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Original Research Article

ADAPTATION OF POST-FORTRESS BUILDINGS AS AN ENRICHMENT OF THE FUNCTIONAL PROGRAMME OF A HOUSING ESTATE ON THE EXAMPLE OF FORT VIII SŁUŻEW IN WARSAW

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A b s t r a c t

The article refers to the problem of adaptation of post-fortress objects from the 19th century located in the strict urban tissue in Poland. The authors of the text analyse the example of adaptation of Fort VIII Służew in Warsaw as a way of making common spaces in housing estates more attractive. The rapid demilitarisation of fortresses from this period caused by the development of the art of war and the subsequent dynamic development of urban planning after the Second World War resulted in the degradation and disappearance of these valuable monuments. The Russian ring fortress of Warsaw is now entirely within the urban fabric. Introducing additions and new utility functions is becoming a way of protecting the existing stock of often degraded spaces left behind by former forts. On the example of Fort VIII Służew, a number of activities related to adaptation, revitalisation and revalorisation of the existing urbanised residential space in Ursynów district are presented. The analysed object together with its surroundings is an example of a way to use post-fortress spaces for both utilitarian and cognitive purposes while respecting historic values. Age-old fortifications, so well preserved in Poland, significantly define and shape urban layouts. The research carried out by the authors of this text shows that appropriate use of the potential of post-fortress buildings from the 19th century can significantly improve the quality and character of colonial buildings and highlight the values associated with this type of specific monument.

Keywords: adaptation, fortification, heritage, new use function, revitalisation

1. INTRODUCTION

Poland has the richest collection of 19th-century military objects in Europe in terms of the diversity fortification schools [1]. This is is largely due due to the political situation following the Third Partition of Poland, during which the country was divided among three partitioning powers: Russia, Prussia, and Austria. As a result, within the current boundaries of Poland, there are three distinct types of

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fortifications from this period, which contribute to the uniqueness of its architectural heritage (Fig. 1). Due to the rapid advancement of military technology, these structures have ceased to serve their original defensive purposes and have often been preserved in an undamaged state.

