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THE RELATIONSHIP BETWEEN FUNCTION AND ARCHITECTURAL FORM – TRUTH OR LIE?

RELACJA MIĘDZY FUNKCJĄ A FORMĄ ARCHITEKTONICZNĄ – PRAWDA CZY KŁAMSTWO?

Abstract

The purpose of the work is to present the relationship between function and architectural form on the example of selected buildings. The truth in architecture can relate to the sincerity of material solutions, but also to functional ones and their reflection in form. Buildings and spaces between them have a specific function and form when built. With time and the changing needs of users, they can be used for another purpose. The presented conclusions are based on field studies and literature research and are the result of an analysis of the relationships between function and form in architecture.

Keywords: architectural form, truth in architecture

Streszczenie

Celem pracy jest przedstawienie relacji między funkcją a formą architektoniczną na przykładzie wybranych obiektów. Prawda w architekturze może dotyczyć szczerości rozwiązań materiałowych, ale także tych funkcjonalnych i ich odzwierciedlenia w formie. Budynki i przestrzenie pomiędzy nimi w momencie powstania mają określoną funkcję oraz formę. Wraz z upływem czasu i zmieniającymi się potrzebami użytkowników mogą być użytkowane w innym celu. Prezentowane wnioski opierają się na badaniach terenowych i literaturowych oraz są wynikiem przeprowadzonej analizy dotyczącej powiązań występujących między funkcją a formą w architekturze.

Słowa kluczowe: forma architektoniczna, prawda w architekturze

1. INTRODUCTION

There are specific patterns for architectural form for many types of buildings. They depend on the function of buildings, which generates the need for certain solutions in their facades. In some buildings, e.g. residential ones, the need for adequate sunlight inside the apartments is important, which is one of the factors affecting the facade. However, the impressive and monumental form of museums, governmental and other public buildings is a reflection of their importance in cities.

Many existing facilities are currently being allocated to new functions. These include historic post-industrial, railroad and harbour buildings. In such a situation, in a building with a facade reminiscent of its historical identity, functions incompatible with its original purpose, which was the truth of this building, may be introduced. The question arises whether this new function is a lie or maybe a new truth, enabling the building a new life.

In newly designed buildings, a variety of different approaches to linking the function with the form may be observed. Some buildings hide their function, while others emphasize it through the solutions of the façade and volume.

With the advent of Bauhaus, the buildings were designed according to its main slogan proclaimed by Sullivan: *form follows function*. Postmodernism brought a different approach, in which the facade of the building was not the result of the layout of the rooms inside the building, but it could have ornament and symbolic elements not characteristic of the modernism. It is now known that during the life of the building, regardless of the period and style it was built in, its function may change many times. This is often due to utility reasons, and is currently also compatible with the circular economy. The principles of sustainable development in architecture are also used in the design process of new buildings – their future and possibility of changing their function are taken into account. For this reason, solutions that can provide the greatest flexibility, both in terms of functional-spatial and construction layouts of the buildings, are used.

2. NEW WAYS OF USING THE EXISTING BUILDINGS

Existing buildings can undergo transformations both in their form and function. This applies to historic buildings, often protected by conservatory rules, and those built nowadays. The possibility of introducing new functions in the facility is often associated with its technical condition, dimensions, type of construction, as well as the form and solution of the facade.

The buildings that are undergoing transformations might be post-industrial and transport-related ones, often of great historical value. They can be transformed into functions completely different from their original purpose or those referring to the history of the place and the identity of the building. Post-industrial facilities are in many cases single-space halls of significant heights and skeletal structure. In such buildings there are great opportunities for rearranging their interiors and because of this fact they can be used for many different functions.

One of the possible solutions is to use post-industrial buildings for exhibition spaces devoted to the history of that building and place. In this way, the function of the building changes, while its characteristic form is maintained, indicating its former purpose and giving it an identity. An example of such a building is, among others, the former coal-washing building on the site of the former Zollverein mine in Essen in the Ruhr region in Germany, which has been transformed into a multi-story museum. Inside and outside of the building, new elements that give it a contemporary character have been introduced – they also have a useful role, e.g. large external stairs, which are a characteristic element of the building, emphasizing the entrance area (Ill. 1).



