

DECLARATION

Name: Milica Radović
Email: milicamradovic@gmail.com

Title of the MSc Dissertation: Chateau Lobkovice Revitalization of the Castle Grounds
Supervisor(s): Arh. ing Klara Kroftova, Ph.D
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I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

I hereby declare that the MSc Consortium responsible for the Advanced Masters in Structural Analysis of Monuments and Historical Constructions is allowed to store and make available electronically the present MSc Dissertation.

University: Czech Technical University in Prague
Date: 06.07.2022.
Signature: 

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To my parents.

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ABSTRACT

Chateau Lobkovice: Revitalization of the Castle Grounds

Chateau Lobkovice is one of the many castles on the territory of the Czech republic. The first structure was built in the XIV century; however, since then it went through several modifications. Through the centuries of its existence, the Chateau suffered destruction, to be rebuilt again. The structure was expanded two times, to gain its current appearance in the XVII century. Nevertheless, with each new owner, the interior of the Castle was adapted.

It was during the second half of the XX century that it underwent the last adaptations. Today it can be found in a severely neglected state, but still successfully standing the test of time. Considering the above-mentioned, there are several different styles intertwined, followed by various construction materials and building techniques.

The objective of this research is the revitalization of Castle grounds. Even though the main focus of the research is on the Castle itself, the proposal for the new use of the buildings and area belonging to the Castle estate will be included. Besides assigning the new function, the aim is to find adequate structural solutions as well as to suggest a functional maintenance plan. Through the material characterization and the damage mapping, the current state of the Chateau will be established and the structure unraveled.

Considering the Castle has been perceived as a monument and a landmark by the population of the Lobkovice village, these actions will allow the Castle to become the place of gathering of the community. Also, it will emphasize the values of the architecture of the Czech castles and their importance for history and tradition.

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RESUMÉ

Zámek Lobkovice: Revitalizace zámeckého areálu

Zámek Lobkovice je jedním z mnoha hradů na území České republiky. První stavba zde vznikla již ve XIV. století, od té doby však stavební vývoj prošel několika úpravami. V průběhu staletí své existence byl zámek několikrát poškozen a následně znovu obnoven. Stavba byla dvakrát rozšířena, v XVII. století získala svou současnou podobu. Kromě exteriérů prošly úpravami i interiéry, které byly s každým novým majitelem zámku upravovány. Posledními úpravami prošel ve druhé polovině XX. století. Dnes jej najdeme ve značně zanedbaném stavu, ale přesto úspěšně odolává působení času. Vzhledem k výše uvedenému se zde prolíná několik různých slohů, na které navazují různé stavební materiály a stavební techniky.

Cílem tohoto projektu je revitalizace celého zámeckého areálu. Přestože se projekt zaměřuje především na samotný zámek, součástí je i návrh nového využití budov a areálu náležejícího k zámeckému sídlu. Kromě přiřazení nové funkce je cílem nalézt adekvátní konstrukční řešení a také navrhnout plán funkční údržby. Prostřednictvím materiálové charakteristiky a mapování poškození byl zjištěn současný stav zámku a rozkryta jeho struktura.

Vzhledem k tomu, že zámek je kulturní památkou a dominantou obce, uje cílem obnovy jeho otevření obyvatelům obce tak, aby se stal místem setkávání. Rovněž budou zdůrazněny hodnoty architektury českých hradů a jejich význam pro historii a tradici.

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АПСТРАКТ

Замак Лобковице: Ревитализација замка и његовог окружења

Замак Лобковице је један од многобројних замака на територији Чешке Републике. Првобитна структура замка подигнута је током XIV века. Међутим, од тада је била више пута модификована. Током векова свог постојања, замак је био рушен и обнављан. Структура је била надограђивана у два наврата, и свој коначан облик добила је у XVII веку, који има и данас. Ипак, адаптација ентеријера се вршила са сваком променом власника.

Последња адаптација је извршена у току друге половине XX века. Данас, иако у запуштеном стању, замак истрајава. Узевши у обзир претходно поменуте промене, различити архитектонски стилови се преплићу, заједно са коришћеним материјалима и техникама градње.

Циљ истраживања је ревитлаизација замка Лобковицеи његовог окружења. Иако је фокус на самом замку, предлог укључује и пренамену објеката који су у склопу имања. Поред саме пренамене замка, препоруке се односе и на структуру. Кроз анализу коришћених материјала и мапирање оштећења, биће установљено тренутно стање замка, а његова структура разјашњена.

С обзиром да је замак Лобковице уважаван од странке житеља села Лобковице као знаменитост овог места, на овај начин замак ће постати центар окупљања заједнице. Такође, допринеће подстицању вредности архитектуре чешких замака, као и њиховог значаја за одржавање културе и традиције.

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1. INTRODUCTION

The territory of the Czech Republic abounds in castles. Different in the period they were built in, their shape and size, they witness the history, standing the test of time. One of those castles is Chateau Lobkovice. The modest appearance of the castle should not deceive. It witnesses the beginning of the noble Czech family - the Lobkovic family.

The Chateau Lobkovice was first mentioned in the early 14th century. Over the time, the castle changed many owners, therefore undergoing several structural changes. It was even severely damaged during the Thirty Years War, and later reconstructed. Consequently, different styles can be recognized in the castle, testifying to the modifications the castle went through. The latest adaptation and conservation project was carried out during the 1980s by the Faculty of Arts, Charles University in Prague.



Figure 1 – Chateau Lobkovice today

1.1. Motivation

The Chateau Lobkovice presents a particular asset, characterized by the presence of three styles, skillfully intertwined: Gothic, Renaissance, and Baroque. With very clear motives of each of them, together they form a unique structure. To preserve the building's authenticity, it is necessary to protect the building from further neglect that leads to decay.

The long existence of the castle has become important for the whole community around the village of Lobkovice, which identifies with it and recognizes it as a cultural monument in this area. Many events are held on the territory of the castle, which connects the community. By providing space for events, the community is encouraged and at the same time connects the tangible with the intangible cultural heritage. Besides the Chateau itself, the project includes the whole area of the castle ground. By

hosting cultural and social events, it will contribute to connection and identification of the community with this space, as well as to connect the tangible with the intangible heritage.

1.2. Objective

The main objective is the conservation and revitalization of the grounds of the Chateau Lobkovice. To assure the regular maintenance of the castle, the best course of action is to assign it a new function. To establish the base conditions for future use, it is essential to know the history and understand the development of the structure. The historic survey provides us with information on the historic context and the events that led to the current conditions.

By indicating the structural problems, the damage map enables us to define the possible causes. It provides clear information if the structure is sound or it requires an immediate intervention.

According to the outcome, the proposal for the further adequate measures, e.g. repair and strengthening, can be defined.

The objective of the research is to give the adequate recommendation on:

- Conservation of valuable architectural elements on the exterior and the interior of the building
- Revitalization of the Castle Grounds through assigning it a new function
- Maintenance (plan) of the Castle Grounds through the regular use of the Chateau
- Connection of the intangible and tangible heritage, through supporting the relationship between the community and the Chateau Lobkovice as a recognized heritage of the area.

Through the historic survey, we will be able to understand the historical context and important events that have led to the current state. Also, the knowledge of the previous interventions gives us an insight into the modifications of the structure, according to the change of use.

The visual inspection and development of the damage map, allow us to establish the connection between the current state and the possible causes of the damage. Also, it raises awareness of future problems if adequate solutions are not implemented. Therefore, to prevent further deterioration of the structure, the proposal of appropriate interventions using strengthening techniques is required.

1.3. Methodology

The methodology applied for revitalization project of the Chateau Lovkovic is based on ISCARSAH principles and guidelines. The study has been followed so the research process has been adequately done. The methodology used to obtain this research is based on ISCARSAH [1] principles as well as the NARA Document on Authenticity [2]. ISCARSAH principles are considered as the guidelines to adequately structure the research process. Firstly, a historic survey of case studies was conducted, based on theoretical research. Resources used the most is the written document made by SURPMO (Státní ústav pro rekonstrukci památkových měst a objektů) [3]. Following the information obtained, and based on ISCARSAH principles of reversibility, minimal intervention and compatibility, preventive measures are defined, as well as further interventions and a maintenance plan are developed. Due to the current state of the subjects of case study, structural analysis was considered unnecessary.

2. CONTEXT

2.1. Neratovice region

The Lobkovice village is one of the oldest Czech villages, which the family Lobkovic is named after. It is placed on the left bank of the river Elba (Labe in Czech). Today, Lobkovice village belongs to the Neratovice municipality, located in the southern part of the Mělník region. According to the archeological finds in this region, today's Neratovice micro-region has been inhabited since the Mesolithic period. The region is placed by the river Elbe that dominates this region that attracted the people from many cultures. The name of the river Elbe originates from the Celts, who named the river "elb", referring to it as the "big river"[4]. The Elbe River changed its flow during the time, shaping the landscape, which we can see comparing the maps from the 18th (Figure 1) and 19th century (Figure 2) with the present one (Figure 3).



Figure 2 – Situation plan of the Chateau Lobkovice from the year 1790. Source [3]



Figure 3 – Map of Lobkovice from the 19th century, Source [5]

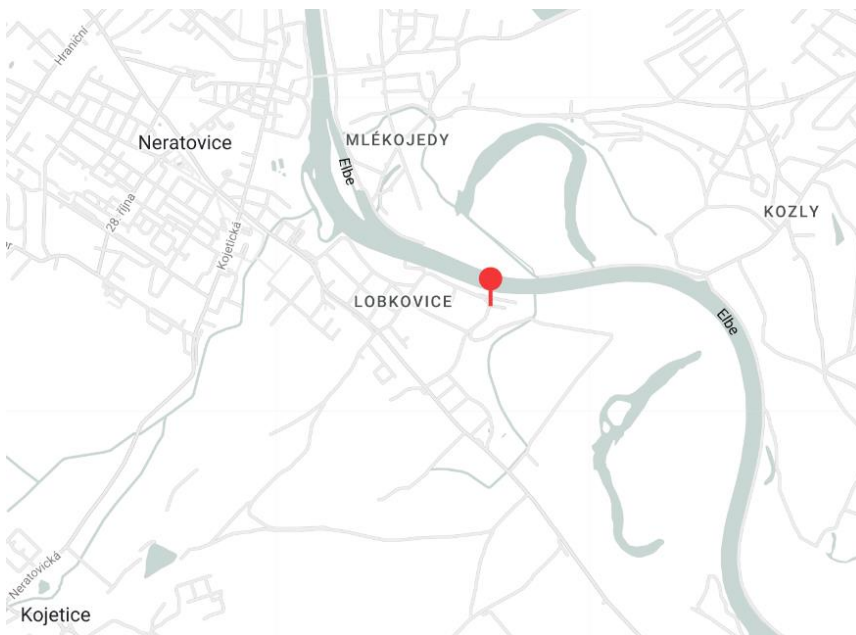


Figure 4 – Map of Lobkovice today. Source [6]

2.2. The Castle grounds

The Lobkovice Chateau is set on the highest point of the cliff restricted by the blind wing of Elba. The cliff craters the embankment, separating the castle grounds from the flatlands, which occasionally get flooded. The buildings that belong to the castle grounds (old brewery, private house, storage building, etc.), rest on relatively flat ground. Along the enclosed area of the Chateau, there are the greenery parts: the woods and pastures, which belong to the castle estate.

