

UTILITY OF ARCHITECTURE OR BEAUTY?

ARCHITEKTURA UŻYTECZNA CZY PIĘKNA?

Abstract

Contemporary architecture is shaped mainly in accordance with the principles of a sustainable environment. Issues related to energy efficiency and the impact of buildings on the environment are particularly important. Aesthetics are also important for the environment. The use of energy-saving and pro-ecological building materials and technologies in architecture affects the change in the quality of the aesthetics of this building. The technological elements necessary to ensure proper technical parameters of buildings are introduced to the buildings themselves and the space around.

An attempt has been made to qualitatively study selected, contemporary European public buildings and apartments.

The main research elements are: quality of aesthetics of buildings and social spaces, spatial planning, aesthetic quality and the way of introducing pro-ecological elements, adaptation of architectural architecture to the requirements of sustainable environment principles.

The research was based on an analysis of the subject literature and photographic documentation made *in situ*.

The analysed examples point to specific (ecological) aesthetic elements used in housing construction due to the adaptation of these objects to the requirements of sustainable environment principles. Often there are natural building elements, space management close to natural elements, as well as technical and technological elements related to energy efficiency, energy production both in facilities and space management. Other technical measures are also used to adapt objects to climate change (construction, protection from the sun, other elements).

In the examples studied there are correlations between aesthetics and pro-ecological technologies and building materials. The materials used, the urban layout and the structure of the buildings show naturalistic and pro-ecological tendencies; however, the aesthetic quality varies.

Keywords: utility, beauty, qualitative research

Streszczenie

Współczesna architektura kształtowana jest głównie według zasad zrównoważonego środowiska. Szczególnie ważnymi zagadnieniami są te związane z energooszczędnością i oddziaływaniem obiektów na środowisko. Także dużym znaczeniem dla środowiska zbudowanego jest estetyka. Stosowanie energooszczędnych oraz proekologicznych materiałów i technologii budowlanych w architekturze wpływa na zmianę jakości estetyki tej zabudowy. Wprowadzane są do obiektów i przestrzeni najbliższej elementy technologiczne konieczne do zapewnienia odpowiednich parametrów technicznych obiektów.

Podjęto próbę badań jakościowych wybranych współczesnych europejskich obiektów użyteczności publicznej i zabudowy mieszkaniowej. Głównymi elementami badanymi były: jakość

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estetyki obiektów i przestrzeni społecznych, sposób zagospodarowania przestrzennego, jakość estetyczna i sposób wprowadzonych elementów proekologicznych, dostosowanie zabudowy architektonicznej do wymogów zasad zrównoważonego środowiska. Badania oparto na analizie literatury przedmiotu oraz dokumentacji zdjęciowej wykonanej *in situ*.

Analizowane przykłady wskazują na specyficzne (proekologiczne) elementy estetyczne stosowane w budownictwie mieszkaniowym ze względu na dostosowanie tych obiektów do wymogów zasad zrównoważonego środowiska. Występują często naturalne elementy budowlane, zagospodarowanie przestrzenne zbliżone do naturalistycznego, a także elementy techniczne i technologiczne związane z energooszczędnością, produkcją energii zarówno w obiektach jak i zagospodarowaniu przestrzeni. Stosowane są również inne środki techniczne dostosowujące obiekty do zmian klimatycznych (konstrukcja, osłony słoneczne, inne elementy).

W badanych przykładach występują korelacje pomiędzy estetyką a proekologicznymi technologiami i materiałami budowlanymi. Zastosowane materiały, układ urbanistyczny i struktura obiektów ukazują trendy naturalistyczne i proekologiczne, jednak o różnej jakości estetycznej.

Słowa kluczowe: użyteczność, piękno, badania jakościowe

1. Introduction

Would it be necessary to shape buildings that only provide appropriate living and functional conditions, physical elements of space, because most users do not need aesthetics or beauty? Would it still be architecture or only physical space, physical architecture?

The question arises: how to shape architecture to meet both functional (usability), technical (durability) and aesthetic (beautiful) needs according to Vitruvius' Triad? Is it possible to sensibly reconcile the approach to the designed objects and the rationalist space with the intuitive one? Is it enough to use one of these approaches?

It can be assumed that the rationalist approach is based on reason as the only source of cognition. On the other hand, the intuitive approach is an instinctive cognition that enables the ability to learn reality directly, with changes taking place (according to Henri Bergson). As a subconscious process, a more creative, abstract, intuitive approach to the problem, it adapts the solution to the already known dependencies, based on experience and knowledge gained empirically.

The shaping of contemporary architecture depends on complex, diverse factors, including: legal regulations, environmental conditions, economic conditions, and applied technologies.

For the study of architecture, qualitative research can be used.

Does the architecture satisfy the needs of users, including higher level ones?

Does contemporary architecture present a high aesthetic value despite the use of energy-saving technologies and other pro-ecological elements?

Is contemporary architecture beautiful and/or useful?

