

## UNIVERSAL METHODS OF ARCHITECTURAL AND URBAN RECONSTRUCTION, RESTORATION, AND NEW CONSTRUCTION USING THE EXAMPLES OF OBJECTS IN UKRAINE

Tetiana LADAN<sup>1,\*</sup>, Liudmyla BACHYNSKA<sup>1</sup>, Boris EROFALOV<sup>1</sup>,  
Oleg SLEPTSOV<sup>1</sup>, Sergii TROFYMCHUK<sup>1</sup>, Mariia ADAMENKO<sup>1</sup>

<sup>1</sup> Kyiv National University of Construction and Architecture, 31 Povitroflotskyi Avenue, Kyiv, 03037, Ukraine

### Abstract

*The article considers the universal traditional and innovative methods of the architect's work as: hereditary and theoretical-experimental methods of "pre-project analysis" (the method of "conservation" of the object by providing it with an educational function; the method of visual communication object with a person using temporary modular structures); traditional theoretical and practical methods ("stylistic" and "artistic"); innovative theoretical methods – "hermeneutic-semiotic" ("semantic-pragmatic" and "syntactic"), innovative practical method – "hermeneutic-semiotic" ("semiotic"). The practical implementation of this method is shown in the examples of experimental conceptual projects for the reconstruction of destroyed and abandoned objects of various scales in Ukraine (city, building fragment, building). Stages of action for the first time reveal the mechanisms of architectural activity of architects based on the implementation of a unique innovative "hermeneutic-semiotic" ("semiotic") method of creativity and the theory of "informative architecture".*

**Keywords:** "Hermeneutic-semiotic" ("semiotic") method; Theory of "informative architecture"; Innovative reconstruction; Innovative "preservation"; Temporary modular structures

### Introduction

During architectural and urban reconstruction, restoration, new construction of objects, the atmosphere of places – "genius loci" (from the Latin – spirit of a place). These issues become especially relevant during aggression and military operations in Ukraine in 2022 and 2023, – when objects (urban planning structure of cities and towns, buildings and structures, urban infrastructure) are destroyed (Popasna, Bakhmut, Maryinka, and others) or partially destroyed (Hostomel, Bucha, Irpin, and others). Professional architectural communities of Ukraine – the *Ukrainian Academy of Architecture (UAA)*, the *National Union of Architects of Ukraine (NUAU)*, teachers of the departments of architecture of the *Kyiv National University of Construction and Architecture (KNUCA)*, including the *Department of Architecture Fundamentals and Architectural Design (AFAD)*, students are already analyzing the degree of damage to architectural and urban planning objects, develop projects for the reconstruction of buildings and structures in the conditions of extraordinary war events. All materials are handed over to interested parties – communities and city administrations of Ukraine.

\* Corresponding author: ladan.tm@knuba.edu.ua

Teachers of the AFAD Department:

- investigate the consequences of the war, and develop strategies for the restoration of architectural and urban planning objects in Ukraine [1] with the involvement of foreign partners from Denmark, Israel and Georgia (Fig. 1), (doctor of architecture, professor, head of the Department – *Oleg Sleptsov*, People's Architect of Ukraine, President of UAA since 2021);



**Fig. 1.** Qr codes for video films and articles about *Oleg Sleptsov's* international activities:

a - about the consequences of the war in Ukraine and strategies of the UAA;

b – in Denmark, c – in Israel, d – in Georgia

- develop architectural and urban planning projects for military personnel and immigrants (Professor of the Department – *Yuriy Seryogin*, Honored Architect of Ukraine, full member of the UAA; Professor of the Department, Ph.D. Architecture, Associate professor – *Liudmila Bachynska*);

- popularize in the educational process the concepts of the formation of modern architecture based on their own method of creativity and teachers of the AFAD Department (Doctor of architecture, Professor, head of the Department – *Oleg Sleptsov*, People's Architect of Ukraine; Professor of the Department – *Yuriy Seryogin*, Honored Architect of Ukraine, full member of the UAA; Professor of the Department – *Yanosh Vigh*, Honored Architect of Ukraine, full member of the UAA);

- introduce into the educational process the methods of professional architectural and artistic education and creative activity, civil buildings, history of ukrainian architecture and urban planning (Professor of the Department, Ph.D. Architecture, Associate professor, corresponding member of the UAA – *Liudmila Bachynska* [2], Ph.D. Architecture, Associate professor, Docent – *Tetiana Ladan*);

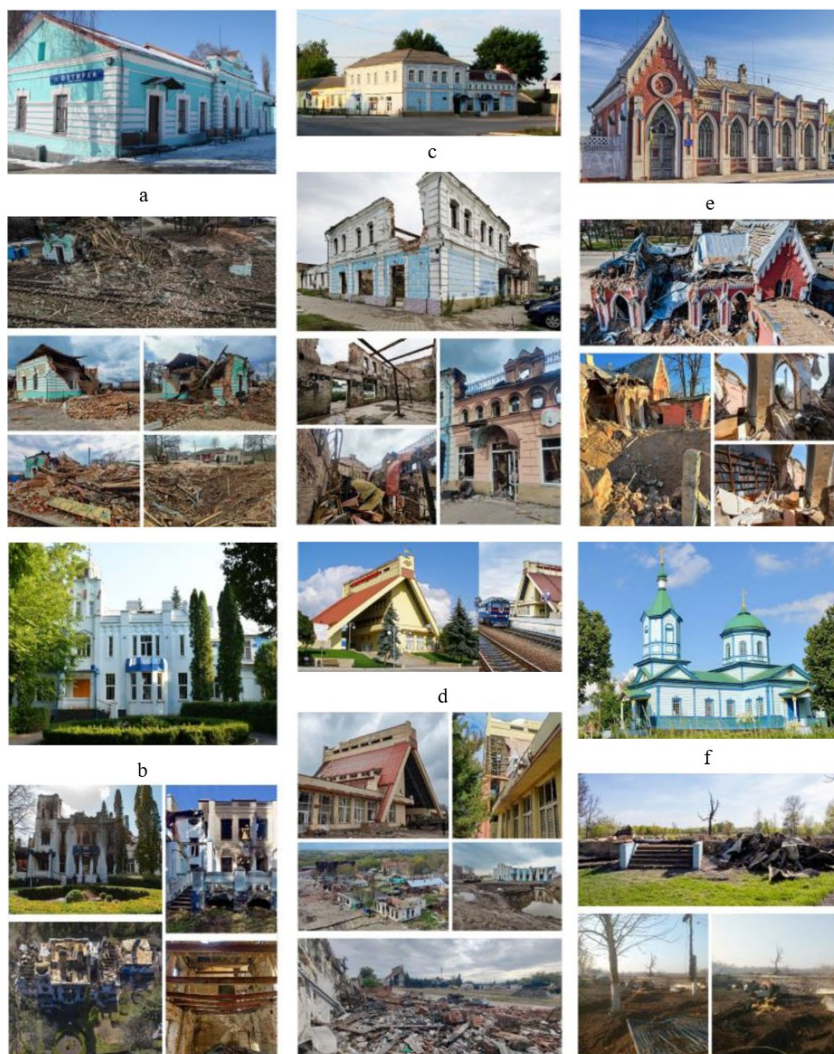
- are developing new theoretical and practical theories in architecture – the theory of formation “informative architecture” based on the synthesis of arts, sciences, phenomena and activities (Ph.D. Architecture, Associate professor, Docent – *Tetiana Ladan* [3, 4]);

- carry out journalistic and research work on the development of features and stylistic trends of world and Ukrainian architecture, introducing those interested in the leading masters of architecture and their landmark projects (Ph.D. Architecture, Professor of the Department, full member of the UAA – *Boris Erofalov*, editor-in-chief of the Architectural Magazines “A.C.C.”, “A+C”).

The Ukrainian Academy of Architecture records the destruction caused during the aggression of the Russian Federation on architectural monuments of various typologies (public, residential, cult) and conveys to the international public all the horrors of the war in Ukraine. An exhibition with photos of the destruction was presented by Professor *Oleh Sleptsov* in July 2023 in Tel Aviv, Israel (Fig. 2).

When restoring, rebuilding, and updating plans and buildings, one should not lose the uniquely formed: planning structure of each piece of territory, features of ensembles, complexes, national traditions, unique form formation and style, taking into account the needs of modern life for the future, with the possibility of implementing a wide variety of solutions in the future, observing sustainable development of territories [5-9]. Provision should also be made for the temporary adaptation of cultural heritage objects to medical and rehabilitation centers and temporary places of stay for people who have suffered psychological trauma from the consequences of the war [10].

When creating a unique artistic image of new architectural and urban planning objects in our modern democratic state, signs, and symbols, planning of the Soviet era before the period of independence of Ukraine, which were imposed on architects by the totalitarian system of power [11].



