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Original Research Article

ASSESSMENT OF THE TECHNICAL CONDITION OF THE KOSSAK MANOR GRANARY BUILDING IN GÓRKI WIELKIE

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A b s t r a c t

The article presents an assessment of the technical condition of the Manor Granary Barn of Zofia Kossak in Górki Wielkie. Due to its architectural value, the building holds special significance for the local community. Proper verification of the technical condition was crucial for the planned renovation and reconstruction in the next stage. It is planned that the Granary building will be transformed into an office and service complex with gastronomic and cultural elements as part of the "Kossak Educational and Cultural Center" project in the future. The history of the granary building dates back to the 18th century when it was part of an estate or manor, mainly serving as a warehouse for agricultural produce and other valuable goods. The assessment of the technical condition of the building was carried out with regard to the planned change of function to create various spaces such as exhibition halls, a café, or office spaces, which are intended to serve the organization of cultural and educational events. The implementation of the project will require a comprehensive technical analysis enabling the proper planning of renovation and modernization works. The scope of works will be related to necessary repairs of the roof, walls, ceilings, and facade, as well as adapting the interiors to the new needs of users. The transformation of the Granary into an office and service facility with gastronomic and cultural functions represents a significant step towards restoring life and functionality to this historic place.

Keywords: granary, historic building, renovation, reconstruction

1. INTRODUCTION

Assessment of the technical condition and change of use of historic buildings is the process of transforming buildings of historical value in order to adapt them to contemporary needs, while maintaining their cultural and historical value. This process is complex and requires taking into account many aspects, such as maintaining authenticity, structural integration of new functions, as well as compliance with monument protection regulations. An important element of adaptation is the

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preservation of original materials and construction techniques. Documents such as the Venice Charter emphasize the need to respect the authenticity of materials and construction methods. In practice, there are various adaptation methods. One example is minimal interference. The philosophy of minimal interference in the existing tissue assumes that all adaptation works should be limited to the necessary minimum in order to preserve as much of the original building substance as possible. Another example is the so-called reversibility. Adaptation actions should be reversible to enable future generations to return to the original form of the building, if necessary. It is worth paying attention to the use of modern technologies and materials that may be compatible with the original structures, but do not violate their historical value. Typically, the adaptation process is associated with revitalization, i.e. restoring functional functions to historic buildings, often by transforming them into cultural facilities, museums, conference centers or hotels. In many cases, adaptation is accompanied by a change in use. This applies to changing the original function of the building to another, e.g. transforming a factory into residential lofts. Legal regulations are also important. In many countries, there are detailed legal provisions on the protection of monuments that regulate adaptation procedures. In Poland, these issues are regulated by the Act on the Protection and Care of Monuments. International standards and guidelines, such as those developed by UNESCO, ICOMOS, or the Council of Europe, also have a significant impact on adaptation processes. It is worth conducting an analysis at the very beginning of the activities. The analysis of case studies allows for understanding different approaches to the adaptation of monuments in different cultural and legal contexts. Examples of successful adaptations can serve as role models. Adapting monuments can be expensive, which is often a significant barrier. Different social groups may have different opinions about historical value and the scope of permissible changes. The dynamically changing needs of society may require flexible and creative approaches to the adaptation of monuments. The adaptation of historic buildings requires careful planning and a balance between the preservation of cultural heritage and contemporary utility needs. This process is based on extensive knowledge of the history of architecture, conservation of monuments, construction engineering and cultural heritage protection law [12, 13, 14].

The Kossak Manor Granary building in Górki Wielkie, due to its historical character and architectural significance, required a technical assessment. The property is currently in poor condition, posing a significant challenge for the planned renovation and reconstruction. The building was transferred to the County Office in Cieszyn by the Zofia Kossak Foundation. It is planned that the Granary will be transformed into an office and service complex, with gastronomic and cultural functions, as part of the "Kossak Educational and Cultural Center" project. The assessment of the current technical condition of the Kossak Manor Granary building in Górki Wielkie was necessary to plan the reconstruction and change the way of using the historic object. The purpose of the Kossak Manor Granary building is to undergo significant change, going beyond the previous framework of its storage function. In the future, the facility is planned to be used for offices, gastronomic services, and cultural activities such as temporary exhibitions and educational workshops. In order to implement this plan, the County Office in Cieszyn has applied to the Polish Government for funding for the investment within the available grant programs.

