

DISSONANT HERITAGE OF COLD WAR MODERNISM OR EUROPEAN HERITAGE OF MODERNIST ARCHITECTURE: CASE STUDY OF RESIDENTIAL HOUSES OF KATOWICE, POLAND

Magdalena ŻMUDZIŃSKA-NOWAK^{1,*}, Magdalena KRAUSE², Jakub BRÓDKA¹

¹ Faculty of Architecture, Silesian University of Technology, ul. Akademicka 7, 44-100 Gliwice, Poland

² Archma Research&Design Office, ul. Okrzei 25, 43-190 Mikołów, Poland

Abstract

The architectural heritage of the former Eastern Bloc (behind the Iron Curtain), including Poland, was until recently treated as a „dissonant” heritage of Communism. Increasing time distance allows an objective look at the indisputable values of this architecture and to reject of the political connotations. Conservatory protection of this architectural heritage is very difficult and complex, particularly referring to individual residential houses of those times. Currently, such sites, remaining in the hands of private owners, undergo uncontrollable transformations leading to their irreversible deformations. The objective of the presented project was to develop the methodology of their conservation on a precisely selected example of a building located in Katowice, Upper Silesia. The obtained results may be used as the basis for creation of a model procedure related to the studied individual residential houses and for preparing a package of conservation guidelines and recommendations for their upgrades and adaptation to modern standards.

Keywords: Architectural heritage; Modern architecture; Cold War modernism; Individual houses; survey; Building conservation; Modernization

Introduction

A general view of the topic as a research problem

The term ‘cultural heritage’ became widespread only in the 1970s, inter alia, thanks to the international “Convention Concerning the Protection of the World Cultural and Natural Heritage” approved by UNESCO during its 17th session in Paris, in November 1972 [1]. This document imposed the duty of heritage protection on the entire international community. Among other aspects, this Convention especially emphasized two key issues: heritage is a shared value and its protection is a shared duty, and heritage as a non-renewable value, which once destroyed, is lost forever. Subsequently, new concepts were introduced, that of integrative conservation and participatory-integrative conservation, respectively [2-4].

However, the term ‘heritage’ is an ambiguous concept, and many intricate meanings and interpretations are hidden behind the deceptively obvious description. It transformed into a separate field of knowledge and a research discipline named heritology - a new scientific discipline including studies on heritage, and interdisciplinary reflection on the term of heritage, which includes the issues of heritage interpretation, management, protection, and its functioning

* Corresponding author: magdalena.zmudzinska-nowak@polsl.pl

in the future. The American geographer David Lowenthal is considered the founder of the discipline, and its leading representatives: John Tunbridge and Gregory Ashworth.

Gregory Ashworth formulated the opinion which synthetically describes the essence of the notion: “Heritage literally assumes both a legatee and an inheritance; the latter only being definable in terms of the former” [5]. Thus, heritage is the transfer process of specific, cultural values. It takes place across the ages and is a form of intergenerational relationship, including not only the transfer, but also acceptance of specific objects. However it also generates many questions, transferring heritage into the area of unclear and fuzzy definitions. John Tunbridge and Gregory Ashworth introduced the notion of „dissonant heritage” to emphasize the problem of disinheritance and rejection of non-accepted heritage of the past [6].

The architectural heritage of the second half of the 20th century is currently a widely discussed topic among architects and conservators across the world. In countries of the former Eastern Bloc, including Poland, the architecture from this particular period was until recently treated as a 'dissonant' heritage of Communism. The memories of the past system are inherently accompanied by the cold war spectra of the Iron Curtain. This element also plays an important role in the discussions about the architecture of that time. The term ‘Iron Curtain’, understood as the isolation of eastern socialist countries in Europe from the western world, started to be used at the end of the Second World War and lasted, with various intensity, until the fall of the system [7]. Despite the fact that a slightly pejorative term “socmodernism” was used not so long ago – following Professor Adam Miłobędzki [8] – when addressing the architecture from this particular period, currently the view of architectural achievements of the second half of the 20th century is changing dramatically. The increasing time distance allows an objective look at this architecture and rejection of the political view allowed its value to be identified [9]. This active interest resulted in an increasing number of studies, publications, conferences and exhibitions. The most spectacular events include the exhibition organized in 2008, in Victoria and Albert Museum in London, dedicated to the European art and architecture of the Eastern Bloc after World War II. It had a significant title: “Cold War Modern: Design (1945-1970)” and presented the unique value of works created in the difficult political context [10, 11].

Currently, many national and international conferences dedicated to these topics take place in Poland, too. This topic is also undertaken by national research centers and organizations promoting architecture, including the notable ones listed below: The Wrocław Architecture Museum, City of Gdynia with its long-term initiative: “Gdynia Modernism”, the International Culture Centre in Krakow or the Architecture Documentation Institute, Silesian Library in Katowice. The topics outlined above are ever better represented in scientific studies and publications.

These initiatives cover modernist phenomena, including ours, in the European or even global perspective, and call for recognizing the radical form of social realism as heritage, as an independent phenomenon, despite political contexts.

After an analysis of the literature and of previously published results of studies on Polish architecture of the second half of the 20th century it may be noted that the interests of researchers have focused mainly on state initiatives, such as public buildings, large residential complexes or urban planning assumptions (as described in detail in the part of the paper dedicated to the analysis of the state of research). The architecture of residential houses built by an individual investor, comprising equally valuable architectural and cultural heritage in the context of its documentation, analysis and conservatory protection, however, has not yet been a subject of studies and publications [12]. Thus, an urgent need for planned studies, preparation of documentation and site evaluation exists, in order to protect the valuable architectural heritage, continuously subjected to uncontrollable transformations, and even demolished. They are not legally protected and no conservatory guidelines for them exist.

Thus, the lack of relevant knowledge was indicated by the authors of this text as a scientific problem. An objective was formulated, together with research questions, which allowed the authors an attempt at tackling the problem.

Study scope and objective

The objective of the studies is to supplement the current knowledge regarding architectural heritage of detached residential houses from the second half of the 20th century, as well as to develop a conservatory guidelines model. This objective includes:

- **The research-cognitive objective** is to supplement and order the knowledge,
- **The methodological objective** assumes development of conservatory study methodology and formulation of recommendations,
- **The application objective** is to use the results of the studies in conservatory and practical activities,
- **The promotion objective** is to popularize knowledge of cultural heritage and to raise social awareness of said heritage.