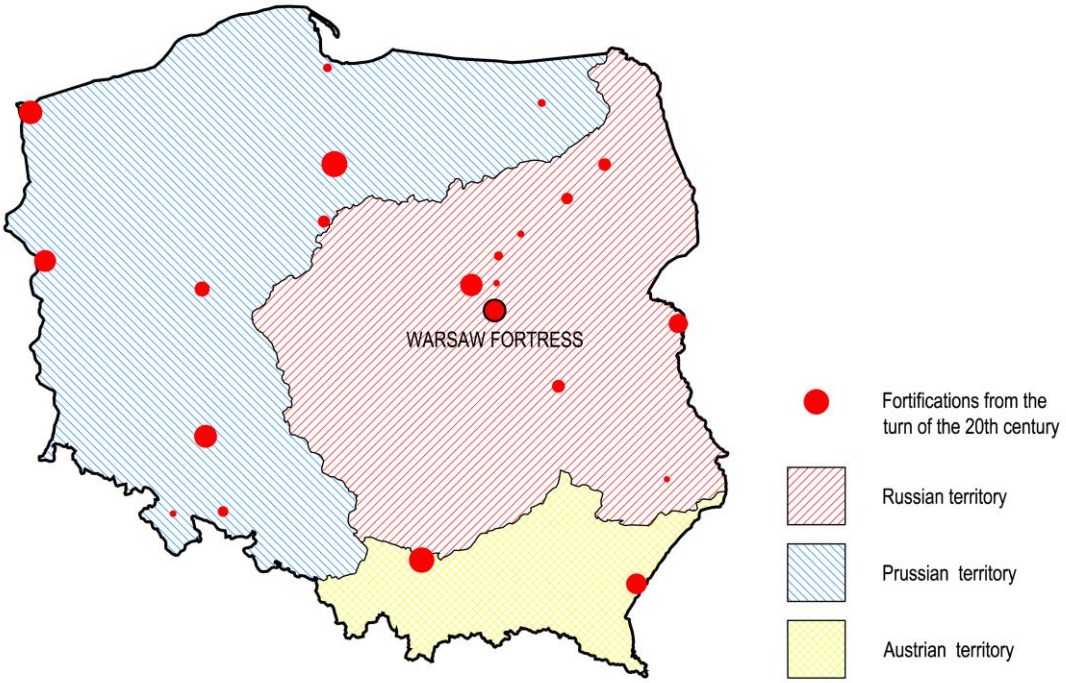

Fig. 1. Map of Poland showing the division into partitions (Russian, Prussian, Austrian) and marking the location of 19th century fortifications. Elaboration Authors

Large-scale fortifications consisting of numerous forts forming defensive rings are often located within densely urbanised areas. The authors of the text analyse Fort VIII Służew in the Warsaw Fortress as an example of comprehensive revitalisation of the entire structure. The construction of the Warsaw Fortress began with the Aleksandrov Citadel between 1832 and 1834 [2]. Subsequent stages included the building of two defensive rings comprising forts, among which Fort VIII Służew is discussed (Fig. 2). The forts were built according to the design of a standard Russian fort (Fig. 3). The first ring was constructed between 1847 and 1865 and consisted of six forts. In 1883, another ring of fortifications was constructed, with the final phase taking place between 1886 and 1892. However, by 1909, the Russian command decided to dismantle the Warsaw forts. Consequently, in 1915, the Russian troops abandoned Warsaw without a fight, leaving the fortress largely intact. The rapid demilitarisation led to the preservation of these structures with minimal damage. Today, urban development has encroached upon all the preserved fortress remnants. Following World War II, there was a dynamic reconstruction of cities, with Warsaw, having been almost entirely destroyed, being rebuilt from scratch. Despite the destruction, the Warsaw fortifications remained discernible in the urban layout due to their earth and masonry structures, influencing the newly emerging city structure [3]. Currently, the relationship between urban development and the preserved forts is fostering the creation of shared and semi-private spaces for residential estates, thereby enhancing their functional and utilitarian qualities [4–6]. The

introduction of green infrastructure is a concept that integrates spatial planning of urbanised areas with environmental protection elements [7]. The Ursynów district in Warsaw, which includes the discussed fort, exemplifies such integration. In an era of rapid urban development and concurrent sustainable development theories, the former fortification areas in large cities are becoming attractive urban recreational spaces from a user's perspective [8, 9]. This also represents a compromise between heritage conservation and enhancing the functional standard of residential buildings surrounding the fortifications [10, 11]. Fortress greenery now constitutes a significant portion of urban green spaces [10].

