Visualising a phantom: 3D-reconstruction, architectural survey and modern urbanistic valorisation of Schloss Neugebäude, Vienna

Dominik MASCHEK / Michael SCHNEYDER / Marcel TSCHANNERL
Liv’in’ past (part of Kunst & Kultur – Verein zur Förderung kultureller Aktivitäten)

Abstract
Based on conventional architectural analysis and archaeological documentation work, a new 3D-reconstruction of Schloss Neugebäude (Vienna) with its vast gardens and surrounding dwellings has been elaborated from 2009 to 2010 by “Liv’in’ past”. However, by showing the first planning stage of Maximilian II and his architects this model is trying to evoke some kind of a historical phantom actually never to be accomplished. Thus, ample historical research had to close the gaps in the archaeological record, shedding light on fundamental questions of architectural history. By using analogies from 16th century Italy, France and Bohemia, the actually unfinished core of the representative southern façade, an impressing ensemble of columns and vaulted arcades, was tentatively reconstructed and linked to a specific fashion of Late Renaissance architectural design. In the same manner, the original shape and subsequent historical development of the roofing was convincingly explained for the first time. Regarding the large gardens and hunting facilities, compelling new evidence could be gathered in combination with the results of the preceding 3D-modeling, allowing for further complex interpretation of Austrian architecture in the late 16th century.

Keywords: virtual reconstruction, 3D-modeling, heritage, urban development

Fig. 1 – Engraving by J. A. Delsenbach, 1715.
Introduction

This paper tries to deal with the question of how an archaeological and architectural survey, finally amounting to a three-dimensional virtual model, may help us to gain benefits not only for a single historical site, but also for its urban context and the people living in such areas. Apart from objects in the very centre of cities, many historical buildings were originally erected in an open and pure natural environment which, over the course of centuries, quite often was turned into housing or industrial areas and thus covered with buildings of different style, size and purpose of use. Therefore, “Urban Archaeology” often has to deal with monumental sites of an originary rural character which nowadays are often surrounded or even partly covered by more recent structures of municipal outfit. The focus of our study, Schloss Neugebäude in Vienna, is considered to be the most important Late Renaissance castle north of the Alps. Nevertheless, its fate has been rather lamentable until today. More than 400 years since the end of the initial building activities, the City of Vienna is taking up its responsibility for this worthy heritage in its property by trying to start a comprehensive revitalisation initiative. This commendable action was immediately confronted by two main questions: What could be an optimal usage for this huge complex? How should rules and conventions of modern heritage management be applied to a monument which actually never has been completed, lacking any documentation of the originally intended design by the commissioner and his architect?

The first answer was easy to be found: This important cultural site should in any case be accessible to the public and thus become a tourist attraction with other functions to be added. However, the second question proved to be more complex due to the difficult definition of valid construction or reconstruction principles. Following a suggestion of the architect Manfred Wehdorn, a decision was made to create a convincing model of the site’s perfection, as it was most probably originally intended by Emperor Maximilian II, the commissioner, and his unknown architect. At this stage, the elaboration of a most plausible 3D-model, based on the serious assessment of all sources available, was assigned to the authors of this paper. As a first task it was necessary to define clear margins within a serious assumption of how the different parts of the castle and the rest of the site were most probably intended to be shaped by their creators. Only then can one start a fruitful discussion about the options and permissions for renovation, reconstruction or modern architectural interventions. Therefore, we would like to show on which conditions and assumptions our work relied, how we gathered all the information needed for a scientifically sound 3D-model, and how we could justify our work as an “idealised” but nevertheless most plausible picture of an important historical site.

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1 This work was conducted by the visualisation team “Livin’ past” (D. Maschek, M. Schneyder, M. Tschannerl). The project was commissioned by the “Stadt Wien”, the city authorities of Vienna, to build an idealized model of Schloss Neugebäude as Maximilian II planned it until his death in 1576. This model will be part of an urban development program in the modern area surrounding the castle.


**Approaching the phantom: Historical and architectural analysis of Schloss Neugebäude**

Schloss Neugebäude is located in the southeast of Vienna. The site has not earned a proper amount of appreciation over a long period of time due to its extraordinary and partly tragic history.

