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## ADVANCED TECHNOLOGIES AND REVITALIZATION OF THE SINGLE-FAMILY RESIDENTIAL ARCHITECTURE FROM THE POLISH SOCIALISM PERIOD. THE EXAMPLES OF REALIZATIONS

### NOWOCZESNE TECHNOLOGIE A REWITALIZACJA JEDNORODZINNEJ ARCHITEKTURY MIESZKANIOWEJ Z OKRESU PRL. PRZYKŁADY REALIZACJI

#### Abstract

The idea of modernization and reconstruction of the buildings from the socialism epoque is undertaken in many works. Very often however, the subject divides public opinion. Many people are unaware of the architectural potential of those buildings, considering them mainly as evidence of the communistic system. Unfortunately, there is still no protection policy for the modern architectural heritage, which would include objects from the 50s to 80s of the 20th century (monuments protection statute). The article presents the results of the research into the present state of the conservation of selected single family housing types from Polish socialism. The types of housing chosen for the research were realized with the *Typical Single Family Residential Catalogue*. Projects presented in the catalogue were included into a bank credit program. The types of credits were analyzed by the compliance of the final realization and the original project. The result of the research will attempt to establish the direction of a typical single-family building transformation over the last 20 years. The study will also aim to create the criteria for the evaluation process of modernization such as: technical condition of the building and media, the possibility of adapting a functional scheme to the changing social needs, new building regulations and economics.

*Keywords: modernization, polish socialism architecture, single-family buildings*

#### Streszczenie

Temat modernizacji i przebudowy budynków epoki socjalizmu jest dziś podejmowany w wielu pracach. Bardzo często jednak dzieli on opinię publiczną. Wiele osób nie dostrzega jej potencjału, uważając, że ta architektura jest przede wszystkim świadectwem epoki komunizmu. Nie została jeszcze niestety wypracowana polityka ochrony dziedzictwa architektury współczesnej, do której można zaliczyć wiele obiektów z lat 50–80. XX w. W artykule przedstawiono wyniki badań nad stanem zachowania wybranych typów budownictwa jednorodzinne powstałego w okresie PRL. Wybrano przykłady zabudowy realizowanej na podstawie projektów z Katalogów Domów Typowych, opracowanych przez Ministerstwo Gospodarki Komunalnej. Wynikiem badań będzie próba określenia kierunków przekształceń zabudowy typowej jednorodzinnej w ostatnich 20 latach. Również określone zostaną kryteria oceny sposobu modernizacji, którymi będą niewątpliwie: stan techniczny budynku i instalacji, a także jego sposób adaptacji do zmieniających się potrzeb nowych użytkowników i przepisów budowlanych.

*Słowa kluczowe: modernizacja, powojenne budownictwo, zabudowa jednorodzinna*

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## 1. Introduction

Architecture during the Polish communist period was derived from the modernism style, which was defined by simple form that evolved from a functional scheme, responding to social demands and using modern technologies. Unfortunately not all of the new technologies of those times were effective. Because of the intensified house building and lack of financial support after the Second World War, the new material and construction solutions seemed cheap and efficient. The new technologies of the building industry were not sufficiently examined in terms of their durability. As a consequence, architecture from this period is rapidly ageing which causes many technical problems with its upgrading. It is hard to modernize those buildings by means of minimal intervention i.e., trying to restore most of the existing material. Usually it is necessary to replace most of the elements that are simply too damaged to restore them.

Lack of systematic building conservation is the biggest problem of the architecture from the 1949–1989 period. Systematic conversion would be more cost-efficient and could provide better quality of materials and elements for the construction.

Nowadays, modernism is given more and more attention in the architects' environment. After years of being ignored, modernism in architecture is being re-appreciated. It is important however, to identify buildings that account for the heritage of socialism and to decide how they should be protected. How to adapt this architecture created half of the century ago to the present needs, without changing its modernistic form, is the question [1]? Currently upgrading large panel buildings or public buildings from the Polish communist period is a popular endeavour. However, little consideration is given to the modernization of post-war single-family housing, which is present in every Polish city as a characteristic element of the post-war heritage.