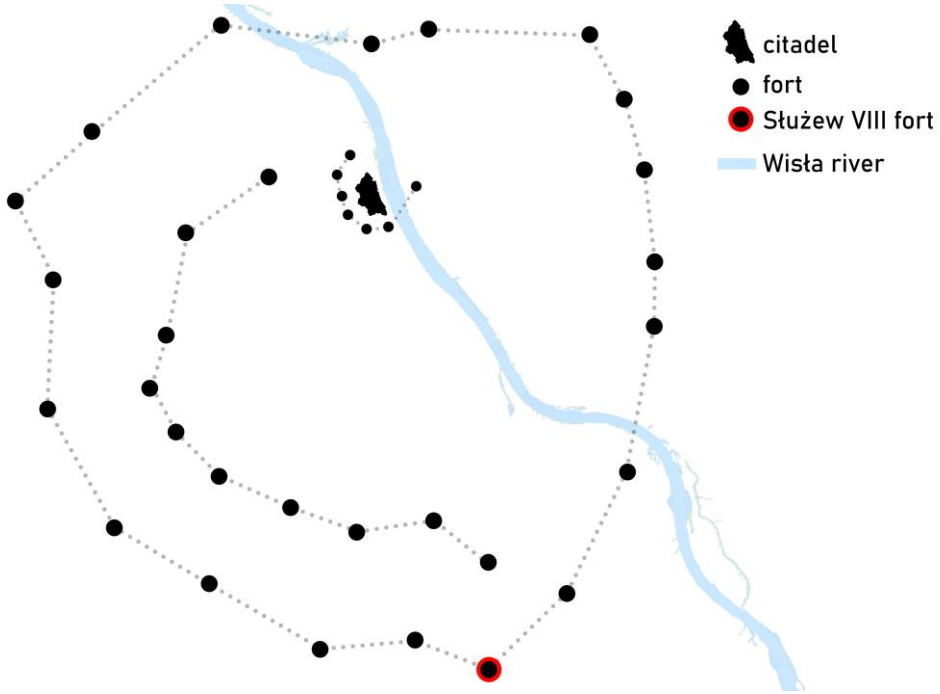

Fig. 2. Spatial structure of the Warsaw Fortress with the location of Fort VIII Służew marked on it. Elaboration Authors

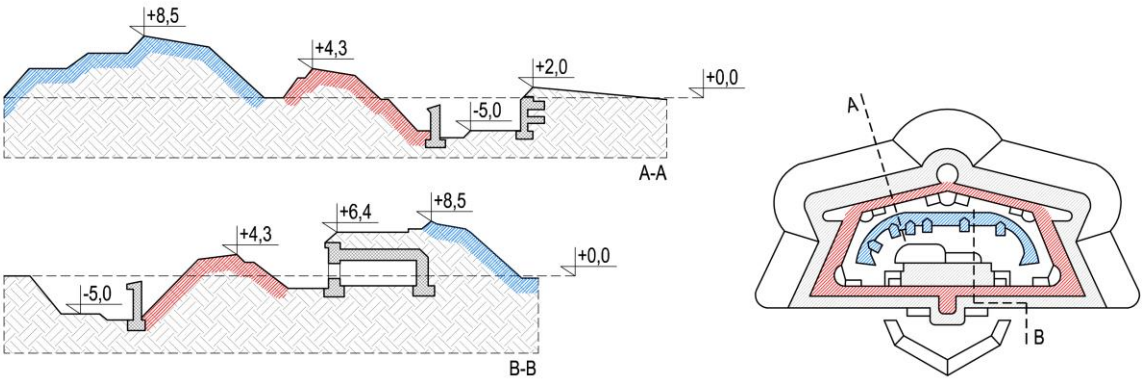

Fig. 3. Plan of a standard 19th century Russian fort according to Yakolev. Elaboration Authors

The analysed Fort VIII Służew in Warsaw serves as an example of an adapted and revitalised space integrated as a communal area within a residential estate. In 2005, the site was acquired by a private investor who, in 2019, undertook a project to revitalise the existing barracks building along with the moat and fort embankments. This project was part of the newly designed residential estate named Fort Służew. The adaptation of the fort to contemporary utilitarian needs (including commercial purposes) represented a compromise between conservation efforts and the investor's interests. The structure was in good technical condition (Fig. 4), but it was at risk of deterioration due to exposure to harmful external conditions and the lack of any functional use.

Fig. 4. Condition before the revitalisation of Fort Służew. Source Festgrupa

2. THE CHALLENGES OF ADAPTING MILITARY ARCHITECTURE

The former utilitarian functions of fortifications are no longer useful today [12–14]. Therefore, these structures require thorough modernisation and revitalisation. These transformations are also driven by economic considerations [15]. The maintenance of historical monuments must be funded by their owners. Balancing the design interventions necessary for adaptation to contemporary needs with conservation efforts is a challenging task. Modern conservation theory does not provide clear guidelines on the issues of adaptation [2, 16, 17].