2. HISTORY OF THE GRANARY BUILDING

The Granary building was erected in the 18th century as part of an estate or manor, likely belonging to the local nobility. From archival information, it appears that the Kossak Manor Granary building was constructed by Erdmann Krzysztof Marchlewski von Pernstein, of the Wieniawa coat of arms, and used from around 1760. It should be noted that in the Cieszyn Silesia region, German culture was intertwined with Polish culture, as evidenced by the large number of Lutheran evangelicals, for example, Adam

Małysz. From its establishment until the outbreak of World War II, the object was rebuilt several times, including by the last owners of the estate, the Kossak family. The Kossak family is remembered in the area as good stewards of the estate, caring for Polish identity and focusing on modernization and the development of the local community. The ownership of the building was transferred by the Kossak Foundation (descendants of the pre-war owners) to the County Office in Cieszyn with the intention that local authorities would properly manage the transferred property and preserve the memory of the previous owners, namely the Kossak family. Probably after 1945, no further structural changes were made to the building, except for local demolitions and openings to adapt it to current utility needs, for state-run agricultural holdings. No materials produced after World War II were found to be used in the building. During the conducted research, it was found that adaptive works were carried out over the years using only pre-war materials (Austrian bricks). Construction of such granaries was common in Poland at that time due to the need for storing agricultural crops and other goods [1, 2]. Granaries, especially those of larger size, served not only as storage facilities but also had economic and defensive significance. They were places for storing agricultural harvests as well as valuable goods such as grain, honey, wine, or spices. During the partitions and World War II, many historic buildings, including granaries, could have been exposed to destruction or change of function due to turbulent historical events. Probably the Kossak Manor Granary also went through these difficult times, which may have influenced its current technical condition [3]. Nowadays, many historic buildings, including the Kossak Manor Granary in Górki Wielkie, are subject to legal protection, which entails efforts for their renovation and conservation. Granaries such as the one in Górki Wielkie are not only material objects but also witnesses to history, tradition, and the way of life of past generations. Preserving and nurturing them is an important element of cultural heritage that is worth passing on to future generations. The Granary building is located near the Zofia Kossak-Szatkowska Museum (the so-called gardener's house) and the Zofia Kossak Foundation (the adapted ruins of the former manor) in the vicinity of the park (Fig. 1) [4, 5].

Fig. 1. Location of the Kossak Manor Granary building and its surroundings

3. ARCHITECTURAL FORM OF THE KOSSAK MANOR GRANARY

The form exhibits characteristic features of traditional rural buildings, while emphasizing their functionality and simplicity of construction. The Granary has a longitudinal rectangular shape (Photo 1), which is a typical layout for such structures. This is a practical solution that allows for efficient utilization of space inside the building, in accordance with its main purpose as a warehouse for agricultural produce or other valuable goods.

Photo 1. South-east elevation of the Kossak Manor Granary - current state

The roof of the Kossak Manor Granary is in the form of a broken Polish roof, hipped, with typical gables, consisting of two parts with very similar roof pitch angles. The lower and upper parts of the roof are separated by a small wooden wall, partly covered with tiles and roofing felt. The building's elevations are simple, which is characteristic of rural constructions (Photo 2). Attention is drawn to the structural element in the form of a double hanger, supporting wooden ceilings in the form of trusses located below. The surface, plastered with stippled plaster and adorned with decorative bands of smooth plaster, gives the building an aesthetic appearance while protecting the walls from adverse weather conditions. Wooden doors and sash windows add a traditional character to the entire structure. The interior of the Kossak Manor Granary is characterized by a practical arrangement of rooms. Arched and barrel vaults are elements that remain from the previous form of the building and are found in the basement and above the ground floor. The oldest part of the building is the basement made of stone, highly resistant to capillary moisture, vaulted with barrel vaults of the same material. Next to it, an intermediate storey of basement-ground floor was added, made of Austrian bricks with barrel vaults. Wooden stairs leading to the floors are another typical element of such buildings [6, 7, 8].

Photo 2. The north-western elevation of the Manor Granary – existing condition

During the technical assessment, it was noticed that the roof, wooden stairs, and ceilings are decayed (biological corrosion), porous, and posed a structural failure risk. Some elements, such as brick walls, are partially damp and frozen, window and door joinery is damaged, and there are gaps and cracks in the plaster on the elevation (Photo 3).