The following research areas have been accepted for thus defined objectives:

• **The material and time scope.** The subject of the study includes existing residential houses, individually designed and built during the 1956-1989 period. The arbitrary end of the surrealism period in architecture was accepted as the starting point of the time scope. The end point is 1989, when political and economic transformation of the country began. Contrary to the stereotypical opinion, the post-war detached houses are not just the so-called “Polish cubes” built according to a copied, typical design, but also very modern residential buildings constructed according to global and European, modern trends, characterized by interesting spatial designs and avant-garde forms.

• **The area.** The studied area is located in Katowice, the second most dynamic growth center of modern architecture during the discussed period, after Warsaw.

• **The material scope** of the presented studies includes archive and source studies (historical studies), in situ studies in the form of a reconnaissance, photographic documentation and survey (architectural studies), architecture and style analysis (structural studies), thermal analysis (physical studies), value assessment (valorization) and conservatory recommendations.

Research questions

The following questions were asked for the accepted scope of studies:

• **What is the current knowledge of the sites?** (studies, publications and source materials)

• **Are the sites a cultural value in terms of modernist architecture?** (artistic and stylistic and structural aspects representing modernism of the second half of the 20th century)

• **How well are the sites preserved?** (the current function, structure, integrity level in the area, preservation/demolition of finishing materials and details, modifications, expansions, etc.)

• **What factors cause destruction of the studied sites?** (technical, aesthetic cultural aspects)

• **What systemic, preventive actions should be undertaken for the studied sites?** (a conservatory procedure model and guidelines)

The current knowledge

The topic of architecture of the second half of the 20th century in Poland has reached a significant number of scientific and popular science publications, although a clear increase of interest in this particular topic has been observed only in the recent years. The few research works from the last century (namely from the period when the studied sites were built) include a very important work by an architect and a researcher – Tadeusz Przemysław Szafer, namely a series of monographic publications issued as three diary volumes presenting the panorama of Polish architecture during the 1966-1980 period [13-15]. The classification system of the presented sites accepted by the author includes a wide discussion of the development of

residential buildings, in addition to education, cities, infrastructure, communication, sports, leisure and health centers and industry. The topic of areas constructed on the basis of typical, detached houses, is further supplemented by individual examples of detached residential houses. It is worth to mention here the design of a detached residential house at a hill slope in Żegiestów by Zbigniew Gądek presented in the publication [13], the project of a pavilion house by Jan Szpakowicz in Zalesie Dolne [14], or photographs of a villa located in the Wola Justowska district of Kraków, designed by Wojciech Pietrzyk [15]. The 1947-1994 periods were the time, during which a specialized publication of the Main Board of the Polish Architect Association (SARP) was issued as a monthly magazine. It presented competition results, published designs and reviewed new investments within the country. An issue dedicated to detached housing was published in 1971, in the introduction to which Andrzej Stasiak underlined the need to have the critics interested in the often neglected topic of detached house architecture [16].

The first years following the systemic transformation in Poland saw the topic of the Communist Poland heritage rarely touched by researchers and historians alike. In 1994, Adam Miłobędzki undertook the first attempt at evaluation of the heritage of the previous regime, introducing the term “socmodernism”, which did not lead to positive associations and indicated the relative disregard of this trend according to the author [8]. This pejorative evaluation of the modernist heritage resulted in no interest of researchers in this topic for years. The following years brought a gradual increase of interest in the topic. Andrzej Basista issued a book which included not only considerations regarding urban planning and examples of architecture, but also presented knowledge on the operation of the construction industry during the Communist Poland period and statistical data, including data related to residential housing [17]. The same year saw a monograph by Adam Maria Szymiski, presenting the architecture in Szczecin during the 1945-1995 periods [18], while Aneta Borowik issued the book about the form and ideology of Polish architecture in the example of Katowice [19]. The listed books are a significant contribution to the view of the architectural heritage of Communist Poland as a valuable heritage, however, they describe mainly state investments, such as large architectural and urban areas, while the phenomenon of individual residential houses and their architecture have been omitted. The few research publications dedicated to the topic of individually designed private houses include, inter alia, the paper by Zuzanna Napieralska, in which examples of experimental architecture related to detached residential houses at the break of 1960s and 1970s in Poland are presented. The author selected and discussed two dome buildings (Wrocław and Warszawa) and two examples of Warsaw residential areas using atrial building layouts [20].

An important source of knowledge also includes doctoral dissertations and publications prepared as a result of research projects in our region, such as e.g. the work by Aleksandra Tomkiewicz which introduced a valuable perspective of comparison with the heritage of European modernism [21].

Another group of sources, significant from the point of view of current knowledge, includes a group of legal and normative acts. Acts, ordinances and resolutions of the Presidium of the Government of the Polish People Republic, related to residential housing (including individual housing) are available and prepared according to archived Journal of Laws and Polish Monitor in the Internet Legal Act System. The most important documents, from the point of view of the studied heritage, include the housing normative of 1954, the resolution of the Council of Ministers of 15th March 1957 on the state help for residential housing funded by citizen, or the resolution of 22nd May 1965 on state help for building of detached residential houses and apartments in small residential houses by individuals.

The sources related to individual residential houses include archives of state agencies and private collections of architects and site owners. They also rarely include archives of design agencies or state archives, as the studied sites were usually built as private buildings.

The knowledge of sites and of their creators can also be obtained from centers interested in science and promotion of knowledge about the architectural heritage of the second half of the 20th century. The Architecture Documentation Institute acting together with the Silesian Library in Katowice documents and collects archive resources related to work of architects in the Silesian Voivodeship. The research activities of the Institute resulted in preparation of the valuable, interdisciplinary compendium of Upper Silesian architecture of the second half of the 20th Century [22], publications presenting the lives and works of the designers: Jerzy Gottfried [23] and Jurand Jarecki [24] and other.

Materials and Methods

A proprietary research methodology was based on the two basic scopes: the accepted, theoretical research assumptions and the accepted conservatory perspective.