III. 1. View of the facade of the Zollverein museum in the Ruhr region and the newly built staircase that is the entrance area (arch. Rem Koolhaas), photo: Spyrosdrakopoulos, source: https://upload.wikimedia.org/wikipedia/commons/c/c0/1380_zeche_zollverein.JPG (CC BY-SA <https://creativecommons.org/licenses/by-sa/4.0>), access: 29.5.2020

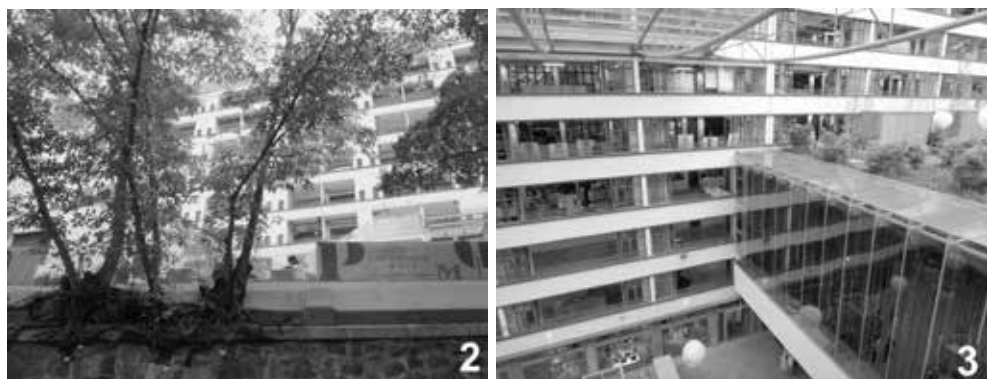
The implementation of the exhibition function in post-industrial and technical heritage buildings is a frequent solution due to the lack of necessity to illuminate interior spaces with daylight. Not only the Zollverein coal mine was used for new museum, but also former power plant in London, where Tate Modern museum was placed. It includes the Turbine Hall, that height allows to exhibit installations and works of art with significant dimensions. Also in the Noord district in Amsterdam, the hall of the former shipyard was devoted to creative spaces for artists (NDSM). Adaptation of this type of buildings allows to obtain in their interior spaces with often unique values.

Non-obvious functions may also be introduced in historical buildings, constituting a kind of negation of their previous purpose. This type of solution might be transformation of the churches for the following functions: the Paradiso concert hall in Amsterdam, the exhibition space in De Nieuwe Kerk in Amsterdam or the bookstore at the former church in Maastricht in the Netherlands. Churches adapted for residential functions are another example. All those functions introduced to the churches are an exact opposite to their original purpose, not referring to the very characteristic form of sacred architecture. In such cases, the function of the building after transformation does not reflect its form.

It is not easy to transform a building into a residential one, primarily due to the criteria that should be met by such facilities. One of them is an adequate sunlight for apartments, so sometimes even an attempt to adapt the hotel to multi-family housing, which seems easy

due to the similarity of those functions, can be problematic when the building is unfavorably located in relation to the sides of the world. Another disadvantage may be the location close to the source of noise, e.g. traffic, which is also extremely important in the design of multi-family buildings.

However, there are also quite the opposite solutions, in which the building that once served a residential function, despite the existing potential, has been transformed into a completely different one. This situation occurred in Hong Kong, where a residential facility serving married policemen, which was built in the 1950s, was transformed into creative space. PMQ is located on Hong Kong Island between Hollywood Road, Aberdeen Street, Staunton Street and Shing Wong Street. On the plot, since 1889, there was a Central School, whose name was changed to Queen's College in 1894. The school's buildings were severely damaged during World War II and later rebuilt in another location. On the plot next to the Hollywood Road in the 1950s, apartments for young police officers (Police Married Quarters) were built. At four levels, three buildings were constructed: residential buildings A (8 stories high) and B (7 floors) and a 2-level building, which originally had a recreational function. These buildings are monuments of the 3rd degree, and the area is important because of its history and structures that were on it. Architecturally, the existing buildings represent the modern era, with a simple facade, horizontal divisions, and no decorations (Ill. 2, Ill. 4).¹ Since 2000, these buildings were not in use. The plot, originally intended for a residential function, became an object of interest for residents of the neighbourhood. In 2005, the situation of the existing trees on the site was discussed and in 2008 a 3-month participatory process was carried out, during which the community presented various concepts regarding the future use of the land. As a result of these activities, in 2010 it was decided to allocate buildings for creative functions.²



Ill. 2. Street view of the PMQ building and information board (photo: author)

Ill. 3. View of one of the historical PMQ buildings and the newly realised link between both buildings A and B (photo: author)

¹ *Consultancy for Heritage Impact Assessment for Transformation of the Former Police Married Quarters Site on Hollywood Road into a Creative Industries Landmark*, Antiquities and Monuments Office, March 2011, pp. III–IV, https://www.amo.gov.hk/form/PMQ-HIA-vol_01-BHIA.pdf (access: 10.05.2020).