**Fig. 2.** The object before the war and after aggression:

- a – the Railway station “Okhtyrka”, 1895, 8.03.2023;
- b – the estate manager’s house in a complex of buildings of L.Y. Koenig, 1911, 27.03.2022;
- c – Merchant F. Kuril’s shop, 1911-1914, 03.2022;
- d – the railway station “Trostyanets” – “Smorodyne”, 1982, 26.03.2022;
- e – Chernihiv Regional Youth Library, end of XIX century;
- f – a wooden temple in the Ascension of the Lord, 1879, 24.03.2022 [12]

Thus, the purpose of this scientific research is to develop universal methods (with the possibility of their use in any historically formed environment) of architectural and urban reconstruction, restoration, and new construction of objects and to show the results of their implementation in experimental conceptual projects of teachers, developed together with by students of the Department of AFAD KNUCA.

*The objects* of this scientific research are Ukrainian cities (building, planning, infrastructure, landscape), city centers, buildings, and structures that were destroyed as a result of military operations, are in a state of emergency in peacetime and today require reconstruction and restoration, renewal of the composite visual structures. As examples, the authors chose the following objects for experimental conceptual design:

- **Object No. 1. General plan of the city of Hostomel, Kyiv region** (Professor of the Department, Ph.D. Architecture, Associate Professor – *Liudmila Bachynska*; Ph.D. Architecture, Docent of the Department – *Iryna Novosad*; Ph.D. Architecture, Docent of the Department *Margarita Yakovenko*; Bachelor of architecture, master's student of the Department – *Liliya Maksymchuk*, February-May 2023);

- **Object No. 2. Okhtryka city center, Sumy region** (developers of the idea: Doctor of architecture, Professor, head of the Department – *Oleg Sleptsov*, People's Architect of Ukraine; Professor of the Department – *Yuriy Seryogin*, Honored Architect of Ukraine; Ph.D. Architecture, Associate professor, Docent – *Serhii Somka*; Master of architecture – *Anastasia Gorbonos*, June 2023);

- **Object No. 3. The river station, embankment, and Postal Square in the city of Kyiv in the structure of the «Historical Landscape of the Kyiv Mountains and the Dnipro River Valley»** (developer of the idea: Ph.D. Architecture, Associate Professor, Docent – *Tetiana Ladan*, September-December 2018, February-June 2019, 2022).

*The subject* of this scientific research is the study of existing [13] and development of universal methods of architectural and urban reconstruction, restoration, and new construction of objects and steps of action that should be followed in creative practical activity.

*Predecessors on the topic* of this scientific research. There are many research methods: “architectural-archaeological” and “architectural-urban planning”. Among the methods that precede creative theoretical and practical activity, the universal hereditary and innovative method of “pre-project analysis” can be singled out, based on which a perfect study of the architectural and planning solution of the object of any scale, environment or context, with the degree of actualization of the previous states of the object and their suitability in the future, is clarified.

To implement this method, a number of basic steps should be taken:

- clarification of the state of affairs in the specified area;
- analysis of the situation and state of preservation of architectural objects and engineering infrastructure;
- determination of the functions of new construction and the degree of restoration of destroyed buildings;
- search for analogs and original concepts;
- identification of local materials, and traditional and modern technologies for the implementation of a spatial model.

The use of BIM technologies, additive means (3D modeling, mock-up) and the sequence of these steps is the key to a successful result when moving to the implementation of the following methods, which involve the creation of architectural and urban planning solutions for the object itself.

Among a number of methods that characterize creative architectural activity, on the basis of which we get a visual result (object project or its implementation in the environment), the following two universal theoretical-practical traditional methods still prevail: “stylistic” and “artistic”.

The “stylistic” method involves the search for a new modern style in each period of the history of world architecture and art. Certain architectural styles are combined into international and national trends. Among the international directions, the following dominate: «modernism» beginning in the 20th century – until 1932 (“constructivism”, “rationalism”, which, unfortunately, did not develop in Ukraine for certain economic and political reasons, but at the present stage has a chance for its recovery and certain transformations); it envisaged complex dynamic

constructions and non-tectonic forms); “postmodernism”. National features are more evident in the directions: “historicism” (neostyle); and most of all in the direction of “eclectics” (“decorativeism”, “Ukrainian architectural modern”, and others). The majority of modern Ukrainian architects follow this method of creativity to this day.

The “Artistic” method is aimed at the synthesis of arts and architecture, synthetic in the combination of various types of arts and the use of figurative symbolic forms. Both architects and artists could work on one object. The objects acquired signs of sculpture. In the process of visual perception of the building, everyone could find the signs that they saw, which contributed to the development of imaginative thinking of the viewers of the architectural object. In Soviet times, such unique buildings were often subjected to severe criticism by the leaders of the totalitarian system of government and architects who worked in this system, as curvilinear forms were considered uneconomical. As a result, unique objects became unfinished buildings and are currently crumbling over time, becoming a background for various art events and creative thematic performances to attract the public and actualize the problem of restoration or reconstruction of a unique object.

## Materials and methods

At the beginning of the 21st century, world architects are gradually abandoning styles and direct artistic images (sometimes banal) and increasingly their creativity can be seen in such universal theoretical innovative and traditional methods [13] that can be formed on the basis of the study of various sciences and areas of activity – semiotics [14], hermeneutics and others: “hermeneutic-semiotic” (“semantic-pragmatic”) method (“hermeneutics” determines interpretation and explanation and is a container of symbols and hidden meanings; “semantics” studies the relationship of signs to the signified and the signified; “pragmatics” studies the relationship between signs and users) and the “hermeneutic-semiotic” (“syntactic”) method (“syntax” studies relationship between signs). These methods involve turning to more meaningful shaping of architectural objects based on scientific knowledge in various fields of activity. According to these methods, there is a possibility of inventing new synthetic names of modern directions and currents in architecture, which is relevant in the formation of not random, but evidential architecture and significantly expands the horizons of creativity. It was the combination of such directions and currents that formed the basis of the theory of “informative architecture” (author – *Tetiana Ladan*) [3].

Since the last of the four main sections of “semiotics” – “semionics” (“syntactics”, “semantics”, “pragmatics”, “semionics”) is revealed in action – studies the processes of formation of new signs, new meanings, new understanding of actions in culture, to the most effective universal practical innovative method can be considered the “hermeneutic-semiotic” (“semiotic”) method (Fig. 3).

***Step 1. Selection of characteristic points of attraction and giving them symbolic names*** – determines the choice of the object with which it is planned to work (restore, improve), which is determined by urgent needs that arise or as a result of the formation and improvement of urban development regulation zones (for formation and improvement tourist and educational infrastructure, needs for comfort, security of stay in the territories for modern man and animals in the variety of perception of biological and landscape: natural, water, land, forest and architectural environment) or as a result of extraordinary events – war (with the aim of faster restoration of destroyed territories by clarifying cause-and-effect relationships, updating or improving historical planning, and determining the degree of suitability for its use in the future). Each point of gravity can get its unique figurative name, which will act as psychological rehabilitation and relieve and restore the psyche of children and adults affected by military actions, in their good nature, fabulousness, and heroization of personalities who perform great deeds for the benefit of human society.

**Step 2. The development of “architectural-artistic novels”** – determines the substantiation of the connections between points of attraction, within the internal structure of the object – during design or conceptual design.

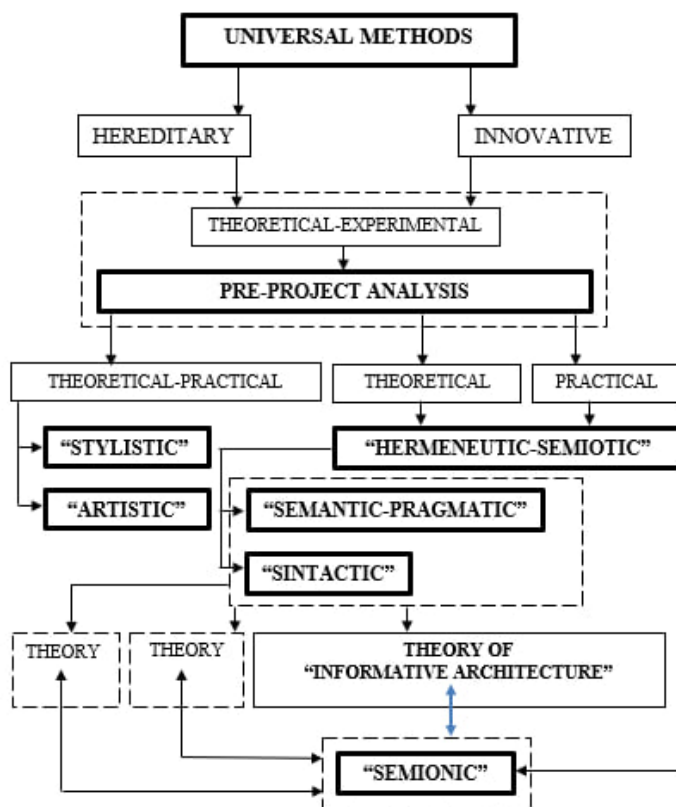
The description of interconnected ideas, in the genre of iconic, symbolic and metaphorical “architectural and artistic novels” (from the Latin “novellas” – the latest), when each subsequent one complements the previous one, should have compositional centers – foci, the number of which depends on the scale of the object. The beginning and the end in the script of the novel should be conditional (without a clear beginning and end), since the constant development of ideas with their implementation for the future is expected.

