's not just about the existing architecture and urban planning situation, and as well as about the factors under the influence of which they were formed throughout the history of the city, and how these or some other factors affect the modern architectural and urban planning situation in the city. Therefore, the main task of this approach is to take into account all the existing environmental features as much as possible, and that will allow integrating the new building into it maximally harmoniously.

Each time period was characterized by its own special determinants, which were reflected in a specific architecture and organization of urban space. Now their best examples are the historical and cultural heritage of the city. Over time there were changes in the public practices and, accordingly, in the urban sociocultural space. Special layers were formed. Less notable "erased", they replaced by more important for the particular time period. Only the most significant ones have remained. They passed from one time period to another and were supplemented by new signs. Today, the historical urban environment is a definite social spatial temporal formation, in which modern life processes are already taking place. The creation of the new or renewal of the existing urban space is a consequence of the society renewal. New social practices will reflect the new social conceptual determinations. Only the fundamental principles of its organization must remain unchanged [7].

2. Basic Theory Part

The purpose of this article is to show what the new building should look like, that is harmoniously inscribed in the historical urban environment, to reveal the principles and techniques of harmonizing the new building and historically formed. On the concrete example, to demonstrate what needs to be done to make the new building a harmonious addition to the existing ensemble of the historic urban street, to enrich it, to contribute to its sustainable development.

The method of comparative analysis and generalization was applied to determine the principles and techniques of the harmonious adding the new building to the historical urban environment. The proposed projects of the renewal and harmonization of the ensemble of the historic street in Chernivtsi were carried out after in-situ surveys and pre-project analysis. The methods of factor analysis, abstraction and accompanying changes were applied to determine the features of the formation and development of the historic urban environment, proposed for renewal. The analysis of its functional development was carried out. The most typical and sustainable functions for this part of the urban area were identified on its basis. The new functions were defined. They can harmoniously complement the existing ones, bring the new life impulse to the historical urban environment and ensure its sustainable development. The result of the composite analysis of the existing buildings of the street was the decision to create the new accent building-insertion, which would be able to restore its broken integrity. Morphological analysis of the existing buildings made it possible to decide on the correct planning dimensions, volume and new forms for the facades of the new building. They must be subordinated in size, parcels and forms to existing historical buildings. This approach is necessary to preserve the street buildings ensemble. The method of experimental design was used to develop the proposal for entering the new house-insertion in the historic street ensemble.

3. Results and Discussion

So, the historical urban environment in the process of its existence has always undergone certain changes. New buildings have appeared on the sites of the destroyed or outdated ones. In this case, it is very important that these new buildings and the changes that have come along with them do not violate the compositional, planning and spatial features of the historical urban environment, its traditions and at the same time can breathe the new life into it. The new life is a new function that will activate it, a new infrastructure that will improve its quality, new buildings that will complement existing ones and replace the destroyed and, most importantly, people who will be able to fill it and revitalize it [8].

The main principles of renewal of the historical urban environment should be tolerance, continuity and harmonious addition [8]. In this case, it will retain its authenticity, historically formed characteristics, and will get the new development, which is necessary for it at the present time, and thereby ensure its sustainability.

The compliance with the principle of tolerance will allow preserving the dominant importance of the architectural monuments and the valuable historical buildings in the existing urban environment. In this case, the new buildings must be completely subordinated to the existing planning and spatial composition of the historical buildings, to the traditional architecture. There are a number of techniques with which it is possible to reveal the principle of tolerance and harmoniously fit the new building into the historically formed and developed architectural situation. I'll give the examples of the most important ones, in my opinion.

Hidden restoration (Fig. 1) is the example of erecting a new building in the same style as the existing historical buildings. Imitation (Fig. 2), is the technique used to harmonize the new buildings or fragments of the new building with the existing architectural monuments and the valuable historical buildings by introducing in the facades the particulars of the new buildings completely imitating the historical ones.