² *Ibidem*.



- III. 4. View of meeting places located in the space of widened corridors in the PMQ building in Hong Kong (photo: author)
- III. 5. View of the space of the extended corridor used for exhibition purposes in the PMQ building in Hong Kong (photo: author)

During the revitalization of the area, fragments of the stone foundations of the former school located here were preserved, exposed and made available for visitors. This action was intended to present the past of this area.³ The main assumption in the implementation of the project was to preserve all existing facilities, introduce high-quality public space and transform the area into a creative hub, which provides studios for artists, workshops, shops, restaurants and exhibition space. The project confirms that a well-made adaptation not only helps to preserve historical buildings, but also contributes to urban revitalization and environmental sustainability.

It was decided to introduce only those changes that were necessary, and new functions were aimed at revitalizing the building and the surroundings. Many externally visible historical elements have been preserved, including façade solutions (III. 3) – on an architectural scale, and a view from the street (III. 2) – on an urban scale. But the focus was also on the elements that are harder to see but are important in the functioning of the building. This includes spaces of widened corridors – previously used by families for eating meals, now became meeting places, intended for the exchange of thoughts and ideas between artists and visitors, thus recreating the spirit of interpersonal interaction (III. 4, III. 5). Newly designed volumes that are an extension of the existing buildings were made mostly of glass, which enabled them to harmoniously fit into the architectural and urban design layout.⁴

The introduction of new functions in existing buildings can be implemented in various ways. Some of these buildings are under conservation protection, which may result in the inability to make some changes, as well as the need to preserve elements referring to their original function – thus leaving a testimony of the truth of the building.

³ *Commissioner for Heritage's Office Development Bureau, Conserve and Revitalise Hong Kong Heritage, Antiquities and Monuments Office, information materials of PMQ and City of Hong-Kong, www.cnc.org.hk* (access: 10.05.2020).

⁴ *PMQ – Former Police Married Quarters*, HKIA Journal, 2017, no. 73, pp. 64–65.

3. NEW DESIGNED BUILDINGS

New buildings already at the concept development stage can be designed taking into account the possibility of changing their function in the future. That attitude is in line with the principles of sustainable development and the circular economy. One of the solutions that can promote flexibility and variability inside the facility is the introduction of a structure that allows any interior arrangement, while the other is the use of curtain walls that allows changes of the facade of the facility in the event of such necessity. For some functions it is also important to provide the minimum floor height required for the intended purpose. An adequate sunlight in some rooms may be another parameter – it should be provided not only for residential buildings, but also for schools and kindergartens. The ratio of the window area to the floor area of the room might be also important.

In architectural design, a particularly unique situation is participation in the creation of a completely new type of building that has never existed before. Then, the question arises about types of the rooms that should be in it, as well as how the building should look like. The search for the right form begins, usually the inspirations come from the existing patterns. For example, in the first half of the nineteenth century with the introduction of the railway in 1830, there was a need to create buildings to serve travellers. Because of that fact, the first railway stations in Manchester and Liverpool were built. Liverpool Road in Manchester was a 2-storey brick building with a simple form.⁵ Over time, the stations became more and more magnificent, propiles and arches appeared, e.g. Euston station in London. Inspirations were also found in religious architecture, and at the turn of the 19th and 20th centuries the most monumental stations were created. Towers and clocks often appeared in the facades.⁶ Above the tracks and platforms there were roofings, including arched halls, which have become a characteristic form of railway architecture, emphasizing the status of the station.⁷ From the second half of the twentieth century, along with the increase in the popularity of individual road transport, railway stations lost their importance, which was reflected in their form.

At the end of the 20th century, there was a renewed interest in rail transport, which affected the architecture of railway stations. Some of the existing facilities did not meet new standards, related to, among others, creating transport modes within railway stations. It was decided to expand historic buildings or build new ones. Two main directions were observed in the design of new stations. The first of them is the introduction of a new railway station as one of the functions in multi-functional buildings. An example of such a solution is the station in Breda, in which the reception building is located in a wide tunnel below the platforms, and on both sides of the railway tracks there are buildings that have office and residential functions (Ill. 6, Ill. 7).