Architectural and artistic “novels” – unusual innovative architectural and artistic thematic areas that describe and define a kind of “permanent” cultural grid of the city, have an educational character, as they reflect in architectural and compositional solutions the best “quotes” from Ukrainian art, design – create a creative environment, form the Ukrainian mentality, a unique modern image of objects.

**Step 3. Development of a sustainable concept of the general script-image.**

The scenario approach to solving the planning decision of the house is also a practice of the thematic interiors of Kyiv at the beginning of the 20th century.

The scenario-image will make it possible to lay out a route of familiarization with the object, to remember it better, to achieve an aesthetic catharsis from what was seen, to emphasize the uniqueness of each of the objects in modern conditions, and to outline prospects for future development [15-17].



**Fig. 3.** Universal methods of architectural and urban reconstruction, restoration, and new construction (the structure of connection was developed by Associate Professor *Tetiana Ladan*)

## Results and Discussions

Let's consider how these steps of the “hermeneutic-semiotic” (“semiotic”) method of creativity can be implemented using the examples of objects of different scales and physical states (which were destroyed during the war in Ukraine and those that were abandoned in peacetime), with characteristic points of attraction and defined foci that require reconstruction, restoration or renewal of the compositional planning structure, in accordance with Ukraine's self-identification in the world and restoration of its borders.

### ***Object No. 1. General plan of the city of Hostomel, Kyiv region.***

Based on the use of the “pre-project analysis” method, it was found out that Hostomel is the first city to come under shelling and bombardment since February 2022 and suffered destruction of varying degrees of severity. Almost all types of buildings: residential, public, administrative, social infrastructure, and industrial were damaged or destroyed. Together with the towns adjacent to the south – Irpen, Bucha, and Hostomel – became a single entity, so expanding the area to the south is impossible. From the east, the Irpin River forms a natural landscape, the territory to the north and northwest is also free from construction, is the property of the city, but is used for agriculture. In the western part of the city, there is an international airport for cargo transportation, which, according to the new master plan of 2020, was supposed to be supplemented with the function of transporting passengers.

The administrative center of the city of Hostomel was formed over a long period and was formed by various objects with different functions and visual and stylistic solutions, the expediency of their appearance was dictated by time: the two-story building of the city council, the symbol of the city's production direction – the AN-2 plane, the Church of the Holy Intercession, a monument to the Virgin Mary, across from it is the station of the precinct police officer and the city library. Nearby are located: a hotel, a cafe, the Alley of Cossack Glory, along which a number of small architectural forms of commercial purpose stretched. The city center does not have an area or signs of an ensemble of buildings.

During the military operations in Ukraine in 2022, a large part of the city of Hostomel was destroyed (Fig. 4a, b and c), so both the buildings and the planning structure of the entire city need reconstruction, restoration, creation of a safe environment with a number of protective and rehabilitation measures for its residents.

The “hermeneutic-semiotic” (“symiotic”) method can be implemented according to the recommended steps.

#### ***Step 1. Selection of characteristic points of attraction and giving them symbolic names.***

As the characteristic points of attraction of the city of Hostomel, we choose those where it is possible to:

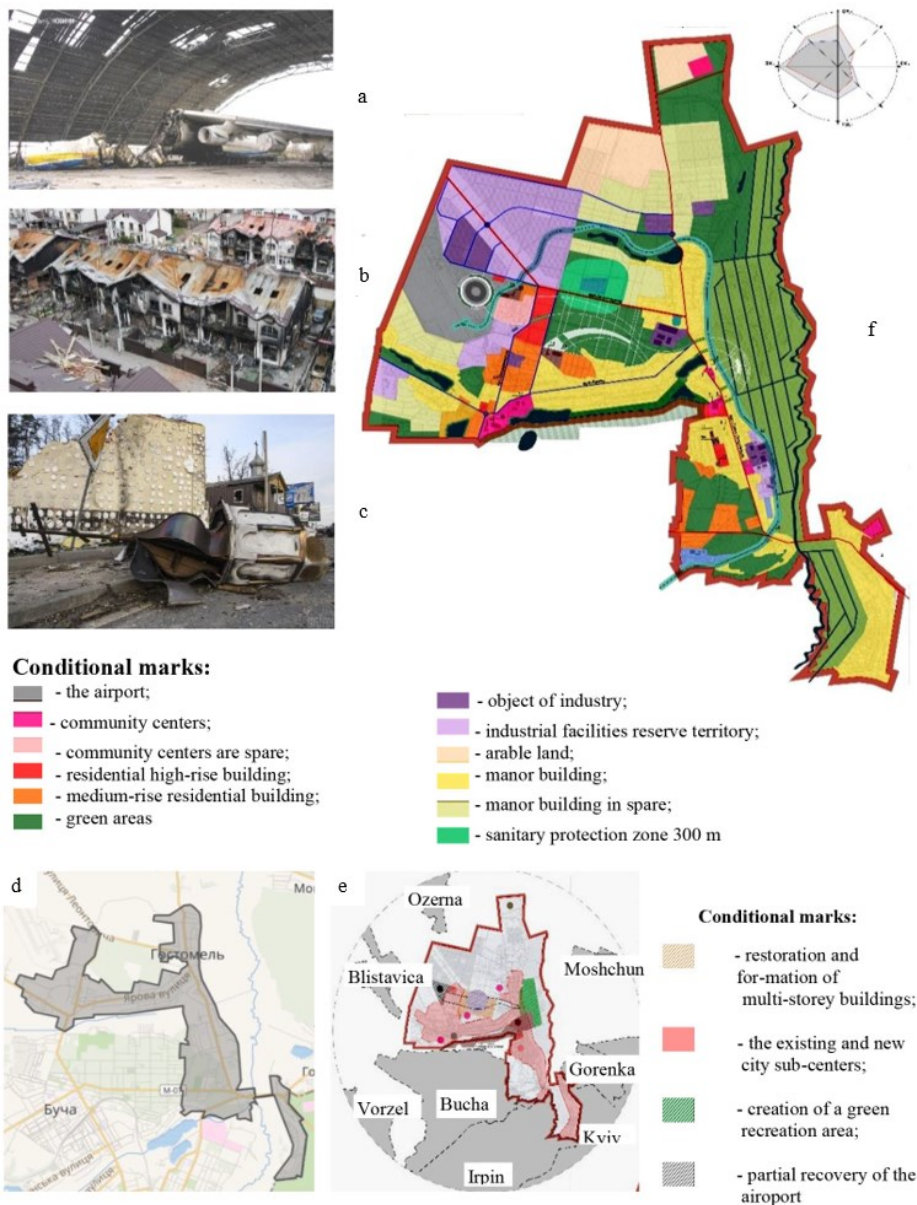
- creation of new zoning, according to the existing boundaries (Fig. 4d), fixed for the city in 1968 (Fig. 4e);
- expansion of park areas;
- creation of a memorial complex: museum, amphitheater, garden, exhibition windows, recreation center, sarcophagus;
- propose the creation of new pedestrian areas, in particular in the territory of the old center;
- to form an ensemble building.

Thus, analyzing the object of research – the city of Hostomel (historical materials, problems, possible prospects for development), seven characteristic points of attraction - functional zones of attraction were determined. According to the location, the functional zones of attraction of the city of Hostomel can receive symbolic names: the airport – “Burning Dream”, public and educational centers – “Hand and Heart”, residential buildings – “Phoenix”, green areas – “Wings of Nature”, cemetery – “Garden of the soul”, industrial zones – “Magic hair” (suggested

by Associate Professor *Tetiana Ladan*), memorial complex – “Garden of silence” (suggested by master's student *Liliya Maksymchuk*).

**Step 2. Development of “architectural-artistic novels”.**

The old general plan of the city figuratively resembles a person holding a burning ball in his hands (Fig. 4d). Therefore, the project of the historical city of Hostomel within modern limits can be identified with the image of Prometheus – the ancient Greek titan, the protector of people from the arbitrariness of the gods.



