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Ronow Castle in Trzciniec – interdisciplinary research on a medieval stronghold at the Czech-Lusatian borderland

Abstract

The Ronow Castle in Trzciniec near Bogatynia, associated with the noble Ronovci family, served as a key political and military centre in the region from the 13th to the 15th century, yet it remains poorly studied in Polish scholarly literature.

This article presents the results of interdisciplinary research conducted in 2022. The scope of the study included archival research, critical analysis of previous studies, and examination of architectural remains and landscape features. The research combined traditional historical methods with modern spatial documentation techniques (ground-based photogrammetry and airborne LiDAR scanning).

The study led to the functional division of the castle complex into four zones: the outer ward, outer fortifications, bailey, and main castle. Evidence of the site's multi-phase development was confirmed, including remnants of defensive walls, communication systems, and cellars. In addition, new architectural elements were identified, such as a two-storey building located in the uncellared part of the castle. The findings also allowed for the verification of some earlier hypotheses, particularly concerning the construction of the outer defences and the supposed existence of a transverse wall with a projecting tower beyond the bailey. However, the precise chronological stratification of the complex remains unresolved. The article highlights the need for further research, particularly through geophysical and archaeological methods, to achieve a more comprehensive reconstruction of the history and architecture of Ronow Castle.

Key words: LiDAR, Middle Ages, castellology, Upper Lusatia, Ronow castle

Introduction

Ronow Castle (German: *Rhonaw*), located in Trzciniec near Bogatynia, is a medieval stronghold situated at the intersection of today's borders of Poland, Germany, and the Czech Republic. Its historical development reflects the political transformations of Central Europe, particularly within the region of Upper Lusatia. Interdisciplinary studies of the site focus both on its architectural remains and the broader landscape context (Lehký, Sýkora 2014; Boguszewicz 2010; Chorowska 2003). The advancement of castle studies today is supported by digital, non-inva-

sive techniques that enable the creation of detailed spatial documentation (Guth 2018). This article aims to present the historical background of Ronow, outline the property's ownership changes from the 13th to the 15th century, and discuss the results of architectural surveys and analytical work carried out to date.

State of research

Research on Ronow Castle began as early as the 18th century. The first known description of the ruins was provided by Johann Benedict Carpzov in 1716 in his *Annalecta Fastorum Zittaviensium*. He noted the castle's location, the condition of the preserved walls and cellars, and the parcelling of the lower ward. His account also included documents concerning the castle's owners, although it contained errors typical of the period. These included reliance on secondary or chancery sources, many of which are unverifiable today, as well as elements of a romanticised vision of the castle's siege.

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Fig. 1. Plan of the broader surroundings of the castle:

- 1 – castle, 2 – main access road,
 - 3 – additional medieval road,
 - 4 – ravines, 5 – dam of the smaller pond,
 - 6 – ford on the Lusatian Neisse River,
 - 7 – roads ascending to the north-east,
 - 8 – well in the western valley,
 - 9 – two proposed locations of the 1399 siege camp (elaborated by P. Hlavenka, M. Sýkora, J. Vidman)
- II. 1. Plan szerszego otoczenia zamku:
- 1 – zamek, 2 – główna droga dojazdowa,
 - 3 – dodatkowa droga średniowieczna, 4 – wąwozy,
 - 5 – grobla mniejszego stawu,
 - 6 – bród na Nysie Łużyckiej,
 - 7 – drogi wznoszące się na północny wschód,
 - 8 – studnia w zachodniej dolinie,
 - 9 – dwie sugerowane lokalizacje obozu oblężniczego z 1399 r. (oprac. P. Hlavenka, M. Sýkora, J. Vidman)



Fig. 2. Plan of Ronov Castle from 1844 (source: Eschke 1844, appendix, modified by R. Biel)

- II. 2. Plan zamku Ronov z 1844 r. (źródło: Eschke 1844, załącznik, zmodyfikowany przez R. Biela)

In the 19th century, research was continued by Christian Adolf Pescheck, Friedrich Wenzel, and Karl Christian Eschke. Though occasionally anecdotal, their works provide key information on the state of the ruins at that time. Pescheck summarised available data on the castle's capture, citing earlier mentions in his footnotes, and recounted the legend of a brave defender killed by a crossbow bolt in 1399. He described a wall in the core of the castle as 12 *Ellen* and 18 *Zoll* high, a 75-*Ellen*-deep well, and a cellar in which a crossbow was supposedly discovered (Pescheck 1837, 494–497). Wenzel highlighted the importance of the well and cellar uncovered in 1794 (Wenzel 1840, 120–122). He referred to destroyed walls in the moat, a standing wall 12 *Ellen* in height, and a well hewn into the rock. The cellar, excavated in 1794, was said to have served as a prison. Wenzel also noted that a gate had stood on the western side a century earlier, although by his time only a remnant of the wall remained. The illustrations accompanying his account depict the southwestern wall section, the well, and the gatekeeper's lodge.

A particularly detailed description of the castle and its surroundings, with many new observations, was published by Karl Christian Eschke in 1844 (Eschke 1844, 269–276). According to his account, the castle was surrounded by a rampart with a wall measuring 1 to 1.5 *Ellen* in thickness, and a moat crossed by a drawbridge. The outer bailey was enclosed by perimeter walls measuring 2 to 3 *Ellen* thick. He also described a wall (Fig. 2e) separating the first bailey and descending along the western slope, terminating in a watchtower (Fig. 2f). The upper castle, laid out as a square with a truncated southern corner – where the gate was presumably located – was surrounded by a wall 12 *Ellen* and 18 *Zoll* high. Eschke also recorded a cellar featuring a channel cut into the floor, interpreted as a drain, with an opening height of 1 *Elle* and 6 *Zoll*. He noted that the second bailey contained a well concealed within a small building, while the first bailey likely housed stables (Eschke 1844, 269–276). Although he stated that these stables were marked with the letter “k” on the accompanying plan, no such marking is present (Fig. 2).

