

## 20<sup>TH</sup> CENTURY FORTRESS GATES IN KRAKÓW AS SPATIAL MARKS OF THE CITY LIMITS

### Abstract

The goal of this study is to present elements of the city's identity which are the fortress gates of Kraków Fortress from the period between 1907 and 1910. In the article, the Author describes gates, fortress structures belonging to the internal ring of the city's fortification, against the background of the development of Kraków's urban structure. The study focuses on their remains, preserved until today, as well as the entire original project that they were part of, and principles of the architectural shaping of their form towards the requirements of the specific function they were to fulfil. Besides field studies, the source materials included archival design documentation, archival construction standards together with design guidelines, as well as theoretical publications from that time.

*Keywords: urban development of Kraków, the edge of a city, fortifications in the space of a city*

### 1. Introduction

Ever since the dawn of time, the basic function of a city was providing its residents with safety – protecting them against enemies and conquerors. Fortifications constituted one of the basic attributes of a European town, indicated in an extended essay by Max Weber, *Die Stadt* (1921).<sup>1</sup> Safety, on the other hand, was a necessary condition for progress and development.<sup>2</sup>

In the system of fortifications surrounding cities, apart from the uninterrupted obstacle provided by the walls and towers that supported their defensive functions, the gates were important elements.<sup>3</sup>

The peak achievement of harmony of the urban organism with the fortifications surrounding it found its expression in geometrically regular Renaissance *ideal city*.<sup>4</sup>

At the end of the 19<sup>th</sup> century, these centuries-old relations between individual components of fortifications were broken, and their harmony was disturbed. The industrial revolution enabled a territorial expansion of urban organisms never encountered before. The development of artillery, its long range, as well as changes in the military tactics, questioned the usefulness of fortifications in the form known for centuries.

The basic component of each fortress was an external ring – the main defence position, located around the fortified city within the radius of several kilometres (ca. 6–7 km). Most fortresses have also another, internal

ring of fortifications, referred to as “the core”,<sup>5</sup> which was located much closer (radius of ca. 2–3 km). The so-called central embankments, or the core of the fortress (*noyau*), lost their significance, they no longer constituted an important defence line. In compliance with the doctrine developed at the beginning of the 20<sup>th</sup> century, a regular siege of these fortifications was not taken into account (as was the case with the external ring of the forts), but only an attack of leading troops of light cavalry or infantry, not equipped with heavy artillery. The internal ring was to constitute mere protection against a sudden, unexpected assault and to enable a planned mobilization of the fortress defenders. Furthermore, it was to prevent an outbreak of panic in the city, which could have been expected if enemy troops had appeared.<sup>6</sup> When designing new fortification systems for the internal ring, reaching a difficult compromise was recommended: <sup>7</sup>on one hand, it was necessary to have as tight a perimeter as possible in order to minimize the costs of execution and the number of garrison; on the other – *on no account could it limit the development of the city*.<sup>8</sup>

In many European cities old fortifications that surrounded the city directly and functioned as the fortifications of the core, were demolished. Despite the resistance of the so-called ‘military factors’,<sup>9</sup> economic and urban

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<sup>1</sup> F. Ringer, *Max Weber: An Intellectual Biography*, The University of Chicago Press, Chicago 2004, p. 203.

<sup>2</sup> A. Jasiński, *Architektura w czasach terroryzmu. Miasto – przestrzeń publiczna – budynek*, Warsaw 2013, p. 27.

<sup>3</sup> After: J. Muczowski, *Dawne warownie krakowskie*, in: „Rocznik Krakowski” No. XIII, ed. Krzyżanowski S., Kraków 1911; M. Tobiasz, *Fortyfikacje dawnego Krakowa*, Kraków 1973.

<sup>4</sup> See: Z. Paszkowski, *Miasto idealne w perspektywie europejskiej i jego związek z urbanistyką współczesną*, Kraków 2012.

<sup>5</sup> In the sources from that time defined as *Noyau*, or *Umfassung*. E.g. M. Brunner (son), *Die beständige Befestigung*, Vienna 1909, p. 18.

<sup>6</sup> M. Brunner (son), *op. cit.*, p. 20.

<sup>7</sup> Orig. *Enger Gürtel, weite Umfassung*, Leithner p. 23.

<sup>8</sup> Cf. e.g. M. Brunner (son), *Die beständige Befestigung*, Vienna 1909; E. Leithner, *Die beständige Befestigung und der Festungskrieg*, Vienna 1899, pp. 20-21. The construction of such reinforcements was given up in many city-fortresses, justifying it (besides the “chronic scarcity of funds”) with the rapid development of their urban organisms, see also: K. Mörz de Paula, *Der österreichisch-ungarische Befestigungsbau 1820–1914*, Vienna 2000, p. 59.

<sup>9</sup> Military Austrian specialists analyzed the examples of e.g. Lille and Paris, as well as Toruń, Metz and Thionville (Diedenhofen). See: articles in the magazine *Mitteilungen über Gegenstände des Artillerie- und Geniewesens*, Vienna 1903: *Veräußerung eines Teiles der Pariser Stadtumwallung*, issue 1, p. 50; *Schleifung der alten Kernumwallung von Thorn; Wallabtragungen in Metz und Diedenhofen*, issue 2, p. 155; *Entfestigung von Lille*, issue 11, p. 842.

considerations prevailed – no new *noyaus* were coming into being.<sup>10</sup>

The beginning of the 20<sup>th</sup> century is, at the same time, the beginning of a path that was to be followed by the contemporary urban thought. In 1909, the first important urban planning competition was organized, which was to decide on the shape of the contemporary Kraków. At the dawn of the previous century, this shape was a manifestation of specific circumstances – the city was ruled by a foreign state, functioning as a hybrid organism of a city-fortress.