The castle estate can be accessed from the two gates. The gates are indicated in Figure 24. The main entrance, from the main road (Palackého street), marked with the orange arrow, is on the west side of the property. The alternative gate accessible from the road parallel to the riverside, marked with the blue arrow, leads directly to the Chateau. The pedestrian pathway separates from that point and allows access to the river bank.



Figure 5 – Ortho photo of the Castle estate. Source [7]



Figure 6 – The main entrance to the Castle grounds.



Figure 7 – The bank of the Elbe river near the Castle grounds



Figure 8 – Buildings that belong to the Castel estate



Figure 9 – Castle surroundings

3. HISTORIC SURVEY

3.1. A brief history of the Chateau Lobkovice

With its rich history, the chateau of Lobkovic has represented a significant figure in the life of the village. Throughout the centuries the chateau has been connected to the Lobkowicz family. During the time, the estate has changed its owners, but always had returned to the hands of the family.

In 1409, the chateau had been purchased by the Mikuláš Chudý of Újezd. Mikuláš is considered the founder of the House of Lobkowicz. The initial structure of the chateau made of wood, later rebuilt into a larger building in Gothic style. The core of the building was a three-story prismatic tower made of rubble stone. Again, in the hands of the new owners, the chateau was expanded. This new structure of the castle was built in Renaissance style. This new form of the chateau has been mentioned for the first time around the year 1610. Later, the Chateau was purchased by Polyxena of Lobkowitz in 1616, as a gift for her husband's birthday. During the Thirty Years' war (1618-1648), the chateau was ravaged: a clash broke out near Lobkowicz, during which the chateau burned down [8]. However, the chateau suffered the biggest damage from bandit groups, during the last few years of the war. Duke Vaclav Eusebius, the only son of Polyxena, who inherited the chateau, wanted to give the property of the castle to his relative, Kryštof z Lobkowicz. For that purpose, several extensive studies have been developed, that describes the state of the property and gives a picture of the devastation. One of them states: "The Lobkowicz chateau is all deserted and destroyed, only the tower stands and a few walls" (2, pg 7). After the death of Vaclav Eusebius in 1677, the chateau has got inherited by his son Ferdinand August. Besides the Chateau, he started reconstruction of the palaces in Hradčany and the Small Town and the residence. Not only the reconstruction of the older part has been done, but the whole new building was built. In the year of 1679, a part of the Chateau designed in Baroque style was added to the tower. The construction manager was Štefan Rische, who was the right hand of di Porta. The chateau has kept this form till today, going only through the minor changes on its exterior [3] .

In 1829, once again, the chateau was sold. The new owner was the influential lawyer Jan Měchura, whose daughter was married to František Palacký, the famous Czech Historian. During his time in the village he wrote the famous "History of the Czech Nation in Bohemia and Moravia". After his death, he was buried in Lobkovice, next to his wife Terezia [3].

During the 19th century was changing the owners frequently. In the late 19th sold to Reitler. However, in 1897 the chateau was returned back to the Lobkowicz family. The chateau was in the ownership of the family a little more than 50 years when it got confiscated by the communist regime in 1948. It was only after the Velvet revolution in 1989 that the chateau was finally again in the property of the Lobkowicz family. Unfortunately, the castle has been returned in a severely neglected state, with the structural modifications in the interior and some minor modifications on the exterior, which will be discussed further [3].



Figure 10 – Lobkovice Chateau, 1796. Source [3]



Figure 11 – The main – western elevation of the Chateau Lobkovice, 1930. Source [3]

3.2. Previous interventions

In the 1978 a “Historical building survey” has been done by the SURPMO (State Institute for the Reconstruction of Historic Towns and Buildings) [3]. The survey contains the important information on interventions done before 1978.

At the end of the 19th century, the roof and the tower were in poor condition. This severely neglected state of the Chateau Lobkovice made it look much older than it was. Still, the masonry structure was in a good condition.

From the new era of Lobkovice, no reports were available until 1916. Also, during that year, there were no interventions done. However, the record from the Prague Bookkeeping Building Office stated that the reparation of the castle happened a year before (1915) to protect the buildings from greater damage. The works included roof repairing, repairing the ceiling - damaged due to leakage, and the construction of the external corridor.

From 1925-to 1926, there was a repair of the tower staircases, exterior and interior walls and ceilings plaster repair. Exterior walls were painted in a gray-green shade, with the window frames painted in a darker shade. Damaged roof tiles were repaired or replaced.

In 1930, the manager of the Lobkovice estate asked the heritage office to enlist the Chateau as the heritage, under the statement that it should be protected as the memorial place of František Palacký. As a result, in 1938, the Chateau became a city estate. The city had an obligation to maintain it following the instructions of the heritage office and to open it to the public.

In 1948, the right-wing of the castle was adapted into Kindergarten. The electricity was embedded in this part of the Chateau. Also, the Lobkovic family attempted to bring back the Chateau to the family, however unsuccessfully.

Lightning in 1950 hit the Chateau, leaving the tower, roof, and Kindergarten demolished. The City office was not able to pay for the castle renovation. In 1951, the city conservator from Brandýs nad Labem declared the Chateau as the state property. Those two years without the roof caused the rainwater leakage, leading to the progression of damage.

The idea of renovating the castle arose in 1952. The photometric institute was asked to measure the castle. Four rooms in the left-hand part of the Chateau were given to Ministry of Health for the storage purpose. This way, the resources for the renovation of the roof was provided.

Only a year later, in 1953, another storm happened, damaging the roof once again. Through the years, the information of the legal owner of the Chateau was lost. Therefore, it was not clear who should provide the resources for the Chateau reconstruction.

In 1956, there was a discussion to keep it as the heritage of the Museum of Writing, focused on František Palacký's work. The Museum was supposed to take the space of the three rooms in the left-

hand part of the castle. However, the rooms have already been used as storage for the Ministry of Health. As the arrangement of the rooms became complicated, the idea didn't live [3].



Figure 12 – Demolished tower (left) and the tower today (right). Source [3]

In 1977 the part of the tower damaged during the storm finally collapsed. The left part of the tower was gone, leaving the staircase exposed. The external corridor suffered damage as well.

The last construction work was carried out by the Faculty of Arts of Charles University in Prague at the end of the 1980s. The work included new roof installation, and adaptation of the right-hand side of the library depository and study center [9]. During these interventions, the ceilings of the ground floor were replaced, along with the stucco decorations from the renaissance period (Figure 17 and Figure 18).



Figure 13 – West elevation of the Chateau Lobkovice in 1978. Source [3]



Figure 14 – South elevation of the Chateau Lobkovice from 1978. Source [3]



Figure 15 – East elevation of the Chateau Lobkovice from 1978. Source [3]



Figure 16 – North elevation of the Chateau Lobkovice from 1978. Source [3]



**Figure 17 – Stucco decoration on the ceilings in the renaissance part of Chateau from 1978.
Source [3]**



**Figure 18 – Stucco decoration on the ceilings in the renaissance part of Chateau from 1978.
Source [3]**

3.3. Building phases

During the centuries of its existence, Lobkovice Chateau has undergone many changes. Therefore, the recognition of the elements of different periods is present. To develop a clear insight into the castle structure, and avoid any confusion, a graphical representation, marking the different periods of construction, was created.

From the technical documentation by SURPMO [3] there are drawings representing floor plans with the different phases of the castle construction marked (Figure 19 to Figure 21). The structure of the castle was classified into five periods. The three main phases of the castle building belong to, respectively, gothic, renaissance and baroque period. Besides them, there are elements from the classical period and the modern period. However, they are mostly related to modifications, adaptations for the new function and reconstructions.