There is a diverse literature on the subject dealing with the analysis of the principles of beauty and aesthetics in many areas of research. Researchers dealing with this issue in various aspects of research can be mentioned: theoretical, philosophical, architectural or urban planning: W. Tatarkiewicz, M. Gołaszewska, G. Schneider-Skalska, A. Böhm, W. Kosinski, S. Gzell.

The issue of beauty in terms of usability is particularly interesting.

Research on this subject was conducted by, among others, Masaaki Kurosu and Kaori Kashimura, as well as Noam Tractinsky. They showed with their research that there are

correlations between perceived usability and aesthetics. Aesthetics is a subjective aesthetic sense, presented as a reception, evaluation and evaluation. Beauty, on the other hand, is a form of a work depicted in terms of order, harmony, clarity of the cognitive message and understood meaning and value of the work. In the analysis of buildings, a holistic approach should be applied due to the multifaceted nature of the issue.

2. Qualitative research on architecture

The qualitative research on architecture that deals with the issue of beauty in contemporary architecture is presented below.

Modern built spaces are adapted to ecological requirements by applying different aesthetic quality to specific technological elements in buildings.

The research was conducted with reference to: impact of the facility on the environment according to the principles of a sustainable environment; aesthetic impact as a perception of space by users, beauty (aesthetic quality of the architectural space, cultural heritage, identity of a place or unification of built environment, loss of diversity of places, creating a landscape without symbols, identity); technical and technological impact on architectural space (technical solutions of facilities, durability, usability).

The research was carried out on examples of modern housing and public buildings.

The analysed buildings are located in Europe, and are objects in which technologies and building materials have been applied in accordance with the directions for environmental sustainability.

The research into the objects has been divided into analyses of individual building elements, which can influence the provision of technical, functional and aesthetic needs:

- structure of the object (interior of the object),
- external elements of the object (for example elevation)
- the surroundings of the object (spatial management connected to the object).

The research involved the literature of the subject and photo documentation as well as knowledge acquired during visits to individual objects.

3. Structure of the object

The structure of the object can be taken as the interior of the object, the division of the object into smaller parts, the specificity of the division of space, the connections between internal spaces, and the construction.

An example of an object with different ecological solutions is the office building: Ministry of Development and Environmental Protection, Sauerbruch Hutton Architekten, Wilhelmsburg, Hamburg, Germany (Ill. 1, 2). The reduction of energy consumption in the building was achieved thanks to the combination of active and passive means: thermal insulation, a facade with limited transparency and protection from strong sunlight, natural lighting (dispersion), solar and geothermal energy, placement of the object on smaller spatial structures (better ventilation, lighting).

The next example is the office building of the headquarters of the Federal Environmental Protection Agency, Dessau, Germany, the Sauerbuch Hutton project – Germany and Louis



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- III. 1, 2. Office building of the Ministry of Development and Environmental Protection, Wilhelmsburg, Hamburg, Germany, Sauerbruch Hutton Architekten. (photo author)
- III. 3, 4. Office building of the Federal Environmental Protection Agency, Dessau, Germany, Sauerbruch Hutton Architekten. (photo author)
- III. 5. Multi-family building in Copenhagen, Mountain Dwellings, Denmark, PLOT + BIG Architect. (photo author)

Hutton, England 2005. (Ill. 3, 4). It uses the following solutions: brick walls (to increase the thermal mass), the atrium is a thermal buffer that regulates the temperature, water reservoir – seasonal energy storage, night cooling by mechanical ventilation, geothermal energy, technical materials: tin, cellulose insulation, wood larch, natural ventilation.

Multi-family building in Copenhagen, Denmark, PLOT + BIG Architekci, Mountain Dwellings, Residential Mountain 2008. (Ill. 5) is a 10-storey residential building, which is located in a suburban area with 80 apartments on the roof and parking directly under each apartment. The gardens on the roof consist of a terrace with a garden that changes its character depending on the season. The car park is cascaded under the building and remains in symbiosis with the apartment building (480 parking spaces with an incline lift). In the north and west, the facades are made of perforated aluminium sheets that allow air and light to flow through the parking lot and create a massive reproduction of Mount Everest.

The object presents a different way of shaping a 10-storey building. Thanks to the use of terraced apartments and terraces, apart from the positive aesthetic effect of the building, every inhabitant has access to the garden and garage. The use of such a facade and roof-terrace may contribute to lowering the temperature in the surrounding space (a component of sustainable development). In the above objects, the structure was divided into smaller parts, which also resulted in the reduction of the optical building body, inclusion in the surroundings and adjustment to the human scale.

4. Exterior elements of the building

External elements such as elevation, roof and external shields were adopted as external elements of the object.

On the example of the Italian Pavilion at the Expo 2015 in Milan (Ill. 6, 7), the external elements of the object are presented with the use of sustainable technology, which is an elevation made of concrete panels with atmosphere cleaning technology. “I.active BIODYNAMIC” concrete slabs used with active TX from Italcementi, in contact with sunlight they clean up air pollutants, transforming them into neutral salts. The whole object in its structure, technology and symbolism refers to the tree. The technology used gives the opportunity to achieve “0” energy demand (structure of the facility, energy-saving materials, technologies of obtaining energy from renewable sources).