Later studies by Alfred Moschkau, Hermann Knothe, Cornelius Gurlitt, and Adolf Schorisch relied heavily on earlier works (see more in: Konczewski et al. 2022). Especially noteworthy is the work of Hermann Knothe, who, drawing mainly on written sources such as the municipal accounts of Görlitz, focused on the 1399 siege and on the estate's history and boundaries. According to Knothe, the village of Trzciniec emerged from the merger of two settlements: *Rohnau* (the original manorial farm) and *Scharre* (a former sheepfold) (Knothe 1857).

In the 20th century, Ronow and its dependent estates were briefly discussed by Josef V. Šimák (1938, 734–737). Much later, Dobroslava Menclová revisited the siege of Ronow, noting that firearms had been used during the assault. Although the first recorded use of such weapons was in 1383 during the siege of the Prague archbishop's manor in Kyje, the events at Ronow nevertheless represent one of the earliest documented instances of evolving siege technologies (Menclová 1972, 203, 204, 213, 214).

In Polish literature, the castle has been mentioned almost exclusively in the form of brief encyclopedic entries, which often reproduce simplified source information and a 1906 inventory plan (Fig. 3). These accounts typically cite the dates of the first mention (1262) and the castle's destruction (1399), without offering broader historical context or critical analysis of the sources (Guerquin 1957; 1974; Pilch 2005; Kajzer, Kołodziejski and Salm 2001).

The most significant studies of the history of the Ronow family and their connection to the castle in Trzciniec have been produced within Czech scholarship (Sovadina 1997; 1998; Urban 2003). The site is also mentioned in the work of František Gabriel, Lucie Kracíková, and Ivan Peřina, which focuses on places bearing the name Ronov. According to these authors, Ronow in Trzciniec appears in sources only in 1283 and 1310, with earlier references considered inconclusive. However, based on its architectural form and location, they suggest a 13th-century origin for the castle (Gabriel, Kracíková and Peřina 2008, 45–50).

In the last two decades, the site has been the subject of interdisciplinary research. In 2012, laser scanning of the entire hill was conducted by Paweł Rajski, enabling the creation of a detailed digital terrain model and visualisations of the walls, particularly those on the southwestern side. In 2019, Ronow Castle was included in the project *Od grodu do zamku*, an online catalogue of fortified sites in Silesia (Legut-Pintal, Rajski 2019).

The most recent contribution to Ronow research is a 2020 study by Jiří Panáček. Drawing on an extensive body of sources, Panáček focused on the genealogical and historical analysis of the Ronow family. Although his 2020 publication does not offer an architectural analysis, it includes an updated plan of the castle and provides a significant reinterpretation of the site's political role within Upper Lusatia. Notably, Panáček firmly rejected earlier, erroneous identifications of Anselm and Předbor with the Ronow near Stvoilínky in the Czech Republic (Panáček 2020, 103–118).

The Ronow family and the role of Ronow castle

The origins of the Ronow family date back to the turn of the 12th and 13th centuries. According to the *Chronicle of Dalimil* (Bláhová 1988, 248), the legendary progenitor of the family was a knight named Chval, who took part in the battle of 1179. His coat of arms, an *ostrev* (in German: *Ronne*), was said to have given rise to the name Ronow. However, the first figure for whom we have reliable source documentation is Smil, a magnate associated with the court of Přemysl Otakar I, who died sometime between 1211 and 1216 (Friedrich 1912, 113, 114). The next generation, represented by Častolov and Jindřich, was active in the administration of the Kingdom of Bohemia. From 1238 onwards, both brothers began to use the predicate “of Žitava” (Sovadina 1997, 8–10).

The Ronows' connection with Ronow Castle in Trzciniec is confirmed by a series of documents from the 1260s. A reference to Smil of Ronow in 1253 – “Smilo de Ronow” (Šebánek, Dušková, 38, 39) – likely refers to Ronow near Přibyslav, associated with the lineage descending from

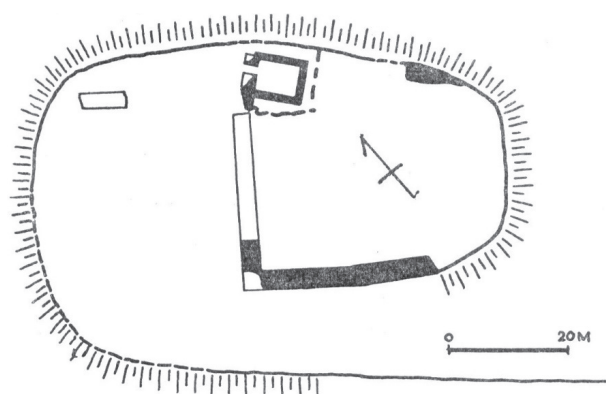


Fig. 3. Plan of Ronow Castle from 1957 (source: Guerquin 1957, 79)

Il. 3. Plan zamku Ronow z 1957 r. (źródło: Guerquin 1957, 79)

Jindřich of Žitava (Sovadina 1997, 13–15; Panáček 2020, 105). Only in 1261–1262 does the predicate “of Ronow” appear in documents related to Žitava and the Ronow discussed in this article: in 1261, it was used by Častolov – “Chastolow de Ronow”, and in 1262, a certain Conrad is mentioned as castellan – “Conradus, burchravius de Ronowe”. Conrad's affiliation with the Ronow family remains unconfirmed; his office suggests the existence of an already well-established administrative structure at the castle (Panáček 2020, 105).

After 1263, the Ronows lost control of Žitava, and by 1267 the area had passed into royal hands. Nevertheless, members of the family continued to use the predicate “of Ronow” (Panáček 2020, 109). A significant change came with a document issued by Henry VII of Luxembourg in 1310, in which the king invoking “ancient hereditary rights” granted Žitava and Ronow Castle to Jindřich of Lipá, the High Marshal of the Kingdom of Bohemia (Emler 1882, 965). However, by 1319 both Žitava and Ronow had been pledged to the Duke of Jawor, and in the following decades, the castle remained under the direct control of the crown or its representatives.