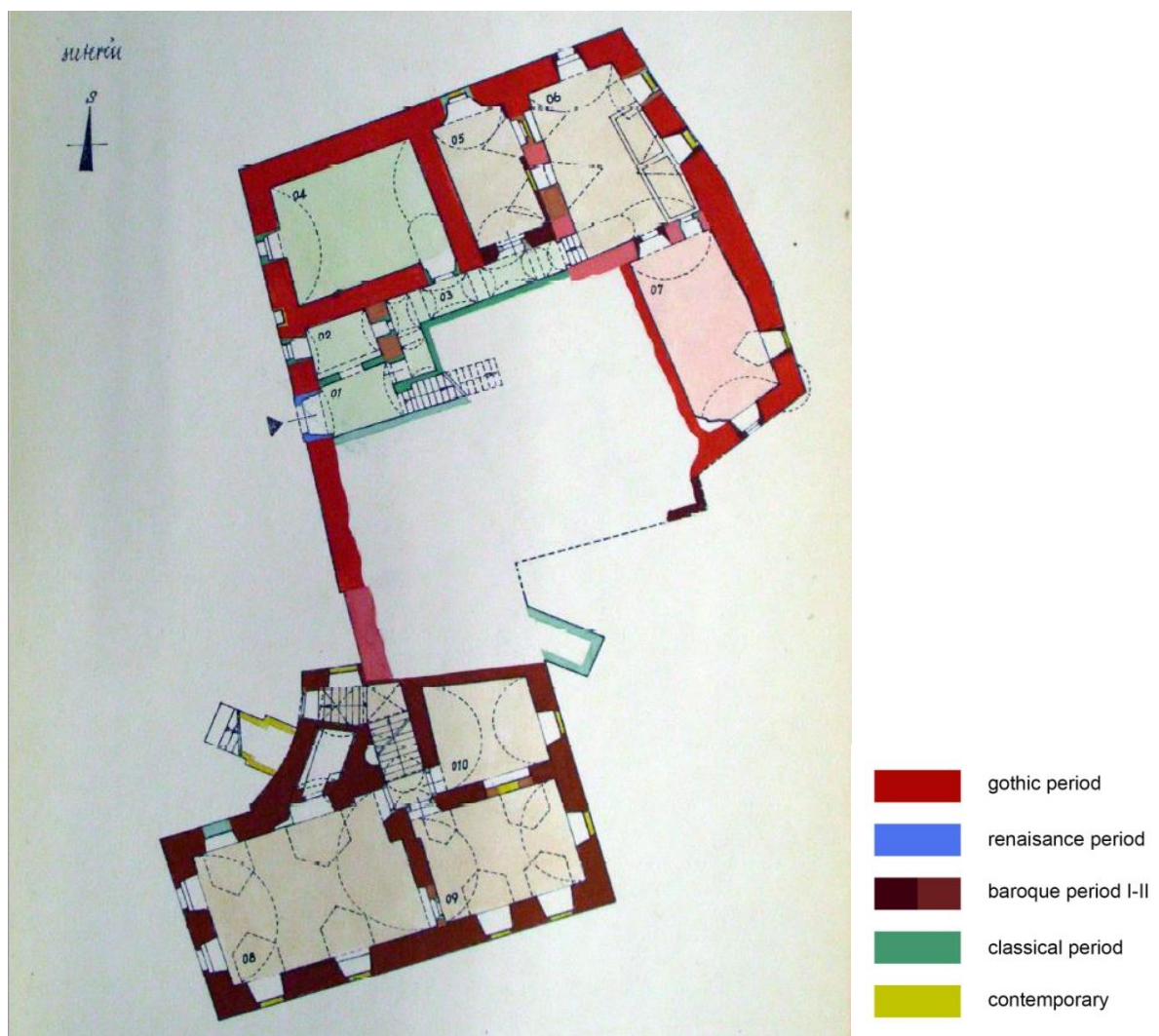


Figure 19 – Periods of construction: Basement. Source [3]

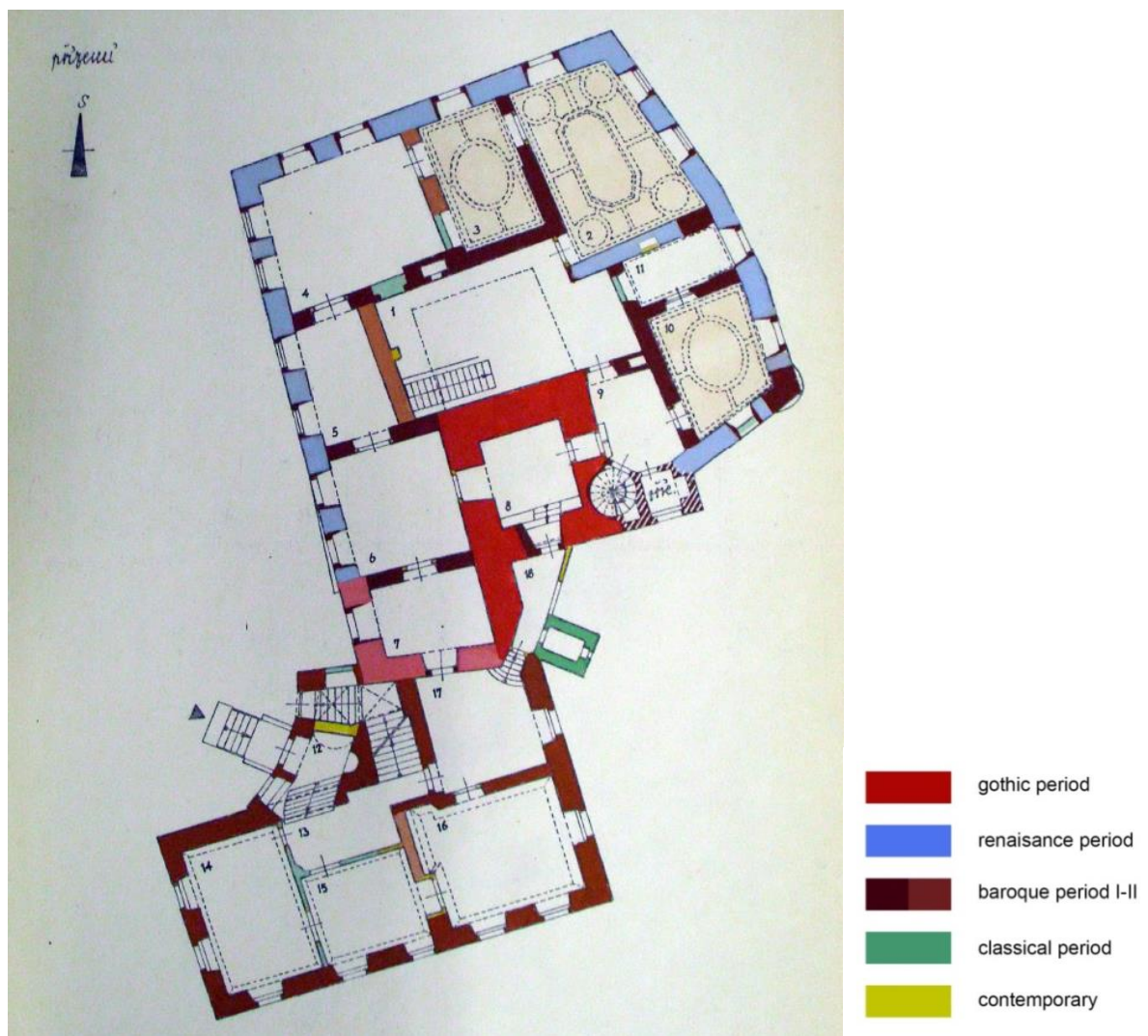


Figure 20 – Periods of construction: Ground Floor. Source [3]

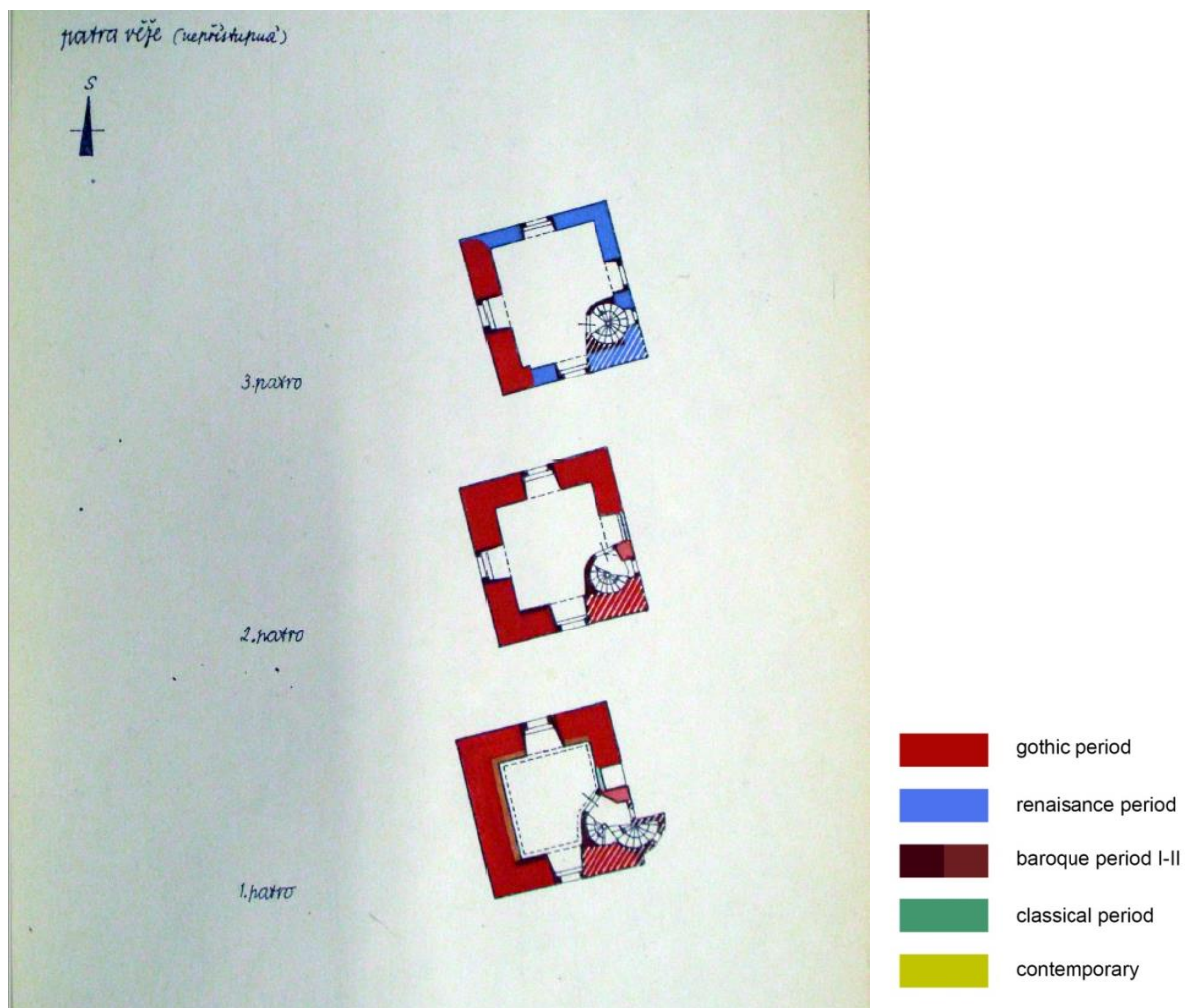


Figure 21 – Periods of construction: Tower. Source [3]

4. GEOMETRIC SURVEY

4.1. Description of the Castel

The castle has been built in three phases, including three different styles: the gothic part – built in the 15th century, the renaissance part with tower added in the early 17th century and the baroque building added during reconstruction of the older parts of the castle after the Thirty Years' War.

The castle has irregular shape and it consists of the basement, ground floor and the attic. The highest point of the castle presents the prismatic tower that together with the wings of the main buildings shapes the inner courtyard.

From the exterior, there is no clear distinction between the part built in the Gothic and the one built in the Renaissance style (in the following address as the left-hand side of the building). The addition of the castle built in the Baroque (in the following address as the right-hand side of the building) stands out from the rest of the structure with its different geometry, making it distinctive. However, the north side of the baroque building has been masterly attached to the southern wall of the renaissance building, making the structure appear as the whole.