Defensive architectural structures are characterised by a diversity of construction, material, and spatial solutions [18]. A significant investment challenge in the revitalisation process stems from the fundamental design principle of forts: they were intended to be hidden and difficult to access from the outside. The distinctive feature related to the adaptation issues of such monuments includes their current state of preservation, degree of preservation, technical condition, ownership, and the functional-spatial characteristics of the surroundings [19–21]. Presently, the development of historical fort complexes involves a range of economic, social, ecological, ownership, and management problems [22, 23]. An essential aspect of developing former fort spaces is the individual assessment of the value of the

preserved historical fabric [24, 25]. Based on this assessment, conservation conclusions can then be formulated [26, 27].

The authors of this text have presented the key information regarding the analysed object in the form of an object card Table 1 to organise the information as clearly as possible. Specific guidelines were adopted for the assessment and completion of a general object card, prepared by the authors. The explanations of the assessment criteria for the object listed in the object card (Table 1) are presented in a simplified form as tables: assessment of the degree of preservation (Table 2), state of preservation (Table 3), and assessment of technical condition (Table 4).

Table 1. Charter of monuments - elaboration Authors

CHARTER OF MONUMENTS	
NAME OF THE FACILITY	Fort VIII (Służew)
SPECIFIC VALUES	-
DEGREE OF PRESERVATION historical substance	Fully preserved
CONSERVATION STATUS	good
TECHNICAL CONDITION	good
DEVELOPMENT STATUS	service function, residential function
PROPERTY	private investor
AVAILABILITY	available

Table 2. Description of the categories for assessing the degree of behaviour - elaboration Authors

CATEGORIES OF BEHAVIOURAL ASSESSMENT	
FULLY PRESERVED	well-preserved, without significant losses, outline and spatial arrangement clear
WELL PRESERVED	most of it preserved, with a low degree of loss and distortion, allowing the original
PARTIALLY PRESERVED	part preserved, also in the form of a ruin, clear outline
RESIDUALLY PRESERVED	not preserved, or relics, ruins of unreadable form
IMMEDIATE	no material traces of the work

Table 3 Description of the state of preservation of fortress works - elaboration Authors

CATEGORIES OF CONSERVATION STATUS ASSESSMENT	
GOOD	clear outline, largely preserved
AVERAGE	clear outline partly preserved
POOR	outline legible in fragments partly preserved
SPECIAL	illegible outline partly preserved fragments of earth elements
NON-SAVED	no visible signs of preservation

Table 4 Description of the technical assessment - elaboration Authors

CONDITION ASSESSMENT CATEGORIES	
GOOD	no visible damage or significant defects
SATISFACTORY	minor damage and deterioration of the historic fabric
AVERAGE	partial damage and significant deterioration of the historic fabric
POOR	structural structure destroyed, preserved substance is at serious risk of destruction

At Fort VIII Służew in Warsaw, theoretical conservation rules were established, concluding that adaptation to contemporary commercial and service functions is a necessary condition for the survival of this monument [26]. Revitalisation was made possible by integrating the former fort areas into the city's structure. Simultaneously, the incomplete state of preservation allowed for the introduction of new additions, including new buildings. These newly designed volumes should stylistically reference the non-existent structures to harmonise with the preserved historical substance [26]. Adaptation is a necessary condition for the continued functionality of such monuments, which are at risk of degradation without proper care [28, 29].

3. DESIGN WORK AND IMPLEMENTATION

Fort VIII Służew, part of a residential estate, was intended to be adapted for contemporary utilitarian functions. In 2005, the dilapidated structure was purchased by Turret Development. The architectural firm Festgrupa undertook the design project in 2016, after obtaining all necessary formalities and approvals from the heritage conservator.