The castle returned to the hands of the Ronow family only in 1389, when King Wenceslaus IV separated it from the Žitava domain and granted it to Anselm of Ronow from the Klinštejn branch. Anselm first served as *Vogt* of Bautzen and later of both Upper and Lower Lusatia (Panáček 2020, 106). The castle was frequently visited by envoys from Žitava and Görlitz, underscoring its central role in the region's political and communication networks (Bobková et al. 2016, 201, 202). However, after 1395, the political situation changed. Anselm sided with Moravian Margrave Jošt in his conflict with the king. As a result, the castle was sold to Hynek Berka of Dubá and Hynek Hlaváč (Hille 1869, 77, 78). The new owners, who were not related to the Ronow family, used the fortress for military operations against towns in Upper Lusatia. In 1399, the castle was besieged and partially destroyed by the troops of the Lusatian League (*Oberlausitzer Sechsstädtebund, Šestiměstí*), who justified the assault by citing the garrison's robber activity (Menclová 1972, 203, 204). Contrary to the will of Wenceslaus IV, the castle was not rebuilt. By the early 15th century, documents already referred to it as a *Burgstall* – a ruin (Sedláček 1914, 133).

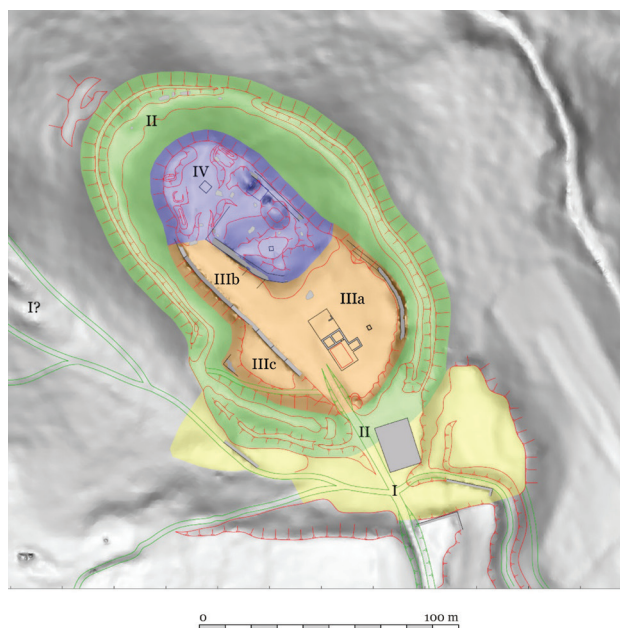


Fig. 4. Delineated functional zones of the complex:

- I – outer bailey,
 - II – outer fortifications,
 - III – lower ward with subdivisions a, b and c,
 - IV – upper castle
- (elaborated by P. Hlavenka, M. Sýkora, J. Vidman)

- II. 4. Wyróżnione strefy funkcjonalne obiektu:
- I – przedpole,
 - II – zewnętrzne fortyfikacje,
 - III – przedzamcze z wydzielonymi podstrefami: a, b i c,
 - IV – zamek
- (oprac. P. Hlavenka, M. Sýkora, J. Vidman)

Results

Based on topographic features and distinct separating elements (walls, moat, embankments), the castle complex can be divided into four spatial zones (Fig. 4). Zone I comprises the outer foreground of the castle and has the most ambiguous boundaries. It is located at the southern edge of the castle area, beyond Zone II, though its extension into the western valley below the castle remains possible. Zone II includes the outer fortifications, consisting of an embankment and a moat that surround Zones III and IV. Zone III is interpreted as the outer bailey, with clearly defined boundaries in the southeastern part of the hill. Zone IV is considered the original residential core of the castle, occupying the northwestern portion of the hilltop.

Zone I – foreground

To the south, Zone I is delineated by a steep scarp; to the north, it is bounded by a moat. Significant landscape modifications during the construction of House No. 18 in the 19th century partially obliterated the original features in this area. Part of the moat was filled in, and the associated embankment was removed, complicating the interpretation of spatial relations in this sector.

Two roads, likely of medieval origin, provided access to this zone. The main road approached from the south

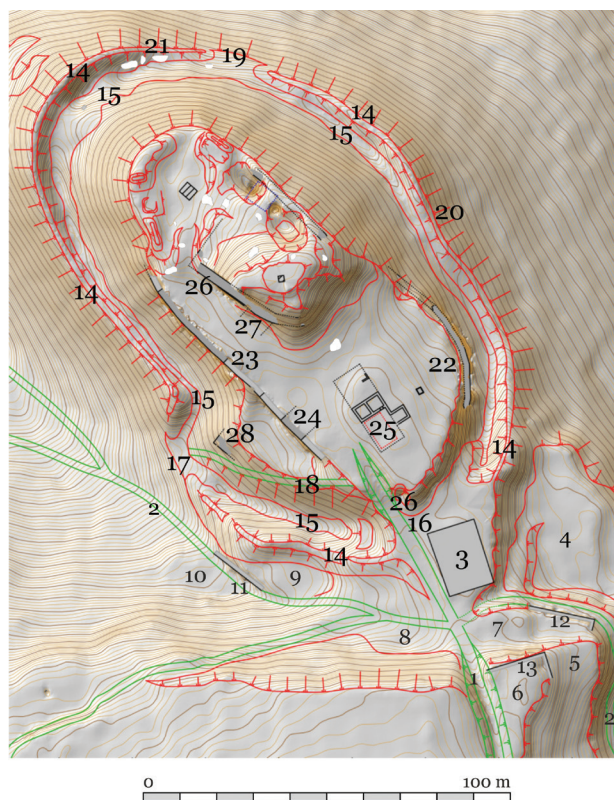


Fig. 5. Plan of the entire castle area (contour interval 25 cm):