Initially planned as a noble hunting lodge and summer residence by the emperor Maximilian II, the building process after his death was continued only half heartedly by his son Rudolf II. Finally abandoned in the 17th century and partly demolished by Maria Theresia in the 18th century, the castle was used as a powder depot during the 19th century. In the early 1920ies it was connected to the crematory of the Zentralfriedhof. Thus, Schloss Neugebäude in Vienna’s 11th district never got beyond the status of an architectural phantom. Instead, it became a fragment of great hopes and ambitions, a testimonial of disrepair as well as a shadow of great Renaissance architecture north of the Alps (Fig.2).

![Fig. 2 – The Neugebäude in its present state](image)

Over the last decades several different attempts were made to analyze the beginning and purpose of the original concept of the castle. In the 1980ies, excavations undertaken by the Stadtarchäologie Wien directed by Ortolf Harl shed some light on the sequence of building phases and the original design of the gardens. As opposed to the previous scholarly concentration on 19th century plans, historical paintings and the analysis of the present state, those excavations for the first time provided valuable information on building activities, which were intended in Maximilian’s first concept, but had never been carried out. Furthermore, the floor plans of some parts of the building and its surroundings could finally be clarified. Additionally, several art-historical publications have exhaustively dealt with prototypes of the castle and tried to identify its architect. Historical documents point to the participation of the Mantovan Jacopo Strada in planning and design. Furthermore, various architectonical details indicate the work of the Roman architect Giovanni Sallustio Peruzzi, son of the famous Baldassare Peruzzi. Peruzzi was in charge of some important papal building projects like Castel Sant’Angelo and St. Peter’s, before Maximilian II called him to Vienna in 1567.

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Summing up the evidence, this first phase of research has generated two main conclusions in terms of Neugebäude’s building history. They are of major importance for the presented visualisation: First of all there is an essential difference between Maximilian’s original plan and the way the actual building was executed. Neither the castle, nor its gardens were finished as planned. Changes in planning and building can already be detected in Maximilian’s lifetime, but they become even more evident after his death in 1576, when his son Rudolf II continued the project. The Neugebäude therefore provides a variety of possible visualisations, which do not wear out by clearly separated, historically evident building phases or stages⁸.

Secondly, the castle’s later history, mainly between the 18th and 20th century, led to the fact that only a minor part of its original appearance as in the time of Rudolf II and even less so under Maximilian II can still be experienced. The magnificent gardens as well as the impressive pillar galleries and interior rooms were rebuilt, bereaved of their building elements or simply left to decay.

So the main purpose of the new 3D-visualisation concept was to recreate an image of the originally intended look of the castle as accurately as possible by the means of regional surveys, archaeological studies, architectonical observations and analogies (Fig.3). The visualisation is intended to be seen as a scientific test arrangement, which makes it possible to approach an assumed historic truth by checking different hypotheses. Finally, it is all about a most precise illustration of an architectural phantom. As a second step, the scientific cognition can be used as a basis for further discussion, which deals with questions of monument conservation and concepts of revitalisation. Last but not least, this listed building can now be analysed in its urbanistic context in order to work out concepts for evaluating and improving the infrastructure for visitors, thereby increasing the attractiveness of the whole area.

Fig. 3 – Aerial view of the reconstructed area from northeast

The main building consists of two side-galleries – orientated east to west – and a central structure which shows articulated risalites to the north and south (Fig.4). Those risalites are also called middle-risalites due to their central location in the composition of the façade. The northern part of the core, which is enclosed by the galleries, is still mainly original and intact, as wall structures and vaults unambiguously show.

