

## THE ISSUE OF ADAPTATION OF SELECTED HISTORIC EDUCATIONAL FACILITIES LOCATED IN THE AREA OF THE HISTORICAL URBAN LAYOUT OF KRAKOW

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### Abstract

*The article concerns the possibilities of adapting selected historic educational complexes (XX General Secondary School and Mechanical Technical Secondary School No. 15), located in the historical urban layout of the city of Krakow, for the purposes of implementing a scientific project entitled "School of the future: modular and mobile Green Classroom system." The work presents the research objectives, research methods, and general assumptions of the "Green Classrooms" system as new educational spaces, which are to be a modular structure that meets both the educational and social-behavioural needs of children and adolescents. Selected school buildings were also analysed, taking into account their history, architectural and urban composition, conservation conditions, and those resulting from planning documents. The summary determines whether the selected facilities and the plots on which they are located can be adapted for the needs of the scientific project and the "Green Classes" system.*

**Keywords:** Historic educational facilities; Architecture; conservation; urban layouts.

### Introduction

The knowledge of almost every society is shaped on the basis of specific, usually several levels of education. Its acquisition is largely based on information provided by teaching staff, but the ability of young people to absorb it also depends on external factors such as mental hygiene, student well-being, and the health and safety of the educational unit where learning takes place [1, 2].

The project "School of the future: modular and mobile system of Green Classrooms" meets the needs for changes in the quality of space and an increase in educational space by offering additional, mobile classrooms. The additional "Green Classroom" space may be a

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classroom or an auxiliary area (library, workshop, or a place to rest during breaks), implemented in a modular system that is possible to adapt to the existing location conditions. An integral element of the proposed "Green Classes" will be pro-ecological solutions, including small retention systems and renewable energy installations [3-5].

The creation of new constructions integrated into old architectural systems requires a series of additional studies regarding the scientific conservation of historical monuments and the coupling of new constructions in such a way that the interventions do not affect the old ones [6-12].

Developing solutions allowing quick implementation of low-cost and energy-efficient projects may be a response to current and future crisis situations, including the consequences of climate change. It is known that in the coming years, entities managing educational institutions will have to face the need to adapt to climate change, rising energy prices, and the demand for renewable energy [4, 5]. Therefore, one of the expected results of the project will be a configurator that allows the selection of solutions that best suit the needs of a given educational institution and the simple preparation of design guidelines and tender documentation. The first stage of the project was a diagnosis of the needs of educational institutions, in particular primary and secondary schools, with particular emphasis on the requirements dictated by pandemic restrictions. This diagnosis was carried out using quantitative and qualitative tools to examine the needs of both students and teachers in specific education sectors in relation to space planning. Combining effective education with properly planned space is becoming an international standard, and the implementation of innovative solutions is always the result of appropriately defining and taking into account multi-faceted needs and constraints.

## Scientific project - substantive basis, scope of research and method

### *Project assumptions*

"Green Class" is an interdisciplinary scientific project implemented by the Krakow University of Technology as part of the programme of the Minister of Education and Science entitled "Science for Society". The main assumption of the program, and therefore also of the project, is to develop and promote a set of good practices in the field of new forms and educational spaces and innovative technologies, as well as new applications of traditional building materials. Another important goal of the project is to diagnose the condition of educational institutions in Poland in terms of their availability and adaptability to changing needs by identifying a key problem for socio-economic development, which is the deterioration of the functioning of educational institutions in Poland, resulting from the low adaptability of structural and functional systems. spatial dimensions of existing buildings to changing functions, including challenges related to the threat of epidemics or the consequences of climate change. The diagnosis will enable research to be undertaken to develop quick and low-cost corrective actions. The substantive scope of the project includes two main parts:

(i) *Diagnosis of the needs of educational institutions, which includes:*

- a) identification of the condition of educational institutions in Poland (online survey research)
- b) in situ research of educational units' representative of individual territorial areas of Poland
- c) mining workshops and surveys in selected schools and participant observations in kindergartens
- d) detailed analyses of the spatial resources of selected school facilities
- e) examination of cultural resources and values and conservation issues of selected Krakow institutions
- f) environmental and natural values of selected school facilities
- g) spatial and planning aspects of selected facilities

- h) legal and formal conditions of school institutions
- (ii) *Development of a modular mobile green class system consisting of:*
  - a) conceptual assumptions based on the diagnosis results
  - b) construction and material solutions of classroom modules and accompanying spaces
  - c) analysis of the possibilities of using renewable energy in the system of modular mobile green classrooms
  - d) issues of universal design and accessibility for people with special needs in relation to educational institutions
  - e) a multifunctional configurator including a set of selectable models of green class modules for use by educational units.