Photo 3. Damage to the western corner of the Kossak Manor Granary

4. CHARACTERISTIC TECHNICAL PARAMETERS

The gross volume of the building is 5179.90 m^3. Volume is a fundamental parameter determining the volume of the enclosed space of the building, which is of significant importance both for structural and functional requirements. In the case of the Kossak Manor Granary, the large volume requires special consideration in planning any renovation, modernization, and adaptation works. The dimensions of the building are depicted on the elevations (Fig. 2 and 3).

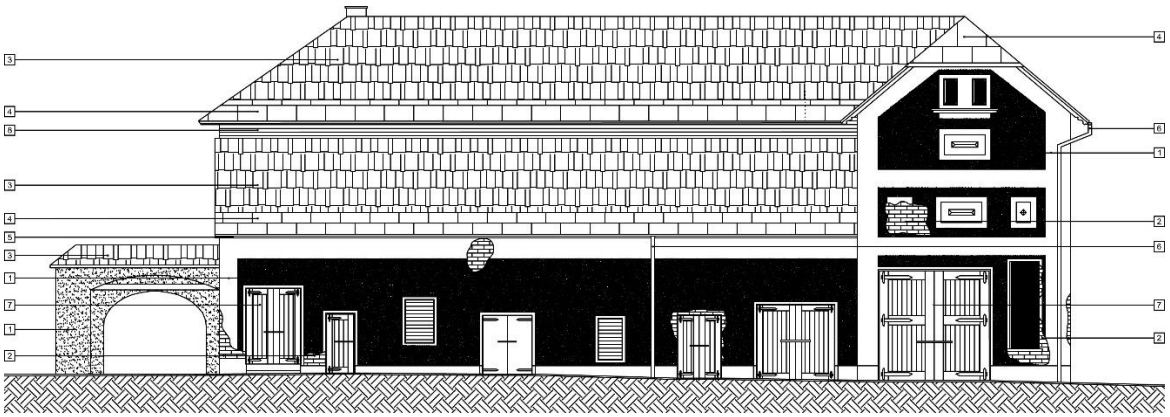

Fig. 2. South-east elevation of the Kossak Manor Granary – inventory

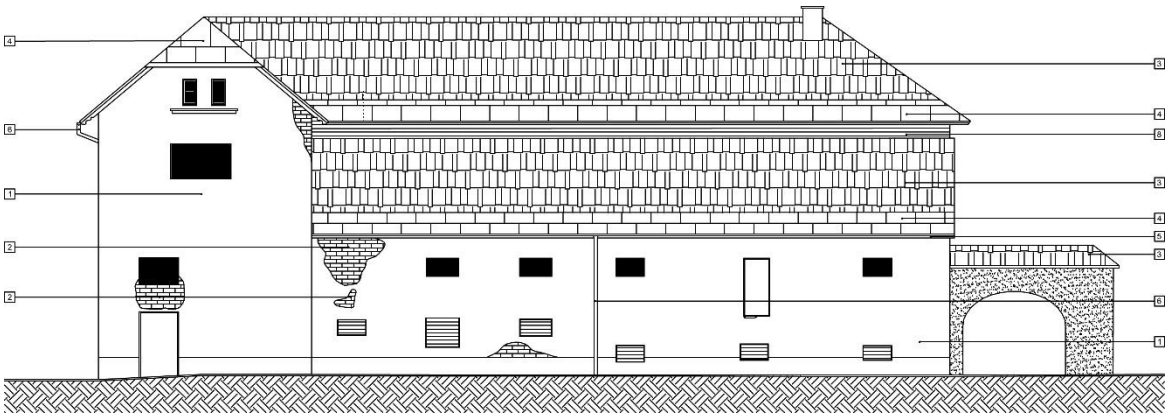

Fig. 3. North-west elevation of the Kossak Manor Granary – inventory

The building footprint area is 486.0 m^2. This is the area on which the building, along with its foundations, is located. In the context of transforming the function of the object, it is important to properly utilize this area to ensure not only new functional uses but also safety and energy efficiency.

The height of the building is 13.10 m. The height of the building is important not only aesthetically but also functionally and in terms of fire safety. Due to the planned changes in the way the building is used, it will be necessary to consider appropriate evacuation solutions to ensure the safety of the building's occupants.

The building has four above-ground floors. The number of floors affects the spatial organization of the building and the planning of any structural and installation changes. In the case of the Kossak

Manor Granary, it is necessary to consider appropriate solutions for each floor according to the new functions to be introduced. Internal layout is shown on the sections (Fig. 4 and 5).