## 2. Single-family house building in 1949–1989 in Poland

Single-family house building started to become more popular in 1956 [2]. In this year the legislation regulations have helped to obtain credits from the government for house projects. An example is the ministry council resolution no. 81 from 15 March 1957, concerning material aid from the State, for house building. For the purpose of the resolution a detached house is a house, a single component or serial semi-detached house with a total floor space of residential units not exceeding 110 m<sup>2</sup>.

The resolution refers to: withdrawing from the building plots, providing long-term loans (up to 90% of investment costs), sharing typical – house projects, facilitating the material supply for the project, promoting the use of building materials from local raw material supplies, entrusting construction and installation works to state contractors, supporting cooperative construction enterprises, counselling and coaching, supporting reconstruction and capital repairs of disused houses, supporting major repairs of houses [3].

The first catalogue of typical houses was established in 1957 and consisted of 17 developed construction projects, another one that was created in June 1958, on behalf of the Ministry of Municipal Affairs and President of Architecture and Urban Planning presented 60 projects of typical houses. Each sheet of the catalogue has presented one type of house giving the building's footprint, floor spaces, cubic volume, costs and construction materials. All of the projects have had specific numbers that simplified its verification [4].

Different types of houses from the catalogue from each category: detached, semi-detached and terraced are presented below.



III. 1. Terraced house type no. 0004, *Katalog Domków Typowych*, Warsaw 1958

Building footprint	56.00 m <sup>2</sup> ; 4.40 m × 12.08 m
Total floor residential units	84.43 m <sup>2</sup>
Building construction (with basement)	Walls: AAC blocks Floors: concrete panels Roof: slag concrete



III. 2. Semi-detached house type no. 0213, *Katalog Domków Typowych*, Warsaw 1958

Building footprint	94.36 m <sup>2</sup> ; 7.25 m × 9.00 m
Total floor residential units	101.39 m <sup>2</sup>
Building construction (with basement)	Basements walls: brick Walls: slag concrete airbricks Floors: suspended beam and block floor Roof: slag concrete panels



III. 3. Detached house type no. 0145, *Katalog Domków Typowych*, Warsaw 1958

Building footprint	76.50 m <sup>2</sup> ; 9.00 m × 8.50 m
Total floor residential units	100.80 m <sup>2</sup>
Building construction (with basement)	Walls: slag concrete airbricks Floors: suspended beam and block floor Roof: slag concrete on suspended beam and block floor

### 3. The current condition of the post-war housing estates

At one time, post-war housing estates of detached houses were built in suburban areas, while the growth of urban space had been absorbed. Today, they are linked with the city centre and have a comprehensive infrastructure. Usually those residential communities have regular urban layout and a legible system of streets. Thanks to the similar volume of buildings, the rhythm of the houses is distinct. Thus the estate harmoniously connects detached, semi-detached and terraced buildings. Another advantage of those estates is an abundance of high vegetation along the communication routes and in private gardens. The disadvantage of the typical house building is an unfavourable functional system, that doesn't meet modern requirements. Narrow hallways and stairs and small rooms are a challenge for an architect today. However, a small floor area that usually hasn't exceeded 110 m<sup>2</sup> is attractive nowadays.

#### 3.1. Modernization of the post-war Polish housing estates

There are neither good examples of upgrading post-war architecture, nor specific statements in the local area development plan that would control any individual repairs and renovations.

As a consequence, this typical house building systematically loses its modernistic character [5]. Detached buildings, popularly called *cubes*, are usually transformed by remodelling and as a result it is difficult to identify what the basic catalogue project was.

Lack of social awareness of taking responsibility for the aesthetics of the neighbourhood has the following effects: each part of a semidetached house may have different colour, roof, windows or even size (height). This disorder and chaos affects our perception in a negative way [6]. Restoring and upgrading of those houses is inevitable, but it is possible to avoid wrong decisions, which consequently would be perceptible for the next years. The incompetently maintained modernizations are the fundamental problem of the post-war housing estates. Deciding on temporary and cheap solutions with a low aesthetic value or hiding the modernistic character of the building raises some questions [7].

The beginnings of the modernization of post-war houses were associated with a certain fashion and trends in architecture. In the 90's it was popular to clad the facades with a *siding*, which was produced of a plastic plank. It was a cheap solution that also provided insulation of the building and helped to hide unattractive façades. Unfortunately after 10 years of use, the material needed replacing because of its degradation. Another method of upgrading those buildings was remodelling them into an old Polish manor house style. This involved building pitched roof, porches with columns or golden grilles in the windows.

a)



b)



III. 4. a) a post-war building covered with *siding*, b) a post-war house rebuilding by changing a roof shape

### 3.2. Modernization of the post-war Polish housing estates by using new technologies and contemporary material solutions.