Research assumptions - theoretical perspective

The presented studies included a qualitative approach as an approach offering the detailed and thorough understanding of the analyzed phenomenon use varied, mainly dedicated sets of research techniques and tools [25]. Qualitative studies become widely used in research in the fields of architecture and urban planning [26]. The authors wrote that the use of various strategies by a researcher may be compared to the “bricolage” technique aimed at effective and comprehensive collection of the required data. Despite the fact that the described studies are related mainly to architectural sites, they also include the widely understood context of the building, including its users, aesthetic problems, a matter of lifestyle and living standard in changing world [27].

Thus accepted research assumptions are reflected in the grounded theory. E. Niezabitowska wrote: “The researcher begins field studies without previously developed theoretical assumptions, namely without pre-conceptualized theories. A theory emerges from and during the studies in situ; it becomes grounded in the field” [25]. It allows the nature of phenomena and their wide context to be understood by observation, photographic documentation prepared in the field and interviews [28].

Individual case study was accepted as a detailed research method, and the procedure conforming to the grounded theory allowed precise selection of the example (case) for the study. Case study is one of the main methods of qualitative studies [29, 30]. One of the objectives behind the case study we performed also included creation and verification of the accepted research methodology.

Research assumptions - conservatory perspective

The proprietary methodology described in this paper is based on selected, strategic documents and modern conservatory approaches, assuming protection of site value and integrity, but open to their appropriate upgrades and adaptation to current conditions and standards. The main document is the Venice Charter approved during the II International Congress of Architects and Historical Site Technicians in 1964, which is an international convention specifying rules of historical site protection in five points, emphasizing, inter alia, the protection of the original substance and of the surroundings of the building (International Charter for the Conservation and Restoration of Monuments and Sites 1964). This document provided the basis for preparation of other doctrine texts in many countries. In 2015, the Polish National Committee of ICOMOS prepared the selection of European doctrine texts, which included 29 documents approved by ICOMOS, UNESCO and by the Council of Europe [31].

A wider theoretical background is provided, for example, in publications, eg.: ‘Values and Heritage Conservation’ - the Getty Institute Research Report [32], “Conservation: Principles, Dilemmas and Uncomfortable Truths” [33], “Conservation of Historic Buildings”

[34], and many other. The latest publications describing the conservatory procedure, taking into account the use of advanced techniques and non-invasive research tools, were equally important. These include, inter alia, works by Stefano Brusaporci [35], Magdalena Krause [36] or many International Conferences proceedings (Digital Heritage. Process in Cultural Heritage 2016; International Conference Metrology for Archeology and Cultural Heritage 2019).

Proprietary study methodology (Fig. 1)

(1) Stage I (Initial research)

- Initial literature and on-site studies.
- Selection of the site for the case study on the basis of the accepted criteria.

(2) Stage II (Detailed research)

- Source query (state and city archives, private collections).
- In situ research (photographic and measurement survey, thermal vision studies).
- Interviews: owners, users (analysis of needs, opportunities and expectations).

(3) Stage III (Synthesis of study results and conclusions)

- Site valorisation and conclusions (evaluation of the preserved condition and of the site value with its surroundings, performed transformations, threats).
- Evaluation of the site in the view of effective regulations and standards.
- Conservatory guidelines.

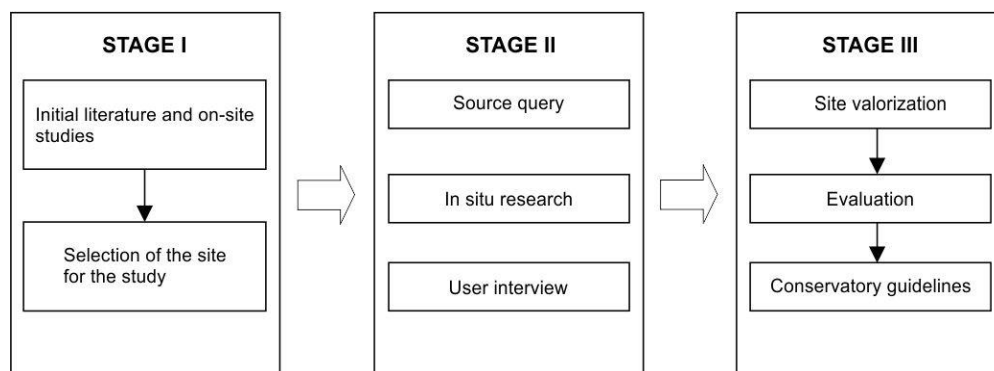


Fig. 1. Research methodology diagram (elaborated by the authors)

Results and discussion

The course and results of initial studies (Stage I)

The current analysis of the structure of Katowice showed the presence of a cohesive set of post-war detached houses in the southern district of the city, commonly known as the 'Ptasie Osiedle' residential estate (the 'Bird District'), developed from mid-1950s. Already our first visits and interviews with local inhabitants of the residential area led to a conclusion that the phenomenon of detached private houses being built progressed along two paths: „popular” mode and the more individual one. Due to this, the houses in the area of research may be divided into two general groups. The first includes the houses built on the basis of repetitive designs mostly developed by state-owned BPTiSBM office (Typical Projects and City Building Studies Office). The second group of houses includes those designed individually, according to individual orders, mostly by well-known and respected architects. The latter group of sites, clearly distinguished against the typical houses with its interesting form, used finishing materials and often original spatial concepts, became the subject of scientific interests, not only

in terms of the architecture and technical solutions, but also of culture understood as the medium of information about lifestyle of local residents, back-then preferred aesthetics or fashion. Furthermore these houses represent many formal references to European architecture [37].

The initial literature studies did not provide many results related directly to the architectural heritage of the area covered by the publication. A few literature sources present the residential area in a brief outline only, as an attractively located within green areas and provided with good communication links with the city center, prestigious enclave of detached buildings.

Preliminary survey proved that a lot of particular types of individual building forms in the area of 'Ptasie Osiedle' residential estate can be distinguished: single story and two story houses and atrial houses. Likewise a very interesting mixed type e.g. two story house with a low functional ground floor and the living space (including kitchen) on the upper floor, or very particular example of a so-called split level house where floors in one part of the building are on mezzanine levels (Fig. 2).