Currently, there are two entrances to the castle. The main entrance is on the right-hand side. The entrance access is through the patio leading to the high ground floor. Positioned on the basement level on the left-hand side the alternative entrance (indicated with the red arrow in Figure 22) leads to the rooms belonging to the oldest part of the Chateau. In the past, the access to this part of the castle was through the door on the right (indicated with the green arrow in Figure 22). During some of the recent interventions, it has been walled up. The decorative stone element that frames the portal still stands.

As previously stated, the basement of the right-hand side was built in Gothic style. The basement consists of the entrance area, hallway, three larger rooms, and one smaller room. This part of the structure lies on the rock, as can be seen in Figure 23. The stairs lead to the inner courtyard on the ground floor. The whole structure has a vaulted ceiling. The windows are placed in the niches with the arches above them.

The right-hand side of the basement can be accessed only from the ground floor by the stairs. It includes three rooms. Most of the windows are walled up, so there is a limited source of light. Same as in the left-hand side, the windows are placed in the niches with the arches above them. The structure of the ceiling is vaulted. On the ground floor, the older and the newer parts continuously connected. The renaissance wings with tower are framing the quadrilateral inner courtyard. Through the inner courtyard is the second entrance to the ground floor level, from the basement of the oldest part of the castle. The tower makes the central part of the castle, and it can be accessed only from the ground floor, through the spiral staircase. The rooms on the ground floor are spacious, except one room on the right-hand side that has been modified for the different purpose (indicated with the blue square in

the Figure 25). The room's sizes vary; the largest room is the size of 66 m², while the smallest one is 4 m². The stairs that lead to the basement have the vaulted ceiling.

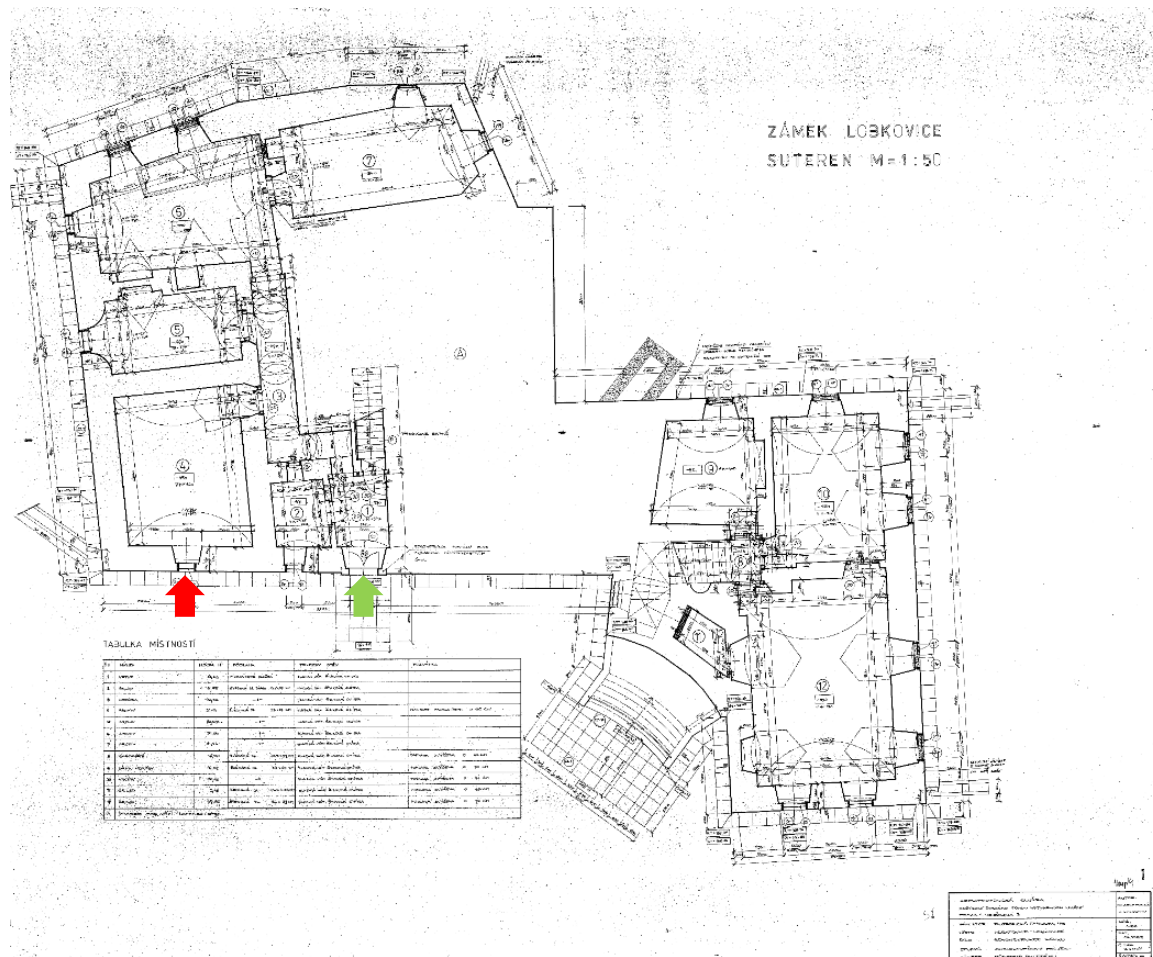


Figure 22 – Basement plan. Source [10]



Figure 23 – The oldest part of the Chateau lays on the rock

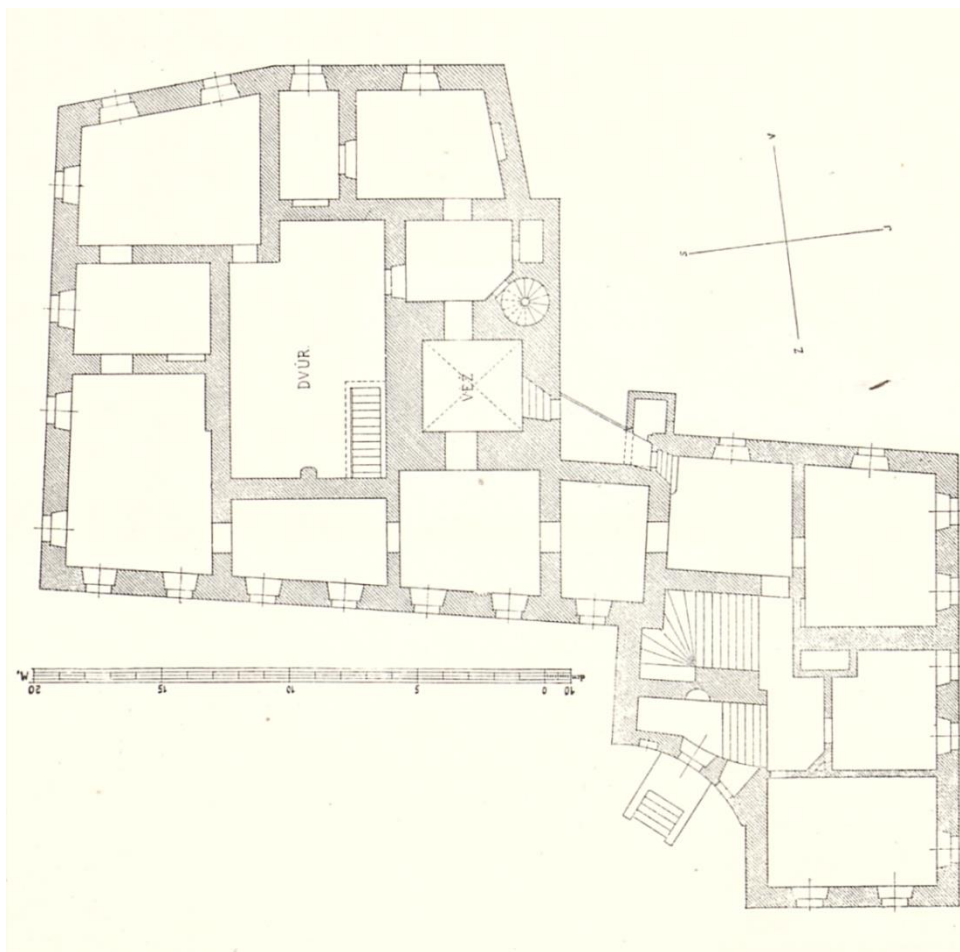


Figure 24 – Ground floor plan of the Chateau Lobkovice from 1901. [3]

Comparing the two Ground floor plans, one from 1901 (Figure 24) and one from the 1980s (Figure 25), several changes in the structure are noticeable. Since the external corridor was demolished due to a weather disaster, the entrance was walled up. Besides, there have been multiple modifications related to the positions of the openings - the existing ones were closed and the new ones opened. However, the most visible difference is in the main entrance area access on the right-hand side of the Chateau. The patio has a new appearance (Figure 27) that doesn't resemble the previous one (Figure 26).