The principle of continuity allows preserving the unity and integrity of the historical environment. The new buildings are considered as a harmonious continuation of the historic buildings. They get the traditional sizes and shapes that are typical for the buildings in this historical urban environment. The continuity in the shape and angles of the roof slopes, in the detailing of facades for new buildings (Fig. 3). The continuity of new buildings can be provided by styling their facade solutions (Fig. 4).

At the same time, the new building begin to take historical, but simplified, stylized forms of the fronton completion, finishing of the window and door openings, decorative details [9]. Usually, this is the stylization of the characteristic details of the existing architectural monuments or the historical valuable buildings in order to support the existing style direction of the historical urban environment.



Fig. 1. Hidden restoration. Brussels, Belgium.
Author photo



Fig. 2. Imitation of the historical forms in the new buildings. Brussels, Belgium. Author photo



Fig. 3. Continuity of sizes and shapes for new buildings.
Strasbourg, France. Author photo



Fig. 4. Stylization of the new buildings.
Legnica, Poland. Author photo

The principle of harmonious complement is aimed at ensuring the sustainable development of the historical urban environment. The new, added building receives the new forms, but is subordinated to the historical (Fig. 5). The new buildings should be regulated and subordinated to historical buildings by composition, scale, number of stories, forms and parcels of facades. Herewith, it is correct to use regional features in the formation of the volume of the new building (traditional forms of roofs and facade details).

The question of harmonious addition is easily solved if the new building must be located in the line with existing historical buildings. Much more difficult task set before an architect is the one, when the new house-insert must fill an empty corner of the historical street or square. The new building at the same time should not be just an ordinary insert but insert accent. The new hotel building in the historical urban environment of Poznan is very good example of such solution, in my opinion (Fig. 6).

This Hotel PURO, designed by the Polish Bureau ASW Architects, was built in the old Jewish quarter, on the stretch between three narrow streets, near the building of the former “Great Synagogue” of the early 20th century. It is one of the few examples of the modern architecture in the historical environment of Poznan [10]. This building is not only organically fits into the existing historic urban environment, and therefore it is the new high-quality architectural and functional accent.

The result of any competent renewal of the historical urban environment should be a high-quality urban architectural environment for permanent residence and temporary comfortable stay of people, multifunctional, with a developed social infrastructure and public spaces [11].



Fig. 5. The subordination of the new building to the historical ones. Ghent, Belgium. Author photo



Fig. 6. A new accent angle fixation in the historical environment. Poznan, Poland. Photo [12]

In addition, the new buildings would be not only harmoniously integrated into it in their volumes, stories, forms, architecture and functionality, they also must be energy efficient. Energy efficiency and independence from fossil energy sources is one of the main issues in the sustainable urban development strategy.

I want to dwell in detail on the example of the renewal and harmonization of the historical urban environment of Chernovtsy in Ukraine. This is the project of introducing the new building-insertion into the existing ensemble of the historical street in the center of the city, which is based on the contextual approach to the renewal of the historical urban environment.

Chernovtsy was founded in XII century. The city has a rich history of formation and development. Its historical urban environment has absorbed different cultural features and preserved unique monuments of architecture and town planning, in the style features of which the multinational influence is reflected. The urban historical architectural environment was formed on the combination of regional features and transformation the best architectural and construction achievements of the Austro-Hungarian, Romanian, Polish, Czech and Russian cultures to the local conditions. Such cultural diversity greatly enriched and determined the uniqueness of historical urban building. It has received a distinctive feature – the combination of the multinational architectural features in one small area [9].

Kobylianska Street is one of the central streets of the city, mostly pedestrian. Most of its surviving historical buildings date back to the end of the XIX and beginning of the XX centuries and are the monuments to the architecture of Art Nouveau and Constructivism (Fig. 7).

In addition to the residential and public buildings, which now are the monuments of national, regional and local architecture, this street also includes the number of valuable historical and modern buildings. And what is more, it can safely apply the definition of the street ensemble to the considered historical buildings.

In spite of the very high degree of the preservation of the existing historical environment, there are the number of so-called “white spots” in the street, the places, where the historical building has not been preserved, and its territory is not built up, or a temporary structure has been built on it in the form of a single-storey pavilion (Fig. 8). Such places destroy the overall composition of the street, break its holistic perception. The new house-inserts are needed for such places.