The risalite’s part orientated to the south was only built in its fundaments but never finished, as the excavations of the 1980ies could prove. This is probably one of the already mentioned changes and reductions of the original design realized by Rudolf II. In order to reconstruct the originally planned prospect of the southern risalite we can, apart from looking at the foundations, only use analogies from Late Renaissance and Early Baroque architecture. The foundations of the southern risalite show a tripartite layout with a main hall and two minor halls on each side of it. This layout can also be traced in the core building. The architectural structure of the southern risalite obviously adds to a huge loggia with a wide opening in its centre, framed by two narrow openings and another two identical openings on its sides. Further projections of the fundament show that these openings in the façade were framed by massive resting bars put in front. This indicates the positioning of columns. The dimension of the projections allows the placing of double columns in the corners of the risalite and the outer edges of the middle loggia in the style of the Loggia di Davide of Palazzo del Te in Mantua⁹. The central opening, which can be reconstructed as a monumental arcade due to the still visible edges of the vaulting, was framed by two single columns (Fig.5).

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⁹ Cf. Markschies 2003, 72-73; Bazzotti (ed.) 2004, 51-55; Lippmann 2006-07, 144-145 Fig. 6; 147. 152. 155; Frommel 2009, 156-157.
This kind of design was quite popular for monumental loggias and columned façades in Late Renaissance and Manneristic Italian architecture\textsuperscript{10}. The layout and especially the covering of the inner parts of the middle-risalite are also based on the foundations and the connection points of the preserved façade of the core building with reasonable solutions for the entrance, using hypothetical patterns of access and departure. You could best compare this to Raffael’s and Antonio di Sangallo’s loggia of the Villa Madama in Rome. This loggia, orientated towards the hippodrome, shows a ground plan conceptually similar to the foundations excavated in Schloss Neugebäude. The front elevation of the Villa Madama consists of a central room, opening north through a large vault, which is set apart from its flanking rooms by a shallow dome. The adjoining rooms are covered by groined vaults\textsuperscript{11}. In the case of Neugebäude this three-part loggia is flanked by two more spatiuous units on its east and west side, which are also vaulted. The fact that these two rooms are directly corresponding with two doorways in the basement can be seen as an indication for staircases on both sides leading up into the middle loggia. As engravings from the 17\textsuperscript{th} and 18\textsuperscript{th} century show the driveway, the main access to the castle led in from the south\textsuperscript{12}. This means that the middle-risalite in its never completed form was planned as a magnificent and representative main entrance, giving access to the halls on the ground floor, the crypto porticoes and the corridors in the basement (Fig.6).

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{fig6}
\caption{Reconstructed southern risalite}
\end{figure}

\textsuperscript{10} Cf. Lietzmann 1987, 183-187; Holzschuh 1989; Markschie 2003, 60-61, 80-81; Bazzotti (ed.) 2004, 30-32; Lippmann 2006-07, 152-161; Coffin 2008, 122 Fig. 6; Frommel 2009, 144 Fig. 165; 152 Fig. 176; 192 Fig. 229; 206 Fig. 247.

\textsuperscript{11} On the design of the Villa Madama and the loggia see Frommel 1984, 311-322, 343, 352; Coffin 1991, 61-63 Fig. 45; Merz 2001, 91-92 Fig. 86; Frommel 2009, 144-148. Cf. Holzschuh 1989, 368; Seebach – Schreiber 1989, 374-376; Coffin 2008, 113 Fig. 28.

\textsuperscript{12} Cf. Lietzmann 1987, 39 Fig. 8; 40 Fig. 9; Knöbl 1988, 36. 50-51.
Reconstructing the northern side of the castle was much easier thanks to the fact that historical images without exception show the northern façade. This might be put down to the fact, as described above, that the southern part of the middle-risalite was never fully realized. In marked contrast to the middle-risalite, the east to west oriented column galleries must have nearly been finished by the time of Maximilian’s death in 1576 for they can be precisely seen in 17th century documents. Herbert Knöbl convincingly showed that major parts of these galleries were demolished to be re-used in the building of Schloss Schönbrunn and the Gloriette in the 18th century \(^{(13)}\) (Fig.7). This is mainly true for the columns, parts of the cornice, and the mouldings. Consequently, the design of the northern façade as seen in our visualisation cannot only be based on distinct historical evidence, but also on exact measurements of original building components (Fig.8). The side-risalites with the “chapel” and the “grotto” as well as the basement of the chateau together with its crypto portico could be used for the visualisation without any alteration because their architectural substance is still mainly intact \(^{(14)}\).