## 2. Research carried out to date

The topic of 20<sup>th</sup> century gates of the Kraków Fortress discussed in the subject literature is treated in quite a general and superficial way by researchers, due to the cross-section and synthetic nature of the studies, devoted to Austro-Hungarian fortifications from the that time,<sup>11</sup> as well as to military investments in Galicia,<sup>12</sup> or finally to the history of the Kraków Fortress.<sup>13</sup> Therefore, this study had to be based predominantly on archival materials – the design documentation and studies devoted to the development and extension of the Kraków Fortress, as well as on theoretical handbooks from that time.<sup>14</sup> The field research and measurements carried out by the Author complement the matter.

## 3. Relation to the spatial development of Kraków

The last territories in Kraków that could be built-up were parcelled out in 1900. Kraków became the most densely populated city of the Austro-Hungarian monarchy; the area of almost six square kilometres was inhabited by

nearly one hundred thousand people.<sup>15</sup> The construction activities in the city were nearly finished as it was limited in physical terms by the old fortifications reaching back to the period of 1860–1866, and in legal terms – by strict legal regulations.<sup>16</sup>

Negotiations with the municipal authorities of Kraków concerning the territorial extension and moving of the internal ring of the fortifications, which had been conducted since 1900, were completed in summer 1907.<sup>17</sup> Since that time the municipality of Kraków could commence successive buy-out of the grounds left after the old fortifications.<sup>18</sup> In March 1909<sup>19</sup> the process of levelling out the curtain embankments was commenced, accompanied by the unhurried demolition of the bastions and old fortress gates erected in 1887.<sup>20</sup> The City Council was also making efforts aiming at the liquidation of the ring railway, which would allow to purchase and level out the former fortification embankment used for railway purposes. It was finally achieved in 1911 and it constituted “opening the path for the natural development of the city towards its suburbs”, relieved of the restrictions in connection with moving the line of fortifications.<sup>21</sup> It should be pointed out that these events had only some symbolic significance and were not supported with any considerable expansion of the urban architecture or spatial development of the city until the outbreak of the World War I.<sup>22</sup>

<sup>10</sup> Although it was hard to talk about a resistant ring fortress without the second line of fortifications, and such views Leithner believed to be a great mistake, E. Leithner, *op. cit.*, p. 20.

<sup>11</sup> Chronologically, the first of the studies: T. Brosch, E. Steinitz, *Die Reichsbefestigung Österreich-Ungarns zur Zeit Conrads von Hötendorf*, 10th issue completing the work „Österreich-Ungarns letzter Krieg”, Vienna 1937, pp. 8-11.

<sup>12</sup> M. Baczkowski, *Austro-Węgierskie inwestycje militarne w Galicji w planach strategicznych Franca Conrada von Hötendorfa (1906–1914)*, [in:] *Śląsk, Polska, Emigracja. Studia dedykowane prof. Andrzejowi Pilchowi*, ed. I. Paczyńska, Kraków 2002.

<sup>13</sup> J. Bogdanowski, *Warownie i zieleń Twierdzy Kraków*, Kraków 1979, pp. 209-210 and 218; W. Brzoskwinia, J. Janczykowski, *Zabytki fortyfikacji Twierdzy Kraków, ochrona i konserwacja w latach 1991–1998*, Kraków 1998, pp. 18-19, 42-43 and 47.

<sup>14</sup> M. Brunner (father), *Leitfaden für den Unterricht in der beständigen Befestigung. Zum Gebrauche für die k. k. Militärbildungsanstalten, Kadetten-Schulen, dann für Einjährig-Freiwillige*, Vienna 1880; M. Brunner (son), *Die beständige Befestigung. Für die k. u. k. Militärbildungsanstalten und zum Selbstunterrichte für Offiziere aller Waffen*, Vienna 1909; E. Leithner, *Beständige Befestigung und der Festungskrieg*, III. Band *Neueste Anschauungen*, Vienna 1899; J. Stipanović, J. Solnitzky, *Genetische Skizzen von Krakau. Aufgabe und Beschreibung der Befestigungen Krakaus lit. A mit Bezug auf die Pläne Lit. B, C, D, D<sub>1</sub>, D<sub>2</sub> und die Ausweise Lit. E und F*, K. u. k. Genie-Direktion in Krakau, Kraków 1905 as amended – condition as of December 1913. Kriegsarchiv Vienna, file ref. B 1423 *Sammlung Stützenstein*.

<sup>15</sup> After: J. Purchla, *Jak powstał nowoczesny Kraków. Studia nad rozwojem budowlanym miasta w okresie autonomii galicyjskiej*, Kraków 1979, pp. 17 and 52. Cf. also: J. Peroś, *Kraków – forteca*, Czas No. 16-17/1910. A slightly different presentation of this issue, turning attention to the factors of profiteering from lands located close to the city centre and insufficient use of the reserves of the available space, in: J. Bogdanowski, *op. cit.*, pp. 189-190.

<sup>16</sup> Prohibitions to erect buildings introduced with a national act of 1867, after: J. Peroś, *op. cit.*

<sup>17</sup> The so-called *Noyautransaktion*. In the sources from that time the date 26 June 1907, after: K. Bąkowski, *Działalność zarządu miejskiego w roku 1907*, p. 79, [in:] „Kalendarz J. Czecha 1908”, Kraków 1908; or September 1907, after: J. Stipanović, J. Solnitzky, *op. cit.*, p. 5.