- 1–2 – roads, 3 – House No. 18, 4–10 – early modern terraces,
 - 11–13 – segments of retaining walls, 14 – outer embankment, 15 – moat,
 - 16 – deformed moat section after the construction of the forester's house,
 - 17 – interruption of the rampart,
 - 18 – former road along the southwestern slope,
 - 19 – interruption or unfinished section of the rampart,
 - 20 – S-shaped bend of the rampart,
 - 21 – rubble of destroyed stone blocks in the moat,
 - 22 – eastern perimeter wall of Zone III,
 - 23 – southwestern wall of Zone III,
 - 24 – medieval wall interpreted as a building façade,
 - 25 – foundations of the forester's house (18th–19th c.),
 - 26 – quarry, 27 – hypothetical gatehouse,
 - 28 – corner of the perimeter wall or guard tower
- (elaborated by P. Hlavenka, M. Sýkora, J. Vidman)

- II. 5. Plan całego obszaru zamkowego (interwał warstw 25 cm):
- 1–2 – drogi, 3 – dom nr 18, 4–10 – tarasy nowożytnie,
 - 11–13 – fragmenty murów oporowych, 14 – zewnętrzny nasyp, 15 – fosa,
 - 16 – miejsce zniekształceń fosi po budowie leśniczówki,
 - 17 – przerwanie wału,
 - 18 – dawny trakt wzdłuż południowo-zachodniego zbocza,
 - 19 – przerwa lub nieukończony odcinek wału,
 - 20 – esowate wygięcie wału,
 - 21 – gruzowisko zniszczonych bloków kamiennych w fosie,
 - 22 – wschodni mur obwodowy strefy III,
 - 23 – południowo-zachodni mur strefy III,
 - 24 – średniowieczny mur interpretowany jako ściana budynku,
 - 25 – fundament leśniczówki (XVIII–XIX w.), 26 – kamieniołom,
 - 27 – hipotetyczny budynek bramny,
 - 28 – narożnik muru obwodowego lub wieży strażniczej
- (oprac. P. Hlavenka, M. Sýkora, J. Vidman)

(Fig. 5: 1), leading from the village and the former manor of Unter-Ronaw, and likely crossed the moat of Zone II via a bridge. This route is supported by field observations and analysis of terrain morphology, particularly a clearly defined cut in the slope of the Działoszyn Ridge. A second,

regionally significant road (Fig. 5: 2) ran from the south-east and descended into the western valley, likely as part of a route between Reichenau and Marienthal.

Within Zone I, to the east of House No. 18 (Fig. 5: 3), a trapezoidal terrace measuring approximately 40×37 m has been preserved (Fig. 5: 4). Additional terraces (Fig. 5: 5–10) and remnants of retaining walls (Fig. 5: 11–13) extend along the zone's western section. While their chronology remains uncertain, superficial survey suggests they may represent early modern modifications of the terrain, possibly related to the regulation of road routes. In the western valley, below the zone, a well is also visible (Fig. 1: 8).

The hill south of the castle and the eastern slope opposite it (Fig. 1: 9) have been proposed as the location of the siege camp during the 1399 assault. These locations were suggested based on topographic suitability and accessibility, though current research has yet to produce evidence confirming this hypothesis.

Zone II – outer fortifications

Zone II comprises the outer defensive structures of the castle, consisting of an external embankment (Fig. 5: 14) and a moat (Fig. 5: 15), which enclosed Zones III and IV, forming an additional defensive perimeter. The entire system takes on an approximately oval form measuring about 160×100 m. The embankments reach an elevation between 270 and 275 m a.s.l., and their course, generally continuous along the western, northern, and eastern flanks, adapts to the natural topography of the hill. On the south-eastern side, both moat and embankment rise to about 280 m a.s.l., indicating intentional adaptation of the defences to terrain features and potential threats. The most substantial segment of the embankment is preserved along the southern and southeastern portions of the site, underscoring their heightened defensive importance. In the area of the former gate (Fig. 6: 16), however, both moat and embankment were significantly altered due to the construction of the forester's house in 1794 and, later, House No. 18 (Fig. 5: 3).

On the southwestern side, the line of the embankment curves sharply; here, the moat floor drops by 3.5–4 m, and the embankment itself disappears entirely (Fig. 6: 17). This interruption is likely related to an old access road (Fig. 5: 18) leading from the valley up to Zone III via the moat. On the northern and northeastern sides, the embankment appears to be interrupted, possibly never constructed in full or eroded over time (Fig. 5: 19). In the eastern section, near the junction of Zones III and IV, the embankment follows a sinuous, S-shaped path (Fig. 5: 20), while the moat bottom rises several meters.

In the northern part of the moat, massive stone blocks were recorded (Fig. 5: 21), interpreted as collapsed material from the upper portions of the castle (Zone IV), likely resulting from deliberate demolition or destruction during the 1399 siege. No traces of foundations, mortar, or masonry rubble were found on the crest of the embankment. Although Karl Christian Eschke (1844) and later authors mention a wall 0.6–1 m in width running along the embankment, no material remains confirm its existence.

However, it is plausible that a palisade or so-called *parkan*, a type of fortification commonly used in response to the development of firearms in the late 15th century at castles in Bohemia and Silesia, once existed here; the remnants of such a structure would not be visible on the surface (Biel 2021).

Zone III – outer bailey

Zone III is interpreted as the outer bailey, whose delineation is clearly defined both by the topography and the preserved architectural remains. It occupies the southeastern portion of the castle hill and is subdivided into three distinct sections (Fig. 4). The first sub-zone, designated IIIa, comprises a courtyard measuring 52×50 m. Adjacent to its southwestern edge lies the second sub-zone, IIIb, measuring 16×40 m. Below, on the southwestern slope, sits the trapezoidal sub-zone IIIc, measuring 11×44 m. Together, these form a complex structure suggesting functional differentiation within the outer bailey.