Dealing with the question of what the initially planned roofing should have looked like was much more complex. Historical pictures are offering different alternatives. The present covering with its pitched roofs in different heights was constructed in the 19th century, while 17th and 18th century views are showing flat roofs surrounded by balustrades (Fig.9). The chronologically most indicative visual sources consist of two paintings by the court painter Lucan van Valckenborch from 1593 (Fig.10), which are depicting Emperor Rudolf II together with his entourage in front of Schloss Neugebäude \(^{(15)}\). Both pictures show the side galleries covered with high pitched roofs, while there is an obvious gap above the middle-risalite. Valckenborch’s paintings are very accurate in terms of topography and architectonical details. In addition, the concordance of both paintings adds to the high historical probability of these depictions. Therefore it is generally believed that these images are historically correct and representative for the building as it appeared in the year 1593.

\(^{(13)}\) Knöbl 1988, 103-118.
\(^{(14)}\) For the design of the “grotto” cf. Lietzmann 1987, 47-48; Hansmann 1988, 57-61; Coffin 1991, 28-31; Barisi – Fagiolo – Madonna 2003, 114-117 Fig. 7-8.
\(^{(15)}\) A detailed study of these paintings was recently undertaken by Griemann 2008, 14-25.
However, based on the 3D-visualisation, some major problems with this widely accepted view could be addressed. Regarding the architectural and historical evidence, it is necessary to propose a new solution for the original roofing of Schloss Neugebäude. In this regard, a look at the documented building process of the galleries provides the first step towards an integrated interpretation of the data available\textsuperscript{16}. In October 1576, stone pillars for the galleries were delivered from Wilfersdorf and Sarasdorf. In 1578, others were brought in from the Leitha-mountains. In 1580, stone-masons were working on the north galleries and entrusted with finishing the pillars. This indicates that the galleries could have been finished only after Maximilian’s death. Furthermore, the fundamental changes in the blueprint of the middle-risalite show that the roofing of the risalite as seen in Valckenborch’s paintings has nothing in common with the originally intended concept. If the middle-risalite had been built in the intended way with its richly decorated façade, it would have been necessary to let it stand out in comparison to the galleries. This again would inevitably have resulted in stepped roofing.

The fact that the middle-risalite is shown without a pitched roof in 1593 indicates that the structures below, which had already been completed, were not able to carry a full-length pitched roof in the style of the galleries. Even more documents support this interpretation. For example, the painters Bartholomäus Spranger and Hans Mont were working in a "torre del fabrica nuova fuori di Vienna"\textsuperscript{17}. This "tower" has convincingly been identified by Hilde Lietzmann as the risalite on the western side of the castle\textsuperscript{18}. So this part must have been roofed by 1575. Another painter, Giulio Licinio, is reported to have been working in the middle room of a "torre del pichetho"\textsuperscript{19}. As the middle-risalite of the main building is the only part with three rooms arranged next to each other, this report must refer to painting works in this section\textsuperscript{20}. All this evidence suggests that in 1581, five years after Maximilian’s death, a temporary roofing of the middle-risalite must have existed. At the same time we also know from the archaeological record that this risalite was never finished in its planned form. Thus, the originally intended roofing concept could not be carried out either.

\textsuperscript{16} The chronological sequence is based on Lietzmann 1987, 73-82 and Knöbl 1988, 31-34.
\textsuperscript{17} Lietzmann 1987, 76. 152-156; Knöbl 1988, 32.
\textsuperscript{18} Lietzmann 1987, 153.
\textsuperscript{19} Lietzmann 1987, 76-77. 150-152; Knöbl 1988, 34.
\textsuperscript{20} Griemann 2008, 5. 9.
This evidence leads to the conclusion that the pitched roofs as seen on Valckenborch’s paintings must have been a temporary compromise to preserve the galleries which most probably were vaulted with a rather fragile plastered wooden structure. This suggestion seems to be even more realistic if we consider Anton de Moys’ drawings of defects in the vaulting system from 1600\textsuperscript{21} (Fig.11). The middle-risalite with its brick vault, however, seems to have been covered only by a very flat makeshift roof.