<sup>18</sup> With the exclusion of the bastions (forts) III (“Kleparz”) and V (“Lubicz”) allocated in 1907/1908 to be used as barracks, and the gunpowder magazine of the bastion VI.

<sup>19</sup> J. Bieniarzówna, J. Małecki, *Dzieje Krakowa*, v. 3, *Kraków w latach 1796–1918*, Kraków 1979, p. 363.

<sup>20</sup> Gates: I “Zwierzyniec”, II “Wola”, III “Czarna Wieś”, IV “Nowa Wieś”, V “Lobzów”, VI “Krowodrza”, VII “Prądnik Biały”, and VIII “Brama Warszawska”. After: K. k. Genie Direction zu Krakau, *Abrechnungs-Plan lit. A. uber den Bau der Festungs-Thore I, II, IV, VIII u. X*, and *Abrechnungs-Plan lit. B. uber den Bau der Festungs-Thore III, V, VI, VII, IX u. XI*, Kraków, June 1887. Maps updated in December 1910, with a note “abandoned and demolished” (orig. *Aufgelassen und demoliert*).

<sup>21</sup> J. Bieniarzówna, J. Małecki, *Dzieje Krakowa*, t. 3, *Kraków w latach 1796–1918*, Kraków 1979, pp. 358-359 and 363.

<sup>22</sup> See: *Najnowszy plan stol. król. Miasta Krakowa, wykonany przez bud. miejs. odd. b. w Krakowie w roku 1916. Uzupełniony w roku 1933*, scale 1:10 000. National Archives Kraków, file ref. II-75.

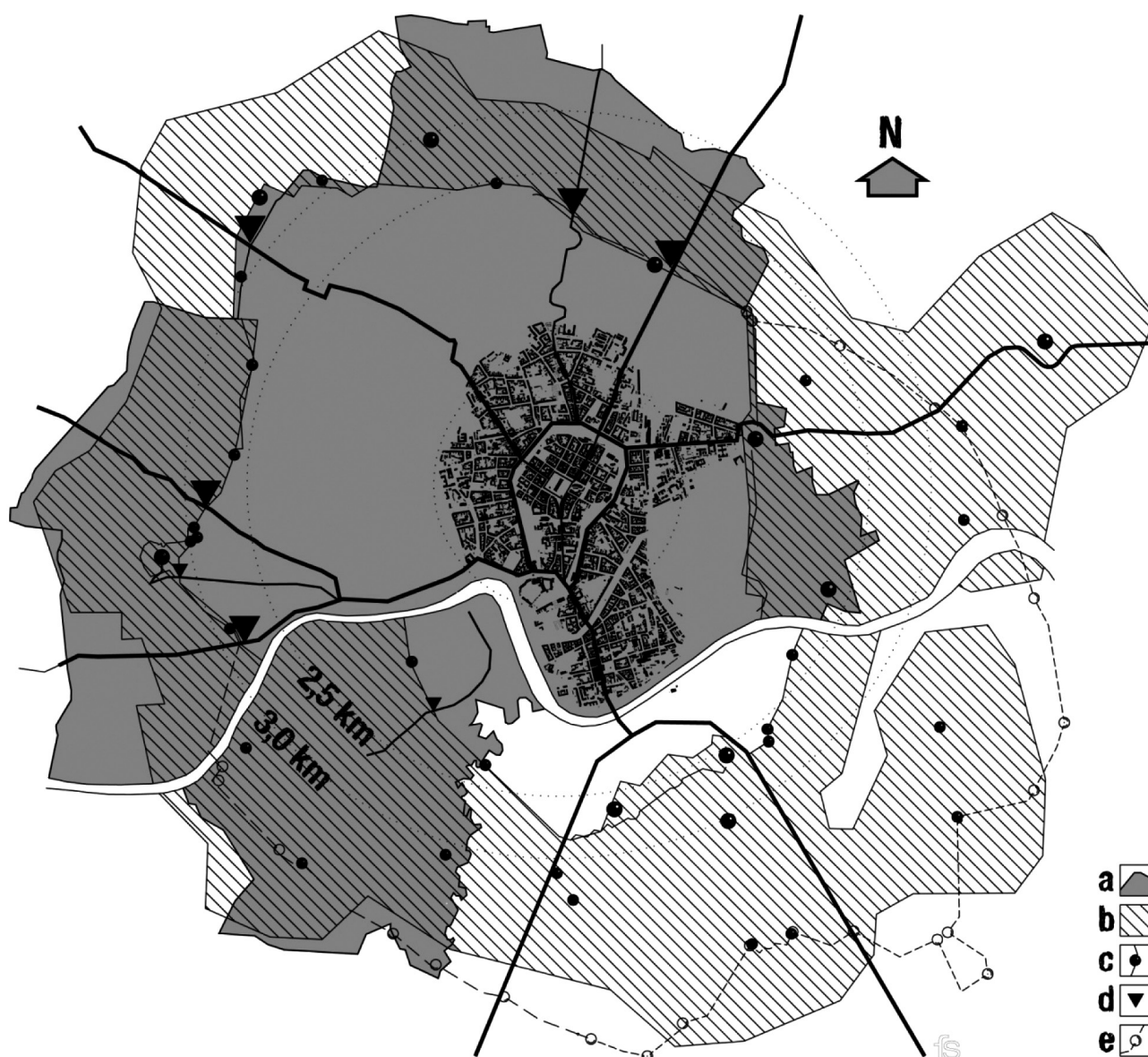


Fig. 1. Schematic plan of Kraków, the state of approx. 1914. Drawn by the author. Key: a) the administrative area of “Greater Kraków”, b) no development area, c) fortress core extension (new *noyau*), d) fortress gates, e) planned expansion of the *noyau*

#### 4. Fortress gates – the first buildings within the new administrative limits of the city

The Kraków bridgehead had always been preferred by Austrian fortification builders, because from the north, which is from the close border with Russia, the main threat was expected. The need to maintain an uninterrupted line of fortifications, *noyau*, was motivated by the vicinity of the border and the fear of the mobility of the Russian cavalry.