The system of new educational spaces in the programme assumptions is to be a modular structure that meets both the educational and socio-behavioural needs of children and youth. A very important development goal is to provide students with interior equipment that will, on the one hand, support proper physical development – i.e., among other things, correct sitting posture and the possibility of frequent movement breaks without leaving the classroom – and will enable diversification of combinations of modular element settings so as to be able to move efficiently between ways of working: independently, in groups, in discussion, conceptually, and in workshops. The proposed basic classroom modules are modules with a rectangular or trapezoidal base measuring 750×375cm and not exceeding 310cm in height. These dimensions result from transport limitations, i.e., the assumption of simple mobility for these structures. The basic classroom structures will be accompanied by additional modules with dimensions of 375×250cm or 750×250cm, enabling the construction of spaces with other functions (corridors, toilets, cleaning rooms, etc.). The project assumes that the modules will be made of wooden frame technology in three possible functional versions, including an open class module only with a roof, a semi-open class where not all walls are closed, and a fully closed modular class with a wall infill.

The materials and solutions provided for in the project make it possible to adapt both the size of the modules and their arrangement and function to various location conditions.

The main assumptions of the project also include the neutrality of modules in historic downtown zones with a focus on maximising the greenery coverage of the facility and the use of wood and subdued colours on the outside of the module. In this case, it also seems important that the aesthetics of the installation elements used (photovoltaic panels or air conditioners) should be dedicated to historic buildings.

#### ***"Green Class" in the historic center of Krakow***

In such a diverse urban structure as Krakow, it is not possible to develop one universal "Green Class" model but only to develop a solution adaptable to specific existing conditions, based on the possibility of configuring individual elements of the module depending on needs as well as certain limitations.

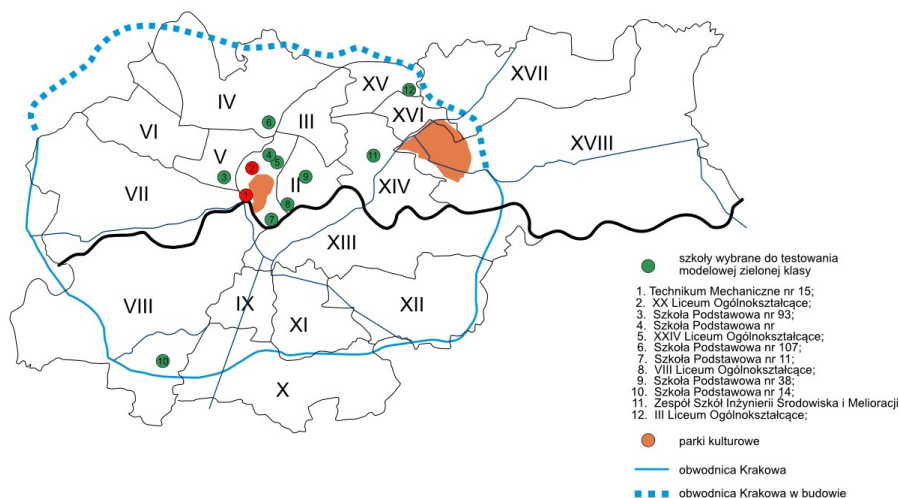
An important limitation here, especially in the area of the historical urban layout of Krakow, may be the area of the school plot.

Many areas located in Krakow are subject to various forms of protection, including cultural and landscape protection, both direct and indirect. The most important include: entry on the UNESCO World Heritage List (including the buffer zone of the area); the historical monument "Kraków - Historic City Complex" (order of the President of the Republic of Poland of September 8, 1994 - Monitor Polski No. 50, item 418); as well as individual and area entries in the register of monuments of the Lesser Poland Voivodeship.

It should be noted that the adaptation of the "Green Class" in areas with less complicated spatial conditions, located further from the center of Krakow, does not pose such restrictions as facilities located in the area of the first and second ring roads.

### Scope of research

12 educational units, 6 primary schools, and 6 secondary schools were selected as the research scope of the presented scientific project. In the first group, the following were analyzed: Primary School No. 11. J. Dietla at ul. Miodowa 36; Primary School No. 14 at ul. Prof. Bartla 29; Primary School No. 38 named after Brotherhood of the Fowlers at ul. Francesco Nullo 23; Primary School No. 75 (Sports Championship) at ul. Grochowska 20; Primary School No. 93 L. Rydel at ul. F. Szlachetowskiego 31 and Primary School No. 107. T. Boya-Żeleńskiego at ul. Zdrowa 6. In the second group, the examined facilities were: Secondary School No. 3 in the estate. High 6; VIII Secondary School named after S. Wyspiańskiego at ul. Grzegorzeczka 24; XXIV Secondary School at ul. W. Wyrwińskiego 1; XX Secondary School named after L. Staffa at ul. Trail 5; Mechanical Technical Secondary School No. 15 at Al. A. Mickiewicza 5; and the School Complex of Environmental Engineering and Melioration at ul. Ułanów 9 (Fig. 1).