And, in this case, it's necessary to add the new building not just to the historically formed urban environment, but to the street ensemble. This requires the use of additional techniques of harmonizing the historical and new buildings. Let us consider in more detail how this can be done on the example of one project.

This project was carried out within the framework of the international student contest on the sketch-idea of the harmonization of the public space of Chernivtsy historical environment and won the second prize (Fig. 9).

The projected new house-insert is located in the structure of the historically formed quarter, at the intersection of two streets, pedestrian and with transport traffic. Its volume must fix the angle of the quarter.

The project of the new building was aimed at creating the sustainable architectural solution of the historic street renewal, so it was necessary to take into account the existing urban environmental context as much as possible. First of all, it is the existing town-planning situation, according to which this new building is not just an ordinary insert, but the new accent, that fixes the corner. Therefore, its architectural solution should be subordinated to the existing ordinary historical buildings and at the same time be allocated as the new accent of the street, stressing the intersection of two streets and determining the main direction of pedestrian traffic. It should take into account the nature of the surrounding buildings, which was formed under the influence of historical, natural and climatic, regional building and architectural features, social and economic factors, and at the same time it should bring the new life impulse to the existing urban environment.



Fig. 7. The buildings of Kobylanska Street in Chernivtsy, Ukraine. The current situation. Photo [13]



Fig. 8. The view of Kobylanska st. from Armenian str. in Chernivtsy. The current situation. Photo [13]



Fig. 9. The house-insert in Kobylanska str. in Chernivtsy, Ukraine. Project proposal, second prize.

Created by the student of ABS-67, KNUCA Holovatiuk Alina;
scientific consultant – Leshchenko N., PhD. Arch., docent KNUCA

A detailed pre-project analysis was carried out. It allowed compiling a detailed initial database. After analyzing the current situation, the tasks that had to be solved were identified and the strategy for their solution was determined. It's necessary:

- to keep the formed atmosphere of the historical pedestrian multifunctional street, where local residents come to spend their free time, and tourists to see how the city lives; to keep and to maintain the status of the street as the calling city card;
- as delicately as possible to fit the new building into the historically formed existing architectural environment, namely, preserving the historical storeys, the parceling of the facades, the shape of the roof slopes, applying the stylization of historical forms in decoration, traditional materials and the coloristic solution;
- to highlight this building as an accent by arranging the accent corner bay window, and the corner terrace on the attic floor; by organization of the main entrance to the ground public floor of the building on the side of this bay; this entrance will fix the corner;
- to create an attractive space for all age categories people due to its multifunctionality and functional flexibility, transformability, due to inscribed additional objects of social infrastructure, places for active and passive recreation;
- to create the barrier-free space, convenient for movement of different categories of users;
- to preserve and to increase the social value of the existing historical urban environment by its functional addition with the new original functions, which today are not enough on the street.

Here there are many residential buildings with restaurants, cafes, shops and souvenir shops on the ground floor. In addition to the main residential function, the new building will have the object of cultural and cognitive function in its structure, namely, the “Chernivtsy Media Center”, which will be located on the ground floor. This means that the new building should enrich the existing urban environment by supplementing it with the cultural function.

Proposed on the first - third and mansard fourth floors, residential apartments are designed for families of 2–4 people, middle-income. There are apartments with the high level of comfort. Visual comfort is achieved by providing the necessary insolation due to the correct orientation of the rooms and the size of the window openings. Acoustic comfort is provided by noise insulation of external and internal walls, ceilings and by using the noise-absorbing insulating glass units SGG climatop acoustic in the window openings. Climatic comfort is achieved through the organization of protection from overheating of the premises in the summer through the window openings on the south and south-west facades; due to the thermal insulation of the building on the outer shell without thermal bridges; due to the natural ventilation of the apartments in the off-season and forced ventilation through the recuperator in winter and summer. The proposed thermal insulation will save on building energy consumption for heating its indoor premises in winter and cooling them in summer. This will allow the house to be cost-effective with low maintenance costs.