The execution of new fortifications of the core in the western and north-western part of the ring was authorized in a decree of the 8<sup>th</sup> Department of the Ministry of War No. 1243 res. dated 26 August 1907. In mid-October 1907 construction works were commenced, which lasted until the autumn of 1910.<sup>23</sup>

<sup>23</sup> J. Stipanović, J. Solnitzky, *op. cit.*, p. 6.

In order to secure appropriate conditions for observing and firing in the direction of the foreground, a zone of strict prohibition to erect any structures was administratively demarcated along the new *noyau* line. The width of the zone was determined to be at least 300 Viennese fathoms (567 m)<sup>24</sup>. The strict prohibition to erect any structures did not allow any buildings, and in areas where it was in force, no new building permits could be issued (orig. *Baubewilligung*). Any changes in the land relief, which might have had a negative impact on the efficiency of the fire of fortress cannons, were also banned.

*The execution of the new internal belt of fortifications around the city was probably one of the last in Europe, due*

<sup>24</sup> The handbook by Maurycy Bruner (son) [1909] gives the value of 600 m; the depth of the zone could have been changed (increased) depending on the land configuration.



to the doctrinal conditions referred to above and the progressing urbanization. Although the line of the fortifications did not fully correspond with the administrative limits of the Greater Kraków, in practice, there were physical signs of the edge of the city, as outside the perimeter of the core, on its foreground, it was prohibited to erect any civil structures.<sup>25</sup>

### 5. Fortress gates as elements of the fortification system

The western and the north-western part of the core, after its reconstruction, consisted of a system of older forts subjected to some minor modernization, and relatively advanced lesser fortifications.<sup>26</sup> The continuous line of fortifications, with a ground embankment and a shallow moat, was executed only where the land conditions required it. Along the remaining sections of the perimeter, only a belt of permanent barbed wire obstacles was planned, which was to be fired at from the forts. Where the core was not exposed to the fire of the artillery (due to the land configuration of the foreground on the slopes of Sikornik hill), free-standing walls sufficed.

In all stages of the siege of the fortress, it was necessary to secure free communication with the foreground and easy transport of heavy cannons, as well as the possibility of quick and protected exits of the garrison to fight the besieging troops. Hence, the fortifications were interrupted in places where there were civil traffic routes.<sup>27</sup> In most cases, these were roads that had been functioning since the Middle Ages. Interestingly enough, so far bearing no names, soon, in 1912, they were given the status of municipal streets and as a result of the works of the Commission for street names of the City Council they were given names, most of which are used even today.<sup>28</sup>

The existing composition of the road network, which exhibited a nearly model radial/peripheral street system, secured an easy extension by concentric accumulation of

rings.<sup>29</sup> Radial roads,<sup>30</sup> linking the city centre with peripheral areas and providing the shortest connections, in the military terminology leading to the foreground, were intersected with ring roads (belt roads),<sup>31</sup> which provided traffic connections along the internal perimeter of the fortifications. The fortress gates were located in points of intersection of these two elements of the system.

Within the scheme of the works that were carried out, five guardhouses with gates were erected, whose function was to directly block the exit roads in the vicinity of which they were located. The “Bielany” gate with a guardhouse protected the route along the Vistula river, running through Bielany to Tynec and Skawina. The “Wola Justowska” gate with a guardhouse closed the main street of the village of Zwierzyniec, running to Wola Justowska. The “Łobzów” gate with a guardhouse blocked the Prussian Route that ran towards Bronowice.<sup>32</sup> The “Prądnik Biały” gate with a guardhouse was located at the road running in the direction of Biały Prądnik, and finally the “Prądnik Czerwony” gate with a guardhouse was erected at the Warsaw Route, a historic royal road (*Strata Regia*) running through the village of Prądnik Czerwony.

The only exception was the “Kościuszkó” gate because it was erected without the building of a guardhouse, and it blocked a local access road from the side of the “Kościuszkó” mound and fort, moved outside the ring of the fortifications. The blockhouses “3a” and “3b” located in the area, constructed in 1910, despite their formal resemblance of the buildings of shelters to the gate guardhouses, fulfilled a different function in the ring.<sup>33</sup>

The facilities listed above were put into use and entered in the inventory of real estates under the supervision of the Engineering Directorate of Kraków, respectively: the guardhouses and gates “Bielany”, “Wola Justowska”, “Łobzów” and the gate “Kościuszkó” – on 31 January 1908, and the guardhouses and gates “Prądnik Biały” and “Prądnik Czerwony” – on 14 February 1911.<sup>34</sup>

<sup>25</sup> On the topic of the edge of the city, e.g. Z. Paszkowski, *Mieszkać na krawędzi*, in: *Czasopismo Techniczne PK z. 3-A/2007*, pp. 204-205. “The composition of the edge of a historic city was a result of a defensive structure, topography [...]. The external “sharp” edges, with borders marked by e.g. the lines of obligatory architecture [...] close the urbanized area, like e.g. fortification lines”; and Gyurkovich J., *Na krawędziach miast (On the Edge of the Cities)*, in: ULAR5: *Między Miastem a Nie-Miastem (Between the City and Non-City); Odnowa Krajobrazu Miejskiego (Urban Landscape Renewal)*, Materials of the International Scientific Conference of the Faculty of Architecture, Silesian University of Technology 2010.