The eastern boundary of the outer bailey is defined by a massive curtain wall preserved over a length of 34 m and up to 5.4 m in height (Fig. 5: 22). The wall runs in a markedly polygonal course, and its facing has been damaged by later erosion. Its construction consists of medium-sized stones carefully laid and interspersed with smaller fragments, displaying a tendency toward regular coursing. Five distinct layers are visible, each between 0.7 and 0.85 m in height. Three wall openings have been preserved: from left to right, the first measures 12 cm in diameter and 1.4 m in depth; the second is square, 11×11 cm, and 1.3 m deep; and the third, 23×22 cm and at least 1.53 m deep, is set at an oblique angle ($\sim 20^\circ$) relative to the wall face, likely serving as a water drain. At this point, the wall's thickness exceeds 1.5 m and is probably closer to 2 m. The mortar is a light ochre-coloured lime binder with a high content of quartz aggregate and traces of mica.

The southwestern wall (preserved length: 70 m; height up to 4.5 m) displays evidence of multi-phase construction (Figs. 5: 23; 6: 7; 8; 8a). Eschke (1844, 270) and Moschkau (1891) treated it as a monolithic defensive wall; however, the variation in mortars and construction techniques confirms the existence of at least two building phases. In the medieval walls B and F (Fig. 6), a light ochre lime mortar with up to 70% washed quartz aggregate (grain size 3 mm to 1.5 cm) and a minor presence of mica was used. In contrast, the early modern walls feature a similar light ochre lime binder with a higher admixture of river sand and fine, dark stones, but without mica. The segments labelled A, C, D, E, and G (Fig. 6) were likely added during 19th-century adaptations for an inn. Notably, wall E was secondarily joined to wall F (at the joint), and wall F retains visible corners at both ends (Fig. 6: 13, 14), suggesting it originally formed a standalone, enclosed construction element, likely a building façade (Fig. 5: 24). Only in the later walls (C, D, E, G) were various niches and technological conduits identified. These are arranged in two vertical tiers and vary in size – e.g., $7 \times 9 \times 65$ cm; $6 \times 9 \times 85$ cm; $13 \times 10 \times 30$ cm – with some set at an angle to the face, likely for drainage purposes.

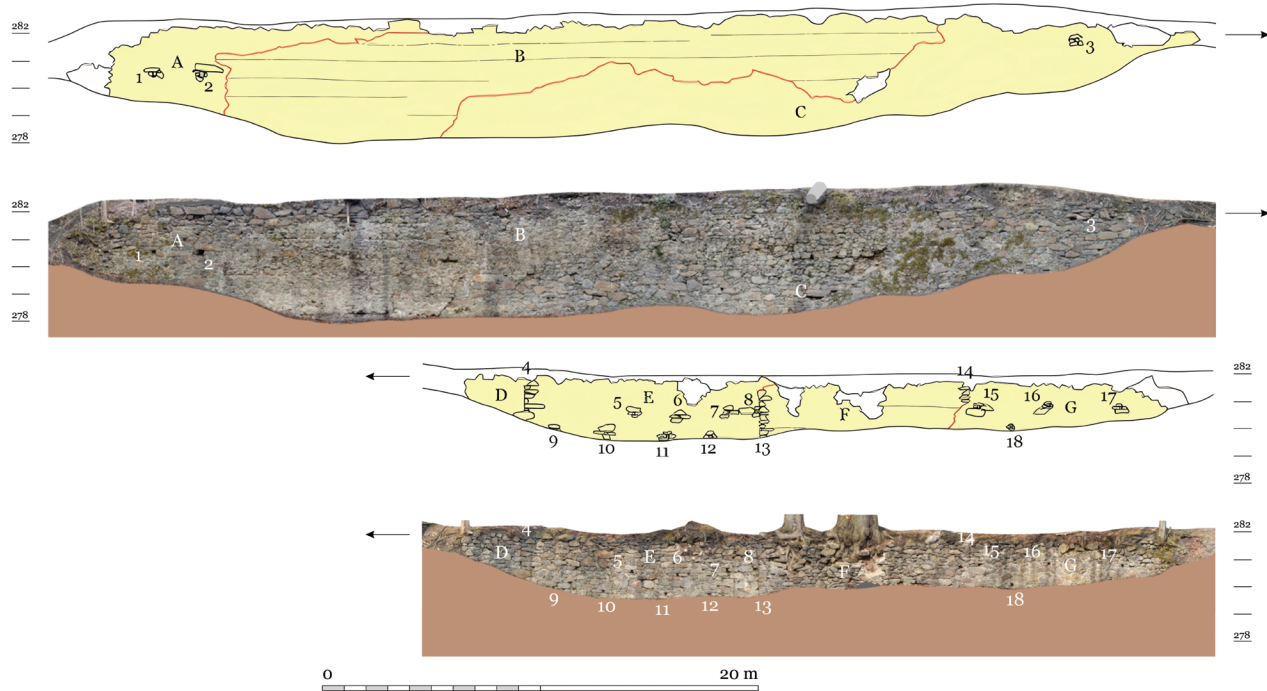


Fig. 6. Photogrammetry and drawing of the southwestern wall of Zone III (external face):
A–G – highlighted wall sections; 1–18 – identified architectural features (elaborated by P. Hlavenka, M. Sýkora)

Il. 6. Fotogrametria i rysunek południowo-zachodniego muru strefy III (lico zewnętrzne):
A–G – wyróżnione odcinki muru; 1–19 – zidentyfikowane elementy architektoniczne (oprac. P. Hlavenka, M. Sýkora)

The largest part of the outer bailey, sub-zone IIIa (52 × 50 m), served as a courtyard. Its surface is nearly level, with slight slopes to the north-east and south-west. Within this area is the foundation of an 18th-century forester's lodge, later converted into a 19th-century tavern (Fig. 5: 25). According to Eschke's plan (Fig. 2), the southern part of the courtyard may have housed the gate and bridgehead; however, extensive alterations due to road construction and the operation of a small quarry (Fig. 5: 26) now complicate the reconstruction of the medieval building layout.