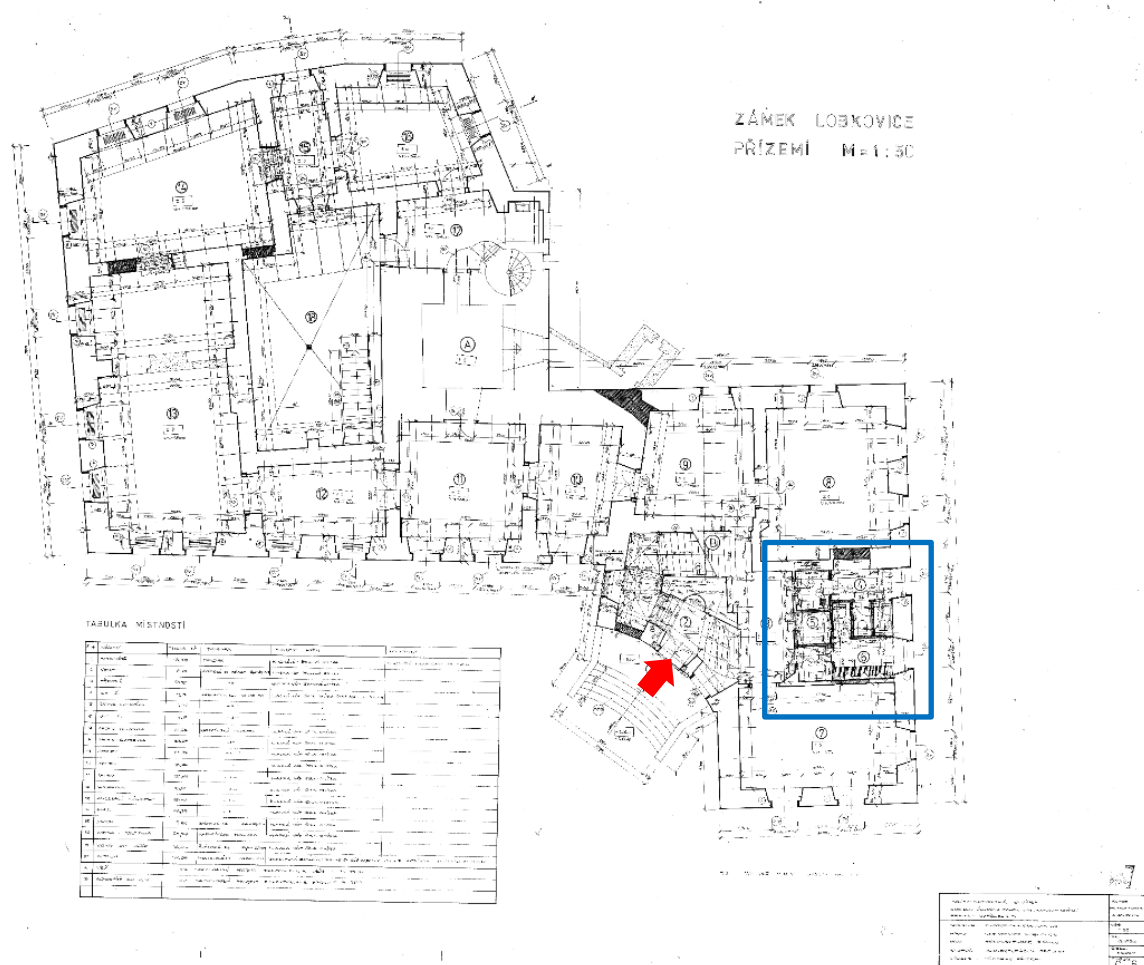


Figure 25 – Ground Floor plan. Source [10]



Figure 26 – The entrance of the right-hand side of the Chateau in 1978. Source [3]



Figure 27 – The entrance of the right-hand side of the Chateau today

The whole slab above the ground floor has been replaced during the previous interventions. The area of attic occupies the same area as the ground floor. However, due to the roof construction, the area that can be used is lesser than the one of the ground floor.

There are no plans of the attic area from the documentation from 1978. The only plan of the attic comes from the 1979 that shows the reuse of this space. Besides the space that belongs to the tower, the area of the attic is divided into two big rooms on the left-hand side and three smaller on the right-hand side. The partition walls are made of the solid brick, width 12cm. One of the rooms was planned to be adapted into sanitary area (indicated with the blue rectangle in the Figure 28), so it has been divided into six smaller spaces. The rest of the attic space was planned to serve as an archive.

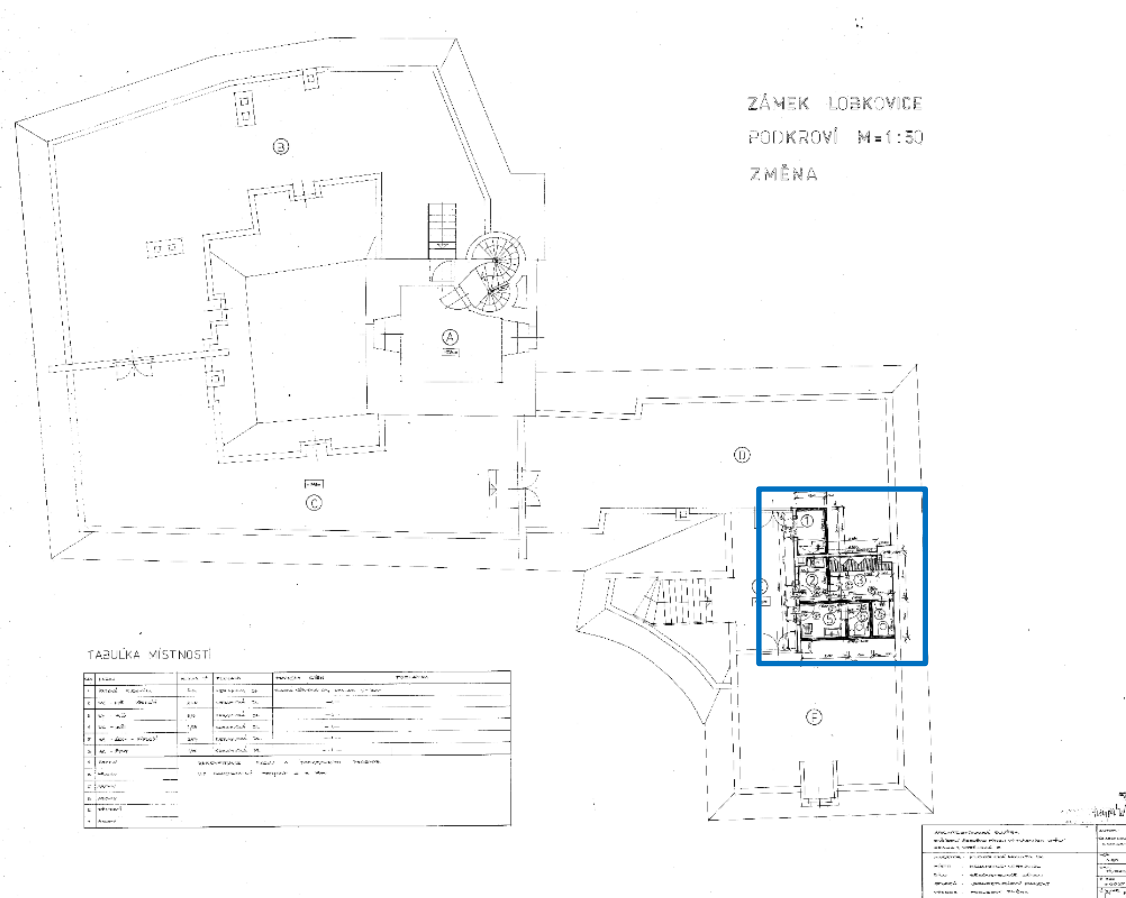


Figure 28 – Attic Floor Plan. Source [10]

4.2. Current state of the Chateau

The important phase of the research is the on-site inspection process, during which a detailed survey was conducted. The on-site inspection aims to collect information that will help us establish a clear picture of the present conditions of the Chateau Lobkovice. The site visit included the visual inspection and geometrical survey with verification of the architectural drawings. Additionally, the damage and deterioration processes were noted along with the potential causes. Based on the outcome, an adequate proposal for the conservation and revitalization of the Chateau will be compiled.

Currently, the Chateau stands empty, with most of its area inaccessible to the public. The only part of the Chateau used occasionally is the basement on the left-hand side of the castle.

The basement and the ground floor of the structure are fully accessible. Access to the attic area is only on the right-hand side of the castle. The rest of the attic is not accessible for safety reasons. Also, the tower is inaccessible, since the spiral staircase is unsafe to use.

For the purpose of the better insight in the present conditions of the structure, the Damage Map was created.

4.2.1. Exterior

The plaster in the part of the left-hand side of the Chateau has been renewed during the last intervention in 1989. Mostly, it stands in a good condition. However, the façade of the right-hand side of the castle hasn't been repaired. The plaster has fallen off in many places, so the stone masonry stands exposed.

The Renaissance portal on the left-hand side of the castle has been walled up. The new one next to it on the left has been opened and it serves to access the rooms in the basement. The main entrance of the right-hand side was made of a wooden door that is still used. Windows in the castle are also wooden, with glass infill. Some of the windows are in poor condition, with the infill missing. The decorative elements around the windows on the left-hand side were repaired or replaced with the new ones. On the contrary, the sandstone decoration around the windows and the main entrance of the right-hand side suffers a type of stone deterioration. Additionally, a lot of the sandstone elements have missing pieces.

The tower, same as the older part of chateau is repaired with the new plaster. It was during the 1977, that the part of the tower collapsed, so the intervention was needed. The plaster is painted so it represents the masonry elements. Still, the bottom part of the tower hasn't got plaster rendering at all. The roof of the tower has been fixed. The balconies of the back façade of the castle, described in the textual documentation and drawings from the 1978, do no longer exist. What is left is a wall that served as the base.

The roof of the whole castle including the tower has been replaced. The new roof is covered with red ceramic tiles. There is only a part of it in the west elevation that is cut-out. During interventions, the chimneys were left out.



Figure 29 – West elevation



Figure 30 – East elevation

4.2.2. Interior

4.2.2.1. Basement – Gothic period

The basement of the left-hand side is occasionally used by the local community for the events. The entrance is from the west elevation through the new door installed on the left side. This part of the castle is regularly maintained. The space is equipped with furniture and gets heated during the winter period. The walls are painted and the floors are covered in stone tiles. However, due to improper choice of the flooring material, damp areas can be found on the walls. Therefore, in some parts, there is a loss of rendering mortar. Also, the efflorescence occurred on one of the walls (Figure 32).



Figure 31 – Basement



Figure 32 – Salt efflorescence

4.2.2.2. Basement – Baroque period

The entrance of the Chateau's basement, built during the Baroque period, is through the main entrance on the right-hand side of the Chateau. This part of the building is currently not in use, and lacks maintenance. The paint on the walls is in a poor condition. Also, there is no flooring done. In some parts, there is a rendering mortar missing, particularly around the doors that have been replaced. The windows have been covered with planks or walled up. The piping for the heating system and radiators has been installed.

4.2.2.3. Ground floor and the attic

The adaptation of the Chateau into library depository and study, by the Faculty of Arts of Charles University in Prague was not realized. Still, some interventions were done. The whole ceiling of the ground floor got replaced. It was made in the ceramic blocks with reinforcement. Today, the ceilings are in poor condition, with the steel elements corroded, making the structure of the first floor appear unsafe.

The adaptation of the Chateau into library depository and study center required new sanitary facilities. One of the rooms in the right-hand side of the Chateau was transformed to match the requirements. The partition walls were made in brick, with the thickness of 12cm. However, the finishing layer of the walls and the doors were never added.

There is no floor finishing installed, so the piping for the heating systems can be seen. Also the radiators have been installed through the whole ground floor.