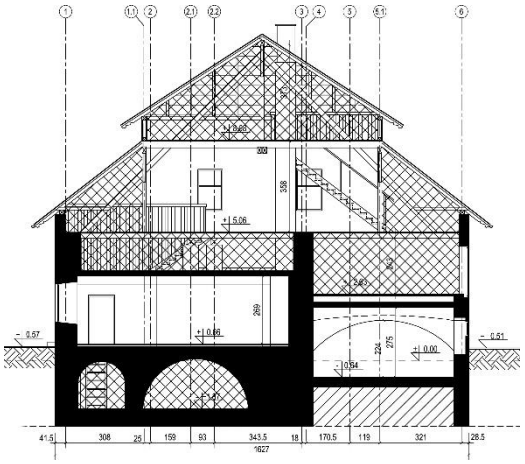

Fig. 4. Cross-section of the Kossak Manor Granary building – inventory

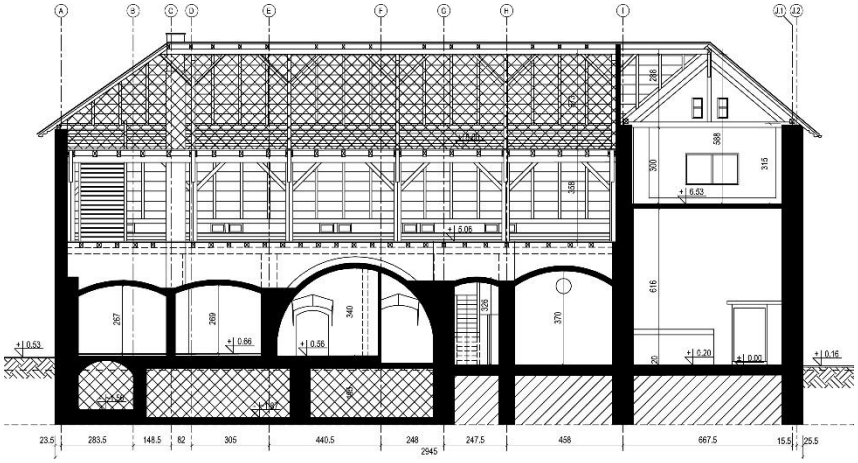

Fig. 5. Longitudinal section of the Kossak Manor Granary building – inventory

After conducting exploratory excavations of the external foundation pads, simple soil conditions were determined for the planned investment. The ground substrate consists of uncontrolled embankments to a depth of approximately 140-150 cm. Next, there are sandy clays with occasional gravel, clayey gravels, gravel interlayered with clayey gravel, and cobblestones with gravel - these soils exhibit favorable geotechnical parameters. This means that the geotechnical conditions at the construction site are suitable, which was a positive factor for the stability of the structure. Geotechnical analysis had to be conducted to ensure proper foundation of the building and prevent any future ground settlements. The results of the analysis confirmed two geological boreholes made in the vicinity of the building.

It is planned to change the use of the building to office and service with gastronomic and cultural functions. The Granary will serve a recreational function by organizing various cultural events, temporary exhibitions, and educational workshops. Exhibition and educational spaces are planned to be designed in such a way as to enable interactive and inspiring learning experiences.

5. PURPOSE AND FUNCTIONAL PROGRAM OF THE BUILDING

Two halls on the ground floor and one hall on the upper floor are planned to serve as exhibition and educational spaces. These rooms will feature various thematic exhibitions and host workshops for the local community. A kitchen facility is also planned to serve the catering needs of cultural events held in the building, such as exhibitions. The catering kitchen will be responsible for preparing and serving meals. A café is planned to be established on the ground floor of the building, which will serve guests of the Granary, the Kossak Manor, and the Zofia Kossak-Szatkowska Museum. This function aims to create additional meeting and relaxation space for visitors to the complex. The Kossak Manor Granary, along with the adjacent Kossak Manor and Zofia Kossak-Szatkowska Museum buildings, as well as the manor park, is intended to form a coherent educational, cultural, and service complex.

6. ASSESSMENT OF THE BUILDING'S TECHNICAL CONDITION AND RECOMMENDATIONS FOR PLANNED DESIGN WORK

Based on conducted exploratory inspections and on-site observations, a comprehensive assessment of the building's technical condition was carried out, and recommendations were proposed for its future reconstruction and modernization.