Another solution of this type is the new Delft train station, once located in a nineteenth-century building (Ill. 8). Currently, the reception hall is located on the ground floor of the new City Hall building (Ill. 9). Between the historic station and the new building there is a square with bus stops, and the historic reception building is used, among others for

⁵ N.B.L. Pevsner, *A history of building types: the A.W. Mellon lectures in the fine arts*, Princeton University Press, Princeton 1976, p. 226 [after:] N. Pevsner, *Lancashire. 1, South Lancashire*, Penguin Books, Harmondsworth 1969, p. 293.

⁶ J. Richards, J.M. MacKenzie, *The Railway Station: A Social History*, Oxford University Press, Oxford 1986, p. 24.

⁷ S. Parissien, *Station to Station*, Phaidon Press, London 2001, p. 31.

gastronomic functions. In both stations in Breda and Delft, the reception halls were reduced to a functional role, and the form of the multifunctional buildings is not characteristic of the architecture of railway stations.



- III. 6. View of the entrance area to the Breda station – behind the glass wall there are railway platforms, and on the left side of the picture – residential buildings (photo: author)
- III. 7. View of the residential part (straight ahead) of the multi-purpose building in Breda, on the left side behind the glass wall there are railway platforms and bus stops, and on the roof there are parking spaces for cars – the Breda railway station (photo: author)



- III. 8. View of the square between the historic Delft railway station building (on the left) and the building of the new railway station and Delft City Hall in the Netherlands (photo: author)
- III. 9. View towards the corner of the building in which the new Delft train station in the Netherlands is located (photo: author)

There are also different solutions in which a return to the form of a railway station as a free-standing building in the urban tissue is observed. Such an example is the Utrecht station, where it was decided to demolish the multifunctional building of the station and the Hoog Catharijne shopping center. In the place of the previous building, a free-standing railway station was built above the tracks, preceded by a public square, next to which a new shopping center was located.

Designing new buildings is associated with many challenges – it is important to introduce the form of the building which is appropriate to its function, but also the principles of

sustainable development should be kept in mind. It is important that functional considerations and the pursuit of the greatest possible flexibility of solutions do not dominate the aesthetics and form of new buildings.

4. WAYS OF SHAPING THE RELATION BETWEEN THE FUNCTION AND FORM OF THE BUILDINGS

One of the ways to refer to the function of a given building is to use appropriate material solutions in its facade, which can become a way to present the truth of the building.

Such a solution was used in the Institute of Sound and Vision in Hilversum in the Netherlands. The building was designed by the architectural office Neutelings Riedijk and built in 2006. Inside, on the underground floors, there is an archive of recordings of radio and television programs made in the Netherlands. The facade of the building is made of coloured glass plates, on which there are various paintings from known productions.⁸ They are not realistic representations, but artistic processed images created in reference to the originals. Jaap Drupsteen chose 768 shots, which were presented on 2,244 glass plates that have a unique pattern. The technology was developed in cooperation with Saint Gobain and TNO.⁹ The scenes are embossed in the glass, and another pattern using colour has been applied to them. The colours used on elements of individual discs smoothly pass to the neighbouring plates, entwining the building like a ribbon, and from the outside resembling a television picture.

Another way to refer to the function of building in its form is to make its interior visible to an observer who stays outside. The form of the building can hide the arrangement of rooms inside the building, e.g. by using an opaque curtain wall, or reveal it, showing the truth about it (by using transparent facade materials). An example of reflection of the building's interior layout in its facade is showing the angle of the lecture halls inside them. That solution can be observed, among others, in the Auditorium of the Faculty of Chemistry of the University of Wrocław, designed by Krystyna and Marian Barski.¹⁰ This building was constructed at the turn of the 1960s and 1970s¹¹ in accordance with the principles of modernism – in order to ensure vertical communication the ramps were used. Inside the building there is an auditorium hall, which level of the floor is accurately reflected in the facade. From the west side, the building opens towards the Odra River through the use of a glass facade, as well as a cantilever suspension, which causes the optical lifting of the upper part of the building, further emphasized by the direction of erecting the ramp.