**Fig. 1.** Location of educational units participating in the project in Krakow. Schools that are the subject of this article are marked in red on the plan.

From those mentioned above, two historic school buildings located in the historic center of Krakow were selected for the purposes of this article. These are: XX Secondary School named after L. Staffa at ul. Szlak 5 and Mechanical Technical School No. 15 at Al. A. Mickiewicza 5. These facilities were built in a similar period - at the beginning of the 20<sup>th</sup> century and are located in an area subject to conservation protection.

### Test methods

For the purposes of diagnosing the condition of educational units, i.e., the selected schools mentioned above, in addition to soft activities such as mining workshops, participant observations, and surveys, a method was adopted to integrate multi-aspect data analyses (the results of which are presented in this article), including archival research, legal and planning conditions, functional and spatial layout of buildings and their surroundings, building structures, conservation protection (in terms of architecture and urban planning), as well as development and land cover, including the current use of the existing natural resource.

### *Analysis of selected educational complexes located in the area of the historical urban layout of Krakow*

Of the selected educational spaces, the most difficult to analyse, taking into account legal, protective, and locational conditions in the context of adapting the "Green Class" modules, are: XX Secondary School. L. Staffa at ul. Trail 5; Mechanical Technical Secondary

School No. 15 at Al. A. Mickiewicza 5 and Primary School No. 11. J. Dietla at ul. Miodowa 36 (Fig. 2).

The above objects were examined in terms of historical, cultural, architectural, urban, and legal conditions (in terms of applicable planning documents and forms of conservation protection).



Fig. 2. The building of the 20<sup>th</sup> Secondary School on an orthophotomap. Orthophotomap [13].

### *XX Secondary School*

The building of the 20<sup>th</sup> Secondary School is located at ul. The trail, in the centre of Krakow, in the area between the mediaeval urban layout of the city and Trzech Wieszczów Avenue.

The history of the school dates back to the Middle Ages, when, in the church of St. Florian, there was a parish school in Kleparz (Figs. 3 and 4). The first source of information about its existence comes from 1410 [14, 15].



Fig. 3. View of the Kleparz market square in the second half of the 19<sup>th</sup> century, on a fragment of a painting by Ludwik Gędek. Photo Images [private archive]



**Fig. 4.** The school building at the church of St. Florian marked (red circle) on Krakow's cadastral plan from 1848. Map [16]

It is known that in the 16th century, the school was located in a brick building funded by Maciej of Miechów. Archival documents also state that in the period from the second half of the 16th century to 1780, the school was subordinated to the Krakow Academy, later came under the city administration, and became a secular school [14, 15].

During the partitions, when the city was occupied by the Austrians, the school became an elementary school, and in the years 1815–1846, it functioned as the so-called municipal primary school, returning to the name of an elementary school after 1846 [14, 15].

In the building next to the church of St. Florian, the school operated until the beginning of the second half of the 19th century, when, due to its poor technical condition, the building was demolished and the school was moved to a new facility in 1878.

The new school headquarters were located near the old one at Kleparski Market Square (Plan Matejki 11). From that moment on, it operated as a four-grade boys' school, and eighteen years later it was transformed into a six-grade school (Figs. 5 and 6).



**Fig. 5.** Urban composition near the building of the 20th Secondary School on a fragment of the plan of Krakow from 1925. Plan [16],

In 1899, the school was reorganised again. There were already two schools in the building: a three-grade department school and a four-grade primary boys' school. The fact that the school began to grow probably influenced the decision to build a new headquarters for it [14, 15].

It was decided to build a new school building on the site of a former farm, on the frontage of Szlak Street, which was extended to Łobzowska Street in the 1880s [14, 15].

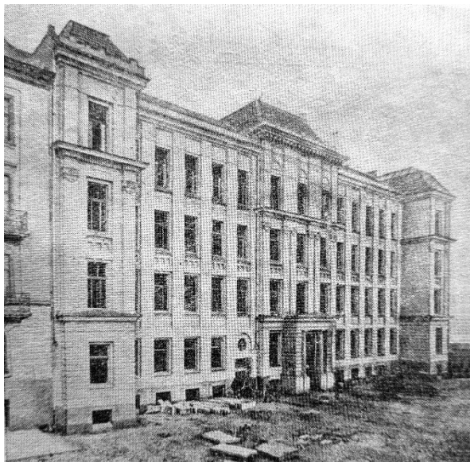


**Fig. 6.** Urban composition near the building of the 20th Secondary School based on a fragment of the Detailed Plan of Krakow with adjacent communes from 1947. Plan [17].