**Fig. 4.** The state of the modern city and proposals for its reconstruction (*Object No. 1*):

*a* – ruined «Mriya» in the hangar; *b* – ruined residential buildings;

*c* – a ruined church in the town Hostomel [18];

*d* – the territory of modern Hostomel; *e* - restoration and formation of multi-storey buildings, the existing sub-center of the city; *f* – proposals for the formation of the general plan on the city



At the same time, if you look at the general plan of the city of Hostomel, within the territory allocated to it since 1968 with the new zoning, you can see how “green wings” are added to the image of Prometheus (Fig. 4f). Therefore, the Phoenix, a magical bird that is reborn after death and is a symbol of eternal life, can be another image of the city of Hostomel. And the collective image of a man with green wings is the personification of a pilot in a helmet, who holds in his hands his passionate dream (the “Dream” plane).

Thus, the airport is the “Burning “Dream”” as a symbol of the past (the destroyed “Dream” plane) and the future (a symbol of the burning of dreams for a new happy life); community centers and auxiliary centers – “Hand and Heart” because they have a suitable location; residential building – “Phoenix”, because people’s lives are restored and revived and this attraction zone can be a focus, which is formed as an ensemble, based on the use of bionic forms (anthropomorphic and ornithomorphic, in particular); green spaces and meadow parks – “Wings of Nature”, relative to the corresponding location on the general plan (behind the back of the general plan in the image of an imaginary person – a pilot); cemetery – “Garden of the soul”; industrial objects – “Magic hair”, because the zones are located on the chin of an imaginary person on the general plan of the city and in different parts of the city, so they can get a corresponding wavy structure when shaping buildings and structures; memorial complex – “Garden of Silence”.

The memorial complex is located on a plot free of development from the administrative center towards the airport, where the Mriya cargo planes (the largest plane in the world), Ruslans, rotorcraft and others were located. The spatial organization of the modern memorial is designed for the emotional perception of the events to which this object was dedicated, and the main feature was to convey to the minds of visitors the idea of any future impossibility of similar events (without recording the act of aggression and the death of war victims, as it was mainly presented during the Soviet era). The memorial in Hostomel is a place of remembrance, painful memories in a complex of alleys and reservoirs, where a person, being in a natural environment, can plunge into thoughts about past events. On the way of its promotion, there are objects - carriers of information that influence the psychological state and emotions of a person. According to the movement scenario, it first gets to the museum area, then to the amphitheater area, where public events dedicated to the tragic facts of our history can be held. In the second part of the memorial, visitors are greeted by a “garden of silence”, conditional “windows” for viewing the space, through which important local accent objects and a recreation area can be seen. The final chord is the sarcophagus covering over the remains of unique aircraft (Fig. 5).

***Step 3. Development of a sustainable concept of the general script-image.***

Thus, the city of Hostomel can be considered simultaneously under the protection of such mythical heroes as Prometheus and Phoenix. In an attempt to decide on a scenario figurative name of the city, its second modern amulet name is proposed – Hostomel-“Promethenix” (suggested by Associate Professor *Tetiana Ladan*).

***Object No. 2. The center of the city of Okhtyrka, Sumy region.***

Based on the use of the “pre-project analysis” method, it was found that the city of Okhtyrka is one of the leading historical centers of Slobid Ukraine, located in the north-east of Ukraine and equidistant from three regional centers – Sumy, Kharkiv and Poltava at a distance of about 100 km. And unfortunately, the city is only 50 km from the Russian border. The attack on the city of Okhtyrka took place immediately after the beginning of the Russian invasion of Ukraine on February 24, 2022. After the aerial bombardment, the City Council was completely destroyed, as well as the People’s House and the Museum of Local History (the last two buildings are architectural monuments of the beginning of the 20th century). During the month, the city was shelled by the enemy from heavy artillery, bombs were dropped on residential quarters. Hundreds of residential buildings were destroyed, critical infrastructure facilities were destroyed.



**Fig. 5.** Examples of reconstructed and new architectural and urban planning objects in the city Hostomel (**Object No. 1**):  
*a* – proposal for the transformation of the former administrative center of the city Hostomel;  
*b* – a new public sub-center with a recreation area;  
*c* – project proposal of a memorial complex in the city center of Hostomel

The administration of Sumy region, in the person of *Volodymyr Bykov* (chief architect of Sumy region, head of the Department of Urban Planning and Architecture) contributed to the provision of raw materials (Figs. 6, 7 and 8) for the purpose of comprehensive reconstruction of a significantly destroyed area in the city center with the restoration of individual buildings, organization new multifunctional space and the addition of memorial, recreational, office and educational functions.



**Fig. 6.** Object before the war and after aggression: Okhtyrka. People's House (**Object No. 2**) [19]



**Fig. 7.** Object before the war and after aggression: Okhtyrka. Local History Museum (**Object No. 2**) [19]



**Fig. 8.** Object before the war and after aggression: Okhtyrka. City Council (**Object No. 2**) [19]

The central street of Okhtyrka – Nezalezhnosti street is located in the historical suburb and had important objects for public and cultural life, which today have all been destroyed to one degree or another – the City Council, the Museum of Local History, the People's House (house of culture), shops (“Book World”, cosmetics store). To the east of the building of the People's House is a small sprawling park area in the floodplain of the Okhtyrka River. 500m south of the project site is the Church of the Transfiguration (“neo-Byzantine” style, the last third of the 19th century). The building is not very well-kept, but very picturesque, which slowly and surely affects the color and style of the city center.

The “hermeneutic-semiotic” (“symionic”) method finds its implementation in the following steps.

**Step 1. Selection of characteristic points of attraction and giving them symbolic names.**

The analysis of the objects remaining on the site, taking into account their historical and aesthetic value, led to the following conclusions:

- significantly damaged buildings are proposed for demolition (the building of the City Council (City Hall), the Museum of Local History (Museum) and commercial buildings);
- the least affected architectural monument is the People's House building (beginning of the 20th century) and is therefore subject to restoration;
- in order to optimize the functions on a small plot, redistribute them (the People's House will retain the functions of the House of Culture; the Museum of Local History will be restored in the same place; the City Council building will move to the vacated plot, nearby, and form a single volume complex with it; trade (department store), recreational, educational and entertainment functions will be concentrated in a new multi-functional building on the site of the completely destroyed City Council);
- a new square and a square with a memorial to heroes will be created between the restored buildings and new buildings;
- all public buildings will be served by general underground parking.

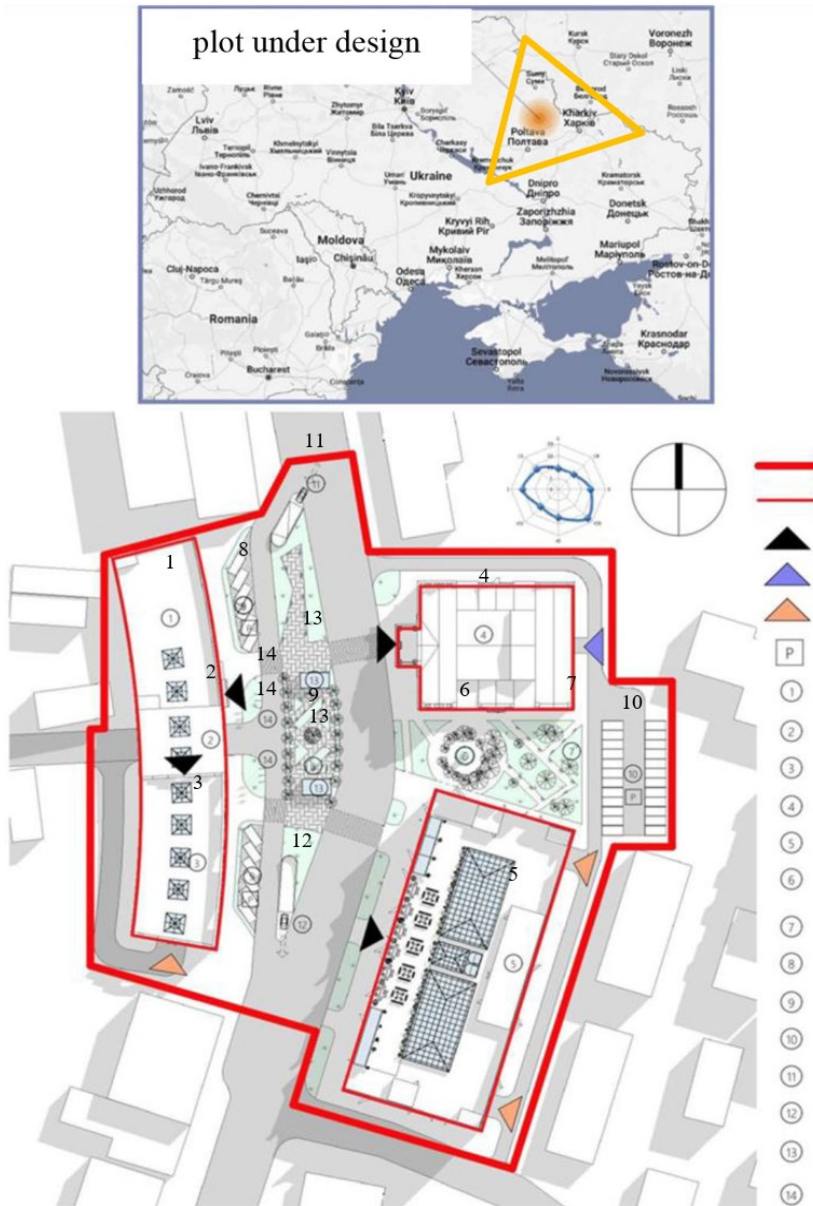
Thus, pronounced points of attraction will be formed to satisfy various interests. To a large extent, a standard intersection will turn into a powerful node of attraction, in addition to the functions that already existed, loaded with new contents – memorial, recreational, aesthetic, propaedeutic, educational, etc. Thus, it is possible to distinguish 3 characteristic points of attraction, which can receive the following symbolic names: “BuNa” – original language, Ukrainian or “CuPe” – in english (People's House or House of Culture – a source of national memory and authenticity); one of the buildings was reincarnated, moved and joined another); “Deco-center” (shopping and entertainment center), (the name is proposal of Associate Professor *Tetyana Ladan*); “Centaur Building” (the name is a proposal of Professor of the Department *Borys Erofalov*, the City Council (City Hall) merged with the Museum of Local History (Museum)).