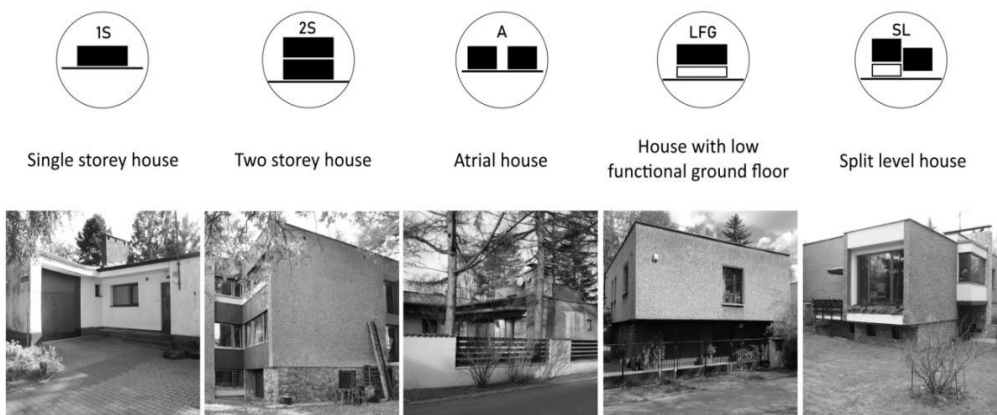


Fig. 2. Types of individual building forms in the area of 'Ptasie Osiedle' residential estate

The interviews with local residents of the area allowed the investor profile for the analyzed houses to be drawn. After the war, together with dynamically growing technical, scientific and academic centers, qualified specialists, such as engineers, architects, doctors or professors flocked to Katowice from the entire country. This group comprised the basis of the new intellectual elite of the city, which strived to ensure comfortable living conditions as a result of their high positions. They built private houses on construction parcels obtained within the 'Ptasie Osiedle' residential estate designed by hired architect taking into account individual needs, requirements and aesthetic aspirations of their customers. The efforts of the designers translated into very interesting effects in the form of unique, often avant-garde houses.

Unfortunately, the passage of time had most of the investors leaving and new house owners often did not respect the value of these sites, subjecting the houses to controversial renovations, modifications and sometimes – demolished them. The small group of houses remaining in their original form is occupied by their still living first owners.

One case, however, is different from the rest. The house at ul. Słowików, which drew attention already during the initial research with its original shape, cleverly matching the local landscape. The three storied building is characterized by a combination of two visually contrasting building blocks - massive cuboids without any windows, and a gable roof covered with ceramic roof tiles. Numerous undercuts and partial overhangs, giving the building the impression of lightness, are also noticeable. It was purchased by the current owners after 2000.

The owners indicated in the interview that their decision to buy the house was based not only on its unique architectural values, but also on its history (architect Zbigniew Weber was the investor and the author of the project) and wished to preserve the original condition of the site, if possible, while being aware of the need to upgrade it, pointing out some inconvenience related to thermal comfort.

The initial study of the biography and the works of the designer and the house investor showed that he was the creator of many known sites, not only in the Silesian Voivodeship but also abroad, including the United States. Unfortunately, no publication has been dedicated to this architect so far, and the collected, fragmentary information is only an introduction at best.

The individual nature of architecture of the own house of Zbigniew Weber, the original condition of the building and the clearly related landscape management condition, as well as the biography and works of the designer-investor allowed this site to be selected as the subject of the planned case study already after initial research. Another advantage lies in the contact with the current owners of the house, open and aware of the value of owned heritage, and more importantly, eager to cooperate and to make the site available for in situ studies. The aforementioned components allowed us to assume, that the selected case of the studied site should enable almost complete studies to be performed, including various aspects: architecture, urban planning, landscape elements and the influence of lifestyle and personality of the investor on the shape of an individual, residential house.

Archive query (Stage II)

The archive and historical studies were related to queries made with the following institutions: National Archive, Katowice branch, Katowice City Hall Archives, Archive of the Main Board of Polish Architects Association in Warsaw. Some of the archive materials could be obtained from the private archive of the current house owners. Professional CV documentation prepared by Zbigniew Weber included a description of all architectural, scientific works and the list of the held positions. Zbigniew Weber graduated as an architecture student from the Faculty of Architecture, Kraków University of Technology. During the 1955-1963 period, he worked at “Miastoprojekt Tychy” design office. The 1973-1988 period of his professional life was related to “Inwestprojekt” design office in Katowice. He is an author or a co-author of several executed commercial, residential and religious buildings and sites, in Poland and abroad. An interesting episode of professional activity of Weber included a yearly contract at the design agency “Berkus ASS” in Chicago in the United States (1971-1972), where he worked in a team designing residential areas.

The archive query with the Katowice City Hall Archive led to source material partially presenting the design process of the studied site, namely the house Weber owned (Fig. 3). Unfortunately, the file contained an incomplete version of project documentation from the execution stage, prepared by Weber. It includes technical descriptions and drawings of floor projections, cross-sections and facade layouts. By comparing the file contents with the list of contents it could be noticed that the file is missing an overall layout drawing, the site plan and a second cross-section.

There are still remaining sources in the form of house photographs, documenting the site from outside and inside. The photographs were taken by Weber, shortly after the end of construction works, and added by the author to the aforementioned Creator Status documentation as a graphical illustration of the design works.