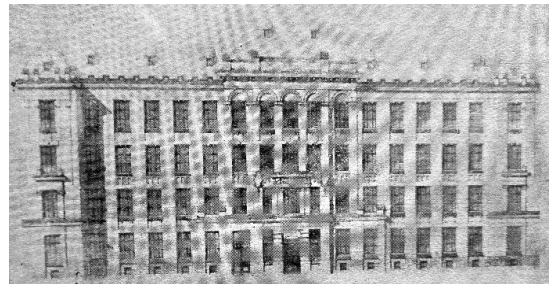
The designer of the new school building was the famous Krakow architect of the turn of the 19th and 20th centuries, Jan Zawiejski, author of designs for such facilities as, among others, the Słowacki Theatre, the Turnau House, the Ohrenstein House, and the Trade School at ul. Kapucyńska (Figs 7 and 8) [18, 19].

The school project was developed in 1908. Two years later, construction of the facility began and lasted until 1911.

The school, built in 1911, is a large, three-story building with an oblong plan. It was located on the southern frontage of the street. From the front, the building has three projections and harmonious vertical and horizontal divisions. There are two wings on the yard side. The style of the building can be described as classicizing modernism [20].



**Fig. 7.** Design of the front elevation of the building of the 20th Secondary School in Krakow by Jan Zawiejski Dig [19]



**Fig. 8.** View of the 20th Secondary School at the beginning of the 20th century, when construction works were being finalized [19]

The school was moved to the new building a year later. In the interwar period, in addition to lessons for students, the school also held didactic courses for school managers and inspectors, as well as training meetings. The building housed an inter-school physics laboratory and a central biology laboratory.

In September 1939, the building was taken over by the Polish Army. During the occupation, the school was taken over by the Wehrmacht, and then the Soviet army was stationed here. After this period, the building had to be renovated so that the school could

function there again in 1946. Twenty years later, it was reorganised again to operate as a 7th grade school. In the years 1970–1971, the school was completely renovated again. In 1976, the primary school was moved to another building. A Teacher Training College began to operate in the building. Then, in 1991, a school reopened in the building, General Education School Complex No. 10, which included the 20th Secondary School [21].

As mentioned earlier, the building of the current 20th Secondary School is located at Szlak Street, specifically in its final part, i.e., between Krowoderska and Łobzowska streets (Figs. 9-13). The building and the adjacent tenement houses form the southern frontage of the street. The plot (register no. 4) on which it was located has a shape similar to a rectangle. On the south side, it is bordered by greenery that fills the interior of the building quarter between Krowoderska and Łobzowska streets. It has been developed in a way typical of most Krakow tenement houses from the turn of the 19th and 20th centuries, i.e., the front part of the plot is filled with a building in a feather-type structure, and the rear part is filled with an undeveloped yard with an area of 412.5m<sup>2</sup>. Currently, part of the rear part of the plot is used as a small parking lot. The remaining part is a small, untidy green space. There are no separate rest and relaxation areas for students on the premises, and the building itself has not yet been fully renovated and revalorized (only the front, northern façade has been renovated so far).



**Fig. 9.** Analysis of the development of the property where the 20th Secondary School is located on a fragment of a cadastral map and an orthophotomap.  
 Legend: property boundaries are marked in purple; school building in orange; green: greenery in the yard, surfaces paved with a grey stripe



**Fig. 10.** View of the front façade of the building of the 20th Secondary School from the semi-western side, October 2022



**Fig. 11.** View of the rear façade of the building of the 20th Secondary School from the south-east side, September 2022.





**Fig. 12.** View of the urban interior behind the building of the 20th Secondary School from the west, September 2022.



**Fig. 13.** View of the urban interior behind the building of the 20th Secondary School from the east, September 2022.

Despite the fact that the high school building is located on a plot of five-story buildings and the plot is relatively small, there is a potential possibility of locating the "Green Classroom" in its rear part. However, you should remember the legal conditions regarding this area and the facility itself.