<sup>26</sup> Dates and data after: Stipanović J., Solnitzky J., *Genetische Skizzen von Krakau. Aufgabe und Beschreibung der Befestigungen Krakaus lit. A mit Bezug auf die Pläne Lit. B, C, D<sub>1</sub>, D<sub>2</sub> und die Ausweise Lit. E und F*, K. u k. Genie-Direktion in Krakau, Kraków 1905 as amended – condition as of December 1913, pp. 6-8. KA Vienna, B 1423 *Sammlung Stützenstein*.

<sup>27</sup> E. Leithner, *op. cit.*, pp. 50 and 65; Brunner (father) [1880], pp. 27-28.

<sup>28</sup> Meetings of the street names Committee in Greater Kraków were completed in April, but their results were announced in August 1912. After: „Dziennik Rozporządzeń dla Stoł. Król. Miasta Krakowa” No. 4/1912 and No. 8/1912. More in: Supranowicz E., *Nazwy ulic Krakowa*, Kraków 1995, pp. 32, 85, 87, 93, 98, 120, 130, 170.

<sup>29</sup> According to the map of the road network, administered by the Engineering Directorate board: K. u k. Geniedirektion in Krakau, *Objektsbuch für die Strasseninstandhaltung. Oleate mit dem in Verwaltung der Geniedirektion stehenden Wegnetze, Beilage 2/1*, scale 1:75 000, Kraków 1911. See also: W. Wicher, *Analiza mieszkowego układu drogowego*, in: „Elementy analizy urbanistycznej”, Kraków 1998, pp. 175-177.

<sup>30</sup> Orig. *Radialstraße*.

<sup>31</sup> Orig. *Gürtelstraße*. See also: Brunner (son), *op. cit.*, p. 42.

<sup>32</sup> The commonly used name „Bronowice Gate” is ahistoric.

<sup>33</sup> Their tactical task consisted in the protection of the right flank of the “Kościuszkó” fort and of the interfiled spreading from the “Wola Justowska” gate. Not classified by Austrians as gate guardhouses, but as flanking structures (orig. *Flankierungsanlage*). A narrow lane running in their vicinity (orig. *Karrenweg*) – later on Hofmana street, did not have any strategic significance. See e.g.: J. Stipanović, J. Solnitzky, *op. cit.*, p. 7, and *Festung Krakau. Ausrüstungsgeneralentwurf. Beschreibung der bestehenden Befestigungen. Mit 92 Plänen und Oleaten. 1914 neu aufgelegt*. Handwritten table. Kraków, March 1914. KA Vienna.

<sup>34</sup> K. u k. Genie Direction in Krakau, *Gebäudeinventar aller in Verwaltung obiger Direction stehenden ärarischen und dauernd gemieteten, dann auf Grund der Einquartierungsgesetze beigestellten und der sonstigen in militärischer Benützung befindlichen Immo-*

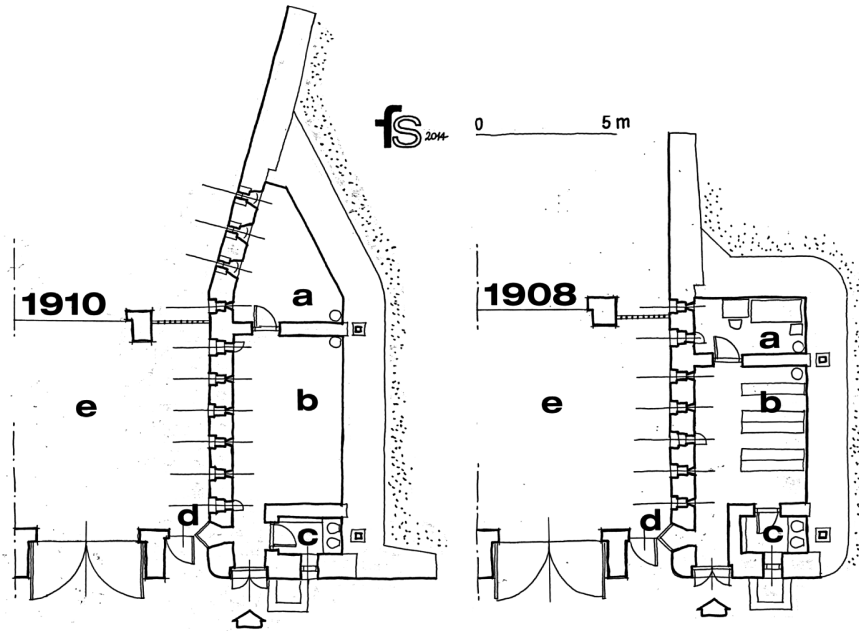


Fig. 2. Layouts of guardhouses “Prądnik Biały” (1910, left) and “Łobzów” (1908, right). Drawn by the author  
Key: a) officers’ room, b) standby room, c) toilet, d) sentry box, e) courtyard (*Zwinger*)



Fig. 3. Reconstruction drawings of the fortress gates “Bielany” (upper) and “Wola Justowska” (lower) – paired with contemporary photos. Drawn by the author

## 6. Interrupted extension

The extension of the further, north-eastern part of the inner ring was designed.<sup>35</sup> The extension was given up, probably due to the growing resistance of the head of the general staff, General Franz Conrad von Hötzendorf. He questioned the usefulness of ring fortresses, especially the Galician ones.<sup>36</sup> He even stated in his memoir from January 1910 that the new *noyau* in Kraków was unnecessary because it would not contribute to strengthening the fortress.<sup>37</sup> Similarly, the extension of the southern front of the inner ring, that is of the Podgórze bridgehead, on the right bank of the Vistula river, was decided;<sup>38</sup> however, the execution planned for 1914 never took place, either.