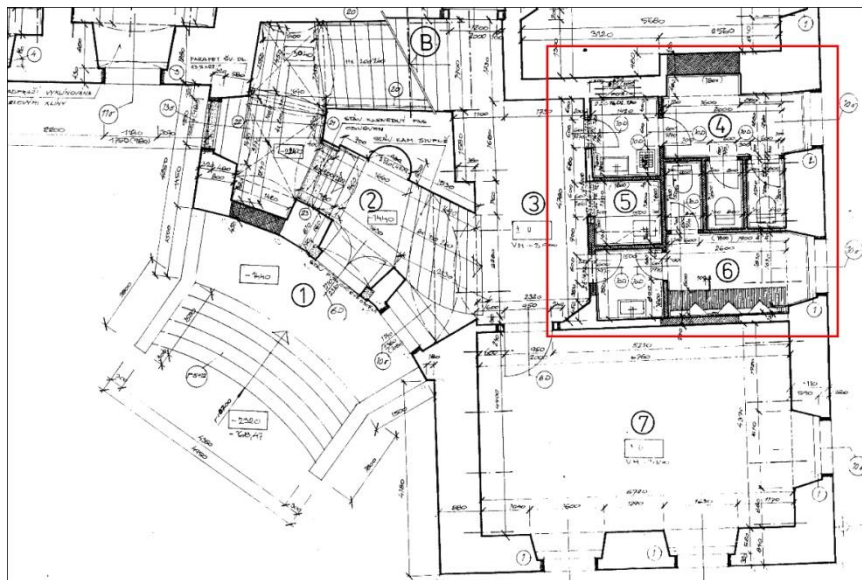


Figure 33 – Adaptations of a room in the right-hand side of the Chateau. Source [10]

4.2.2.4. Inner courtyard

The inner courtyard can be accessed in two ways. Directly from one of the rooms from the ground floor (Renaissance part), or climbing the stairs from the basement (Gothic part). The whole inner courtyard suffers from the raising damp in the walls, causing rendering mortar to detach in the lower parts of the walls. Also, due to inadequate draining system, the floor and the stairs are suffering biological colonization and vegetation to grow. In the corners of the eaves there are moist. The north wall of the inner courtyard had two window openings, now walled up. The sandstone frames of the windows are in the good condition.



Figure 34 – Inner Courtyard of the Chateau

4.2.3. Tower

The tower can be entered from the ground floor of the Renaissance part of the Castel. The steel staircase exists, though it was impossible to climb due to safety reasons. From the exterior, the tower doesn't show any damage in the upper part. The rendering mortar has been renewed during the last intervention in 1980s. However, the bottom part of the tower stands without any rendering, leaving the structure exposed to external conditions. Also, there are cracks noticed in the bottom part of the tower. The cracks appear to be structural.

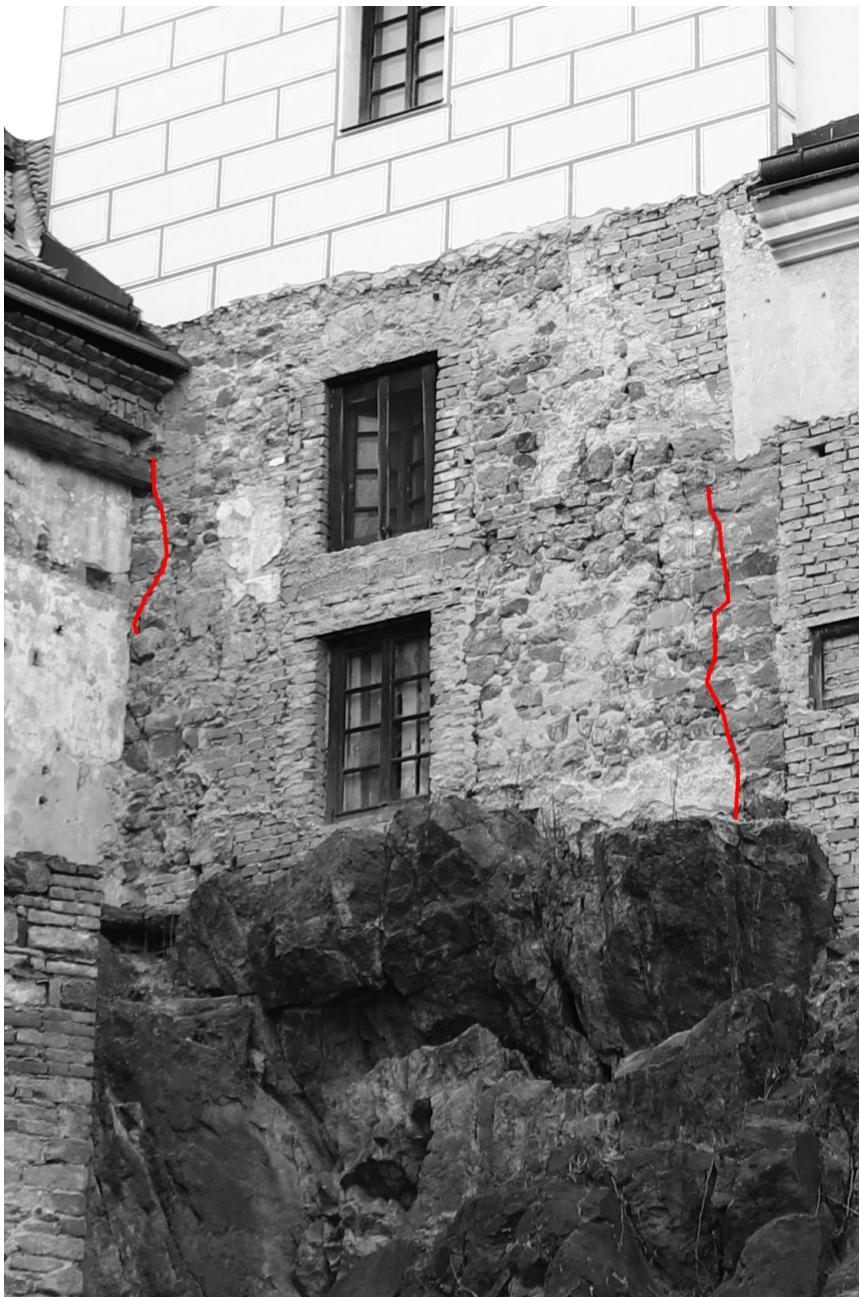


Figure 35 – Cracks in the bottom of the tower

4.3. Damage mapping

Considering the above mentioned interventions on the castle, it is noticeable that the left hand side – the coexisting renaissance and gothic part, suffers less damage than the right hand (baroque) side. Several types of damage can be described. On the baroque part, there could be clearly noticed the degradation of the rendering mortar. This type of damage is due to the lack of the maintenance for a long period. It can cause further penetration of the moist into the masonry, threatening to cause a structural damage. The bottom part of the castle suffers some biological colonization. There can be noticed different types: lichen, algae. This type of damage is caused by humidity in the areas for a long time (r).

The layer of vegetation covers the bottom part of the castle (~30cm). The vegetation keeps this area moist. Further, the humidity in the bottom of castle walls makes a good substrate for different types of biological colonization, like lichen and algae.



Figure 36 – Damage mapping: West Elevation



Figure 37 – Biological colonization on the entrance staircase



Figure 38 – Biological colonization on the entrance staircase



Figure 39 – Missing pieces and degraded sandstone decoration



Figure 40 – Deterioration of the sandstone [11]



Figure 43 – The base of the demolished external corridor



Figure 44 – Damage Mapping: South Elevation

4.4. Material characterization

4.4.1. Walls

The cross-section of the wall is not available, only on the base of what used to be an external corridor. Also, no material survey was ever done, nor was the survey after destruction.

The building dates to the early 14th century. Its structure has changed over time, therefore may consist of irregularities due to the non-homogeneity of the materials. The cause can be found in different materials, according to the available resources at that moment. The other reason is diverse construction technologies, characteristic of the particular period (r).

There is no detailed description of the structure in the textual documentation available. Therefore, the characterization of the material was based on graphical documentation and performed a visual inspection. Based on the drawings, the thickness of the structural walls in the basement and in the ground floor is about 1m, with the niches where the windows are, where the walls have a thickness about 0.4m. In the attic, the thickness of the structural wall is 0.25cm. However, the morphology of the walls is hard to determine.

Since the rendering mortar covers the masonry structure, determining the exact types of masonry was mostly impossible. However, there are missing patches of it in some areas. These areas allow us to recognize non-homogeneities in the building material due to past reconstructions and interventions.

In Figure 45 – Figure 48, we can detect the structure's non-homogeneities. Diverse types of stone are present, in irregular shapes and different sizes. The brick pieces served as the infill where the stone parts were missing. Above, the stone and brick masonry are entwined.



Figure 45 – Right-bottom part of the right-hand side of the castle



Figure 46 – Stone and brick masonry



Figure 47 – Stone and brick masonry

Since the windows and doors were replaced, implying that the current ones are not traditional, the structure that fixes them in place had to be replaced as well. The average thickness of the structural walls in the basement is about 1m. In the niches where the windows are positioned, the walls have a thickness about 0.4m. The partition walls are with the average thickness of 0.7m. The ones made in the same period as the castle built from the stone masonry. The ones added during the adaptation from the side of Charles University of Arts are made from the brick masonry with the thickness of 12cm.



Figure 48 – Brick masonry visible from the interior

As previously mentioned, the rendering mortar covers the exterior part of the castle. However, due to the annual freeze-thaw cycles, as well as the presence of the water, the mortar started to degrade and detach from the structure surface. The paint on the façade, on the right-hand side of the castle (built in the Baroque period), has been worn off due to aging and environmental factors. Also, the environmental factors affect the appearance of biological colonization.

4.4.2. Floors

According to the textual documentation, the historic floor of the attic had to be replaced due to severe damaged caused by the absence of the roof structure. The new floor of the attic was made of the “HURDIS” floor system (Figure 49). On the other hand, the structure of the ground floor is the historic one, vaulted ceiling. However, when renovated, the layers of the floor above the structural elements were removed.



Figure 49 – “HURDIS” ceiling system. Source [12]

The basement, on the left-hand side of the castle is the oldest part of it, made in the Gothic style. The rooms have the vaulted ceilings, with the arched niches above the windows. Both from the interior and the exterior the rendering mortar has been renewed, so the morphology of the walls can't be determined.



Figure 50 – Deterioration of the mortar

4.4.3. Roof

The roof is a timber structure, covered with the ceramic tiles. It consists of the rafters (10/14cm), top plate timber beam (14/14cm) and ties (8/16). However, the parapet wall is made of concrete, as it can be seen in the Figure 51.



