

Marek GOSZTYŁA<sup>1</sup>  
Rafał LICHOLAŁI<sup>2</sup>

## ANALYSIS OF THE RESULTS OF THE DESIGN PROCESS PERFORMED ON THE HISTORIC ARCHITECTURAL STRUCTURE BASED ON THE EXAMPLE OF THE EXTENSION OF HISTORICAL DIDACTIC COMPLEX IN RZESZÓW

The article analyses the issue of the extension of the historical architectural didactic complex in Poland. The conditions of the building before the design process was described and the adopted design solutions were analyzed. Design works allowed to arrange form of facades. The results of the work is an additional didactic and administrative space. The article analyses the results of cooperation between local delegation of Regional Office of Protection of Historical Monuments and the architect, which allowed to extend the possibilities of historical use of the object in combination with the newly design part.

**Keywords:** historical architectural complex, architectural expansion, design in historical architectural structure

### 1. Introduction

Historical architectural buildings demonstrate designers creative aspirations, but also in many cases there are not changed their function despite the passage of years. The necessity of the growth of urban centers is forced by permanent demographic growth. Requirements of the needs of a specific destination have changed over the years, which means that technical conditions and room programs also have changed. The Act on the Protection of Monuments and the Care of Monuments defines the scope of works that can be performed with the preservation monument [1]. One of the treatments that allows historic building to adapt to new requirements in the expansion of the building. The issue of adaptation historical building to modern requirements has been many times described in literature [2–5],

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<sup>1</sup>Marek Gosztyła, Politechnika Rzeszowska, Katedra Konserwacji Zabytków, al. Powstańców Warszawy 12, 35-959 Rzeszów; tel. 178651939

<sup>2</sup>Corresponding author: Rafał Licholałai, Politechnika Rzeszowska, Katedra Konserwacji Zabytków, al. Powstańców Warszawy 12, 35-959 Rzeszów, r.licholałai@prz.edu.pl

but there were no tools allows to analyze designed solutions. Registration in the monuments register allows to ensure proper protection of the historical building, but also imposes the need to cooperate between the designer and the local unit of the Protection of Monuments Office. The obligation to consult design solution with the conservation office imposed on the architect is undoubtedly a burden, but also positively affects to the final result, which do not blur the original design solution, but ensure the reference to the historical buildings. Designing in historical areas requires detailed historical analyzes, which allows full understanding of the context of place. An example of such works may be the project of expanding historical building located in Jałowego street in Rzeszów (Figure 1).



Fig. 1. View on the analyzed building with extended part

## 2. Characteristic of the analyzed building

The school complex of Presentation Sisters is located at the crossroads of Cieplickiego Avenue and Jałowy Street in Rzeszów. Both historically and nowadays, the buildings have a didactic function. The approximate date of construction is 1880 (Fig. 2) [6]. After World War II the building was used by the military Pedagogical University, since 1972 it was the seat of the Rzeszów branch of the Maria Curie-Skłodowska University in Lublin, and since 1996 it has been the seat of the General Secondary School, which in subsequent years was transformed into the Complex of General Education Schools run by the Congregation for the Presentation of the Blessed Virgin Mary [6].

Since the moment of its creation, the building have been renovated and extended, e.g. in 2003 a gymnasium was built. Systematic changes in the architectural structure caused chaotic form of frontage of building on the side of

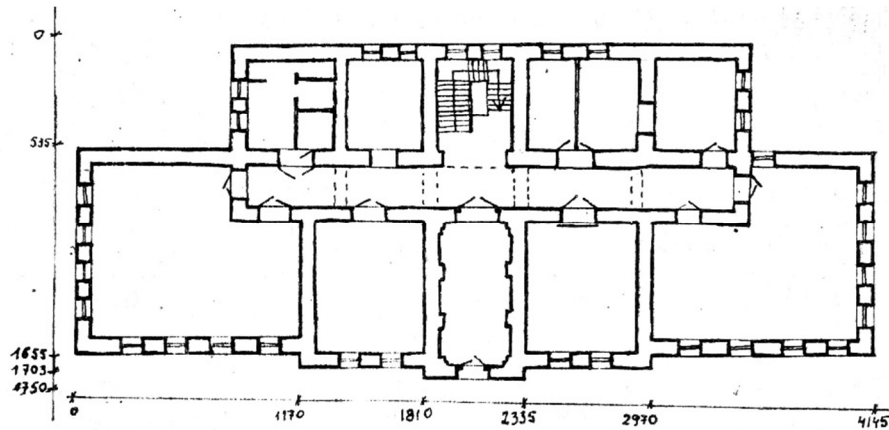


Fig. 2. Plan of the oldest part of the didactic building constructed in 1880.