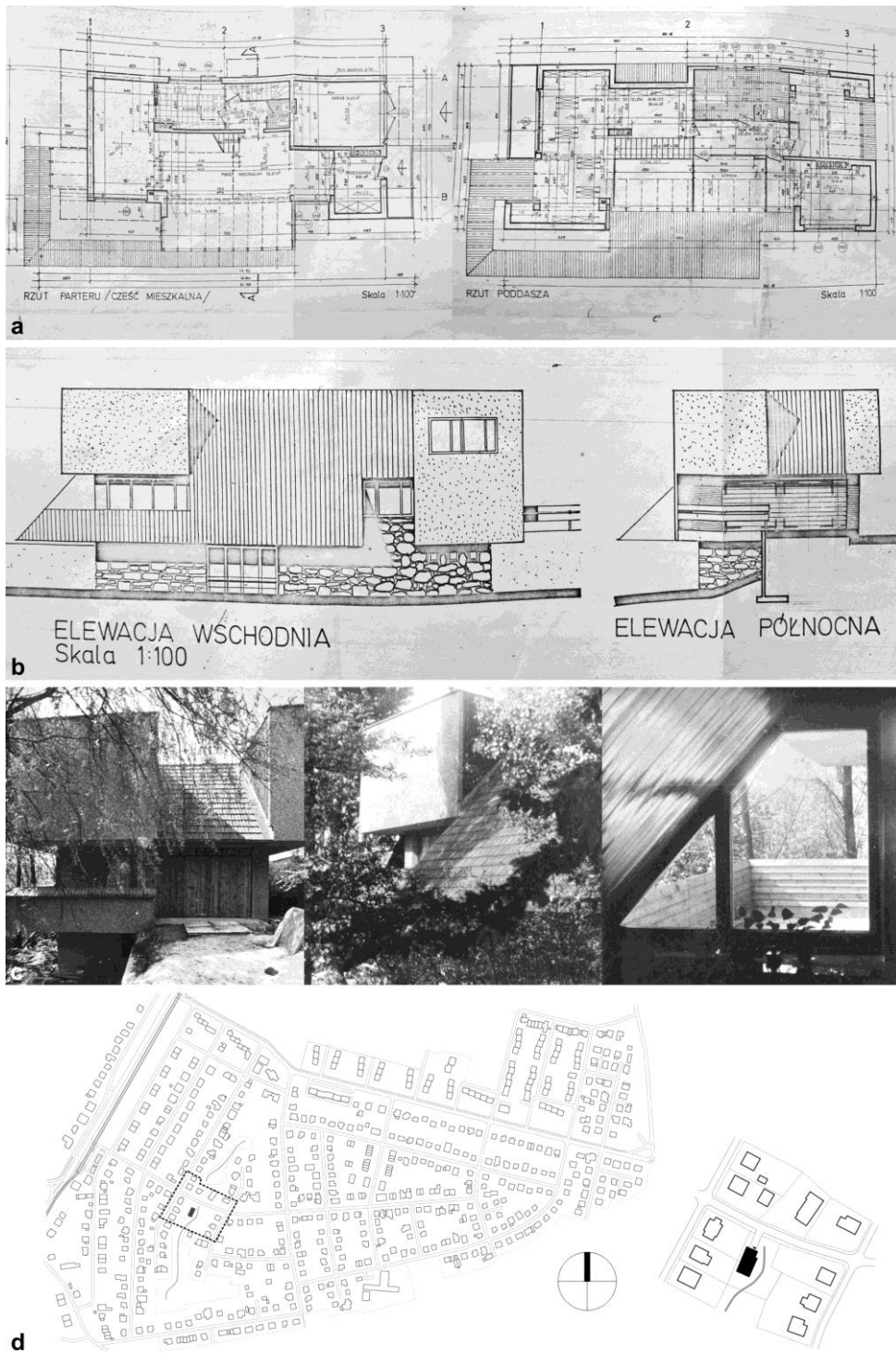


Fig. 3. (a-b) Archive project documentation of the house of Zbigniew Weber (source: Archive of the city of Katowice), (c) archive photographs taken by Zbigniew Weber in 1980 (source: Archive of the Association of Polish Architects), (d) layout plans: local area and surroundings of the house (elaborated by the authors)

In situ research (Stage II)

A visual inspection, as well as photographic survey, drawings and measurements were taken for the land parcel, the external shape of the buildings and for its interiors during this stage. The landscape shape and management, the external form, the composition and layout of building shapes, its spatial layout and finishing materials were studied (Figs. 4 and 5).

The house of architect Zbigniew Weber is located in the central part of the 'Ptasie Osiedle' residential estate, at ul. Słowików, one of the main streets of this residential complex. It is surrounded by parcels occupied by one and two floor residential houses built in 1960s and 1970s. The parcel, formed as an irregular polygon, is characterized by wavy terrain. A narrow stream comprising a source of Kłodnica River, which flows along the north-south direction, flows through the parcel. The river flows from a discharge protected by a ferroconcrete trough, dug into an embankment. The approximately fifty years old willow growing near the northern boundary of the area is a particularly picturesque example. Varied broad-leaved trees and tall bushes grow deep within the parcel.

The house outline was composed into the irregular landscape. The building seems to have two floors; however, the designer used the land morphology such that the building actually has three levels on the side of the garden.

The building is characterized by combinations of cuboid and angular shapes. The roof angle intersecting these shapes is visible between them, forming a spatial combination perceived as interesting. The facade on the south-eastern side has also been shaped using the roof angle and cuboid forms. A significant part of the ground floor covered by the sloped roof has been moved significantly in front of the house outline, thus creating a massive overhang above the covered terrace available from the cellar level. The analysis of finishing materials led to a conclusion that vertical external walls have been covered with a lime-cement plaster with added gravel, the characteristic structure of which provides visual depth. The walls of cuboidal pylons, located near the surfaces of sloped roofs, are finished with narrow pine planks, painted in dark colours and nailed vertically. The same planks are present in the entrance facade, as a door cover and as a garage door cover. Sloped roofs are covered with red, ceramic tiles.

The studied building includes three levels: the basement level, partially dug into the embankment, the ground floor and the first floor. The main entrance is preceded by an entrance space provided as a terrace suspended above the embankment. The closed atrium leads directly to the imposing, open space of the living room comprising a partially cubic, single level room, partially limited by the roof slope on one side. This roof smoothly transitions into the open, top floor in the form of a mezzanine. A single staircase leads to the mezzanine, the ferroconcrete steps of which are anchored in the load-bearing wall. Two trapezoidal windows draw attention on the ground floor, in the living room. Their shape is dictated by the line of the roof slope. A corner fireplace is located in the further part of the living room, covered with decorative stone. The single space of the ground floor interior is closed by the dining room, where light is provided by a spacious window and glass doors, leading to the suspended terrace. A separated kitchen has been designed next to the dining room, separated with a sliding door. The ground floor includes a staircase leading to the cellar and a garage composed as a part of the building structure. The space of the topmost floor includes two areas: the semi-open area with the mezzanine and an array of closed rooms: two bedrooms and a spacious bathroom with a toilet. The master bedroom is located inside a cuboid shape. Practical storage spaces and wardrobes are hidden in slick, cuboidal spaces created by overhanging parts of the overall shape between roof slopes.