Also, in the architecture of Rem Koolhaas (OMA – Office for Metropolitan Architecture) the aspirations to shape the facade closely related to the interior of buildings can be noticed. Examples of such solutions are the Educatorium on the campus of the university in Utrecht

⁸ N. Marzot, *Netherlands Institute for Sound and Vision* [in:] S. Komossa, K. Rouw, J. Hillen (eds.), *Colour in contemporary architecture: projects, essays, calendar, manifestoes*, SUN architecture Publishers, Amsterdam 2009, pp. 62–65.

⁹ *Building* [in:] The Netherlands Institute for Sound and Vision, <https://www.beeldengeluid.nl/en/visit/whats-on/gebouw> (access: 26.05.2020).

¹⁰ K. Ziental, *Barscy* [biography note] [in:] R. Eysymontt et al. (ed.), *Leksykon architektury Wrocławia*, Via Nova, Wrocław 2011, p. 953.

¹¹ G. Hryncewicz-Lamber, J. Urbanik, G. Adamczyk-Arns, *Top-down and Bottom-up MOMO Advocacy Strategies in the City of Wrocław*, Expansion&Conflict, Proceedings of the 13th Docomomo International Conference Seoul, Docomomo 2014, pp. 77–82.

(1997) (Ill. 10) and Kunsthall in Rotterdam (1992) (Ill. 11).¹² In Kunsthall, communication inside the building is based on ramps, which results in the lack of a clear division into individual floors.¹³ In both Kunsthall and Educatorium, the elevations show the angle of inclination of the internal ramps of the lecture halls located inside. The sloping ceiling line shown in the facades divides them into two parts – both glazed, but with a different division. The highly transparent Kunsthall façade makes it possible to observe the interior of the lecture hall, gallery and other spaces – the facade not only provides contact with art, but also shows the technical part of the building in a fair way.¹⁴ Both in the designs by Krystyna and Marian Barski and Rem Koolhaas, the relationship between function and form is very tight, the buildings clearly send a signal about their destiny – this is their truth.



Ill. 10. View of the facade of the Educatorium building in Utrecht, that layout reflects the interior of the building (arch. Rem Koolhaas), photo: Ben Bender, source: https://upload.wikimedia.org/wikipedia/commons/9/91/Uithof%2C_3584_Utrecht%2C_Netherlands_-_panoramio_%2819%29.jpg (CC BY-SA (<https://creativecommons.org/licenses/by-sa/3.0>), access 2020.5.26

Ill. 11. View of the facade of the Kunsthall in Rotterdam, that layout reflects the interior of the building (arch. Rem Koolhaas), photo: Henk Monster, source: https://upload.wikimedia.org/wikipedia/commons/8/8f/Museum_of_art_%22de_Kunsthall%22_Rotterdam_-_panoramio.jpg (CC BY (<https://creativecommons.org/licenses/by/3.0>), access 2020.5.26

5. CONSLUSION

The relationship between function and architectural form is an issue that is taken up in every creative design process. Depending on the function of the building, its form is shaped differently. At the time of construction, the building has a specific function, which usually corresponds to its facade and together they form a coherent whole, constituting the truth of the building. The facades can manifest their function in different ways. This can be accomplished through different materials, e.g. glass plates, inscriptions, drawings, or by using divisions on facades that indicate the arrangement of rooms inside – usually the chosen solution is purposely appropriate for a given type of a building. Over time, some buildings lose their original purpose. Implementation of new functions in existing facilities is currently a commonly used solution. Sometimes new functions refer to the previous ones, easily blending in

¹² OMA, <https://oma.eu/> (access: 29.05.2020).

¹³ R. Koolhaas, *Content*, Taschen, Köln 2004, p. 79.

¹⁴ I. Böck, *Six Canonical Projects by Rem Koolhaas: Essays on the History of Ideas*, Jovis, Berlin 2015, p. 212.

with the existing structure and the immediate surroundings, forming a coherent assumption and testifying to the truth of the building. Other times, the new function may seem just the opposite of the previous one, standing in opposition to the building's form. The question may then arise whether the relationship between form and new function is truth or lie, while what is important is that buildings gain a second life, that ensures their existence in the urban fabric, often enriching and diversifying the offer of the area. This is how they can manifest the truth of architecture, which in this case may be the functionality and flexibility of solutions, despite the lack of reflection of the function in the form of a building.

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