Sub-zone IIIb (16 × 40 m) may have functioned as a separate architectural unit. This interpretation hinges on the analysis of a short southern section of the southwestern wall of Zone IV (Figs. 5: 26; 7: 1; 8b), which lacks a visible outer face, suggesting it was later cut back (Fig. 8c). It is therefore possible that a structure 7.6 m wide abutted the curtain wall of Zone IV (Figs. 5: 27; 7: 7), crossing the longitudinal axis of IIIb and functioning as a gatehouse or a building flanking the entrance.

Sub-zone IIIc (11 × 44 m), situated at a lower elevation than IIIa, may have originally formed a single continuous space with it. This is suggested by the fact that sections of the southwestern perimeter wall (Figs. 5: 23; 7: 8), which today separate IIIa and IIIc, appear to be of early modern origin. A road leads to IIIc from the west, descending from the outer fortifications along the slope (Fig. 5: 18); although partly destroyed by later alterations, it is still visible. Above this road lies the foundation of a rectangular structure (preserved dimensions: 2.5 × 5.5 m), traditionally interpreted as a guard tower (Fig. 2: f), though it might also represent a wall corner (Figs. 5: 28; 8d). The construction

technique indicates a medieval date: the wall was built from carefully arranged medium-sized stones laid in regular courses, with a light ochre lime mortar containing a high proportion (up to 70%) of washed quartz sand (grain size 3 mm to 1.5 cm), and minimal mica content.

Zone IV – the castle

Zone IV, referred to as the castle, constitutes the principal component of the complex, located in the northern section of the hilltop. This area, with maximum dimensions of 41 × 70 m, features a relatively flat topography. Most of its surface lies at approximately 285 m a.s.l., with the exception of a raised area up to 3 m higher in the south-eastern portion (Fig. 7: 9). The zone is enclosed by the remains of a perimeter wall (Fig. 7: 1–6), which displays a consistent construction throughout: medium-sized stones supplemented with smaller ones, laid in courses and bonded with a light ochre lime mortar containing roughly 70% light quartz sand and a small amount of shale. The layout suggests that the built environment surrounded an irregular courtyard. A concrete slab located within the courtyard (Fig. 7: 10) covers a well described in early accounts. The only presumed entrance to Zone IV may have been located where it is today (Fig. 7: 11), in which case the southwestern section of the curtain wall would have had to turn westward. At the hypothetical course of this wall, substantial rubble remains are still visible.

The best-preserved section of the castle's curtain wall is located on the southwestern side, where it measures 2.5 m in width (Fig. 7: 1). The outer face of this segment

is 17.5 m long and partially retains a two-stepped plinth, projecting 0.18 m at the upper and 0.14 m at the lower level (Fig. 8b). The inner face is preserved over a length of 9.5 m (Fig. 9). At an elevation of 287.83 m a.s.l., the lower edge of a socket for a beam plate was recorded, measuring 20 cm in height and 30 cm in depth (Fig. 9: 1). Directly above are five beam pockets (Fig. 9: 2–6), originally embedded in the wall. Each is about 30 cm deep, with spacing intervals of 0.84 m, 0.99 m, 1.06 m, and 0.99 m. Although the wall face is not preserved, the impressions suggest the beams had a cross-section of approximately 20×20 cm. This structure indicates the presence of a multi-storey building (Fig. 7: 12), with the upper floor situated at around 288.25 m a.s.l. Within this wall, mortar joints corresponding to 11 nearly horizontal construction layers were observed, sloping slightly in accordance with the terrain. A short wall fragment, 0.9 m in length, is set perpendicular to this segment and likely formed part of the same building (Fig. 7: 6).

Three depressions interpreted as cellar remains are located in the northeastern and eastern part of Zone IV (Fig. 7: 13–15). The largest measures 9×12 m and contains a flat-bottomed area of 2×4 m (Fig. 7: 13). Two large blocks of the perimeter wall, 7 m and 3.3 m long respectively, collapsed into this space, suggesting that the majority of the depression is filled with rubble. From here, a passage leads into a second preserved cellar measuring 5.4×6.6 m (Fig. 7: 14), which features a barrel-vaulted ceiling and a ventilation opening in its southwestern side. The third chamber (8.5×7 m), located farthest north (Fig. 7: 15), contains a partially preserved narrow entry corridor leading towards the central cellar. All three cellars likely belonged to structures abutting the northeastern section of the curtain wall. Based on a clearly defined terrain edge (Fig. 7: 16), it may be inferred that a gap or passage existed between two parallel wings (Fig. 7: 17). Alternatively, the layout may have followed an L-shaped plan, with a transversely oriented two-storey building.

In the southeastern portion of Zone IV lies a distinct raised area, separated from the surrounding terrain by a steep scarp. At its summit, on a levelled platform, stands a modern concrete tank (Fig. 7: 9). The front, southeastern face of the rise may originally have been linear, but now it forms a concave depression, likely the result of a landslide or wall collapse (Fig. 7: 18). Notably, if this entire elevation were composed solely of rubble, for instance from a collapsed bergfried, it would have completely filled the underlying depression to the north (Fig. 7: 13), which it did not. This suggests that the elevated section may conceal a structure of largely intact masonry. It is unlikely, however, that it was a cylindrical bergfried, as all of the fallen wall blocks, including those at the southern base, exhibit straight faces.