![Fig. 11 – Technical drawing by A. de Moys, 1600](image)

But which kind of roofing could have been intended in Neugebäude’s original blueprint? Various documents and accounts of that time frequently mention the transport of copper\textsuperscript{22}. Thus, a roof made of this material seems plausible. The flat version proposed by Knöbl is deduced by traces of the makeshift roof, but, as the paintings of Valckenborch show, they seem to have been steep saddle roofs\textsuperscript{23}. Vaulting heights and preserved structural connections in the halls of the middle-risalite also point to the fact that in the original blueprint the roof was planned to be raised above the galleries’ roofs. Searching for comparative examples of similar Mediterranean pillar-architecture meeting a northern climate, a striking analogy can be found in the copper roof of the Belvedere located on Prague’s Hradschin (Fig.12).

![Fig. 12 – The Belvedere in Prague](image)  ![Fig. 13 – Neugebäude’s copper roof](image)

\textsuperscript{21} Lietzmann 1987, 51 Fig. 18-19; 87-88; Knöbl 1988, 49-53.
\textsuperscript{22} Lietzmann 1987, 69 n. 83-86; 72; Knöbl 1988, 31-32.
\textsuperscript{23} Cf. Lietzmann 1987, 42 Fig. 11; 88.
This monument was designed and built by Paolo della Stella between 1535 and 1563 for Kaiser Ferdinand I, Maximilian's father\(^{24}\). It was completed only five years ahead of the beginning of construction works at Schloss Neugebäude. This chronological coincidence, the similar architectural structure of the galleries, and the fact that the Habsburgs were commissioners for both buildings, are indicative of similar roofs on Neugebäude and the Hradschin Belvedere (Fig.13).

Another crucial point in the chateau’s planning were the widespread gardens, which are subdivided into a southern garden, a so called *Fasangarten*, and a northern garden\(^{25}\). The garden south of the castle was surrounded by a wall with galleries placed in front of it and four two-floored towers with a hexagonal ground plan on each corner (Fig.14). These towers, which must have been finished before Maximilian’s death according to several historical documents\(^{26}\), can be seen in different images from the 17\(^{th}\) and 18\(^{th}\) century\(^{27}\). Unfortunately, these paintings and engravings show the ground plan and the design of roofs and floors in many regards widely differing from each other. So, for the new 3D-visualisation (Fig.15) once again Lucas van Valckenborch’s paintings were used as they are the chronologically closest source. This choice is also supported by Ortolf Harl’s excavation results, which proved the hexagonal ground plan as shown in Valckenborch’s paintings.

The structure and layout of the inner ambulatory can be convincingly reconstructed with the help of Knöbl’s research\(^{28}\). This proved to be easier as several of the original columns and balustrades were reused as spolia in the castle and the so called *Roman ruin* of Schloss Schönbrunn. The entrance to the south garden was given via a door of which the location is known but not the design. Two alternative hypotheses can be offered here: Either there was a wrought iron gate, or an open arcade with the balustrade-flanked ambulatory of the gallery continued above.

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\(^{24}\) Cf. Lietzmann 1987, 177-179 Fig. 49; Knöbl 1988, 93-95; Markschies 2003, 92-93; Lippmann 2006-07, 144. 163 n. 13.

\(^{25}\) Cf. Hansmann 1988, 79-81 Fig. 53.

\(^{26}\) Lietzmann 1987, 72-73; Knöbl 1988, 32.

\(^{27}\) Lietzmann 1987, 39 Fig. 8; 40 Fig. 9; 96 Fig. 30; Hansmann 1988, 80 Fig. 53; Knöbl 1988, 50-51; Lippmann 2006-07, 146 Fig. 7-8; 150 Fig. 12.

\(^{28}\) Knöbl 1988, 114-115.
The reconstructed landscaping scheme of the southern garden follows contemporary Italian and French examples. The south garden was surrounded by the so called Fasangarten. This part of the area was bordered by a wall which is now partly integrated into the urn grove of the Zentralfriedhof, into the crematory area respectively (Fig. 16). The shape of the surrounding wall as well as of the towers and their roofs presented in our model were taken from engravings dating back to the 17th and 18th century. Their architectural substance can still be seen today but with various alterations due to the fact that they were used as powder depots in the 19th century. The planting of trees refers to the initially intended use of the area as a hunting and game reserve.

