The Landscape Creation and Integration in Design and Urban Planning of Medical Institutions

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To cite this article:

Received: September 14, 2019; Accepted: November 4, 2019; Published: November 19, 2019

Abstract: The article reveals advanced all over the world approach to architecture and urban planning design of hospitals with active usage of landscape. The newest examples of competitive and already implemented projects of medical facilities are examined, which clearly illustrate the active integration of natural and artificial reservoirs, peculiarities of natural and formation process of explicit artificial landscape in the environment of medical institutions. The article is aimed at sticking the urban planners’ attention at the importance of the design and integration of the natural already existing including landscape design approach into the hospitals’ design in order to strengthen the therapeutic effect with the exterior of the medical building and the public welfare of its location.

Keywords: Architecture and Urban Planning Design, Medical Establishments, Modern Tendencies, Water, Landscape

1. Introduction

Exterior together with the interior and the public welfare areas of the hospital significantly affect the emotional state of a person, especially the one who is sick, stressed and agitated consequently. The architecture appearance of the hospital building and its surrounding area might enhance these patient’s negative feelings or, conversely, produce feelings of confidence, peace and hope for the speed recovery. It’s a real obligation of a modern architect to be aware of such an ability of emotional impact of healthcare facilities architecture. Special attention of the architect should also be paid to the development of the modern and natural environment of the hospital. The territory of any medical facility should have a minimum set of compulsory constituent elements (entrance area, pedestrian sidewalks and highways, designated parking spaces for patients and staff, and official transport). In addition to these components the territory of a medical institution, designed on the modern principles of environmental and natural design, has to be qualitative and have the detailed improvement and landscape, that might guarantee the comfort staying for different groups of patients (age, with physical disabilities, etc.). This comfort could be satisfied with the availability of landscaping and park design – all these meet a person entering a hospital and from the very beginning and thus the person is able to evaluate and get an emotional impression of the surrounding architectural and urban space of the medical building and its territory in general.

2. Literature Review

2.1. The Concept of the Urban Planning Location of Medical Buildings

Nowadays there are a lot of scientific studies focused on various aspects of architectural and urban planning of medical institutions. The issues of urban planning location of medical buildings were considered in the works of Rusina V. V. [1], Chuchmareva E. Z. [2], Podchaska-Vyshynska V. [3], Bulakh I. V. [4-7] and Didichenko M. O. [8]. A number of studies have been aimed at revealing the general principles of architectural design of medical institutions [9-11], volume and space [12-14] functional and planning [15-17] architecture methods of various range of hospital institutions.
phenomenon), a comparative method (selection of similar
buildings are revealed in the article: integrity, separation and
psychologically adjusting the state of health, mood and
Numerous studies were devoted to the features and
essential subject properties, distraction from the bits, which
statistical, abstract-analytical (mental selection of the
were used: inductive (from a single one to general),
one qualitative state to some another).
(timeline research and revealing the laws of transition from
consideration the research object as a set of the functional
institutions by studying the object in an interdisciplinary way
complex approach (the discovery of new architectural and
links' types and adjusting them into a single mechanism),
studying the integrity of an object, identifying the variety of
environment of a medical facility as an integrated system,
systematic approach (considering the internal and external
urban planning design was carried out on the basis of a
landscape while the architectural and medical institutions
internal and external environment, emergence.
The study of the formation features and integration of the
landscape while the architectural and medical institutions
urban planning design was carried out on the basis of a
systematic approach (considering the internal and external
environment of a medical facility as an integrated system,
studying the integrity of an object, identifying the variety of
links’ types and adjusting them into a single mechanism),
complex approach (the discovery of new architectural and
urban planning qualities of the environment of medical
institutions by studying the object in an interdisciplinary way
on the edge of different design types), a functional approach
(consideration the research object as a set of the functional
options; disclosing functional integrity), a historical approach
(timeline research and revealing the laws of transition from
one qualitative state to some another).
Depending on the tasks set, a number of research methods
were used: inductive (from a single one to general),
statistical, abstract-analytical (mental selection of the
essential subject properties, distraction from the bits, which
allows to compile a generalized image of the under study
phenomenon), a comparative method (selection of similar
organizations as the research objects in order to clarify the
processes of change, the dynamics of the researched
phenomenon). The method of historical analysis was used to
summarize the architectural, urban planning and the
improvement of healthcare facilities experience, the gradual
introduction of landscape techniques in the formation of the
external environment of medical institutions, the coherent
awareness of the landscape design role and the need for its
implementation as a component of the "therapeutic
environment". While studying the role and influence of the
"treatment environment" aesthetics the method of qualitative
and quantitative analysis of the world leading countries
innovative design experience was used. The methods of
statistical, comparative analysis and fieldtrips were partly
applied in the study to address the peculiar issues. It is
recommended to use the experimental design method when
formulating the landscape integration proposals for the
architectural and urban planning of medical institutions in
various urban conditions.