**Step 2. Development of “architectural and artistic novels”.**

The leading consideration for the formation of a new urban complex is continuity, because all the functions that existed on this fragment of the central street, which existed here before the destruction began, are preserved. The unifying planning elements of the new urban center is a square with a square and a parking lot. The super-idea is the organization of a self-sufficient multi-functional center, which, according to the scale of the plans, will become the main point of attraction – the focus of the project solution.

The dialogue between history and modernity unfolds in the landmark building of the Museum of Local History (Museum), which attracts attention by the fact that it simultaneously reminds of the events that unfolded at this place in March 2022, and with its architecture “speaks” of the existence of a previous historical building, account of the use of: exposed brickwork, windows with a border and deliberately decorated roof clips, as if cut into the wall. The museum is connected to the building of the City Council (City Hall) by a glass transit bridge. As a result, a postmodern semantically complex multi-layered space is created, in which the postmodern

“Centaur Building” (City Hall Museum) and the modern volume of a shopping and entertainment center, dressed in stylistic forms of decorativeism with hinged facades, are located next to the authentic building of the People's House (House of Culture) – screens (Fig. 9).



**Fig. 9.** Okhtyrka. General plan of the restored area (**Object No. 2**):  
 Red – boundaries of the site and buildings; Black – main entrance;  
 Blue – service entrance; Orange – loading/unloading; P – parking lot;  
 1 – City Hall building; 2 – Glass transit; 3 – Museum building;  
 4 – People's House; 5 – Shopping mall; 6 – Memorial to fallen heroes;  
 7 – Small garden; 8 – Square; 9 – Temporary parking spaces;  
 10 – Service parking spaces; 11 – Entrance to the underground parking lot;  
 12 – Exit from the underground parking lot;  
 13 – Elevators to the underground parking lot; 14 – Flagpoles

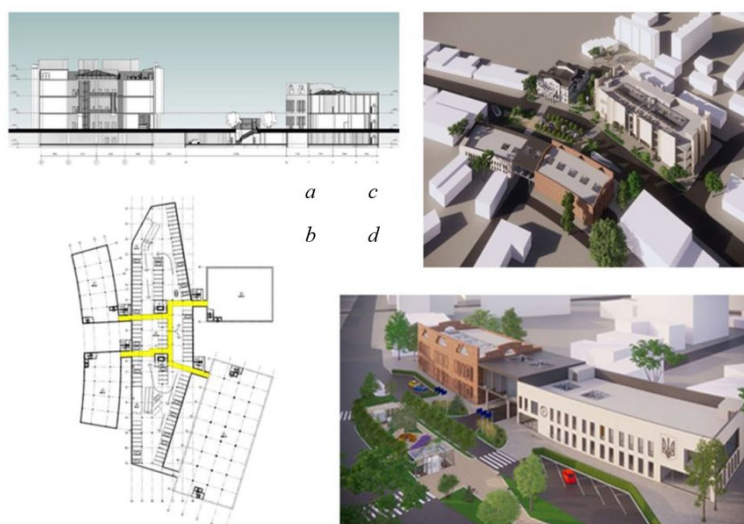
A question of technology. The fundamental principle in the creation of this project is the “dialogue of times” – purposeful preservation of stylistic, figurative and functional features of individual buildings and even the appearance of new simulacra of antiquity in new modern clothes. To follow such an installation, it is desirable to use appropriate materials and structures that would suit the historical and functional order of the building, distinguish one from the other and diversify the space. Accordingly, the types of restoration actions for different objects differ: restoration (People's House or House of Culture), reconstruction (Local History Museum), new construction in the form of expansion (City Council or City Hall) and emphasized new construction (shopping and entertainment center). The texture and materials should also correspond to the stylistic differences of the buildings – from fragile plaster decoration and hardened facade bricks to glass, metal and composite surfaces and sophisticated facade systems.

**Step 3. Development of a sustainable concept of the general script-image.**

Visiting the object will consist of a series of consecutive events: exclamations in the form of flagpoles in front of the building of the City Council (City Hall) and the Museum of Local History (Museum) – invitation and accommodation (with means of landscaping the square, parklets, square, equipped parking) – selection of the function and construction of the route (visiting one or more facilities of the center and recreation) – exercise or implementation of the target task - convenient evacuation. This corresponds to the scenario approach in architectural design.

Thus, on the site of discrete buildings in the center of the old Slobid city of Okhtyrka, loaded with a certain meaning, but scattered and to some extent random, a complex environment loaded with important local and universal meanings and saturated with many useful functions can be created.

This approach implies direct reproduction and reconstruction of existing buildings (administrative and cultural and educational), restoration (architectural monuments), creation of new architectural objects (commercial and entertainment) in the mode of historical dialogue and saturation with new active functions (Fig. 10).



**Fig. 10.** Okhtyrka. Materials from the diploma project on the topic (**Object No. 2**) - “Principles of reconstruction of office, educational and shopping centres (on the example of multifunctional center at 8-11, Nezalezhnosti street, in the city of Okhtyrka, Sumy region)”, 2023:  
 a – transverse section of the restored site;  
 b – the underground level of the restored site;  
 c – view of the restored area from the southwest;  
 d – view of the restored City Hall and the Museum

In general, the proposed conceptual idea can be called: “ReKraMobile” – in the Ukrainian language (which is consonant with “Retromobile”), “ReCuMobile” – in English, as it consists of details (objects) from different times, which over time and as a result of certain historical events received: “Re” – Reincarnation; “Cu” – preserve the Culture of the region; “Mobile” – transformation in movement (proposal of Associate Professor *Tetiana Ladan*).

**Object No. 3. River station, embankment, Postal Square in the city of Kyiv in the framework of the “Historical Landscape of the Kyiv Mountains and the Dnipro River Valley”.**

Based on the use of the “pre-project analysis” method, it was determined that the central part of the city of Kyiv needs updating of the architectural and urban compositional structure and image, namely:

- it is possible to advantageously emphasize the picturesque serpentine steep relief of the Dnieper slopes, organize the dendrology and landscape by clearing green plantings from self-sowing and thickets, and strengthen the slopes with the help of anti-slide measures. “Oaks, sycamore and cedar groves are possible here, a new Lilac Garden, a new Magnolia Garden, a new Chateau de Fleur... Potentially, this is a botanical garden of the new era” [17];

- for the convenience of movement and familiarization with landscape, history and architecture monuments, cableways and monorails can be built on steep terrain differences. Areas with height differences in the relief structure of the right bank of the city center of Kyiv were considered by architects as early as the 40s of the 20th century. A system of mechanized lifts was proposed (architects: *Viktor Andreev, Ivan Taranov*, 1944) [20]. The idea was not implemented, but it is still relevant;

- it is expedient to compositionally emphasize the water axis of the Dnipro River, the creation of which was still foreseen according to the general plan of the city of Kyiv in 1935 (architects: *Pavlo Haustov, Hryhoriy Golovko, Vadym Grechyna, Pavlo Yurchenko* and others) [20];