Fig. 4. (a) Axonometric view of the house of Zbigniew Weber in the context of parcel management (elaborated by J. Bródka), (b-d) photographic documentation of the house from the outside (photos by J. Bródka)



Fig. 5. (a-d) Photographic documentation of the interior of the house of Zbigniew Weber (photos by J. Bródka)

Physical studies (Stage II)

Thermal vision studies were performed in order to study the building, including its potential weak points and in order to approve the adequate conservatory instructions and protective measures for the building (Żmudzińska-Nowak, M. Krause, and P. Krause 2018). The measurements were performed on 23/01/2020, at ambient temperature of -2°C , using a thermal vision camera FLIR E95, the temperature difference between the house interior and the surroundings was approximately $20\text{--}25^{\circ}\text{C}$. Analysis of thermograms recorded on the outside of the analysed building indicates low quality of external walls in terms of their thermal insulation. Detection of infrared radiation on the inside of the building additionally revealed strong local cooling of internal surfaces of the sloped roof. Thermogram analysis indicates the presence of numerous, intense, linear thermal bridges. A thermal bridge present along the joint between the roof structure and the ceiling above the ground floor is particularly noticeable and manifesting as strong cooling of internal surface of the roof and of the ceiling.

Structural studies (Stage II)

Structural studies of the building were performed on the basis of the preserved elements of project documentation by the architect Zbigniew Weber, the performed measurement, drawing and photographic records and using the results of thermal studies. They enabled structural systems present within the described building to be studied and analyzed (Fig. 6).

The analyzed building includes three levels. The lowest level – the cellar/basement level – is a box with ferroconcrete walls, 38cm thick, cast between load-bearing, ferroconcrete pillars, which also provide the vertical frame of higher floors. The basement level cuboid is half-dug into the embankment, the average slope of which is 30° . The ceiling above the basement spaces is monolithic with the exception of one room covered with a groin vault made of bricks. The internal height of the level is 215cm.

The middle level – the ground floor – is a space placed on the basement box and partially overhanging and protruding beyond the basement outline. The overhang is supported on massive, ferroconcrete binding joists comprising an extension of basement ceiling beams. The load-bearing ferroconcrete pillars have been complemented with a monolithic structural wall used as the anchor for ferroconcrete steps of a single staircase. The space between the pillars is filled by lighter walls. The sloped roof passing through the height of two levels and terminated behind the knee wall of the overhung living room draws attention. The roof, made as a steel and wooden structure, is supported on two ferroconcrete binding joists. The height measured inside the ground floor spaces is 250cm. The space above the living room (within the outline of the sloped roof) is open, making the impressive ground floor intersecting the mezzanine space located one level higher. The first floor, clearly lower inside the level (215cm) is characterized by different structural layouts of external walls. A brick wall erected on a ferroconcrete binding hoist is the first type. A wooden frame wall is the second type of used walls. It is used to close the slick cuboids tangent to the structures of sloped roofs. The ceiling above the first floor is made using the Ackermann system, with a wooden structure used above the slopes. Water is removed from flat spaces in two ways. The overhanging ground floor terrace and a part of the ceiling-roof above the attic are provided with openings in the attic discharging rain water to spouts. The main part of the ceiling-roof includes an opening discharging water to a protected discharge pipe running through all floors.