It should be observed that, in July 1914, another extension plan of the north-eastern and southern front of the *noyau* was developed.<sup>39</sup> Among the planned new structures, at least 5 were to be direct road blockages. Instead of forts and guardhouses, small blockhouses were to be erected, equipped with machine guns underneath armoured cupolas.<sup>40</sup> Therefore, a change in the doctrine and anticipation of completely different systems of fortifications, popular as late as in the inter-war period, is well visible here.

## 7. Design solutions

Roads were closed with iron doors of the gates, located between brick pillars, with the span of 3.7 m. The middle pillar, sitting in the axis of the road, was higher (ca. 5.4 m) and crowned with a coat of arms – a two-headed eagle (orig. *Doppeladler*). Each entrance was to be equipped, from the outside, with at least two closures, located one after the other (in the distance of ca. 9 m), so that the gate could be closed, whereas the second one would open in order to allow the passage. When letting people and patrols in and out, there was a rule to be followed, according to which both closures could not be open both at the same time.<sup>41</sup> In the brick pillars of the gates there were vertical

wings. In case of emergency wooden beams were to be inserted into them, forming a strong barricade.

Only small forces were supposed to be enough to defend the gates,<sup>42</sup> but they were to be fully protected against enemy shelling. Hence, one-storey shelters were erected near the gates – these were guardhouses, block-like structures covered with a flat roof. The smaller the building, the more difficult of a target it was for the enemy's artillery. Therefore, the functional programme was condensed to the necessary minimum and adjusted to the size of the group of defenders. The rooms, with a width of 4 m in the lumen and the height of 2.4 in the lumen, were arranged in a succession. It consisted of the standby (alert) room (orig. *Bereitschaftsraum*, floor area ca. 25 m<sup>2</sup>), a toilet with a cesspit (orig. *Abort mit Senkgrube*, floor area ca. 7.5 m<sup>2</sup>) and finally the officers' room (orig. *Offiziersraum*, floor area ca. 7 m<sup>2</sup>). Water was to be provided from wells located in the vicinity forts or from the municipal water supply network.

Between the external and internal closure, there was a small courtyard, the so-called ward (orig. *Zwinger*), closed with a fortress grate, preventing an enemy from approaching the main gate too close.<sup>43</sup> The remaining walls of the courtyard were created by the wall of the guardhouse with loopholes, from which it was possible to cover a small space with rifle fire, and a retaining wall on the opposite side of the road. Shooters were protected with steel shields embedded in the wall. Some of the loopholes were wider, which allowed to observe the direct surroundings, and they were protected with a closure from the inside.<sup>44</sup> From the outside, the loopholes had a step-like structure, for the purposes of protection against rebounds and shard. Additionally, wooden frames were installed, adjusted to the shape of the holes, where potential rebounds could get stuck.

In order not to have to open the main gate every single time, additionally, a smaller door was placed for pedestrians and patrols. It was called a patrol wicket. The wicket was located near the steel sentry box – a triangular avant-corps, equipped from the top with characteristic protective spikes.<sup>45</sup>

In the *Prądnik* gate, guardhouses from 1910 the modification of the floor plan was introduced. By placing a part of the exposed (external) wall in an oblique position, the footprint was similar to the shape of a spindle. Three additional rifle loopholes, placed in the oblique section of the wall, allowed to fire also along the foreground of the embankment. Since they were equipped with special handles,

*bilien*, 13. Supplement dated 31 January 1908, 14. Supplement dated 14 February 1911. KA Vienna, file ref. Inland K VII h.

<sup>35</sup> According to the decree of the 8th Department of the Ministry of War No. 1686 res. von 1910. Acc. to J. Stipanović, J. Solnitzky, *op. cit.*, p. 7.

<sup>36</sup> As a result of changes in the assumptions pertaining to the defence of Austria-Hungary and the political situation on the Balkans, the modernization of fortifications in Galicia became the last on the priority list.

<sup>37</sup> M. Baczkowski, *op. cit.*, p. 115.

<sup>38</sup> According to the decree of the 8th Department of the Ministry of War No 1253 ex 1912 from 1913. Acc. to J. Stipanović, J. Solnitzky, *op. cit.*, p. 7.

<sup>39</sup> Decree of the 8th Department of the Ministry of War No 1355 res. from 1914. After: K. u k. Festungskommando, *Genereller Übersichtsplan ad Erl. Abt. 8 N<sup>o</sup> 1355 res. v. 1914*, July 1914, scale 1:10 000. KA Vienna, file ref. Abt. 8 k 415. The outbreak of the war shattered these plans.

<sup>40</sup> K. u k. Festungskommando, *Skizze einer Flankierungsanlage zugleich Straßensperre*, July 1914, projection and cross-section, scale 1: 100. KA Vienna, file ref. Abt. 8 k. 415.

<sup>41</sup> G-43, *Artillerieunterricht für die k. u k. Festungsartillerie*, VI. Teil. *Einrichtung der beständige Befestigungen*, Vienna 1914, p. 32.

<sup>42</sup> According to the design documentation, the garrison were to consist of more than twenty privates under the leadership of an officer.

<sup>43</sup> Brunner, *op. cit.*, p. 65.