Figure 51 – The roof structure

Since non-homogeneities of the structure have been noticed, the morphology of the structure needs to be further investigated. These non-homogeneities of the used material affect the mechanical properties of the structure. To make an accurate diagnosis of a structure, a complete description of the masonry building needs is required. Only this way the adequate basis for any future intervention can be provided. To provide sufficient information on the materials, advanced inspection techniques are necessary.

5. REVITALIZATION PLAN PROPOSAL

5.1. Change of use recommendation

5.1.1. Castle estate

Along with the revitalization of the Chateau itself, the scope of the project includes the whole area that belongs to the Castles estate. As is has been previously noted, the area consists of the ancillary facilities that, together with the castle form a courtyard of the estate. The Page 1 of the Annex gives a better insight into the Site plan proposal of the Castle grounds.

The Castle estate would be accessible through four entrances presented in the Figure 52, indicated with arrows in different colors. The main entrance is placed on the west side of the property and it is indicated with the red arrow. This is the pedestrian entrance, for the visitors. The access of the visitors by car is indicated with the purple arrow. Besides, the agricultural vehicles can access the property through the entrance indicated with the orange arrow. The function of each space is presented in Table 1.

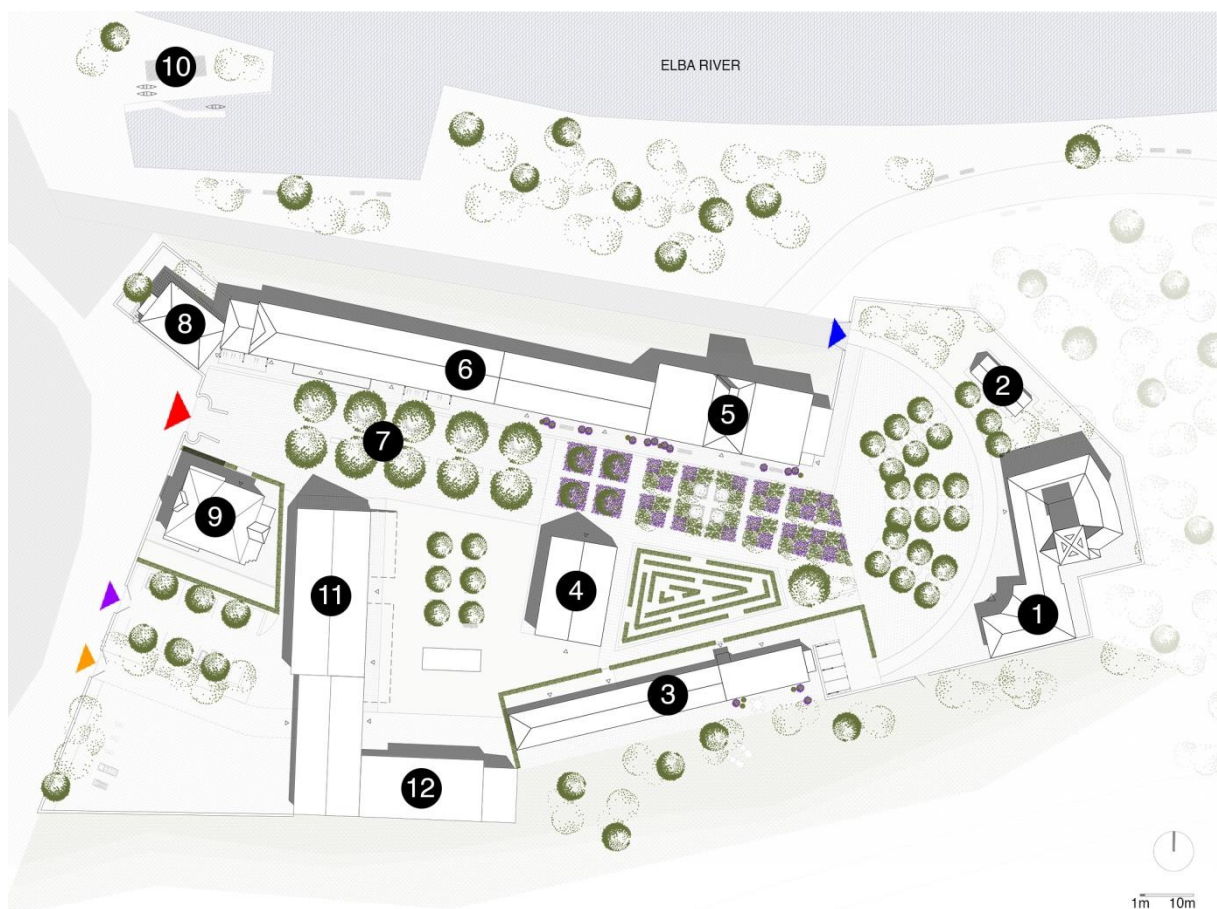


Figure 52 – Site plan of the proposal project

Table 1 – Spaces labeled in the *Site plan*

Label	Function
1	Chateau Lobkovice
2	Winter Garden
3	Private House
4	Dinning and Presentation Space
5	Restaurant and Cider Brewery
6	Accomodation for Visitors
7	Farmers' Market
8	Villa Labe
9	Villa Kastelan
10	Canoeing and Kayaking Centre
11	Carpenty Workshop
12	Wood Storage
13	Chicken and Peacock House

The estate of the Chateau of Lobkovice will have multiple purposes. Since the estate contains auxiliary facilities, their new use has to correspond with the Castle.

The Chateau would have a private area, but most of it would be public. Building No.3 will keep its use as a private area for the estate owners. It includes the small garden in front of the building and the private parking lot. Access to the parking lot of the estate is through the alternative entrance, indicated with the blue arrow in Figure 52. The idea is to reestablish the Chateau (No.1) as an event space – conference hall, with the space for the community of Lobkovice village to organize the festivities (weddings, traditional festivals, etc.). Considering the event space, accommodation for the visitors has to be provided. To fit the requirements, building No.6 will be adapted into the accommodation space. Building No.8, Villa Labe, and No.9, Villa Kastelan will keep their present use, as private accommodation.

Since the property is located near Prague, positioned in nature, making it a good space to host retreats. Some retreats organize by the Chateau personnel, such as carpentry workshops or the cider-brewing workshop. However, the possibility of a third party to create retreats would be available. The retreat workshops will take place in buildings No.6 and No.11. Building No.11 will be adapted into a space for the Carpentry workshop, while building No.5 will host the cider-brewing workshop. Also, a restaurant would be placed within building No.5. Building No.4 will be used as the space for open-air presentations, and lectures in the scope of the workshops, as well as the dining area. Additionally, the retreat participants will have an option to volunteer in the everyday activities of the estate. The equipment for Kayaking and Canoeing (building No.10) on the Elba river will be available for the retreat participants, as well.

The farmers market will be placed in front of Building No.6. Here, the locals will have a possibility to present their products, not only agricultural, dairy or meat but also their handicrafts and other manufactured products. They will actively participate in presenting their products during the festivals and manifestations that would be organized within the castle estate. This way, the community will benefit and would be brought closer together.

There are two additional entrances to the parking lots, one for the visitors that arrive by car (indicated with the purple arrow), and the other for the agricultural vehicles (indicated with the orange arrow).

The garden that stretches parallelly with building No.5 consists of fountains combined with greenery, mostly lavenders and deciduous trees that provide shading during the summer months. The elements of the gardens implemented are inspired by the examples shown in Figure 53 . The gardens are In addition to the garden there is a green maze. Also, in front of the Chateau, there is a set of 3 fountains in 3 rows positioned radially along with the marquise. The fountains are followed by a set of trees on both of their side.

On the left-hand side of the castle, there is a winter garden, indicated as building No.2. Figure 54 presents the recommended design of the winter garden.



Figure 53 – Garden design recommendation. Source [13]



Figure 54 – Winter Garden recommendation. Source [14]

5.1.2. Chateau Lobkovice

The left-hand side of the basement is currently used by the community of the Lobkovice village. The space is equipped with the furniture – tables and chairs, as well as the furnace. To preserve the relation of the community with the Chateau, this space will remain in the function of the event space for the community needs. It will be adapted to host various events such as weddings or cultural manifestations or, commemorating tradition. This space includes a lobby area, two multipurpose rooms and a wine storage.



Figure 55 – Basement: future use recommendation ¹

The new main entrance to the Chateau is indicated by the dark green arrow in the Figure 44. It leads to the stairs providing the access to the inner courtyard. The alternative entrance is indicated with the light green arrow. Currently, this entrance is walled up, so the “reopening” of this entrance is required. This way allows the access directly to the lobby. From the lobby, through the hallway, two dining rooms, a larger one and a smaller one, are accessible. The wine storage can be accessed only through the larger dining room.

¹ The larger scale drawing of the Basement Floor Plan with the indicated function of each room is in the Annex.

The right-hand side would be adapted into Family Chapel. The Chapel is accessible through stairs from the Ground floor of the Chateau. Since the Chapel belongs to the private area of the Chateau, with the owners' allowance, it can be accustomed for the public weddings ceremonies.

The ground floor is divided into two main parts - the private on the right-hand side and the part open for public on the left-hand side of the Chateau (Figure 45). The right-hand side of the part is adapted to match the requirements of the apartment for a member of the family. The access is through the patio of the main entrance. It consists of the master bedroom, living room with the dining area, kitchen, bathroom, guest bathroom and the service room. The left-hand side of the Chateau will serve as a congress center. Since the main entrance of the Chateau belongs to the private area of it, the only access to this area is through the entrance on the Basement level. Further, the stairs lead to the inner courtyard. From the inner courtyard multiple rooms can be accessed, allowing circular communication. Besides the lobby and the congress hall, the space is equipped with sanitary facilities and the kitchenette. For the purpose of the sanitary facilities, larger intervention is required. The access to the Attic is from through the tower (indicated with the yellow arrow). However, since there is no existing vertical communication, there is a demand for a staircase structure to be designed. The communication would include an elevator as well.



Figure 56 – Ground floor: future use recommendation²

² The larger scale drawing of the Ground Floor Plan with the indicated function of each room is in the Annex.



Figure 58 – Display cases recommendation: Modular Display Case System - Zone Display Cases. Source [15]

5.3. Structural recommendation

5.3.1. Base conditions

The visual inspection results have shown that, even though the appearance of the Chateau from the aesthetical point of view appears discouraging, the structure doesn't show any severe structural problems. However, some structural issues have to be monitored. To achieve base conditions, necessary for future use, the appropriate interventions are required.