The building has been divided into at least four segments (designated from A to D), taking into account the diversity of materials used in its intended form. This indicates a gradual expansion of the facility. The individual segments are not structurally interconnected, which affects the statics, rigidity, and overall strength of the building structure (Fig. 6). A double-hanger truss was installed above segments A-C, while a single-hanger truss was installed above segment D.

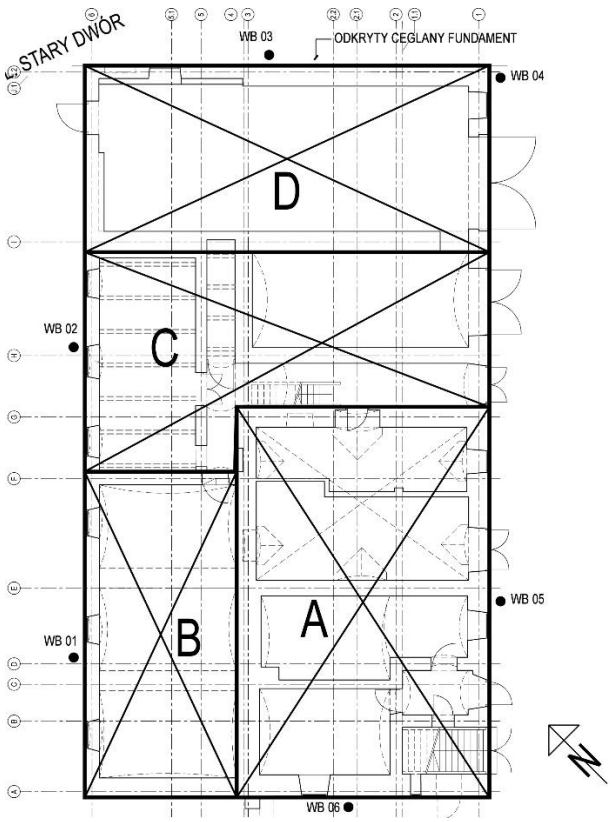

Fig. 6. Ground floor plan with division into segments of the Kossak Manor Granary building

Segment A: The oldest part of the building, made of stone (Photo 4), both walls and vaults. The walls at the foundation level do not have setbacks. Probably, as part of further expansion, rooms were built on the ground floor above the existing basement, also made of brick and vaulted. The stone foundation walls do not draw water, which occurs below the foundation level. The water table level was confirmed by geotechnical boreholes and exploratory excavations made during the site reconnaissance. The foundations do not require additional heavy waterproofing, due to the properties of the material from which they were made; stone does not draw water hygroscopically, any moisture is solely related to improper drainage of rainwater.

Photo 4. Vaulted basement of the Kossak Manor Granary building

Segment B: It has a part of the basement with barrel vaults supported by brick transverse arches (photo 5).

Photo 5. Basement with barrel vaults supported by transverse arches

Segment C: Directly connected to segment A, it is characterized by new shallower foundations and an external shallow foundation wall under a newer ground floor level.

Segment D: It has a ceramic slab on steel beams and a single-level hanging roof truss (Photo 6). Wooden structural elements did not show any damage during visual inspection and macroscopic examinations; however, after sampling, it turned out that they are significantly damaged internally (Photo 7).

Photo 6. Roof truss in segment D

Photo 7. Internal damage to the wooden element

During the on-site inspection and exploratory excavations, a number of structural damages and problems were identified, such as the destruction of wooden ceilings (Photo 8), damage to stairs (Photo 9), pillars (Photo 10), corrosion of wooden and metal elements, and local frost damage to bricks in areas affected by leaks or rainwater penetration (Photo 11).

Photo 8. Damaged wooden ceiling

Photo 9. Damaged wooden stairs

Photo 10. Damage to the ceiling and its supports – pillars

Photo 11. Damage to external walls

Based on the conducted technical assessment, the building has been deemed to be in an emergency condition. Urgent implementation of necessary repair works has been recommended, including but not limited to roof replacement or repair, repair of ceilings (or their replacement associated with the planned change of building function - changes related to fire safety). Drying and repair of load-bearing walls, repair of cracked vaults on the ground floor, and strengthening of foundations to equalize pressures on the ground and thus limit the possibility of future cracks and damage to the building are also recommended (it should be taken into account that there are several different segments from A to D).