The building provides for technical rooms and places for communications of engineering equipment. It is possible to use the energy of the sun and earth for the operation of the recuperator and heat exchanger for ventilation; ground-water heat pump for heating and cooling; as well as solar energy for the evening illumination of the facades; for the hot water supply.

As a result of such building construction, the historical urban environment will be functionally enriched and will be supplemented by the new harmonious house with comfortable living conditions. The proposed approach of using energy-efficient technologies, renewable energy sources for the energy supply of the new building and reduction of harmful emissions into the atmosphere will contribute to the sustainable development of the urban environment.

4. Conclusion

Thus, the task of any new building, which is inscribed in the historic urban environment, is to preserve its value and to support its sustainable development. For this, it must become the harmonious

continuation of this environment. To become the harmonious continuation of the historic urban environment the new building must:

- be subordinated to the formed historical character of the surrounding houses, their scales, volumes, number of storeys, parcels of its facades;
- be continuity in form-building, based on a regional context;
- be functional supplement to it, enrich and enliven it, which will lead to the increase of its quality;
- be made of the eco-friendly modern building materials, using energy-saving technologies, which will allow to obtain high indicators for its ecology and energy efficiency and ensure sustainable development of the urban environment.

The principles and techniques, used to fit the new building into the historically formed urban environment, depend on its value and the degree of preservation. As a result, regardless of use of renewal principles and techniques, the historical urban environment must retain its authenticity, historically formed planning, integrity of the voluminous-spatial composition and at the same time get its new currently relevant development. This will ensure its sustainability.

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НОВІ БУДИНКИ В ІСТОРИЧНОМУ МІСЬКОМУ СЕРЕДОВИЩІ

Анотація. У статті порушено питання, якими мають бути нові будівлі, що зводяться в історичному міському архітектурному середовищі? Вони повинні бути його гармонійним продовженням і активізувати його, максимально враховувати історично сформовані особливості і одночасно відповідати сучасним вимогам. Виділяється контекстуальний підхід до оновлення історичного міського архітектурного середовища як найбільш делікатний і цілісний, який дозволяє всебічно проаналізувати історично сформовану міську ситуацію, врахувати всі її нюанси, щоб гармонійно вписати в неї нову будівлю. Результатом будь-якого грамотного оновлення повинно стати якісне міське архітектурне середовище для постійного проживання і різноманітного комфортного перебування в ньому місцевих мешканців і гостей міста. Нові будівлі повинні привнести новий життєвий імпульс в сформоване міське середовище і

забезпечити його сталий розвиток. У статті показані принципи і прийоми, які використовуються для гармонійного поєднання нових будівель з історично сформованим міським архітектурним середовищем. Дається оцінка значення їх застосування для збереження його сталості. Запропоновані теоретичні викладки докладно розглянуто на прикладі проекту оновлення і гармонізації забудови ансамблю історичної вулиці в місті Чернівцях (Україна). Цей проект був виконаний після проведення передпроектного аналізу, за яким були визначені особливості формування та розвитку запропонованого до оновлення історичного архітектурного міського середовища. Був проведений аналіз його функціонального розвитку для виявлення сталих, найбільш характерних для даної частини міської території функцій. Запропоновані нові функції повинні гармонійно доповнити існуючі, привнести новий життєвий імпульс в історичне міське середовище і забезпечити його сталий розвиток. Результатом проведеного композиційного аналізу існуючої забудови вулиці стало рішення про необхідність зведення нової акцентної будівлі-вставки, яка б змогла відновити її порушену цілісність. Морфологічний аналіз існуючої забудови вулиці дав можливість прийняти рішення щодо коректних планувальних розмірів, об'ємів та нових форм для фасадів нової будівлі. Вони мають бути підпорядковані існуючим історичним будівлям. Такими підхід необхідний для збереження сформованого ансамблю забудови історичної вулиці і забезпечення його сталого розвитку.

Ключові слова: оновлення, історичне міське середовище, новий будинок-вставка.

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