The first group of conditions are those related to the protection of monuments and cultural landscapes. The building of the 20th Secondary School is entered in the register of monuments of the province. Lesser Poland (No. A-977, entry from June 14, 1994). The analysed property is also located within the boundaries of the area recognised as a Historical Monument "Kraków - Historic City Complex" (order of the President of the Republic of Poland of September 8, 1994, Monitor Polski No. 50, item 418), within the buffer zone of the area included on the World Heritage List. UNESCO Heritage Site, as well as within the area entered in the register of monuments - the urban layout and the development complex of the former 4th cadastral district of the city of Krakow - "Piasek" (no. A-1446/M). The above means that all investment activities in this area must be agreed upon with the Małopolska Provincial Conservator of Monuments.

For the area in which the building of the 20th Secondary School is located, a Local Spatial Development Plan (hereinafter referred to as the Local Development Plan) has been adopted: Kleparz (Resolution No. LIII/1464/21). In the draft plan, more precise provisions and direct references were made to historic buildings entered in the register of monuments or included in the municipal register of monuments (appearing mainly on street frontages). The following arrangements are considered to be definitely positive for the landscape and existing monuments: the order to highlight the most valuable objects in the landscape in illumination, defined in the draft plan as: dominants, subdominants, and architectural accents. This also applies to the building at ul. Trail 5. In accordance with its recommendations in § 129.1., a service development area is designated, marked with the symbol U.3, for which the primary purpose is a service function, developed with service buildings. The plan allows for the location of playgrounds in this area. In terms of development and land development, the following are established:

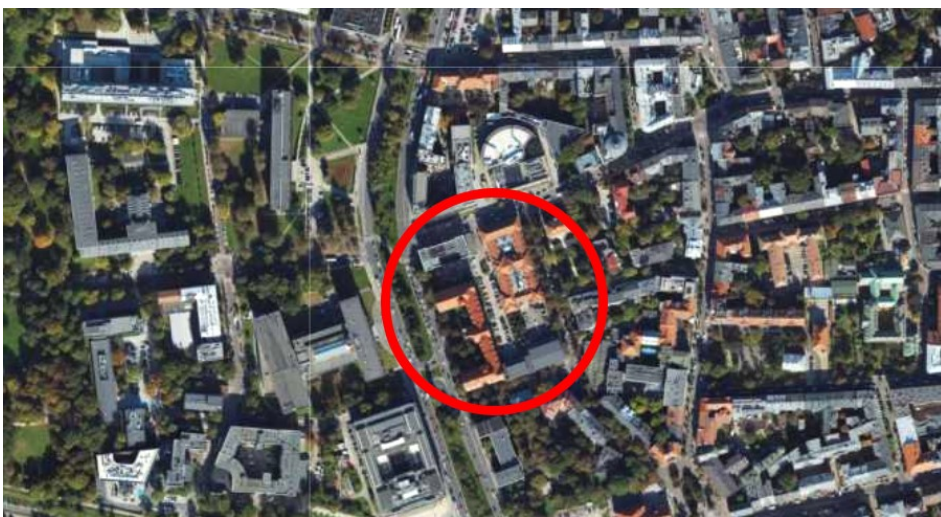
- i) minimum biologically active area index: 20%;
- ii) development intensity index: 1.5 – 2.0
- iii) maximum building height: 24m.

In the area designated in the plan, there is a facility entered in the register of monuments, marked in the drawing of the plan at ul. Route 5-7, a former school building of St. Florian from 1911, within the boundaries of plot no. 4, rev. 119 Śródmieście (reg. no. A-977), for which an

order is established to protect the shape and dimensions of the building. For this reason and because of the small school plot, the difficult task will be locating a full-size modular classroom. In the case of the 20th Secondary School, the only option is to build an open modular system that complies with the restrictions related to the prohibition of locating temporary buildings with the function of a playground not defined in the plan's dictionary but used for students' recreation.

#### ***Mechanical Technical Secondary School No. 15***

The building of the Mechanical Technical School No. 15 is located at Al. A. Mickiewicza 5 and is part of the Mechanical School Complex No. 1. Szczepan Humbert (Fig. 14). In addition to the Technical Secondary School, the team includes Basic Vocational School No. 14.



**Fig. 14.** The building of the Mechanical Technical Secondary School No. 15 on an orthophotomap [13].

The history of the building in which the technical school is located begins in 1894, when the Krakow City Council adopted a resolution on the city's transfer of land for the construction of new buildings for the State Industrial School. The architectural design of the school was commissioned in 1896 by Sławomir Odrzywolski, who had prepared several concepts before completing the final design in 1909 [22–25].