The complexity of the Służew Fort project involved both conservation restrictions [2, 30, 31] and the intricate specificity and diversity of the surrounding built forms (Fig. 5). The original fortification structure consisted of the barracks section and the earth ramparts. Initially, the investor aimed to build only a residential apartment complex on the northern side of the plot. However, the ruined historical structure was recognised for its investment potential, and the green areas free from construction, which were under conservation protection, were decided to be adapted into a city park.

The existing structures within the area of Fort VIII – Służew (Fig. 5, red dashed line), include a barracks building adapted for commercial services and a series of residential buildings constructed in the 1970s for the senior officers of the People's Army of Poland. Some residential buildings are located between the barracks and the front rampart. The remaining area of the fort comprises green spaces. The immediate vicinity of the fort includes structures of the Allotment Gardens (ROD), such as sheds, garden houses, and garden architecture elements. Directly adjacent to the northern border of the fort, three multi-family residential buildings, up to nine storeys high, have been built ("Fort Służew" by Turret Development), featuring a cascading form and brick elements that reference the fort's architecture. The nearest structures to the south of the fort are collective housing buildings (student dormitories) that are part of the Warsaw University of Life Sciences (SGGW) campus (Fig. 5, blue dashed line), as well as terraced and semi-detached residential buildings. The remaining surroundings of the fort consist of multi-family and single-family residential buildings (individual, terraced, semi-detached) with varying heights from 1 to 11 storeys, separated from the fort by Dolina Służewiecka Street, Nowoursynowska Street, Jan Rodowicz "Anoda" Avenue, and the Służewiecki Stream (Fig. 5, green dashed line).

Fig. 5. Structure of the urban layout around Fort VIII Służew. Elaboration Authors

The renovation works of the only preserved structure at Fort VIII – Służew involved removing the soil from above the barracks building, reinforcing the structure, and introducing a ventilation system. This was a requirement to comply with building regulations for ensuring proper ventilation in the planned commercial premises. Subsequently, the soil was reapplied to recreate the original outline of the fort. A ventilation system, as well as water, sewage, and electricity systems, were introduced to meet the requirements for service facilities. All the technical infrastructure was concealed within the earth ramparts (Fig. 6). An interesting solution was using the soil excavated from the new residential estate construction as material to recreate the non-existent earth mounds. The profiles of the earth ramparts were restored according to the conservator's recommendations, and a park was created on the newly formed land for the estate.

In the renovated barracks spaces, service premises were established (Fig. 7), with the restoration involving the repair of masonry structures, preservation of original plasters, and retention of external window and door joinery. The renovation works were completed in 2019. The next phase involves a project to expand the fort with additional structures that align with the original shape of the fort (Fig. 8).

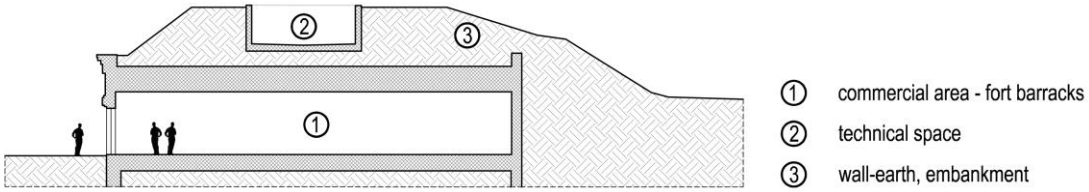

Fig. 6. Method of hiding technical installations in the earth embankment - elaboration Authors