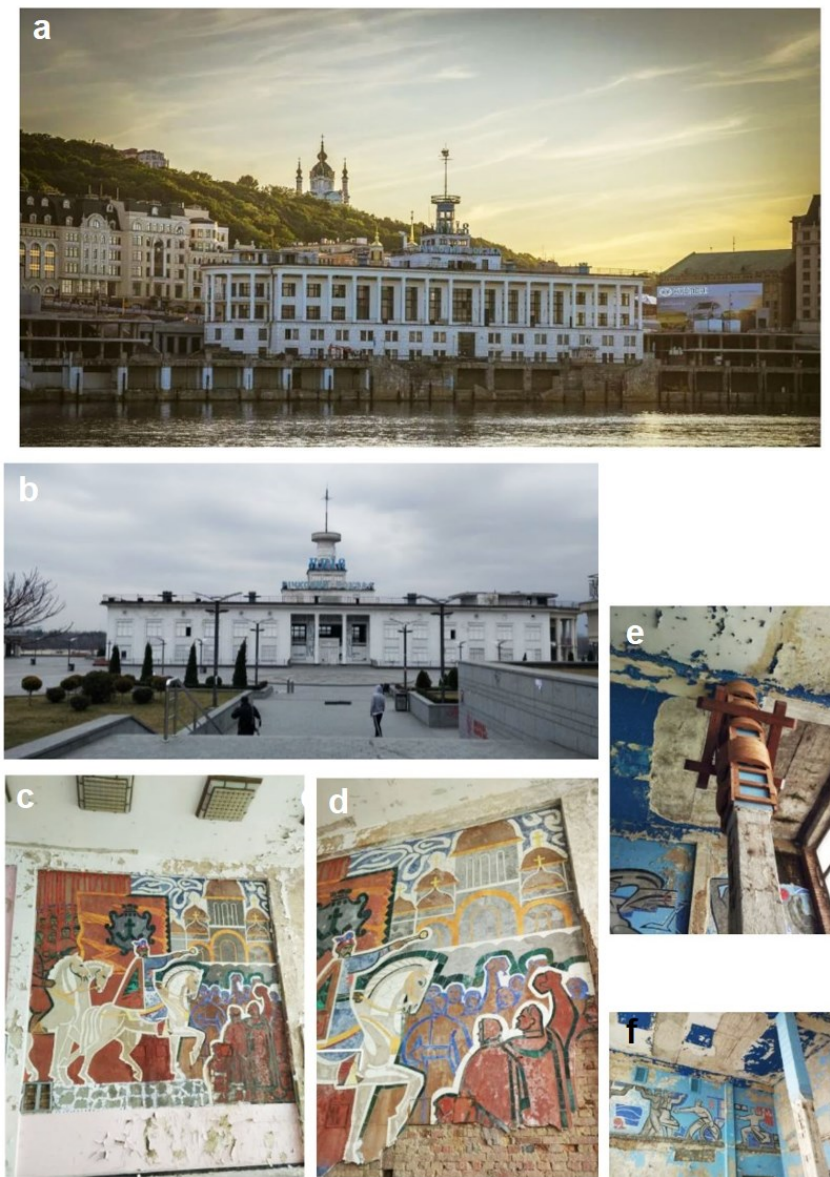
- the territory of the granite embankment on the right bank (architect *Vasyl Osmak*, 1935-1938) and the sandy embankment on the left bank, on the islands, will receive appropriate landscaping with the possibility of recreation near the water and on the water;

- the embankment and green islands, peninsulas can get functional composite connections (pedestrian, bicycle, via cableways, visual), which will become advantageous points of view, including on the panoramas of the right and left banks of the city of Kyiv with exits to the territory of the embankment;

- individual unique architectural objects on the embankment and the edge of the slopes can become composite educational and cultural focal points.

**Step 1. Selection of characteristic points of attraction and giving them symbolic names.**

According to the project, the river station has the architectural image of a ship, built in the “neo-renaissance” style (architects: *Vadym Hopkalo, Vadym Ladny*, artists: *Ernest Kotkov, Valery Lamakh, Ivan Lytovchenko*, 1961). During the years 2012-2021, in peacetime, it acquired a neglected state, both externally and internally (mosaics and wall paintings were in a state of disrepair), has the status of a newly discovered architectural monument (since 2016). Restored (2021-2023), put into operation in 2023 (leased for 10 years, now the function does not correspond to the purpose – the premises are an educational institution – a university). When it was being built, the building stood out favorably against the background of Kyiv's green hills, but at the same time it closed Postal Square from the water's surface. Now the building has lost its compositional dominance because it is visually blocked by bridge highways, the architecture is lost against the background of the green slopes of the Upper City elevation (Fig. 11).



**Fig. 11.** Photo of the River Station (**Object No. 3**):  
 a – against the background of the Dnipro slopes;  
 b – from the side of Postal Square, 2019;  
 c, d, e, f – emergency state of interiors, 2016, 2019 [21]

Along the embankment of the right bank of the Dnieper and on the steep hills of the Dnieper slopes, 18 architectural and artistic points of attraction with symbolic names can be formed: “Butterfly and Flowers” (interactive bridge and monorail road along the boulevard on Podil); **“River Gate” (reconstruction of the River Station, Post Square and embankment)**; “Endless Moment”, “Seize the Moment”, “Light Dimension”, “Formula 5”, “Bow and Arrow” (complex of themed sites with ramps and stairs on the Dnipro slopes); “Ruta” (a complex of bridges from the Dnieper slopes to the embankment above the highway); “The Path of Fate” (reconstruction of the Green Theater); “World Tree” (bridges along the fragments of highways



for pedestrians); “Symphony” (a complex of interactive bridges on the Dnipro hills); “Aqua” (additional berth in the extension of the lighthouse bridge); “Serpentine” (a system of bicycle paths on slopes); “Cosmopolis” (children's city of the future near the Palace of Children and Youth); “Panorama” (monorail transport system along the embankment); “Circles in the triangle” (improvement on the slopes near the Dnipro metro station); “Buzzing Bird” (complex of spatial pavilions for birds and people's recreation), “Balance” (complex of temporary rest areas along the 160 horizontal).

On the islands, it is proposed to create 6 architectural and artistic points of attraction with symbolic names: “Voice of the soul” (a glamping museum – a summer residence for artists with a workshop for *Ivan Marchuk*); “Catch a wave” (beach area on Trukhanov Island); “The Sixth Element” (Park Cinema); “Lybid” (water park on the territory of the Hydropark); “Forest song” (recreation park); “Butterfly” (improvement of the embankment and bridges to the island).

Along the embankment of the left bank of the Dnieper, it is proposed to create an architectural and artistic point of attraction with the symbolic name: “Yakir” (a park near the embankment of the Rusanivka housing estate).

**Step 2. Development of “architectural-artistic novels”.**

In the process of experimental conceptual design, each of the 25 points of attraction received a description according to the genre “architectura-artistic novel”. In this scientific study, we present an “architectural-artistic novel” that developed on the territory of the lower city, is the focus of archeology and innovation (the historical and cultural focus of the Podil district), with the figurative and symbolic name “River Gate”.

Raising the building of the River Station (as a landmark, with the preservation of the external architecture of the building and interior decoration) to the platform, two floors up and rotation relative to one of the semicircular risalites, the arrangement of the appropriate supports will determine the favorable urban planning position of the building, thanks to which it will be possible to form a through passage that will connect the square, the embankment and the pier for ships and yachts. On Post Square, lanterns-umbrellas will protect visitors from the sun, and an appropriate favorable atmosphere will be created: landscaping and a fountain. The underground part in and around the area of archaeological research will be given over to the function of a historical archaeological museum (Fig. 12).

Thus, with the help of raising the building, the so-called water gates of Kyiv can be formed, which will open the water-air space of the Dnipro River to the Postal Square. There will be a symbolic connection between the achievements of the past and the present with sustainable development for the future – a network of cable cars towards the city center. Spatial support sculptures in the form of “Atlantean archaeologists” and “caryatid archaeologists” (prominent figures of Ukrainian culture, archeology, art and architecture who contributed to the expansion of knowledge about ancient Kyiv) will symbolically hold history and modernity on their heads and shoulders.