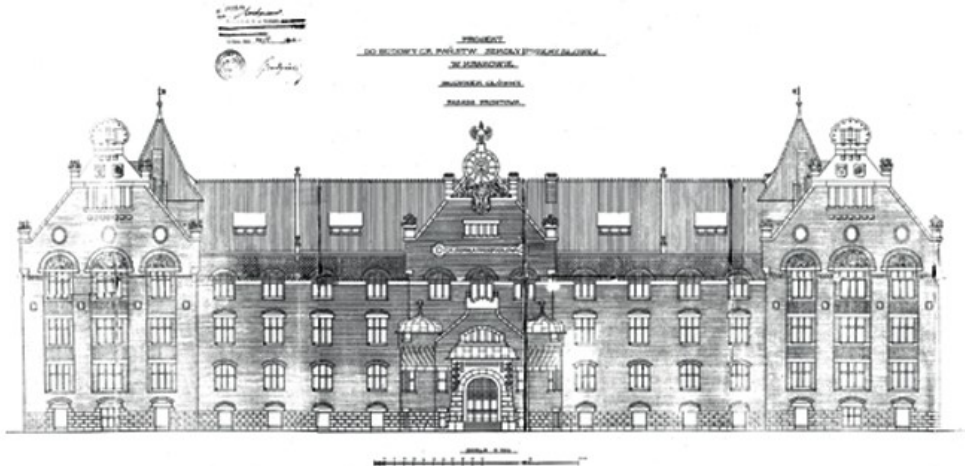
In 1898, the streets and the mill road were re-regulated in the place where the complex was to be built [26]. Its construction was completed in 1912 and included three buildings: the main building (1908–1912), the chemical laboratory building (1908–1913), and the mechanical workshop building (1913–1916/1917).

Originally, the designer planned the composition of the complex to be symmetrical, with the main building - the dominant - emphasizing the axis of the layout, oriented perpendicular to the later axis of Aleja Trzech Wieszców. This concept had to change, among others, due to the school's desire to acquire as much land as possible for development and the need to reduce costs. These two factors caused some randomness in the compositional arrangement of the ensemble [23].

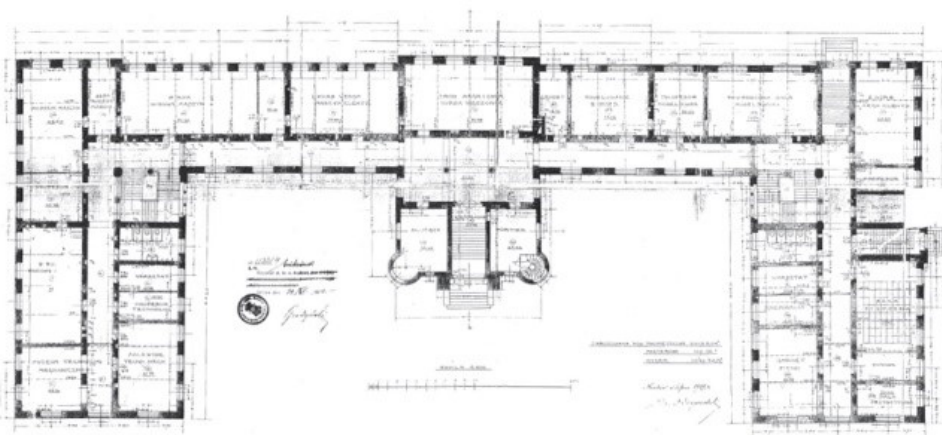
The design of the complex includes the traditions of architecture represented by Odrzywolski and other Krakow architects of the late 19th century. These are: historicizing details and decoratively shaped brick elements, playing a dominant role in all facades; the influence of early modernism and Art Nouveau, and especially the general climate of "new art",

favouring the search for new and original forms, manifested not only in details but also in proportions and planes, in a sense referring to Viennese patterns; referring to specifically interpreted native forms drawn from folk traditions [22-25].

The main building (currently the Technical School building) is a building with an area of approximately 2,500m<sup>2</sup>, with two wings protruding strongly from the face of the building (from the north and south) and a central one in the form of an avant-corps, where the main entrance to the building is located.



**Fig. 15.** Design for the construction of the Central Industrial School of the State Industrial School in Krakow, main building, signed and dated "S. Odrzywolski, in July 1909" – façade; in the APKr collection, ref. ABM, fasc. 309 [27]



**Fig. 16.** Design for the construction of the Central Industrial School of the State Industrial School in Krakow, main building, signed and dated "S. Odrzywolski, in July 1909" – ground floor plan; in the APKr collection, ref. ABM, fasc. 309 [27]

During World War I (1914–1908), the main building stopped serving as a school because it was converted into a hospital. Three years after the end of the war, the building was renovated so that the school could operate there again in the years 1921–1939. In the 1920s, the chemical laboratory and mechanical workshops were rebuilt. The building's development was

interrupted by the Nazi occupation. During World War II, the complex housed the forest office, the foreign exchange office, and then the main German police headquarters. After driving the Germans out of Krakow in January 1945, the school began to renovate the buildings. In March 1945, both the "freshly finished building where learning took place" and the "main building where renovation began," as well as the workshop building, were taken over as a Red Army hospital. The school equipment was again destroyed. The school returned to its original location on April 6, 1945, but the buildings required general renovation [23, 24].