4. The Aesthetics Problems of Medical
Institutions

4.1. The Basis of the Problems of the Aesthetics of Medical
Buildings

The problematic of the of increasing the aesthetic level of
architecture of medical institutions is obvious today. Most of
the existing health care facilities in Ukraine were built in the
Soviet Era of Ukrainian statehood development. During this
period, the main state task was to create a powerful network
of medical and preventive institutions in the shortest possible
time and with less financial costs of, which had to cover the
entire population of the country. In order to achieve this,
the design and construction of health care facilities were carried
out according to typical industrial-scale construction projects.
The architecture of the medical institutions was a physical
envelope for rigid medical technological processes, a
functional machine devoid of unnecessary elements of beauty
and aesthetics. The person in need of physical healing, during
treatment, got into a temporary cell-box, aesthetic vacuum,
without the possibility of visual contact with the world of the
beauty (Figure 1).

4.2. The Position of the Aesthetics of Medical Buildings in
Modern Ukraine

The mentioned problems have only intensified during
Ukraine's independence. The last wave of construction of
health-care facilities on the territory of Ukraine ended in the
70-80's of the last century, the buildings naturally got
physical and moral aging. It should be emphasized that
modern urban planning regulations and rules of Ukraine are
aimed at practical and technical indicators of the formation of
architecture and urban environment, including the aspect of
health care facilities design.
Figure 1. Ukrainian hospitals in the 21st century. (a) Kyiv City Clinical Hospital №6, Ukraine (b) Kyiv ambulance hospital, Ukraine (c) Kyiv ambulance hospital, Ukraine (d) City Clinical Hospital No 11 in Odessa, Ukraine (e) Hospital in Genichesk, Ukraine (f) Territory of Kyiv City Children’s Clinical Hospital No 1.
Issues of raising the aesthetic and philosophical level of the architectural and urban planning environment, its imagery, often depend on the professionalism of the architect, at best solved intuitively, without proper justification. The search for aesthetic expressiveness and contextuality of the medical environment is replaced by standard-typical proposals, which are not consistent with the existing urban environment, therapeutic properties and potential of the architecture. Modern healthcare facilities are gaining the character of a properly designed technical system, consequently.

5. Landscape Integration in Architecture Design and Urban Planning of Hospitals

The aforementioned aesthetics problems of the medical establishments are typical not only for Ukraine, but are sharply expressed and illustrated with the example of the given state. At the same time, there is a world bright experience of conceptual and competitive design, as well as the real construction and functioning of medical institutions, which together form the best practices of the architecture models of medical institutions.

These innovative examples take into account the issues of aesthetization and harmonization of the medical building with the environment, actively integrating the natural environment and, if necessary, forming their own artificial landscape with reservoirs. Such a project approach may go even a century ahead of the opinion of architects about the external and internal organization of structures intended to treat people both physically and psychologically in countries where there is a problem with the architectural and urban development of health care institutions.

Considering and analyzing the world experience of hospital design, two main trends that are absolutely absent, even in the embryonic state, in the architecture of Ukrainian medical institutions could be figured out. These trends can be conditionally characterized as the integration of landscape and reservoirs in the design of master plans of medical institutions. A lot of examples of landscape orientation in modern hospital projects all over the world already exist.

5.1. Design of Lady Cilento Children's Hospital in Brisbane

Thus, the giant green tree inspired the design of Lady Cilento Children's Hospital in Brisbane, a project designed by Lyons and Conrad Gargett (Figure 2). Trying to avoid the common “catwalk” and “tower” image of the hospital, the architects designed a 12-story building with two spacious atriums, rooftop terraces, and a network of branch-based interior spaces. The two atriums, symbolically referred to the trunks of surrounding trees, help visitors and staff easily navigate the pediatric center [31].

They are connected to different rooms that extend beyond the facade, forming balconies. Green and purple ribs protect the exterior of the building from direct sunlight, and the walls on the first level are covered with live plants. Inside, colored graphic images on the walls and sculptures in the form of parrots, butterflies, beetles and insects, according to the architects ideas, should distract small hospital patients.