<sup>44</sup> K. u k. Technisches Militärkomitee, Projektsbehelf Nr 33, *Direktiven für die Konstruktion von Gewehrsharten in Mauerwerk*, Vienna 1906. Due to the later conversion of the loopholes into window openings, these differences could be read by comparing the width of the preserved brick load distribution arches, originally located over the loopholes.

<sup>45</sup> Orig. *Schilderhäuschen*, in the subject literature commonly given an ahistoric name of "the sponson". In Kraków – the only preserved one at the building of the "Bielany" guardhouse. Similar structures are preserved in Przemyśl – one of them at the Sanok Barrier dating back to 1898.



Basic data on fortress gates in Kraków from the period 1907–1910<sup>59</sup>

Proper name	Date of construction	Cost of construction (1914)	Location (contemporary street names)	State of preservation
“Bielany”	1907/1908	24 287 K 11 h	ul. Księcia Józefa/Malczewskiego	The guardhouse building preserved
“Kościuszko”	1907/1908	14 014 K	al. Waszyngtona	Relics of the retaining wall
“Wola Justowska”	1907/1908	25 814 K 36 h	ul. Królowej Jadwigi/Piastowska	The guardhouse building preserved
“Łobzów”	1907/1908	23 211 K 42 h	ul. Bronowicka/Rydla	No longer exists
“Prądnik Biały”	1910	27 400 K	ul. Prądnicka/Doktora Twardego	No longer exists
“Prądnik Czerwony”	1910	35 400 K	al.29 Listopada/Kamienna	No longer exists

the so-called rifle carriages, they provided a much more powerful and higher fire rate.<sup>46</sup>

### 8. Structure

Design-related normative guidelines for individual resistance standards were the result of research and field testing conducted by the royal and imperial Technical Military Committee.<sup>47</sup> Less important facilities, and the structures of the inner ring – *noyau* – could be treated as such, according to the doctrine, could be executed according to a lower standard for economic reasons; with the resistance to impact of projectiles of medium caliber (ca. 150 mm), the so-called – *granatsicher*.<sup>48</sup> In compliance with the design guidelines, the 150 cm-thick exposed walls were made of limestone, on a cement mortar. The exposed walls were additionally protected by a massive ground mound and a stone mattress, which compensated the energy of the shells. The 90 cm-thick walls from the side of the courtyard and from the side of the outfield (the interior of the fortress), were made of brick on the cement mortar.

The steel and concrete composite structure of the flat roof is a system applied e.g. in a decade older forts in Kraków. Girders made of steel beams were arranged ca. every 36 cm. The spaces between the lower foot plates of the beams were filled with arched steel vault cells. The steel structure constituted a formwork, combined with the rammed concrete<sup>49</sup> into the flat roof plate, with the thickness of ca. 90 cm. The system benefitted from the favourable properties of both materials – the tensile strength of steel and the compressive strength of concrete, securing considerable rigidity and load

capacity. As the field tests had proven, a shell explosion caused a breach in the upper layer of the flat roof, and the strength of the explosion only caused a slight longitudinal bend of the steel girders.<sup>50</sup> That is why the internal brick partition walls did not reach the beams of the ceiling, but they ended ca. 10 cm below it, maintaining an expansion gap protecting against cutting down.

The flat roofs were covered with belts of galvanized steel and a 50 cm ground layer covered with grass in order to camouflage them.

The characteristic rounding of the edges of the flat roof, as well as of the external corners of the building, was to make artillery projectiles falling at some angle slide along them. Two-leaf entrance steel doors, were made of 2 cm-thick steel, with loopholes.

A large share of the crushed limestone, that is a locally available material, in the structure of the walls, is noticeable. Brick and stone walls exhibited visible toothing, which granted them with a specific climate of austere aesthetics.

### 9. Functioning of the fortress gates

It is worth mentioning how, in the light of the army regulations, the fortress gates functioned in the time of peace. The archival records imply their mainly police and order-related character, provided for in a formal way.<sup>51</sup>

All orders pertaining to gates constituted the competence of the Commanding Officers of the Fortress. The duties of the Commanding Officer of the Fortress included the specification of times of opening and closing the gates which were to be closed at night, through which the vehicle traffic was allowed only conditionally or was totally banned.<sup>52</sup>

<sup>46</sup> Orig. *Gewehrlafette*. K. u. k. Technisches Militärkomitee, Projektsbehelf Nr 21, *Instruktion über die Einrichtung und Verwendung der Gewehr-Lafette*, Vienna 1896.

<sup>47</sup> Orig. K. u. k. *Technisches Militärkomitee*. The committee was one of the auxiliary bodies of the Ministry of War.

<sup>48</sup> K. u. k. Technisches Militärkomitee, Projektsbehelf Nr 16., II. Teil, *Direktiven für die Konstruktion permanenter, granatsicherer Kriegshohlbauten*, Vienna 1904. See also: Brunner (son), *op. cit.*, p. 47. In the inter-war Polish inventory documents there was a note “safe against grenades”.

<sup>49</sup> Orig. *Stamfbeton*.

<sup>50</sup> Morz, *op. cit.*, p. 148.

<sup>51</sup> Royal and imperial rules of military service, A-10, a. *Dienstreglement für das kaiserliche und königliche Heer. Erster Teil*. Vienna, 1904; § 69. Opening and closing the gates in fortified places (orig. *Öffnen und Schliessen der Tore in Festen Plätzen*) pp. 223-225, § 82. Guard and posts in fortified places (orig. *Wachen und Posten in Festen Plätzen*) pp. 282-285. Additionally the rules of service in fortifications, E-9 *Festungs-Reglement*, Vienna 1902; Item 29. Order for gates and passages (orig. *Thor- und Passage-Ordnung*).