### Results and discussion

Figures 17 and 18 show the urban composition of the former industrial school complex, including the building of the Mechanical Technical School No. 15, on a fragment of the Krakow plan from 1925 and 1947, respectively.



**Fig. 17.** Urban composition of the former Industrial School complex, including the building of the Mechanical Technical School No. 15, on a fragment of the Krakow plan from 1925. Plan [28].



**Fig. 18.** Urban composition of the former Industrial School complex, including the building of the Mechanical Technical School No. 15, on a fragment of the Detailed Plan of Krakow with Adjacent Communes from 1947. Plan [29].

Figures 19, 20, 21, and 22 also show a view of the former industrial school complex and the building of the Mechanical Technical School No. 15 on the semi-western side. at the beginning of the 20th century and view of the Mechanical Technical School building No. 15

from the southeast side, at the levels of 1912 and 1913, respectively, on the southwest side, in the second half of the 20th century.



**Fig. 19.** View of the former Industrial School complex and the building of the Mechanical Technical School No. 15 from the semi-western side. at the beginning of the 20th century [30].



**Fig. 20.** View of the building of the Mechanical Technical School No. 15 from the south-east side. around 1912 [31]



**Fig. 21.** View of the building of the Mechanical Technical School No. 15 from the south in 1913 [27]



**Fig. 22.** Aerial view of the building of the Technical Secondary School of Mechanical Engineering No. 15, from the southwest, in the second half of the 20th century [32]

During the Polish People's Republic, the team underwent frequent reorganisations, which partially blurred the original character and goals of the Industrial School. In 1947, the Secondary School of Chemistry was separated from the complex and began to operate in the building of the former laboratory. In September 1951, as a result of the reorganisation of vocational education, the State.

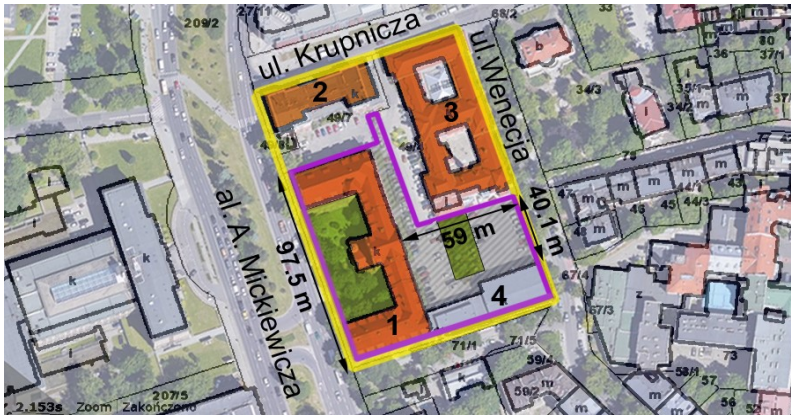
The Industrial School, the oldest technical university in Poland, was closed. In place of its Faculty of Mechanical Engineering, two schools were established: the Mechanical Technical Secondary School named after Szczepan Humbert and Basic Vocational School No. 1. Stan

This lasted until 1970, when both schools were merged into the Mechanical School Complex No. 1 [33, 34].

As mentioned above, the building of the Mechanical Technical School No. 15 is located at Al. A. Mickiewicza, at the intersection with ul. Sz. Humbert. At the same height, on the other side of the avenue, the main building of the National Museum and the Jagiellonian Library are located. The Technical School building forms the eastern frontage of the Avenue. The plot on which the entire complex was built has the shape of a rectangle, with its longer side parallel to the Avenue (currently, this rectangle consists of plots no. 49/5, 49/4, 49/8, 49/7, and 71/2). From the Avenue side, the complex is separated by a brick fence, in which there is a gate leading to the main entrance to the Technical School building. The axial location of the gate indicates a symmetrical, two-quarter composition, probably inspired by the modernist gardens of the time.

It should be noted that another building was added to the relatively architecturally homogeneous complex of buildings of the former Industrial School, which was part of the Mechanical School Complex. Szczepan Humbert. This building was "added" to the southern wing of the main building in the 1970s.