Source: Archive of the Provincial Office for the Protection of Monuments Delegation in Rzeszów, Poland

Ciepliński Avenue (Figure 3). The design of the extension of the architectural complex simultaneously allowed to calm down the stormy form of the building and created additional spaces for didactic, administrative and recreational purposes. Prior to the design process, a technical expertise was created, which showed no sign of damage, signs of subsidence or displacement of foundations exceeding the permissible values [7].



Fig. 3. View from Ciepliński Avenue before the design process shows the chaotic form of analyzed building. Source: Archive of MWM Building Design Group design studio, Rzeszów, Poland

### 3. Expansion concept

The development conditions for the extension of the analyzed building are described in planning permission issued by Mayor of the City of Rzeszów among others from the side of Jałowy Street a line of development was determined as continuation of existing face of the historical building and from the side of Ciepłińskiego Avenue the designer was obliged to maintain basic elements of the designed building parallel to the edge of the roadway and the maximum height of the extension was also determined. Due to the chaotic form of the historical building from the eastern side, the designer decided to create extension based on two main directions. One of them is parallel to the Ciepłińskiego Avenue, and the second one is parallel to the path leading to nearby “Park of Unity” (Figure 4). On the ground floor and the first floor there are classrooms and administrative rooms, while on the top floor there is a classroom and a utility terrace. Also on the ground floor there are utility rooms and an atrium. The main entrance from the side of Jałowego street has not been changed. From the side of Ciepłińskiego Avenue an emergency exit has been designed. The extension of the historical building is a design challenge for both the architect and the constructor. The structural design must not affect the historic elements, but economical efficient is also important issue. The main structural system has been designed partly as reinforced concrete and partly as steel structure [7].

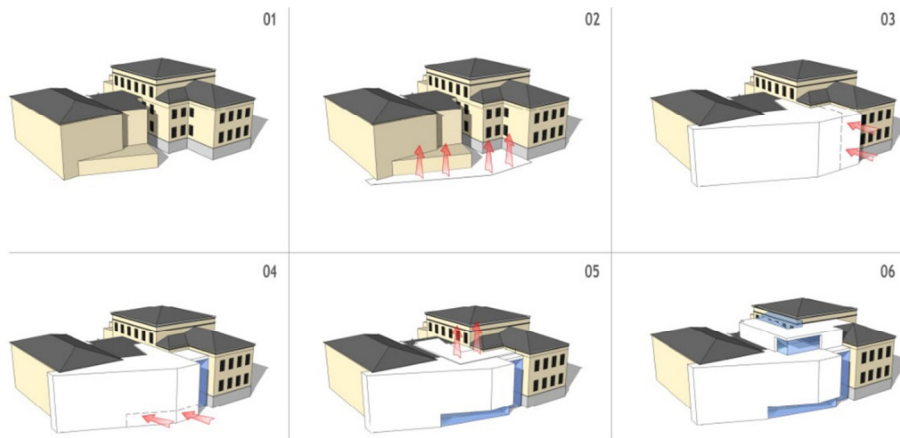


Fig. 4. Diagram of the creation of the designed part.

Source: Archive of MWM Building Design Group design studio, Rzeszów, Poland

### 4. Architectural analysis

Assessment of the impact of the adopted design solutions in urban space is a complex issue due to a large numbers of factors influencing the final perception of the solid. In order to examine the impact of the adopted architectural solutions the analysis has focused on separating the elements forming whole geometry of

the solid e.g. analysis of the contour points of the façade. This methodology allowed to analyze the separated features of the architectural complex and then refer the conclusions to the context of the place.

Designing the face of the wall parallel to the axis of the roadway positively influenced to the perception of the architecture solid. The designer decided to reduce the number of edges of east elevation. The values of the distances between edges of elevation from Jałowego street (which has not been changed during the design process) is from 5.4 m to 11.8 m with average value equal to 8.36 m. The values of the distance between the façade edges from the Ciepliński Avenue before the design process were from 1.6 m to 11.2 m with the average value equal to 4.47 m. After the extension the values of the façade edges distance are from 3.6 m to 11.8 m with average of 7.05 m. The designed extension caused a situation where the values of the edge distances of both elevation are similar, which gives the impression of a harmonious architectural complex (Figure 5).