5.2. Design of Modern Hospital in Denmark (BIG, Herzog & de Meuron and C. F. Møller)

Other examples of landscape design approach in the architectural and spatial design of modern medical institutions are the finalists of the international competition for the project of the largest hospital in Denmark: BIG, Herzog & de Meuron and C. F. Møller. The aim of this competition was to create a large-scale 124,000 m² Nyt Hospital Nordsjælland hospital complex. The site chosen for construction is the former hunting grounds: the hilly landscape with the country's largest forest area and many small lakes. The task of the architects was to unite the three existing independent hospitals into a single medical complex that would serve the area with 312,000 inhabitants. Housings had to be connected to the environment, and each of them had to be provided with the most convenient road access. The hospital is designed for 662 patients and exclusively single units [32-34].

Team of the Danish office C. F. Møller has created a project where relatively high hospital buildings are immediately visible against the background of the surrounding landscape. The "pure functionality" of this variant of the hospital meant that the largest hospital in the country should be deployed as if it was a whole city with everything needed for both the patient and the doctor. The center of the complex is defined by a hall with two circular patios in the plan. At the ground floor level, the building was annexed with a lobby covered with curved roofs, the silhouette of which echoes the smooth lines of the surrounding hills (Figure 3) [34].

The concept of the BIG architecture office involved the creation of a space capable for healing. Their variant of the hospital complex consists of eight buildings represented on the plan in the form of intersecting rings with courtyards. The architects explain their choice of this form by functional necessity: from the window of each unit it will be possible to admire the views of nature, a green courtyard or the surrounding landscape, all the rooms will be provided with sunlight, and the opportunity to walk into the yard – in the "own" garden – create conditions for communication of people. According to the authors, the fresh air, beautiful scenery and positive mood are true recovery satellites.

Hospital buildings have different heights, sometimes even falling to the ground – depending on the shape of the relief. The flat roofs are planned to be greened and the complex is almost merged with the natural environment (Figure 4) [32].
Figure 2. Children's Hospital Lady Cilento Children's Hospital in Brisbane (Australia). Lyons and Conrad Gargett office.
Figure 3. International competition for the hospital building in Denmark, architecture office C. F. Møller.
Herzog & de Meuron offered two- and four-story buildings implemented in the landscape. In the layout, the circle lines of the hospital complex are like the simplest living creatures, rather than the usual hospital building. This configuration of
the hospital plan makes it possible to provide the units with daylight. The free section of the enclosures forms the courtyards and the roofs of the hospitals are green. The presented version of the project of the hospital from Herzog & de Meuron reflects the close connection of the building with the surrounding landscape, thanks to the internal courtyards and rooftop gardens, which forms the aesthetically maintained space of a modern medical facility (Figure 5) [33].

The building of H. Hughes Medical Institute in Virginia (USA), designed in 2008 by architect Rafael Vinoly, reflects the combination of tendencies of active introduction of the surrounding terrain and placement of water in design a distinct architectural appearance of a modern medical building (Figure 6). H. Hughes Medical Institute performs the functions of a state-of-the-art medical laboratory for computational and electrophysiological examinations, robotic research, contains conference rooms, minigotels, spacious lobby, registration and rest area, private offices, treatment rooms, etc. It is envisaged to use this treatment facility for short-, medium- and long-term medical research programs, which is made possible by
advanced 21st century biomedical research techniques. The building of the Medical Institute includes three separate functional areas, which provide advanced research and treatment, thanks to the flexible integration of the hospital into the environment, a hotel for short-term visitors, as well as a housing for long-term accommodation [35].

Figure 6. Howard Hughes medical institute VIRGINIA (USA), design by Rafael Vinoly architects.

6. Conclusion

The carried out research of the issues of landscape formation and integration in architecture and urban planning of medical establishments testified the necessity of their introduction in order to improve the aesthetics and harmonization, as well as the healing properties of medical objects. Already built contemporary innovative projects of hospital buildings, as well as references of international competitions and conceptual projects of medical buildings describe that by means of landscape design it is possible to create an individual look of the territory, to emphasize or create a natural environment, especially necessary for residents of urban metropolitan areas. Landscape approach to the formation of the master plan of the hospital allows to solve not only the issue of accommodation of basic components and elements of improvement, but also to create a park environment intended for rest, restoration of physical
and psychological condition of sick people, which, of course, can be achieved shortly in the conditions of aesthetic and the natural environment.

References


Biography

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