Currently, in addition to the buildings, the plot also includes a disorderly parking lot and two small green areas. The first one is located in the entrance area to the building, from the avenue side, while the second one is at the back of the building, from the street side. Most of the plot area is paved. As in the case of the area near the building of the 20th Secondary School, there are also no separate rest and relaxation zones for students, and the building itself has not yet been fully renovated because so far only the western or front façade has been renovated (Fig. 23).



**Fig. 23.** Analysis of the development of the property where the Mechanical Technical School No. 15 is located, on a fragment of a cadastral map and an orthophotomap [13].

Legend: the boundaries of the former educational complex are marked in yellow; the borders of the plot on which the building of the Mechanical Technical School No. 15 is located are marked in purple; the built-up part of the plot is marked in orange (the main building of the complex - currently the building of the Mechanical Technical School No. 15 - 1; the building of the former chemical laboratory - currently the Chemical School Complex - 2; the former building of mechanical workshops - currently the Vocational Training Center no. 1 - 3; new building from the 1970s - the 20th century - 4); green: greenery in the yard, surfaces paved with a grey stripe.



**Fig. 24** View of the building of the Mechanical Technical Secondary School No. 15 from the south-west side, September 2022



**Fig. 25** View of the entrance area to the building of the Mechanical Technical School No. 15 from the west, September 2022.



**Fig. 26** View of the urban interior behind the building of the Mechanical Technical School No. 15 from the east, September 2022.



**Fig. 27.** View of the building of the Mechanical Technical School No. 15 from the north, September 2022.



**Fig. 28.** View of the former Industrial School complex and the building of the Mechanical Technical School No. 15 from the east (from ul. Wencja), September 2022.





**Fig. 29.** View of the former Industrial School complex and the building of the Mechanical Technical Secondary School No. 15 from the north (from Krupnicza Street), September 2022.

## Results and discussions

The results of the analysis allow us to conclude that, despite the fact that the plot on which the Technical School building is located (register no. 49/5) is already heavily invested, there is a potential possibility of locating a "Green Classroom" there. It could be located in the south-eastern part of the area, next to a green square.

It should be remembered that in the case of the area in question, there are a number of legal conditions related primarily to its conservation protection. It is worth noting that there is currently no approved local development plan for the area where the building of Mechanical Technical School No. 15 is located. It is under investigation.

Due to its historical value, the Technical Secondary School building was entered in the register of monuments of the Lesser Poland Voivodeship (No. A-750, entries from May 7, 1988, and April 28, 1998). The area where the complex is located lies within the boundaries of the area recognised as a Historical Monument "Kraków - Historic City Complex" (order of the President of the Republic of Poland of September 8, 1994, Monitor Polski No. 50, item 418), within the buffer zone of the area included on the UNESCO World Heritage List, as well as within the area entered in the register of monuments called urban layout and development complex of the former 4th cadastral district of the city of Krakow, "Piasek" (no. A-1446/M).

## Conclusions

To sum up the above, it should be stated that the complexes analysed above - educational buildings (and their area): XX Secondary School, named after L. Staff, and the Mechanical Technical Secondary School can potentially be adapted to the "Green Classes" system.

However, it should be remembered that these facilities, along with the real estate on which they are located, are subject to a number of legal conditions that must be taken into account in the adaptation process. These conditions result primarily from the value of the historic subject schools, which were designed by famous Krakow architects at the turn of the 19th and 20th centuries in accordance with the then-current architectural trends. Both objects come from the beginning of the 20th century, an important period in Krakow's architecture associated with historicism, neo-styles, and eclecticism [35–38].

Moreover, both complexes are located in the historic centre of Krakow, in the area between the mediaeval urban layout and the so-called second bypass, which is Aleje Trzech Wieszczów. This area is subject to conservation protection under three separate forms of protection: Historical Monument ("Kraków-Historic City Complex"), the UNESCO World Heritage List (buffer zone), and area entry in the register of monuments ("Piasek", no. A-1446/M).

The above means that all interventions (related to the implementation of the project and the adaptation of the "Green Class") in the analysed properties must be agreed upon by the Małopolska Provincial Conservator of Monuments and must also comply with the legal regulations contained in the planning documents, i.e., in the local spatial development plan.

To sum up, it is worth noting that the proposed "Green Classes" solution interferes relatively little with the existing cultural landscape. Thanks to the use of appropriate finishing materials, it also enables a harmonious reference to the aesthetics and architecture of historic buildings. Therefore, from the conservation point of view, it seems to be acceptable, especially since the described scientific project is significant and important from the point of view of broadly understood social interest.

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