An example of external elements of the structure with applied pro-ecological technologies is the USA Pavilion at the World Expo 2015 in Milan (Ill. 8, 9) with regulation of the obfuscation of the roof. The technologies used here are: light control, UV and IR blocking, room lighting management, creation of visual barriers, change of glass from translucent to transparent, Suspended-Particle-Device (SPD) Smart Windows, (SPD).

The next example is Energy-plus-houses (Ill. 10.). It consists of terraced housing, with services in a building located on the street, with a lot of greenery design by Rolf Disch, Freiburg-Vauban in Germany, 2008.

This is an example of the possibility of introducing energy production technology in housing construction. The so-called energy houses are buildings that produce more energy than they need and have a positive energy balance and are free of CO₂.

Elements used in these objects play an energy-saving role, but also fit into the aesthetics of the objects.



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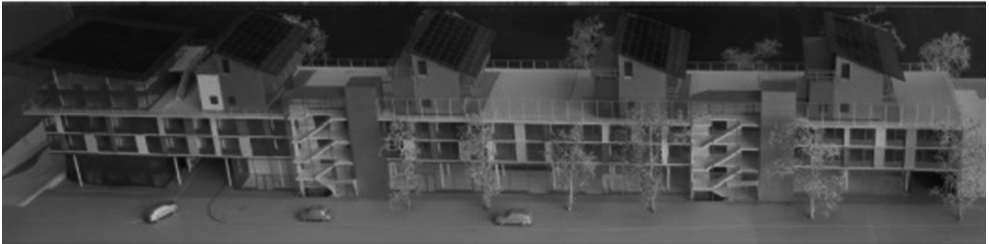
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III. 6, 7. Italian Pavilion at the World Expo 2015, Milan, Italy. (photo author)

III. 8, 9. Suspended-Particle-Device (SPD) Smart Windows (SPD), USA Pavilion at the World Expo 2015, Milan, Italy. (photo author)

III. 10. Energy-plus-houses, Freiburg-Vauban in Germany. (photo author)

5. Surroundings of the object

The nearest surroundings of the object include the spatial development connected with the object, located in the immediate vicinity of the object under study.

Equally important in applying the principles of sustainable development beyond the proper, pro-ecological and energy-efficient shaping of buildings is the development of the area around it. An example is a multi-family building – 8 Haus, Ørestad City, Copenhagen, Denmark (Ill. 11, 12).

Natural materials such as gravel, greenery and water were used here, avoiding the so-called “Tight soil, sealed. A water reservoir was also used for cooling the climate.

The next example is the Housing Estate on the Water in Hamburg, Germany (Ill. 13, 14). consists of three buildings with 3 independent two-storey apartments and a 10-storey tower with 22 apartments. All buildings are located in a water tank, which is a rainwater storage facility. Water also plays a role in lowering the ambient temperature and improves the microclimate.

Examples of effects on the climate microclimate by lowering the temperature are also water-based houses in Amsterdam, the Netherlands (Ill. 15, 16).

The floating housing estate is located in a bay that is “moored” on piers connected to the mainland. This location also allows for water communication, traditional in this area. House architecture is diverse, with different materials, but limited by the same parameters with a maximum cubic volume. The constant temperature of the water ensures energy saving and a good microclimate.

These settlements, their immediate surroundings contribute to better living conditions of the inhabitants.

The elements used in these objects refer to the naturalistic shaping of space, they fit into the context of the environment.

6. Summary

Legal regulations as well as the principles of sustainable development indicate the necessity of using environment-friendly, energy-saving materials and construction technologies.

The presented examples present a variety of technical and technological solutions related to contemporary needs.

All examples of objects combine aspects such as:

- adaptation to user requirements;
- preservation or reference to the identity of the place, respect for the context;
- shaping the structure of the facility enabling the use of natural, pro-ecological technologies;
- high aesthetic quality of architectural space, facilities.

Contemporary European architecture, despite the need for technical adaptation to the changing climatic conditions, maintains the most important correlations between the natural environment, the built environment, and the cultural zone in the examples mentioned.

Placing the technical elements of facilities such as ventilation, heating and IT systems that acquire renewable energy can be problematic. These elements may be of low aesthetic value.



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- III. 11., 12. 8 House, Ørestad City, Copenhagen, Denmark, Bjarke Ingels Group (BIG). (photo. author)
III. 13, 14. Multi-family housing estate at the International Construction Exhibition (IBA) in Hamburg, Germany; Houses on the water, passive houses in the pool with rain, Schenk. (photo. author)
III. 15, 16. Waterfront homes, IJburg, Brigantijnkade, Amsterdam, the Netherlands, + 31Architects. (photo. author)

However, due to the appropriate use of pro-ecological elements and the shaping of objects, a high aesthetic value can be achieved.

Certainly, it is not enough to design and produce objects adapted to a sustainable environment.

However, the right combination and integration of project activities and architectural qualitative research can ultimately help you achieve valuable architecture and a positive design experience. Such activities may also contribute to the creation of an architecture that meets all elements of the Vitruvian canon.

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