The current upgrades put on modern design solutions include good and sustainable materials and technologies. They are mainly caused by the fact that advanced restorations often occur while changing the house owner. The new proprietor usually can afford comprehensive modernization [1].

Contemporary modernizations is using ventilated facades with modern materials such as cladding of fibre-cement panels, HPL slabs or aluminium panels. This type of renovation provides comfort by keeping the exterior walls dry, helps to maintain a constant temperature inside and also provides additional sound insulation. It is also common, to design large glazings in the facades but it requires the use of glass with low heat permeability. a relatively new solution is using a profile glass, which diffuses the light and gives good acoustic and thermal insulation.

Because the majority of installations in the building need to be replaced (due to their poor state of repair), people usually choses innovative central heating and ventilation system solutions, heat pumps, heat recovery units and BMS systems: intelligent building management system.

### 3.2.1. House upgrading by rebuilding

Modernization by rebuilding is extremely invasive for the building structure. It changes the shape and the size of the building because of enlargement. The problem with this type of modernization is to combine an old construction with the new one. a good example of such an upgrade, commended by the architects, is the “Black Cube” project designed by Kameleonlab studio from Wroclaw.



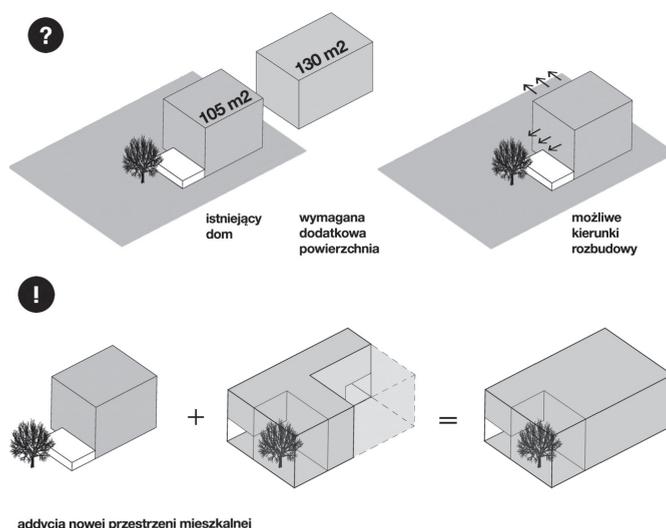
III. 5. a) a post-war house before the upgrading, b) the realization of the modernization project (source: [8])

The building was enlarged by an addition of the elements. The existing part was built using traditional technology – with a solid brick of 38 cm. The extension, also designed with traditional technology used silicate blocks of 18 cm. and mineral wool insulation of 12 cm. An important change was replacing all of the floors due to the low height of the rooms. The investor acquired more space and comfort by raising ceilings from 2.6 m to over 3.0 m. New floors have been

designed as cast in situ floor of 16cm. a problematic issue was the non-ventilated flat roof over the existing part of the house; it was necessary to replace most of the wooden beams. The new part of the building was covered with a cast in situ floor and a skylight was built over the living room. An interesting project idea was to keep an existing tree and to compose it with a building. Unfortunately, during construction, the tree was damaged and had to be removed. Most of the elevations have been covered with wooden vertical planks in a dark colour, but in contrast and to avoid monotony, the architects used an intense light green colour to accent the entrance of the building. Regarding the wooden planks, vertically placed planks have a longer life span and effectively preserve joints from water penetration. The new staircase has been glazed with profile glass, which is a good alternative to the glass bricks, popular in post-war designing. Profile glass