A further building relic, this time above ground, is located in the northeastern part of Zone IV near the northern corner (Fig. 7: 19). This rectangular feature (5×9 m) is surrounded by a small earthen rampart; on the courtyard side, a 2 m-long, 1.2 m-wide wall segment without a preserved face projects from it. The final feature is a slight depression along the western edge of the zone (Fig. 7: 20), rectangular in plan (3×4 m). Scattered across the entire

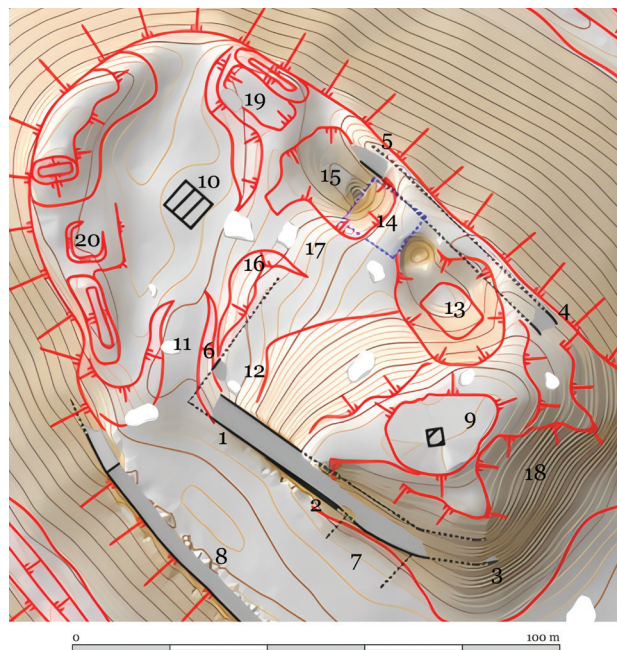


Fig. 7. Plan of the castle – Zone IV (contour interval 25 cm):
1–6 – fragments of the perimeter wall, 7 – hypothetical gatehouse,
8 – fragment of the southwestern wall of the lower ward,
9 – elevation with concrete reservoir,
10 – concrete slab covering the well in the castle courtyard,
11 – presumed location of the former entrance,
12 – hypothetical two-storey building,
13 – largest depression interpreted as a cellar,
14 – preserved vaulted cellar,
15 – depression with a partially preserved corridor,
16 – topographic edge, 17 – possible passageway,
18 – erosion trace of the elevation (building?),
19 – remains of an above-ground structure, 20 – rectangular depression
(elaborated by P. Hlavenka, M. Sýkora, J. Vidman)

II. 7. Plan zamku – strefy IV (interwał warstw 25 cm):

- 1–6 – fragmenty muru obwodowego,
- 7 – hipotetyczny budynek bramny,
- 8 – fragment południowo-zachodniego muru przedzamcza,
- 9 – wyniesienie z betonowym zbiornikiem,
- 10 – betonowa płyta nad studnią na dziedzińcu zamku,
- 11 – przypuszczalna lokalizacja dawnego wjazdu,
- 12 – hipotetyczny budynek piętrowy,
- 13 – największe zagłębienie interpretowane jako piwnica,
- 14 – zachowana, sklepiona piwnica,
- 15 – zagłębienie z częściowo zachowanym korytarzem,
- 16 – krawędź terenowa, 17 – możliwe przejście,
- 18 – ślad erozji wzniesienia (budynek?),
- 19 – relikty naziemnego budynku, 20 – prostokątne zagłębienie
(oprac. P. Hlavenka, M. Sýkora, J. Vidman)

area are numerous fragments of wall masonry, both large and small, which appear to result from deliberate demolition rather than natural decay.

Conclusions

The investigation of Ronow Castle confirms the existence of an extensive fortification complex with a multi-component layout comprising at least four clearly defined functional zones. The developed spatial model remains preliminary in nature, based on non-invasive research methods, archival queries, and comparative analysis. The spatial



Fig. 8. Ronov Castle in 2022:

- a – preserved section of the southwestern perimeter wall of Zone IV, corner near the hypothetical entrance,
 - b – perimeter wall of Zone IV from the south, at the site of the presumed dismantled gate,
 - c – tower or corner of Zone III, view from the south-west,
 - d – southwestern wall of Zone III, view from the south-west
- (elaborated by M. Sýkora)

Il. 8. Zamek Ronow w 2022 r.:

- a – zachowany odcinek południowo-zachodniego muru obwodowego zamku (strefy IV), narożnik w pobliżu hipotetycznego wjazdu,
 - b – mur obwodowy strefy IV od południa, w miejscu hipotetycznej rozebranej bramy,
 - c – wieża lub narożnik strefy III, ujęcie z południowego zachodu,
 - d – południowo-zachodni mur strefy III, ujęcie z południowego zachodu
- (oprac. M. Sýkora)

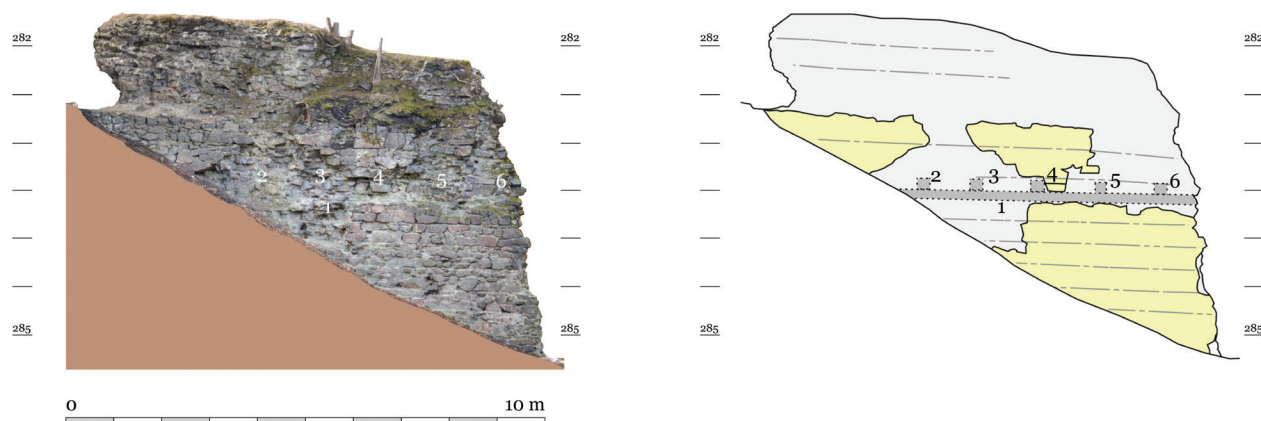


Fig. 9. Photogrammetry and drawing of the southwestern wall of Zone IV (internal face): 1–6 – identified architectural features