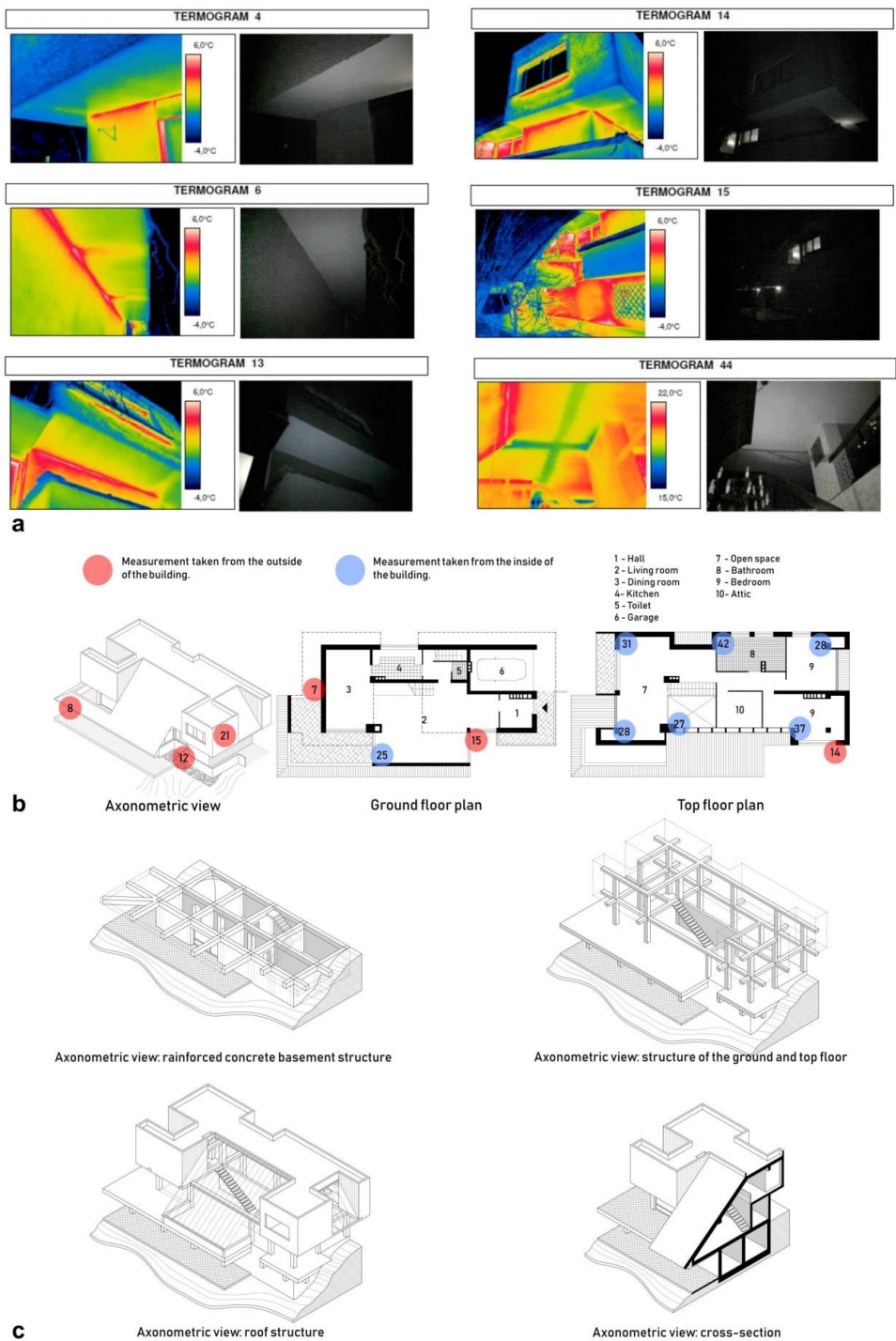


Fig. 6. (a) Thermograms 4,6, 13-15 and 44 (elaborated by the authors),
(b) thermal problems in the building - critical points scheme (elaborated by the authors),
(c) building structure diagrams (elaborated by the authors)

User interview (Stage II)

The interview with the site users was intended to precisely specify their needs and expectations resulting from their everyday use of the house. The users were asked to point out the factors decreasing the utility value of the building in their opinion.

The first indicated factor, significantly influencing user discomfort, includes large heat losses (confirmed by results of the performed thermal vision study). They also pointed out the faulty structure of wooden windows throughout the house, also resulting in significant heat losses.

The second factor is also related to the wooden windows; with the user raising doubts regarding functionality of the trapezoid wooden windows limited by the sloped roof surface above the living room – for cleaning, the windows have to be removed from the frame, as the designer did not foresee the option to open the windows temporarily.

Taking the above into account, the owners decided to increase the thermal standard of the building, by providing thermal insulation on the sloped roofs and on external walls in the near future, as well as by replacing the wooden windows throughout the house with new windows with perfectly restored form, but with improved thermal insulation and functionality. The owners do not foresee other changes related to the functional program and the intended use of the building.

Results of the study

The third stage includes site valorization in the aspect of condition preservation and integrity, evaluation of introduced changes, of the value and definition of potential hazards and problems. Then, the building was evaluated according to the effective regulations and standards. This stage ended with a summary in the form of clear conservatory instructions.

Site valorization

The evaluation of preserved condition included building verification in terms of three aspects: management and layout of the property garden, its shape, the condition of finishing materials and joinery, the preserved condition of the interiors in terms of their spatial assumptions and equipment. The analysis led to the following conclusions:

- The garden is characterized by a landscape with significant terrain drops and embankments descending towards the course of the Kłodnica River. A tree habitat with different species and ages was observed. According to the reconnaissance, the interview and a comparison with archive materials the garden preservation condition was deemed to be good. The original, brick fence with forged metal elements requires renovation.
- The house shape is varied and made of combinations of intersecting cuboids and angles. Walls are covered with plaster with added gravel and wooden facade planks. The roofs are covered with ceramic tiles. The preserved condition was evaluated as good and is influenced by: the building shape which has not been transformed and with layout conforming to the preserved archive materials. The divisions of wooden windows, finishing materials and their colors have also been preserved. The roof cover requires maintenance. Missing ceramic tiles and partial damage to wooden elements protecting the sloped roof structure are visible.
- The interior is characterized by many open spaces. The interior is finished using high quality materials (oak, larch, terrazzo, marble). The preserved condition should be evaluated as very good – the floors (wood panels), ceramics, finishing materials on walls and their original colors just require some refreshing. The preserved details, such as bespoke, designed handles, door knobs (attention is drawn to the sliding door between

the dining room and the kitchen) and original, built wardrobes increase the value of the interiors.

The evaluation of introduced changes included analysis of history of building modifications (from the initial condition until now, in the following aspects: land management, shape, finishing materials and interior equipment) led to the conclusions:

- The garden landscape did not change; the plants are almost the same other than ivy reduction in the 1990s.
- In terms of shape composition and finishing, the original exterior of the building has been preserved. A VELUX-type roof window was added in the entrance facade, in the sloped roof, in 1998.
- The interior layout remains unchanged. A significant change of the intended use of the room above the garage was introduced on the first floor: from an unused cellar into a room (with a roof window). The initially open recesses formed by a part of the building shape protruding outward were also closed.

The general evaluation included analysis in the aspects of architectural and stylistic value, urban and landscape value, functional and utility value, cultural value:

- The architectural and stylistic value: the studied building, designed in the latter half of 1970s, is an interesting and outstanding example of detached housing architecture of the studied period, not only in terms of its architectural value, but also because of its preserved, nearly original condition. It is also a testimony of the intention of the designer to implement stylistic tendencies dominating the global architecture at the break of 1970s and 1980s.
- The urban and landscape value: the surroundings of the building combine values of valuable natural landscape and of cultural landscape. The integrity of the building and of its surroundings is a conscious decision of the architect, who designed a picturesque complex including a building with a complex shape set, providing an excellent match to the irregular landscape.
- The functional and utility value: the use of space by the architect ensured high functional value of the studied detached house. The clear gradation of functional zones of the house draws attention: from the open, presentable zone with the semi-open leisure space on the top floor, to the bedroom part with access to bathroom and toilet, separated by a sluice-like corridor. The skillful placement of window openings and visual separation of leisure terraces had the architect provide the users with privacy.
- Cultural value: the house execution based on an individual design allows preferences and individual needs of the investor, as well as the current standards and fashion to be identified. The case of the studied site is more interesting, as the investor is also a known and reputable designer with extensive domestic and foreign portfolio, enriching the cultural context. The own house designed by Zbigniew Weber is a proof of imagination and creativity of the author, who created a unique work, not only in the local area, despite the normative restrictions.

The analysis of threats and problems included verification of factors negatively influencing the studied building. It was related to the following checks: of potential external threats and problems, potential threats and problems resulting from daily use of the house. The analysis led to the following conclusions:

- The external partitions of the house are not currently insulated, contributing to conditions promoting damp condensation inside.