In connection with the planned reconstruction of the building and its change of function from storage to office-service with gastronomy, after conducting a technical assessment, final conclusions and recommendations for the designer have also been formulated. Considering the current technical condition, for such a reconstruction to be realized, comprehensive repair and modernization works will be necessary, including the replacement of some load-bearing elements, drying of walls, and adjustment - strengthening of foundations to adapt the building to its new planned function, thereby balancing the

loads on the ground. It was noted that previously, grain was stored on the floors, up to 50cm high at the external walls and up to 100cm high in the center of the room, to prevent biological degradation of the crops (the building was unheated), and periodically the crops had to be manually moved. This previous use is confirmed by vertical wooden beams approximately 40cm high placed on the external walls of the floor with hanging trusses. The new planned function will require the application of live loads of at least 5kN/m^2 (slightly higher) plus compliance with fire protection requirements as for partitions in public utility buildings. Simultaneously, the change of function will entail the introduction of REI requirements for the roof truss. Due to the poor condition, a complete replacement of the roof and floor structures has been proposed, as well as drying and protection of basement and foundation walls (against rainwater), and deepening and strengthening of existing foundations to balance (equalize) the loads transferred by the building to the ground.

In summary, the conducted assessment of the building's technical condition and the proposed recommendations are necessary to protect the building from further degradation and to adapt it to the planned change of function. The future reconstruction should address all identified issues to ensure that the building meets the required legal standards of safety and functionality.

The renovation and reconstruction

Plan for the Granary will focus on a wide range of works aimed at restoring the building to an appropriate technical condition and adapting it to its new intended use. The planned scope of investment should include:

1. Roof repair or replacement, which will be covered with graphite-colored cement tiles.
2. Replacement of decayed roof truss elements and addition of decorative finials to the rafters.
3. Replacement of existing window and door joinery with new units matching the existing style.
4. Restoration of external plasterwork with decorative details and construction of a sandstone plinth.
5. Repair of sheet metal work, gutters, and downpipes.
6. Replacement of damaged wooden ceilings with new reinforced concrete ceilings mainly for fire safety reasons.
7. Cleaning and repair of barrel vaults.
8. Installation of new floors in the rooms.
9. Repair and, if necessary, replacement of parts of external walls, along with restoration and recreation of architectural details in the building.

The investor plans to in the future:

1. Adding new entrance openings on the northwest and northeast elevations and bricking up existing openings.
2. Adding new window openings in the attic.
3. Introducing new reinforced concrete floors to replace the damaged wooden ones.
4. Replacing the existing wooden stairs with new reinforced concrete staircases.
5. Constructing new partition walls and removing parts of existing ones to adapt to the planned new function of the building.

Building changes resulting from the planned change in use:

Conversion of utility rooms into office, service, gastronomic, and cultural spaces. The renovation and reconstruction plan for the Manor Granary encompasses comprehensive actions aimed at restoring the building to an adequate technical condition and adapting it for its new purpose as a multifunctional office-service facility with gastronomic and cultural functions. These works will require extensive changes to the building's structural elements in the future.

7. CONCLUSION

The building of the Manor Granary in Górki Wielkie, being a historical monument, was in poor technical condition at the time of our study. The outcome of the study was to define appropriate technical guidelines for the proper design of renovation and design works related to the planned reconstruction. It is worth mentioning again that the County Office in Cieszyn, mainly the County Governor, planned to transform the facility into a mixed office and service complex with gastronomic and cultural elements, creating an ambitious "Educational and Cultural Center at the Kossaks". Therefore, the assessment of the technical condition of the Manor Granary was a key stage of this undertaking, aiming to provide adequate insight into the financial expenditures necessary to adapt the building to its new functions. The conducted research helped estimate the investor's the amount of financial investment needed to acquire external subsidies or grants.

The history of the Manor Granary dates back to the 18th century when it was an integral part of the estate, primarily serving as a storage for agricultural produce and other valuable goods. Over the centuries, its functions may have changed depending on socio-economic needs. Today, despite neglect and poor technical condition, the Granary still retains many features of traditional rural architecture, constituting an important element of the region's cultural heritage. The planned reconstruction aims to transform the building into a multifunctional facility, offering space for gatherings, learning, and relaxation. It envisages the creation of diverse spaces such as exhibition halls, a café, or office rooms, intended to host cultural and educational events. Ultimately, repurposing the Manor Granary into a mixed-use complex with gastronomic and cultural functions will undoubtedly be a significant step towards revitalizing and restoring functionality to this historic site, integrating it with the local community and culture.

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