(elaborated by P. Hlavenka, M. Sýkora, R. Biel)

- Il. 9. Fotogrametria i rysunek południowo-zachodniego muru strefy IV (lico wewnętrzne): 1–6 – zidentyfikowane elementy architektoniczne
- (oprac. P. Hlavenka, M. Sýkora, R. Biel)

distribution of architectural elements enables the hypothetical reconstruction of their functions and, to some extent, their chronological development (Fig. 10).

The castle (Zone IV), enclosed by a massive perimeter wall with a clearly defined gate and remnants of interior buildings, likely constituted the original residential core, to which additional fortifications were subsequently added in response to the evolving needs of its owners. The layout of the defensive system suggests that its individual components underwent multiple phases of reconstruction. The configuration of ramparts and ditches points to their phased development, and parts of the outer circuit (Zone II) may be associated with late 14th-century extensions, potentially in reaction to the advent of gunpowder weaponry.

A key framework for interpreting the castle's architectural history is its ownership history. The documented association of the castle with the Ronow family in the 1260s, and its subsequent grant to Anselm of Ronow in the 14th century, delineates potential phases of construction and transformation. The castle's destruction in 1399 by the forces of the Lusatian League marks the end of its function as a seat of power.

The research also enabled the verification of certain earlier interpretations – some archival data, particularly concerning measurements and spatial subdivisions, were corroborated by the current state of preservation. Other hypotheses, such as the crowning of the outer rampart with a defensive wall or the existence of a transverse wall with a tower extending beyond the lower castle's perimeter, were not confirmed. Nor was it possible to definitively identify the hypothesised siege positions from 1399. The road network and terrace arrangement are interpreted as products of early modern redevelopment associated with changes in regional communication routes.

Summary

The most recent investigations of Ronow Castle in Trzciniec have significantly expanded our understanding of this multi-part defensive complex. The study focused on the detailed documentation of architectural remains and their relationship with the surrounding landscape. The dating and interpretation of certain structural elements still require further analysis, particularly through targeted archaeological sondages (excavations). Although comparative studies with other regional castles were not the main focus,

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Fig. 10. Hypothetical reconstruction of the ground plan of Ronow Castle:

- a – preserved medieval walls,
 - b – reconstructed course of medieval walls,
 - c – preserved early modern walls, d – contemporary buildings,
 - e – fragments of destroyed walls
- (elaborated by M. Sýkora)

Il. 10. Hipotetyczna rekonstrukcja planu zamku Ronow:

- a – zachowane mury średniowieczne,
 - b – rekonstruowany przebieg murów średniowiecznych,
 - c – zachowane mury nowożytne, d – współczesne budynki,
 - e – fragmenty zniszczonych murów
- (oprac. M. Sýkora)

they may offer a useful foundation for future research on Central European fortified architecture.

Ronow Castle remains an important site for future interdisciplinary investigations. Continued work, including geophysical prospection and intrusive excavation, may reveal previously unknown aspects of its history and architecture, underscoring the value of this historic structure as evidence of medieval engineering the complex political developments in the borderlands of what are now Germany, Poland, and the Czech Republic.

Translated by
Radosław Biel

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Streszczenie

Zamek Ronow w Trzcińcu – interdyscyplinarne badania średniowiecznej warowni na pograniczu czesko-lużyckim

Zamek Ronow w Trzcińcu koło Bogatyni, związany z możnowładczym rodem Ronowców (Ronovci), odgrywał w regionie kluczową rolę polityczno-wojskową od XIII do XV w., pozostaje jednak słabo rozpoznany w polskiej literaturze przedmiotu.

W artykule zaprezentowano wyniki interdyscyplinarnych badań przeprowadzonych w 2022 r. Zakres prac obejmował kwerendę archiwalną, krytyczne studium wcześniejszych opracowań oraz analizę relikwów architektonicznych i uwarunkowań krajobrazowych. Zastosowano tradycyjną metodologię historyczną w połączeniu z nowoczesnymi technikami dokumentacji przestrzennej (fotogrametria naziemna, lotnicze skanowanie laserowe LiDAR).

W wyniku przeprowadzonych badań dokonano funkcjonalnego podziału terenu zamkowego na cztery strefy: przedpole, zewnętrzne fortyfikacje, przedzamcze oraz zamek właściwy. Potwierdzono ślady wielofazowej rozbudowy założenia, w tym relikty murów obronnych, systemu komunikacyjnego oraz piwnic, a ponadto zidentyfikowano nowe elementy architektoniczne, m.in. dwupiętrową budowlę w niepodpiwniczonej części zamku. Wyniki umożliwiły również weryfikację części wcześniejszych hipotez, dotyczących m.in. konstrukcji umocnień zewnętrznych oraz istnienia rzekomego muru poprzecznego z wieżą wysuniętą poza przedzamcze. Nie rozstrzygnięto natomiast kwestii szczegółowego rozwarstwienia chronologicznego. Autorzy artykułu wskazali na potrzebę kontynuacji badań, zwłaszcza z zastosowaniem metod geofizycznych i archeologicznych, w celu pełniejszej rekonstrukcji historii i architektury zamku Ronow.

Słowa kluczowe: średniowiecze, zamek, Górne Łużyce, Ronow, LiDAR