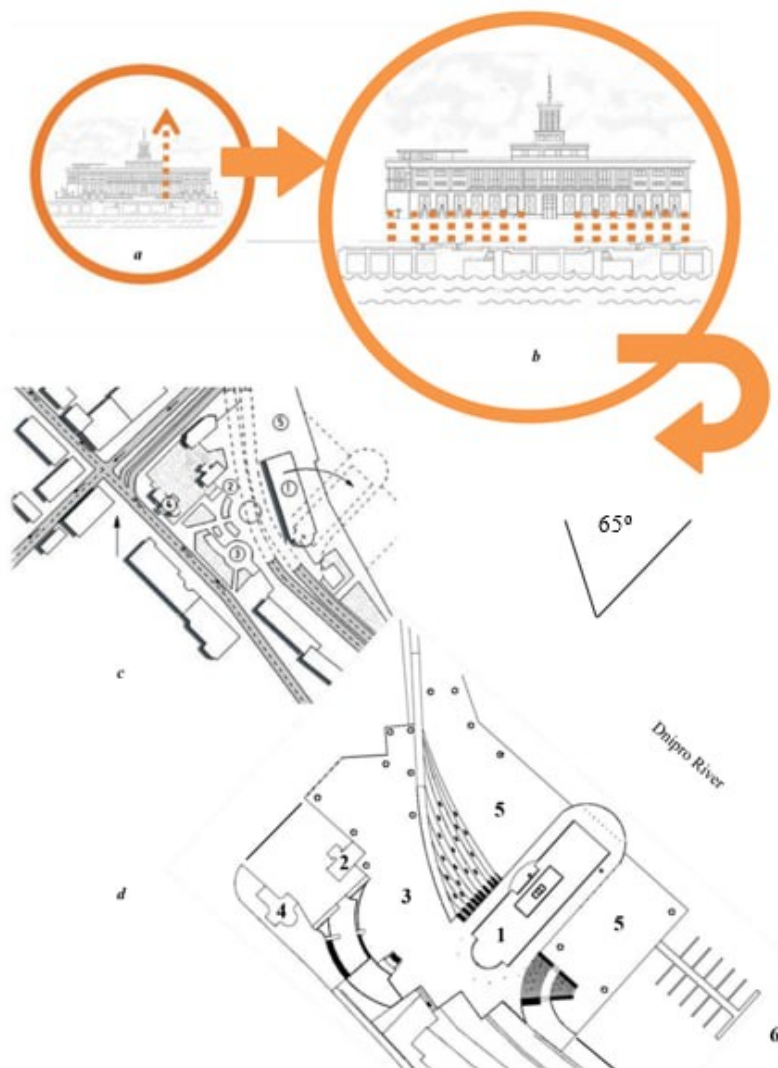
Lifting and rotating the building of the River Station, as if on a hinge, relative to the semicircular elevation by  $65^\circ$  will allow the simultaneous application of innovative technologies, and will be a good advertisement for the capital of Ukraine, as one of the leading capitals of the world, in which innovative solutions work to preserve architectural monuments.

The end rectangular facade of the River Station will thus be directed towards the Dnipro. It will be possible to install an interactive screen for light shows, and the building itself can act as a lighthouse. The allegory of the wings of a seagull can be formed by a system of terraces and ramps, which will direct the descent from Postova Square to the embankment of the Dnipro River.

In this way, a new spatial informational and spiritual center-focus can be formed in Podil multi-layered, figurative, iconic: “River Gate” (“portal” – a symbol of an open combination of the past, present and future, a land liner-lighthouse, dominant), Post station (information center), the Church of the Nativity of Christ (spiritual center), the funicular (prospective portal to the upper city) and the “Postova Square” metro station, the network of cable cars in the direction of

the city center (transportation center); museum of history and archeology (center of science and education). The means of dynamic shaping of small architectural forms can be implemented: noise protection and air purification from exhaust gases, informativeness (kinetic installations - clock, barometer, weather vane, thematic sculptural compositions). Spatial constructive solutions (wooden and metal trusses, hyperboloid structures, cables) will create openness and ease of perception of architectural and planning solutions.

Every visitor to the capital will definitely want to pass through such a symbolic gate, get acquainted with the innovations, history and culture of the city and make a wish for happiness.



**Fig. 12.** The concept of the reconstruction of the River station – “River Gate” (Object No. 3):  
 a – raising the architectural monument 2 floors up;  
 b – rotation relative to the hinge-risalit;  
 c – scheme of the master plan before the reconstruction,  
 d – scheme of the master plan after reconstruction  
 (1 – River station; 2 – Postal station; 3 – Poshtova square;  
 4 – Church of the Nativity of Christ;  
 5 – Seafront; 6 – mooring for ships and yachts)

**Step 3. Development of a sustainable concept of the general script-image.**

Thus, the selected 25 compositional points of attraction (the territory of the “Historical Landscape of the Kyiv Mountains and the Dnipro River Valley” and partially beyond it) can be assembled into a general scenario-image called “Educational Palette”, which will emphasize in the center of Kyiv: creative research architectural and artistic, natural atmosphere of the historically formed environment, Ukrainian national traditions. And the angel's wings serve and will serve as a talisman for the city of Kyiv and future generations, as islands along the Dnipro River were naturally formed according to their configuration.

In the general structure of the iconic and symbolic unique image of the city, the focus of attraction – “River Gate” (River Station) can become the pearl of the Podil district with the return of its original function and significant expansion of the functional and planning structure.

As a result of the dominance in the conceptual development of natural forms, it is advisable to use ecological materials (wood, metal) and open structural cable systems.

*Each of the aforementioned research objects had public discussions at various stages of preparation and development of conceptual project proposals.*

**Object No. 1. General plan of the city of Hostomel, Kyiv region.**

In the process of course conceptual architectural design, students had the opportunity to jointly discuss and develop ideas with teachers at all stages of work (development of the master plan and the city center). The experience of the scientific and practical work of the teachers, the responsibility and perseverance in the compositional and artistic views of the students made it possible to implement the appropriate ideas into the project as perfectly as possible. Later, the concept was supplemented by an independent expert (Associate Professor *Tetiana Ladan*, September 2023) in the direction of visual characterization of all components of the object.

**Object No. 2. City center of Okhtyrka, Sumy region.**

The discussion regarding the relevance of the reconstruction of the object took place at the highest administrative level in the person of the Head of the Department of Urban Planning and Architecture, the chief architect of the Sumy region, *Volodymyr Bykov*, who provided the relevant source materials (photos, drawings) and invited Professor *Oleg Sleptsov* to take up this topic for students and teachers in development. Upon completion of the joint work of the managers and the student, all materials were handed over to the city administration for further analysis and possible implementation. Over time, the project concept was supplemented by independent experts with a visual description of all the components of the object (Professor of the department *Boris Erofalov*, Associate Professor *Tetiana Ladan*, September, 2023).

**Object No. 3. River station, embankment, Postal Square in the city of Kyiv in the framework of the “Historical Landscape of the Kyiv Mountains and the Dnipro River Valley”.**

The results of scientific and experimental project development for the reconstruction of the Postal Square near the River Station were publicly presented at the all-Ukrainian competition for the best concept of the reconstruction of the Postal Square “River Gate of the Millennium of Kyiv” in the city of Kyiv in the Architect's House (December 28, 2018), (Fig. 13).

At the end of the first round of the competition, the public of the city, the professional community of architects, and other specialists could familiarize themselves with the materials of the competition, submit their proposals for consideration by the participants in the second round.



**Fig 13.** QR-codes of videos and project materials about Tetiana Ladan's competitive activity:  
a - protection of the concept of the “River Gate” project; b – poster of the idea of the “River Gate” project.

In the process of developing ideas, the organizers of the competition (one of the founders of the public organization “Community of Andriyivskiy Uzviz” *Vitaly Biletskyi*, 2017-2021) held weekly discussions and meetings with experts on various issues: infrastructure, engineering, protection of architectural monuments and development of tourism business in Ukraine. Upon completion of the second round of the competition, the best ideas of the first round and projects of the second round were publicly exhibited for the residents of Kyiv at an exhibition in the Architects' House (May-June 2019).

According to the lecture-practical course “Reconstruction and new construction in a historical environment” (lecturer – Professor *Oleg Sleptsov*, practical classes – Associate Professor *Tetiana Ladan*), teachers together with students of the 5th year developed an experimental project of the complex of educational institutions “Educational palette” as an extension of the territory of the Palace children and youth in the city of Kyiv (September-December, 2018). These developments were publicly presented at the open methodical festival of out-of-school education institutions “Kyiv-M-Fest” in the Kyiv Palace of Children and Youth (the authors received the Grand Prix Diploma of the festival in the nomination “Organization of pre-professional, profile and professional training based on an out-of-school education institution”, February 19-21, 2019).

Later, this idea was further developed by *Tetiana Ladan* together with 3rd-year students of the Faculty of Architecture KNUCA, who jointly developed 12 conceptual complex projects (points of attraction) near the Palace of Children and Youth. The idea of informative BIM design was used, when each group of developers had information about what other groups were doing and, thus, it was possible to achieve a coherent result and high-quality solution development. One of the developed ideas was publicly presented as a poster of the “Humming Bird” project as a poster presentation at the annual Ukrainian Urban Awards competition (February-June 2019).