Fig. 16 – Proposal for the landscaping scheme in the southern garden

The garden on the north side of Neugebäude spreads over several terraces and could be reached through the cryptoportico. The inner structure of its surrounding wall was reconstructed in analogy to the partly preserved Fasangarten’s wall. The landscape pattern of the plantings follows an engraving by Delsenbach as the primary source, supported by the analysis of French comparative examples for the relevant period. The arrangement of the flowerbeds is based on studies by Manfred Wehdorn. This part of the garden has been revitalised and opened to the public due to a project of the Stadt Wien conducted in 2010. Further to the north there was an artificial pond functioning as a connection between the castle and the surrounding countryside, i.e. the natural environment.

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29 Cf. Hansmann 1988, 27-29, 31-33, 39-41, 51-68; Coffin 1991, 159-172, 195-214; Lazaro 1999, 40 Fig. 2-4; 44 Fig. 11; Barisi – Fagiolo – Madonna 2003, 59. 68-74 Fig. 13. 18; Coffin 2008, 103 Fig. 15; 109 Fig. 23; 114 Fig. 30; 116 Fig. 32; 165 Fig. 1; 181 Fig. 10.
30 Lietzmann 1987, 39 Fig. 8; 40 Fig. 9; 96 Fig. 30; Knöbl 1988, 50-51.
31 Cf. Hansmann 1988, 51-57; 66-67; Coffin 1991, 159-163; Boudon 1999, 162 Fig. 1-3; 163-164 Fig. 5-6; 165 Fig. 8; 168-169 Fig. 15; 170 Fig. 17; 173 Fig. 24-26; 175 Fig. 30; 177 Fig. 35; 180 Fig. 41-42; 181-182 Fig. 45-46; Guillaume 1999, 124 Fig. 2; 125-127 Fig. 4-9; 128 Fig. 11; 129 Fig. 13; 131-133 Fig. 17-19; 136 Fig. 24.
Its shape suggested in our model is in line with the main accordance in the few historic images and the archaeological discovery of a central, north-south oriented carriageway supported by wooden beams. There are no other clues to the design of the artificial pond (Fig. 17).

The looks and function of the buildings placed to the northeast of Schloss Neugebäude, the so called Löwenhof (Fig. 18), mainly have been visualised according to the shape of the remaining structures, studies on building history and archaeological surveys of earlier years\textsuperscript{32}. Only for the so called Ballspielhaus (Fig. 19) the important historical realization arose from close architectural study that this in fact could have been a sporting facility. This suggestion seems to be sound because of the similarity of its basic measurements with buildings verifiably used for the "jeu de pomme" - for example the Ballspielhaus of Maximilian II in Prague\textsuperscript{33}.

\textsuperscript{32} Lietzmann 1987, 56-58; Knöbl 1988, 64-67. 75.
\textsuperscript{33} Cf. Lietzmann 1987, 176 n. 197; Knöbl 1988, 65.
Synopsis
As frequently indicated above, the 3D-visualisation of Schloss Neugebäude, a never finished historical phantom and masterpiece of monumental Late Renaissance architecture north of the Alps, is not an aesthetic end in itself. Rather, it has not only suited to create a better understanding of fundamental problems of planning and design but also helped to give conclusive answers on several crucial questions for the first time by analysing the building in all its four dimensions, including the aspects of diachronic change, unfinished intentions and practical realities. This provides a valuable basis for further deliberations on monument preservation and heritage management concerning the area in its actual state and historical tradition. Therefore, the 3D-model of Schloss Neugebäude in its never achieved perfect condition is representing the great scientific potential of 3D-reconstructions for the work of archaeologists, preservationists, architects, town planning engineers and, finally, for the historic site in its urban context itself. So, hopefully, this new ideal reconstruction, which is based on a balanced evaluation of archaeology and building history, will contribute not only to a new scientific discussion, but furthermore will bring this ambitious masterpiece of European Renaissance architecture back to the public mind (Fig.20).

Fig. 20 – The ideal reconstruction of Schloss Neugebäude
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Pictures

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