- The closure of cuboid recesses of the first floor (resulting from parts of the building shape protruding outward) with wooden partitions and local obstruction of walls by functional elements results in improper ventilation and presence of damp and mould on internal walls.
- The uncut plants have a destructive impact on the building facade by pressing against the house outline.

Assesment of the site in the view of effective regulations and standards

Residential buildings built before 1989 need to be upgraded to ensure their conformity with the effective construction law. The main relevant regulations include the Ordinance of the Minister of Infrastructure. The calculation method is also based on the Polish standard related to thermal properties of buildings, qualitative detection of thermal faults in the building outline and to the infrared method. The 'Act on protection and care of historical sites. The studied building does not meet the requirements related to thermal insulation and other requirements related to energy saving. Currently effective law should be balanced with respect to the conservatory approach, said balancing act poses a significant challenge.

Conservatory guidelines

Conservatory conclusions developed during the previous stage were used to formulate a set of instructions providing a response to the identified problems and comprising proposed preventive activities, protecting against potential threats. The prepared instructions include both the surroundings and the internal environment of the studied site.

External protection guidelines

The first group includes instructions related to the external context – the land parcel area:

- The landscape, including pits and formed embankments, should be preserved.
- The dug in retaining walls of embankments (especially along the parcel boundaries) should be reinforced.
- Patency of the river (Kłodnica River) and the shore line quality should be taken care of.
- The ferroconcrete outlet portal of Kłodnica River source bed should be secured.
- Trees and bushes should be maintained and cared, regularly cut
- The fencing foundation should be reinforced and missing material should be replaced.
- The following recommendations have been developed for the building structure.
- The layout and structure of external shapes forming the house outline should be protected.
- The terrace above the overhanging part of the building and the ground floor terrace should not be covered.
- The present, flat roofs may not be modified/expanded into sloped roofs.
- The height of attics influencing perception of shape ratios should be retained.
- No new window or door openings are permitted in all external surfaces of the building.

Internal protection guidelines

The performed physical examination indicated a problem related to building freezing. The first group includes instructions intended to improve the thermal standard of the building:

- Providing thermal insulation of external walls on the inside using cubes with a heat transfer coefficient of $0.045\text{W}/(\text{mK})$.
- The ceiling-roof should be insulated using mineral wool or foam with a heat transfer coefficient in the range of $0.030 - 0.045\text{W}/(\text{mK})$.
- The sloped roofs (attic) should be insulated on the inside using mineral wool with a heat transfer coefficient in the range of $0.030 - 0.045\text{W}/(\text{mK})$.

- Air circulation should be improved using hygro-controlled window inlets. Other instructions are related to retaining the original structure, details and interior layout:

- The interior layout, namely room ratios and heights, should be protected.
- It is recommended to restore the original partitions on the first floor, namely to remove the light wooden structure with doors, separating the heated rooms from the storage space in recesses resulting from the overhang of external parts of the building. This recommendation is related to the assumed restoration of thermal balance in the interiors and in partitions and elimination of the destructive impact of closing the recesses.
- Large functional equipment should be moved away from external walls. This recommendation is related to the assumed restoration of thermal balance of the partitions.
- It is recommended to follow the drawing instructions of the designer, related to furniture placed inside the functional space, included in the project documentation.

Discussion of the research problem

The performed studies showed that the research problem undertaken by the authors, namely the need to supplement the current knowledge about the architectural heritage of modernist, detached residential houses from the second half of the 20th century in Poland and to develop a model conservatory procedure remains important and current:

Discussion of the accepted research methodology

The accepted methodology is derived from theoretical scientific assumptions and from the accepted, conservatory perspective:

- The presented studies accepted a general, qualitative method, enabling detailed identification, analysis and evaluation of the subject of the study.
- An approach resulting from the widely accepted theory was also accepted. It proved to be useful, as research assumptions and hypotheses could be formulated and partially verified during field collection of information and analysis of materials.
- A single case study was accepted as a detailed study method, enabling thorough study of the selected site using multiple information sources, various techniques and research tools. The case study also allowed to verify the accepted research methodology.
- The accepted conservatory perspective of the study was derived from the conservatory approach, which assumes protection of site value and integrity, while it remains open to their correct upgrades and adaptation to modern conditions and standards.

The pilot case study presented in this publication proved effectiveness and correctness of the accepted research methodology. It allowed a complete image of the site and of its context to be built, thus providing the basis for evaluation and indication of a conservatory procedure. The accepted methodology is thus effective, and its comprehensive nature allows it to be used in future studies. The applied methodology is also of framework (open) nature and may be easily adapted through expansion or reduction of its elements. Thus, the objective of this work in terms of research development was achieved.

Discussion of achieved results and their usefulness

The achieved results of the case study are complete and exhaustive, confirming correctness of research methods, techniques and tools, and correct selection of the site as the study objective.

- The study allowed to collect and prepare archive materials.

- Detailed in situ studies were performed, together with evaluation of the preserved condition and introduced transformations of the site.
- An analysis of hazards and of upgrades needed was performed.
- An recommendations package intended to protect the site (conservatory guidelines) was prepared and limits of possible transformations required from the point of view of modern standards and legal requirements.
- The achieved results are directly useful to the owners of the site, who plan a building upgrade with full respect of its value.
- The prepared guidelines package may also be treated as a model in terms of structure.

In a summary, the presented studies confirmed correctness of the presented research problem, correctness of the accepted methodology and allowed the approved objectives of this work to be achieved.

Conclusions

Currently, the architecture of the second half of the 20th century, born behind the Iron Curtain, has ceased to be treated as a "dissonant" heritage, but still remains at risk of neglect and destruction. Particularly difficult is the situation of private single-family houses, which are not under conservation protection and are undergoing an uncontrolled transformation.

The presented case study is an attempt to develop a model of complex conservation processes regarding landscape, urban, architectural and structural aspects that can be used in a variety of cases. This process also includes increasing the comfort and quality of residents' life in accordance with modern standards.

The perspective of studies on architecture of detached houses from the second half of the 20th century, previously not undertaken, remains open, and the increasing interest in the topic of modernism may facilitate the growth of research. The need to protect the threatened heritage of modern culture, including the studied object, provides a real dimension for a continuation of studies in this field. The development of research may also contribute to promotion of knowledge of cultural heritage and raising social awareness related to said heritage, which is a factor supporting heritage protection.

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