III. 6. „Black Cube” - view from the terrace  
(source: [8])



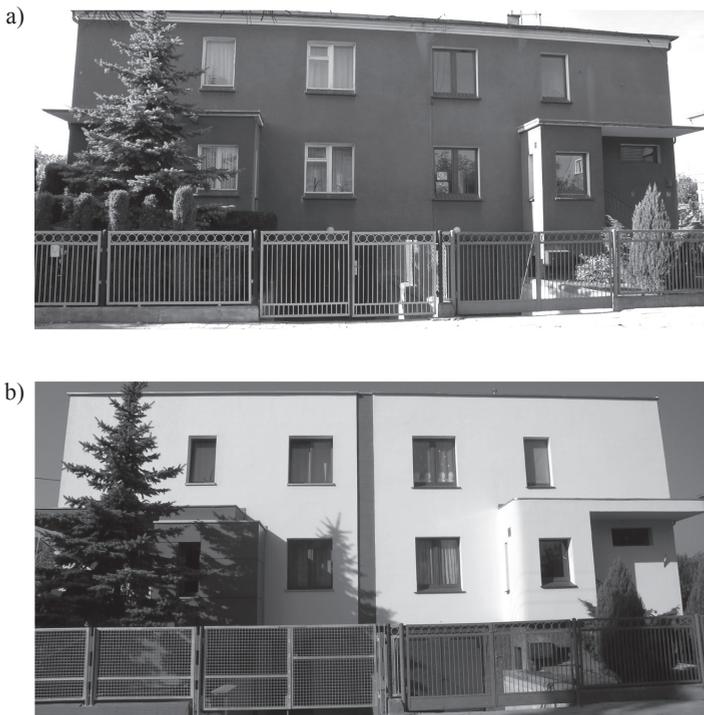
III. 7. „Black Cube” – sketches of the building shape formation  
(source: [8])

is a good solution for large glazing where it is important to provide high thermal insulation and additionally, it also protects from excessive solar access to a building and assures good acoustic parameters. a steel openwork structure in the back of the building surrounds a terrace. It is possible to fix the vertical wooden blinds or curtains to the construction and reduce sunlight penetration in the living room [8].

### 3.2.2. New quality of building – modern form

Creating a new quality of buildings by changing facade aesthetics is one of the most popular forms of upgrading the post-war architecture. The basic advantage is good relation between the price and the final effect. Usually with this kind of modernization there is no need to include any construction changes. The main emphasis of renovation work is put on restoring the existing building elements by repair and renovation: steel fencing and railings sandblasting, impregnation of wood cladding and joints, cleaning stone cladding facades.

One successful example of this type of modernization is a semi detached house project designed by ISBA studio from Wroclaw. Cooperation among the neighbours was fundamental for this project. The aim of the project was to increase house thermal performance by technical solutions that would let the building envelope have better thermal parameters. The upgrading has also assumed to improve aesthetics of the building by changing the colours and creating new architectural details.



III.8. a) a post-war building before the upgrading, b) the realization of the modernization project; (source: [9])

An existing building is an example of typical polish architecture from the 60's XX – a simplified modernism. To give a building more geometric aspect the architect decided to remove the cornice from the top of the flat roof. At the concept stage, all of the elements extending beyond the general construction, such as entrance vestibule or the balcony, were to be plastered and painted in a different colour, but in the end it was decided to cover them with plywood. Originally the base of the building was covered with anthracite tiles. After thermal insulation the tiles were replaced by a scratch pattern plaster, which eventually gives the effect of distinguishing the base from the rest of the building. During the restoration work, the problem of accessibility to the garden from the terrace has been solved by designing openwork metal stairs. Railings and home fencing have been designed in a similar light industrial style, which gives a compact final effect [9].

#### 4. Conclusions

At the present time, entirety and the modernistic character of the post-war residential housing is brought into question. It might be a *to be or not to be* for this architecture. Numerous upgrades of these types of buildings, due to the generation change or just an individual need, are systematically and permanently changing the character of residential communities [10].

New technologies in the construction industry are surely improving the quality and durability of the renovations. Putting on good materials is becoming increasingly popular, even at the price of higher costs. Temporary solutions sink into oblivion but they are still present in local spaces. In the modernization process, an important issue is to keep the simple and modernistic character of the building block, even when the construction rebuilding.

We haven't yet developed a recipe for healing and effective modernization of post-war urban spaces. The method of do's and don'ts by providing strict guidelines in LDP wouldn't necessarily bring the desired effect and it may even aggravate an aversion to this type of architecture. It is important therefore, to develop the knowledge of the aesthetic values among people, the ability to recognize it and practice [4, 11].

Single family housing is just a little part of the post – war building industry. Public buildings or blocks of flats from this period arouse more emotions among the architects and society, but detached houses shouldn't be treated with neglect. Its strength and potential lies in a complex of residential community.

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