In continuation of the compositional analysis of the “Historical Landscape of the Kyiv Mountains and the Dnipro River Valley” in the future, *Tetiana Ladan*, together with the students of the 3rd year, developed 13 conceptual complex projects (points of attraction) throughout the territory of the research object and partially beyond it. Similar to the experience of previous developments, the idea for the reconstruction of the River Station and its adjacent territory (embankment and Post Square) was improved. The class was conducted online, so each student had the opportunity to virtually participate in joint work on an interactive screen (Zoom work platform) to develop each of the ideas, directly together with *Tetyana Ladan*, who during the online classes had the opportunity to conduct a master class on figurative design-projection based on the “hermeneutic-semiotic” (“semionic”) method of design (February-June, 2022).

Thus, in general, a complex concept of a figurative architectural and town-planning composition of the renewal of the “Historical Landscape of the Kyiv Mountains and the Dnipro River Valley” and partially beyond it under the name “Palette” emerged, in which the “River Gate” attraction point can become one of those that will lead to complex reconstruction, restoration and implement innovative solutions in the modern architecture of the city of Kyiv.

### ***Legal Issues***

In the process of working on the projects, the requirements regarding the norms and rules of architectural design and the development of project documentation were taken into account within the building regulation zones of various categories and territories of historical areas of cities in accordance with the laws and state building standards of Ukraine: Law of Ukraine on Protection of Cultural Heritage; Order of the State Committee for Construction, Architecture and Housing Policy of Ukraine No. 41 dated 26.02.2001 on approval of the Procedure for determining the boundaries of monument protection zones; Law of Ukraine On Regulation of Urban.

### **Conclusions**

The proposed universal methods of architectural and urban reconstruction, restoration and creation of new objects can direct the process of creative activity of architects in two directions: hereditary or innovative (Fig. 3).

At the initial phase of contemporary architectural design, the integration of a comprehensive theoretical-experimental approach involving “pre-project analysis”, BIM design, and the application of additive technologies such as 3D modeling, mock-up, Projection mapping (akin to video mapping and spatial augmented reality) represents a crucial foundational stride towards advancing both theoretical concepts and the practical implementation of proposals concerning the reconstruction and restoration of buildings and structures.

For instance, when faced with extensive devastation that cannot be restored in the short term, employing media facades and structures to restore objects of varying scales (at the level of a city, its center, or individual buildings and interiors) can offer a range of options for reconstruction, restoration, or the retrieval of lost elements (urban structures, buildings, their volumes, or intricacies of interior adornments like frescoes and mosaics).

Modern media tools and techniques can facilitate this process, fostering three-way exchange and communication between architects, authorities, and the public. By engaging residents in selecting the most viable restoration ideas through methods such as voting or gathering feedback from local communities, the approach paves the way for a gradual societal adaptation to forthcoming changes. This serves to preserve the emotional resonance, alleviate social tensions, underscore cultural values and traditions, and retain the collective memory of significant events. It also outlines potential trajectories for the development of specific territories, buildings, and monumental artworks.

In the case of damaged structures, the integration of augmented reality through media surfaces emerges as a viable means to conserve sense of space even in the absence of a physical three-dimensional structure [22]. Furthermore, the approach allows for the distinction of authentic historical elements from contemporary ones, emphasizing the prospects of creating augmented reality during reconstruction and restoration. It can be implemented through the integration of lightweight, temporary modular structures known as “media facades”, and “media skins” or utilization of video projections, including video mapping or 3D mapping [23]. Notably, these strategies can be introduced even under stringent resource constraints, which will confirm the fact that the issue is receiving due attention and specific plans are in place to address it. This approach not only visually harmonizes the space but also empowers a sense of control over the situation, expediting the reconstruction process.

Experience of the usage of different types of sights of architecture shows that at maintenance or research of their further permanent function, it is expedient at first to give them a temporal cultural and educational humanitarian function as an exhibition center, university, or school. So, at first, the public and authorities are to be informed about the problems of an object in the process of its renewal, reconstruction, or restoration. Certain conceptions and strategies, and project competitions are to be conducted including international ones. At the same time, conservation of the objects that are destroyed in the war-time or collapses and with time are provided.

Due to cosmetic repairs and restoration and maintenance of the temperature regime, in connection with its temporary functioning, artistic events can take place on the territory of the object – exhibitions of paintings, photo shoots, lectures, and master classes, auctions. In this way, the largest number of people can familiarize themselves with the restoration of the object and get involved, the search for patrons is ongoing. For the formation of a stable consciousness of young people based on respect for the history of architecture, the formation of knowledge about national styles and national traditions, the temporary educational function in the object at the “school” and “university” level is of the greatest importance appropriate. For example, to provide education in a secondary school, it is necessary to concentrate on the following premises: four junior classes (the area of each class is 95m<sup>2</sup>), five universal classes (the area of each class is 60m<sup>2</sup>), and three laboratory classes (the area of each class is 90m<sup>2</sup>). The rejection of the cellular structure and the use of open spaces in schools allows them to be placed in buildings with fewer walls and an increased amount of glass, sufficient height of the premises (educational – at least 3.5m to ensure new ventilation; sports – at least 6m), appropriate water supply and sewage, maximum use of daylight [24]. When designing an educational space in the conditions of reconstruction of the object, in addition to classrooms, it is important to provide such basic functional groups of

premises in the building as: the food block, assembly hall, administrative, health complex, economic and auxiliary premises – lobby, recreation, restrooms. An example of such a temporary use of a building is the River Station, which now serves as a temporary international high school – the American University Kyiv (AUK). Thus, the educational function can become one of the methods of temporary “preservation” of architectural monuments.

At the stage of developing conceptual projects for reconstruction, restoration, or creation of new objects, architects use such universal theoretical and practical methods as:

- “stylistic”, which involves the imitation of theories, directions, and styles from the work of a certain author, with a compilation or author's transformation of elements;
- “artistic”, which is based on the synthesis of architecture and arts.

Such universal theoretical innovative methods such as: “hermeneutic-semiotic” (“semantic-pragmatic”) and “hermeneutic-semiotic” (“syntactic”) can direct architects-creators-scientists to develop new theories in architecture to get rid of in the architectural science of unspecified names of directions “post-post...”.

Universal practical innovative “hermeneutic-semiotic” (“semiotic”) method allows:

- implement the results of developed theories according to previous methods into the practical activity of architects;
- based on the proposed steps of actions, figurative and symbolic names of a series of iconic “points of attraction”, and “focuses” to model the organic unity and energy-integrated organism of the object of various scales, which will allow performing complex reconstruction and restoration of objects;
- when creating forms, put, according to the names, into the compositional solutions forms that are based on historical folk traditions, establish a connection with nature and art, which will allow the objects to be unique. In the process of being in such an environment, an adult or a child will feel comfortable and safe, will receive moral and spiritual purification, and will reach catharsis.

The context and environment will help to form a visual orientation of architectural and urban planning objects.

In general, such a methodological approach will create conditions for the implementation of a comprehensive strategy for the formation of an energy model for each of the architectural and urban planning objects of reconstruction, restoration, or new construction in Ukraine. The resulting relieving, rehabilitative environment, in accordance with the sustainable development of architecture and urban planning, will allow residents of all corners of our country to gain energy recovery from the consequences of the war. At the same time, modern ecological materials, methods, and technologies: (bio-receptive concrete) [25], wood, metal; video-ecology [26], and media facades will help make the architecture of buildings and structures such that will have a close connection with traditions, innovations and the natural environment with the theatricalization educational space for visual relaxation and rehabilitation of residents.

## Acknowledgments

The team of authors expresses sincere gratitude to everyone who participated in the development of experimental projects and provided the opportunity to use the original project materials. Among the people we should personally mention:

- Head of the Department of Urban Planning and Architecture, Chief Architect of the Sumy Region, full member of the UAA – *Volodymyr Bykov*;
- Professor of the Department of AFAD of KNUCA – *Yuriy Seryogin*, Honored Architect of Ukraine, full member of the UAA;
- Associate professor of the Department of AFAD of KNUCA, PhD Architecture – *Serhii Somka*;
- Docent of the Department of AFAD of KNUCA, PhD Architecture – *Iryna Novosad*;
- Docent of the Department of AFAD of KNUCA, PhD Architecture – *Margarita Yakovenko*;
- Master of Architecture of the Department of AFAD of KNUCA – *Anastasia Gorbonos*;

- Bachelor of Architecture, Master's student of the Department of AFAD of KNUCA –*Lilia Maksymchuk*.

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Received: November 20, 2023

Accepted: February 16, 2024