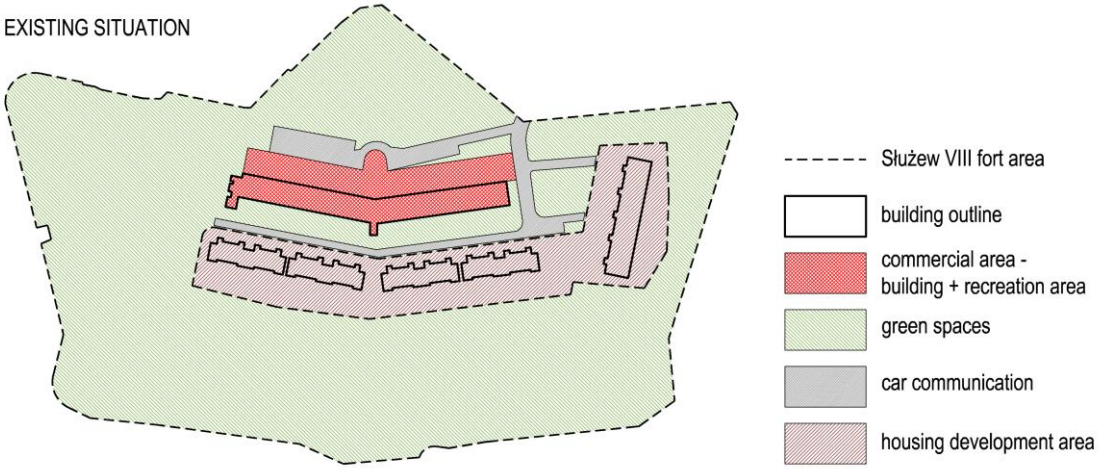

Fig. 7. Functional layout analysis considering existing stages. Elaboration Authors

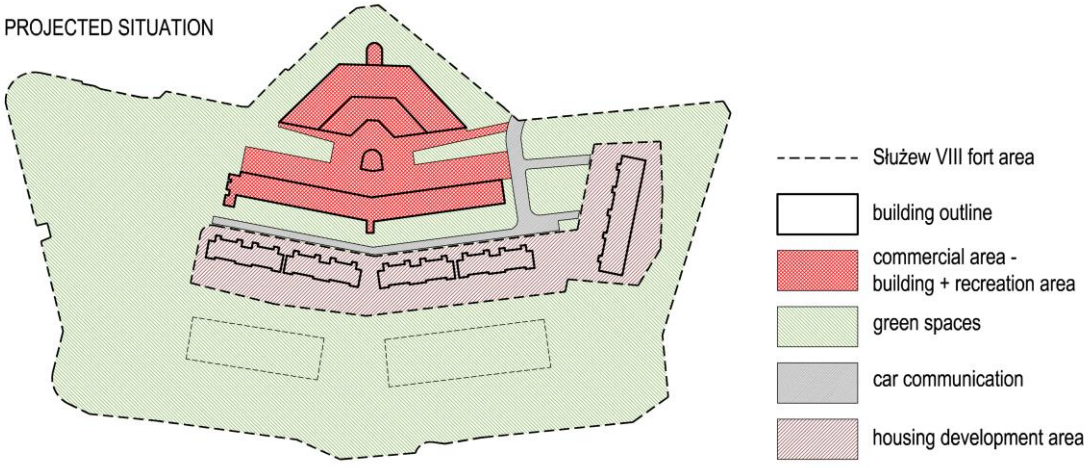

Fig. 8. Functional layout analysis considering projected stages. Elaboration Authors

The fort has been partially preserved. The original historical fabric includes the fort rampart with the fort ditch and the rear barracks. This allowed the designers from Festgrupa to introduce contemporary additions and adapt the existing rooms and fort spaces.

The design intention was to restore the fort while preserving the historical value of the interior and the area around the barracks (Fig. 9). Changes to the functional layout of the fort involved only the divisions between parts of the structure and the designation of sanitary and utility areas. The existing walls, vaults, and window joinery, which were in good condition, were preserved. New material additions were made with respect for the existing space. Glass doors leading to individual rooms were introduced to highlight the character of the 19th-century fort. Additionally, systems for ventilation, air conditioning, fibre optics, and underfloor heating were installed to accommodate various utilitarian functions. Year-round use prevents corrosion caused by destructive weather conditions.