The biggest issue in the Chateau is the rising damp in the basement level, particularly in the oldest, Gothic side of the Chateau. These issues are the result of the poor ventilation system, as well as the inappropriate choice of material for floor construction. The concrete floor prevents moisture evaporation into the air, which causes the rising dampness in the walls. The rising dampness in the walls is the main cause of the detachment of the plaster as well as the appearance of the salts on their surface (efflorescence). To solve the humidity, an appropriate ventilation system should be introduced. For instance, "IGLU" is the ventilated under-floor cavities for civil and industrial buildings that are being built new or reconstructed. This system allows for controlling humidity and temperature. The "IGLU" system is modular, placed side by side in sequence to a predefined direction. On the top of the created self-supporting created platform, the concrete layer is cast. The simple piping system is placed in the cavity area below, allowing connection with the outside. This way, the natural airflow that crosses the cavity and eliminates moisture is created [16].

The reinforced concrete slab is cast on top of the infill layer on top of the vault. The infill layer provides a flat separated for the slab and the finishing. The infill is made from the foam glass that provides thermal insulation as well. The hydro-isolation membrane is placed between the concrete slabs from the infill. The finishing layer of the floor is parquet, placed on the layer of glue.



Figure 59 – IGLU' System. Source [16]

When the problem of humidity is solved and the dry environment secured, the deteriorated wall and ceiling rendering mortar should be replaced. First, all the damaged areas should be mechanically removed and properly cleaned. Then, the joints should be refilled with lime-based mortar. All walls without the previous rendering should be rendered in a lime-based mortar and painted in white color.

In case there are hidden cracks in the mortar joints under the rendering, on the vaulted ceiling, the joints have to be cleaned carefully, drenched and the new mortar joints applied. However, if the gap between two units is too large, the wedges have to be input between the units. This way the stability between the units will be provided.

The structure of the Attic is the "HURDIS" ceiling. The aforementioned type of ceiling consists of hollow ceramic blocks supported by the IPE steel profiles. In this case, the ceiling has to be further inspected. In case there are any corroded IPE steel beams or damaged ceramic blocks, their replacement is required.

The windows are in a poor condition. A lot of them are missing the glass infill, or the framing has weathered. Therefore, they should be replaced with the new ones. Even though the windows that are currently present are not traditional, still the new ones should resemble them. The window suggestion as in the Figure X and to be double glazed, to provide good insulation properties.

The portal on the left-hand side of the Chateau should be re-opened.

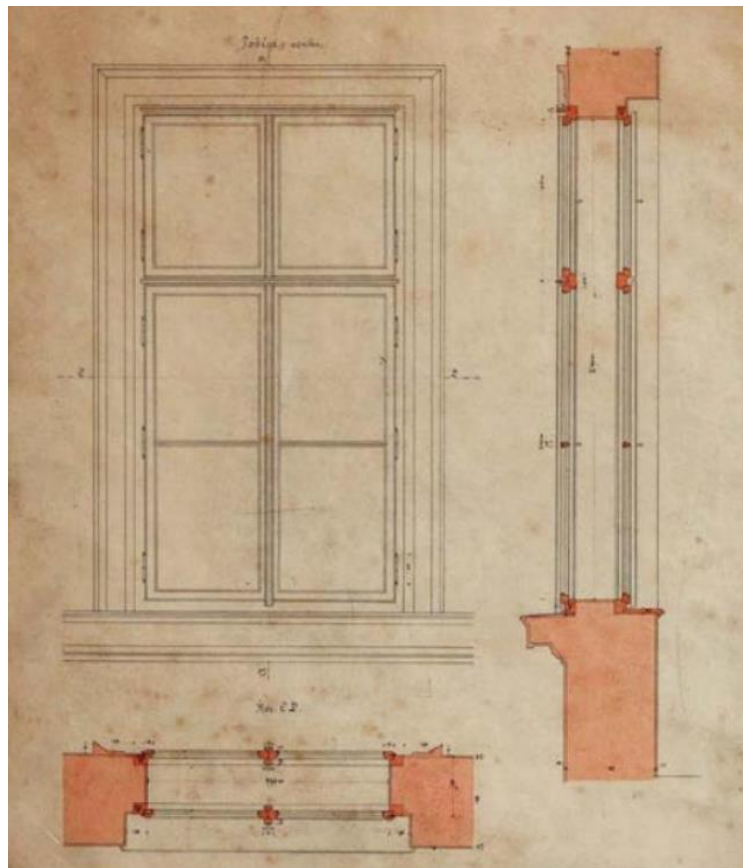


Figure 60 – Window reference. Source [17]

5.3.2. Implementation of the membrane structure

Since the inner courtyard will serve as the entrance zone, a covering that will protect it from the precipitation will be needed. For this purpose, the membrane structure has been designed. The membrane is attached to the roof structure, since its eaves crates a rectangular shape. The structure is inclined. The drainage system is integrated in the mast of the membrane, where it further goes into the drainage system of the inner courtyard. The membrane was designed using the “FORMFINDER” software [18]. In its plane the dimensions of the membrane are roughly 5x6m, while the height is 1.5m or 5.1 with the mast (Figure 63).

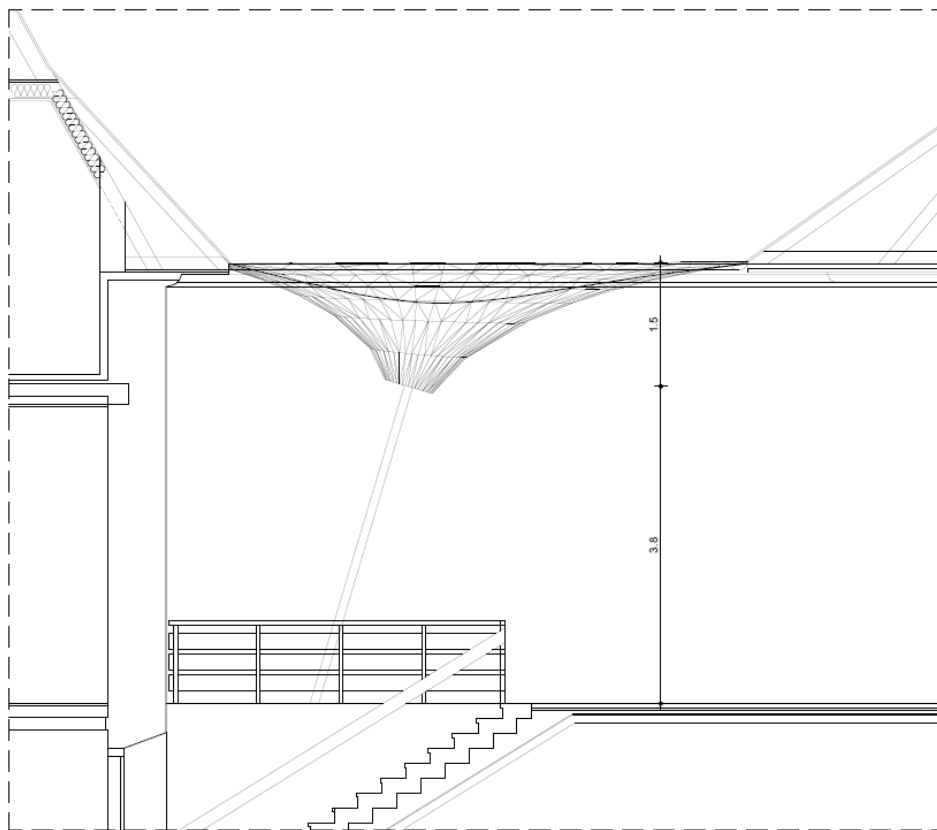


Figure 61 – Membrane structure: section

6. MAINTENANCE

6.1. Base conditions

To develop a maintenance plan and agreement on the base condition of the Chateau has to be established. To fulfill the expectations of the maintenance plan tasks, the base conditions should be straightforwardly described. The complete documentation on the base conditions has to be available, including the written guidelines as well as the visual examples, such as photographs and drawings. The description of the state of each element (original elements and additions) has to be clearly outlined. After completion of the maintenance plan tasks, the entire intervention should be documented. With each full intervention, the structure state improves. Therefore, the base conditions have to be reevaluated.

In case of a change of use, the new base conditions have to be determined. Nevertheless, the base condition should consider the following:

- Walls: paint, rendering mortar, state of the unites and mortar joints;
- Floors: finishing layers state
- Roof: leakage prevention
- Carpentry: doors and windows - both frames and infill
- Prevention of degradation of the stone elements around the portal and the windows
- Castle grounds state: regulation of vegetation, control over biological colonization

The materials and the building technique should be according to the traditional ones, i.e. the mortar used should be lime-based and the carpentry should be hand-crafted. Also, the tools used should comply with the traditionally used ones. The craftsmen must know traditional techniques, so the conservation would be adequate.

6.2. Maintenance plan

A regular maintenance plan schedule should be developed to maintain the set base conditions. This way the potential difficult and costly interventions would be prevented. Besides the regular and mid-term conservation works, it should also cover monitoring and testing. Some of the maintenance activities like grass cutting and cleaning should be more frequent, while activities such as wall painting, and roof inspection should be done periodically.

Overall, the maintenance recommendations are:

a) Regular:

- Vegetation Removal
- Grass cutting
- Surface cleaning

b) Mid-term:

- Wall painting
- Inspection of the roof
- Carpentry painting
- Repair/replacement of lost material
- Biological colonization removal

c) Monitoring

- Crack development and growth on the Tower
- Humidity levels in the basements area

7. CONCLUSION

The Chateau Lobkovice has a long history and presents a landmark for the people of the Lobkovice village. Even though it suffered a lot of changes - destructions, repairs, and adaptations, the Castle still stands. Despite the neglected appearance of the castle, its structure doesn't show any severely structural problems. However, further, the structure evaluation should be performed.

With the revitalization of the Chateau it will become the new center for the event, formal and informal gatherings. Through the exhibitions in the Museum of Writings, people will get a chance to know more about the history of the people of the Czech Republic and its significant people. The accommodation space will let visitors to stay at the Chateau estate for a longer period and enjoy the charms of this region.

The regular maintenance and the proper care will allow the Castle an opportunity to continue its subsistence. By achieving the base conditions and through further use, the Castle will continue to live. Along with the community of the village, Lobkovice would be brought closer together. A proper space to cherish the culture, through traditional events would be created. With the continuous use of the Chateau, as well as of the buildings that belong to the estate, the maintenance can be provided regularly. Overall, with the revitalization and maintenance, the Chateau will become a usable and well-integrated space into the community and its culture.

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ANNEX