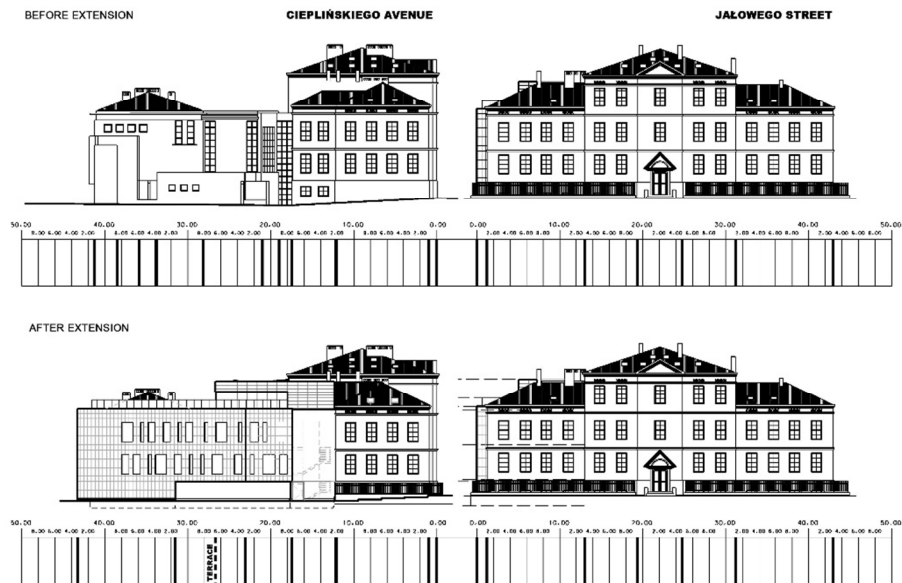


Fig. 5. Scheme presenting the analysis of façade edges in a historic architectural complex before and after extension. The study was created based on materials from the archives of MWM Building Design Group design studio

An analysis of the density of points forming the contours of the façade at Cieplińskiego Avenue and Jałowego Street has also been developed. The east elevation before the design works had an inconsistent form, which is shown on heatmap diagram (Figure 6). The design process limited the number of edges and contour points. The design caused the accumulation of points at the contact of the historic part with the extension part, while in the south-west direction (where the “Park of Unity” is located) the amount of contour points were reduced to a minimum, which calmed down the façade at Cieplińskiego Avenue.

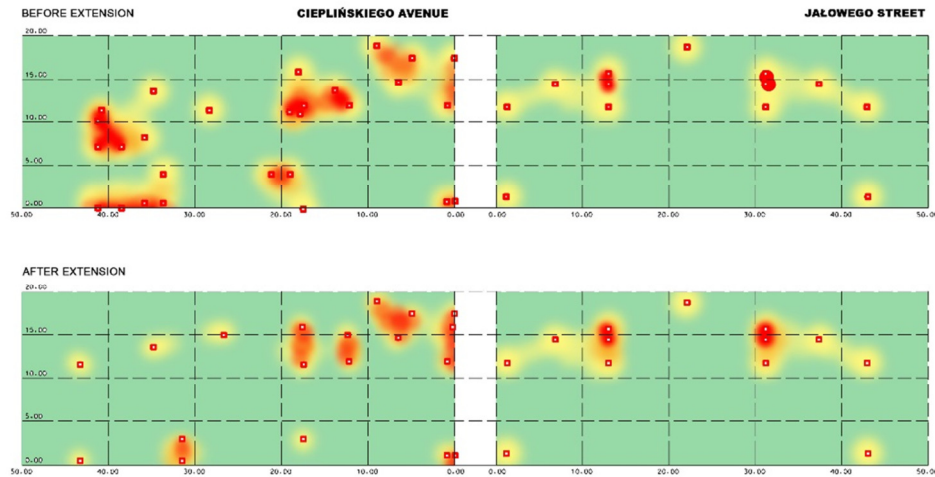


Fig. 6. Scheme showing the heatmap of density of contour points for the analyzed facades before and after the design process. The study was created based on materials gather from archives of MWM Building Design Group design studio

## 5. Conclusion

Constantly developing urban centers oblige designers to adapt buildings to new or changed needs with simultaneous maintaining historical buildings in the least changed character. The outcome of the design work in the historical architectural structures is influenced by numerous factors e.g. the development context, legal conditions or the competences of the local conservation office. Design process in the historical objects should guarantee the durability of the adopted solutions with the least possible interference in the preserved elements. The analyzed design process of the extension confirms the assumptions of the necessity of cooperation between designers and the conservation office in every stage of the execution of the investment. The works carried out allowed to expand usability of the historical building.

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