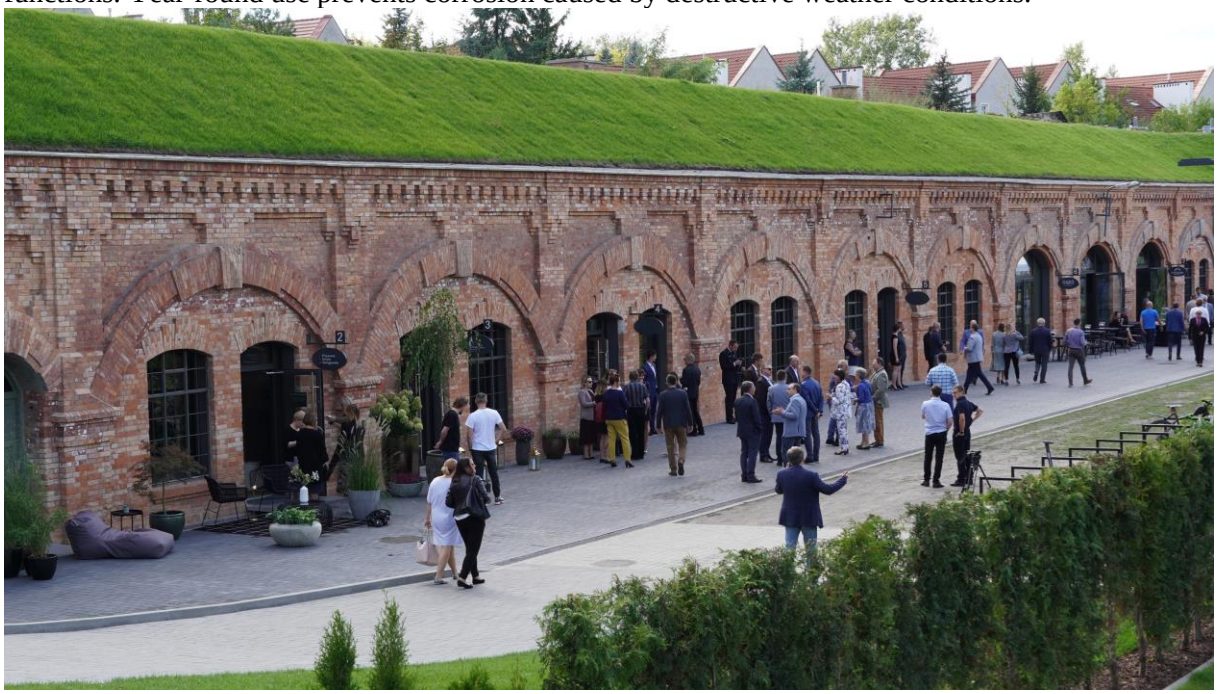

Fig. 9. The barracks of Służew fort after revitalisation. Source FestGrupa

The landscaping of the fort area, including the clearing and revitalisation of the earth ramparts, previously overgrown with invasive vegetation, and their transformation into a mini park, also prevents the destructive effects of uncontrolled greenery.

The small architectural elements accompanying the landscaping were elegantly integrated into the lower part of the designed park. This ensures that they do not disrupt the perception of the historic architectural form.

The design studio FestGrupa, as the authors of the project, undertook an attempt to reconstruct the ravelin as a para-historical addition to Fort VIII in the next stage. The project envisions a residential and commercial function that references the historical layout (Fig. 10). The design proposes a three-storey above-ground structure with commercial services on the ground floor. The planned building features green roofs and slopes reminiscent of the fort's earth embankments. The current parking area serving commercial services has been eliminated in the project, with new parking spaces planned as an underground garage. While the architectural form has been preserved, the material used for the reconstruction of the volume is modern, in accordance with conservation principles.

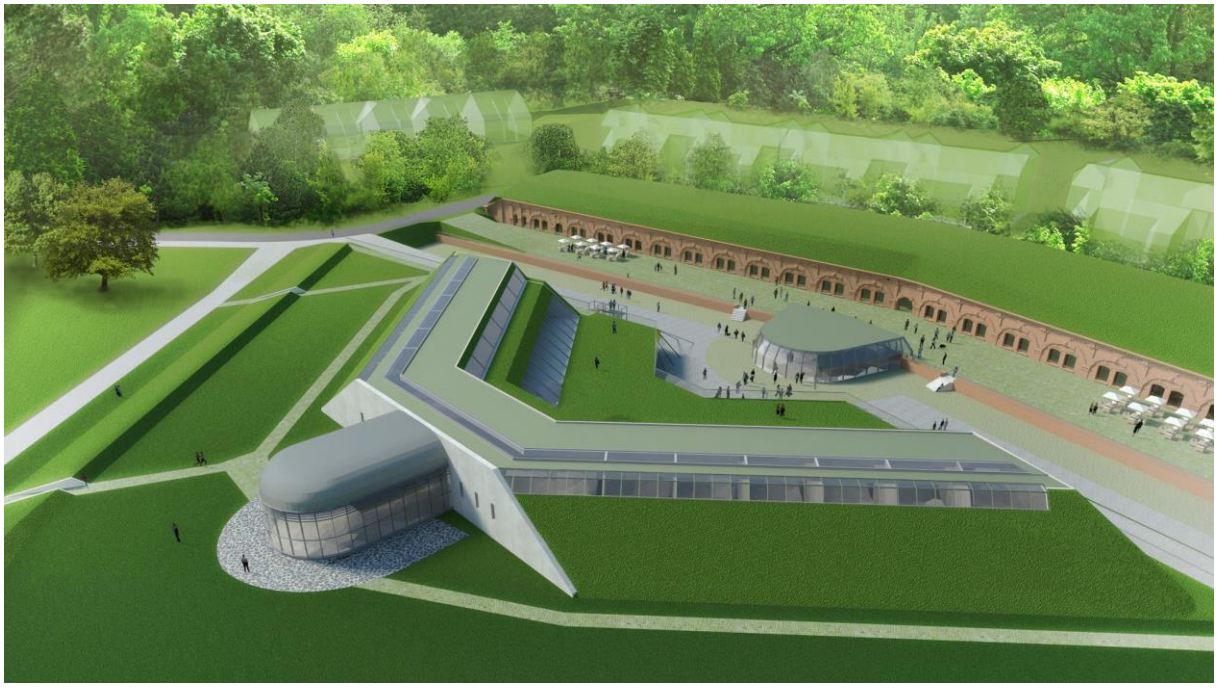

Fig. 10. Fort Służew expansion project. Source Festgrupa

4. CONCLUSIONS

The thoughtful adaptation and expansion of Fort VIII – Służew have the potential to create a central hub. The surrounding buildings, comprising multi-family residential structures and the university campus buildings, provide a solid base of potential users for commercial and recreational services.

The residential terraced housing constitutes an irreversible intervention in the structure of the fort, which the authors view negatively. The existing allotment gardens form a direct and enclosed framework around the fort, acting as a spatial barrier that isolates the site. The current configuration of the allotment gardens is a contentious issue, and it may be worth considering the creation of several pedestrian paths cutting through the gardens. These paths would provide distinct entrances to the fort area from the residential estates, helping to integrate the park, which is part of the residential estate and fort, into the public green space network of Warsaw.

The revitalisation of Fort VIII in Warsaw is an example of positive collaboration between the interests of a private investor and the respect for historical value. Conservation principles were preserved and honoured, and the already functioning "Fort 8 Estate" allows for the evaluation of this revitalisation from a user's perspective. The service area located within the historic fort space has become its hallmark. The once deteriorating and endangered monument has been given new life. The adaptation of the historic Fort VIII – Służew was a necessary condition for the continued existence of such a monument, which was at risk of degradation without proper care.

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