<sup>52</sup> *Dienstreglement...*, p. 223.

In case of emergency, e.g. during mobilization, the exits were to be left closed all day and night. The gates were to be opened only maintaining due precautions. The keys were under the custody of the commander of the gate guards, who opened the gates personally, assisted by armed troops.

Before opening the external closure (a grate or a barrier), a small patrol was sent out through the patrol wicket to comb the nearest area. The officer responsible for the keys, together with his troop, was waiting until the patrol returned inside the courtyard, in the ward. The external closure was opened if the patrol spotted no enemies. More than one closure could never be open. The only exception from this rule was a situation when a long column of soldiers was marching through the gate.

At night and in the conditions of poor visibility, the gate could only be opened with strengthened guards and having notified the posts on the embankment.<sup>53</sup>

In justified cases, the commanding officer asked all people entering the fortress for their name, status, occupation, place they had come from and how long they intended to stay within the fortress; all those who were leaving the fortress had to state their destination. It was possible to enter only if the data collected were complete and sounded satisfactorily. If necessary, travellers were asked to produce their identification papers and all suspected ones were sent to the main guardhouse. When arrest warrants were sent to the gate guards, all the staff, not only the guards at the door, were supposed to observe passers-by and to arrest all those who looked suspicious.

It was prohibited to run and ride through the gate quickly (in a coach or on horseback). Coachmen were supposed to maintain appropriate distance from the coaches that were in front of them so as not to cause any hold-ups, especially in rush hours.

The guards in front of the gate stopped all covered or loaded vehicles and notified the post in the guardhouse. The guardhouse sent a patrol which searched the vehicle thoroughly; further ride was possible only if nothing suspicious had been found. In certain situations such precautions were undertaken also in case of vehicles leaving the fortress.

## 10. What happened next

During the extension of the fortress, due to the mobilization in 1914, most blockades of roads within the area of the *noyau* were liquidated, in order to facilitate traffic and military transport. The gates that remained were “Bielany”, “Wola Justowska”, “Łobzów”, “Prądnik Biały”, “Prądnik Czerwony” and “Zakrzówek” in the south-western part of the inner ring.<sup>54</sup>

On 7 May 1918, the City Hall of the Capital Royal City of Kraków issued a letter to the Royal and Imperial Engineering Directorate in Kraków, signed by the Polish Vice-Mayor, Józef Sare, with a request for demolishing the still-existing fortress gates: “Due to the liquidation of the

fortress, it seems that the fortress gates will not be necessary for military purposes, therefore we kindly request their liquidation as soon as possible, starting from the one located at Warszawska<sup>55</sup> Street, but also other gates located within the territory of the city of Kraków as now they constitute an unjustified traffic obstacle”. Such a direct request initiated a very vivid exchange of letters between the Engineering Directorate in Kraków and the Ministry of War in Vienna. In the course of the correspondence, it was agreed that it is possible to permit to liquidate the closures and to demolish the brick pillars as they did not have any defensive values for the military authorities any longer and they were not valuable, neither for historic nor artistic reasons. The fundamental essence of the considerations was the question of passing the costs through onto the municipality of Kraków.<sup>56</sup>

When Poland regained independence, the Polish Army took over the facilities of the fortress. A review of archival inventory drawings allows to state that, at the end of the 1920s, most gate closures and pillars did not exist,<sup>57</sup> and likewise, it was not planned to use the facilities for combat-related purposes. According to the list drawn up in autumn 1920<sup>58</sup> the guardhouse of the “Prądnik Biały” gate was rented “for an office of the company of Olkusznik for an annual rent”, and the other guardhouses were “unoccupied”. The guardhouse of the “Wola Justowska” gate was later on adopted for the purposes of a technical building (pump hall).

## 11. Summary<sup>59</sup>

Until today, two guardhouses of the former fortress gates from the period 1907–1910 have been preserved: the

<sup>53</sup> At present 29 Listopada Avenue. The subject of the petition was, therefore, liquidation of the “Prądnik Czerwony” gate.

<sup>54</sup> After: K. u. k. Geniedirektion in Krakau/Nr. 4248 “*Abbruch der Festungstore*”/am das k. u. k. Kriegsministerium in Wien, signed by captain Emanuel Czech. Further – letters dated 31 May, 19 June and 19 July 1918. Letter of the City Hall in Kraków enclosed to the correspondence. Copies in the collection of dr Reinfrid Vergeiner.

<sup>55</sup> Apart from the then still preserved gates “Kościuszko” and “Zakrzówek”. After: Engineering District Management, *Plan bramy fortecznej L.XVIII Dz. XI w Zakrzówku*. Projection and views 1:100, Kraków, July 1924; *Plan obiektu No I/[ ]/1, wartownia przy b. bramie fort. „Bielany”*, *Plan obiektu No I/[ ]/2, brama fort. „Kościuszko”*, *Plan obiektu No I/[ ]/5, wartownia przy b. bramie fort. „Wola Justowska”*, *Plan obiektu No I/[ ]/6, wartownia przy b. bramie fort. „Łobzów”*, *Plan obiektu No I/[ ]/7, wartownia przy b. bramie fort. „Prądnik Biały”*, *Plan obiektu No I/[ ]/8, wartownia przy b. bramie fort. „Prądnik Czerwony”*. Projections 1:200, 1:100 and cross-sections 1:100, 1:50; in: „B. Twierdza Kraków. Zeszyty ewidencyjne”, Kraków, November / December 1927.

<sup>56</sup> M. Zaliński, *Wýkaz wszystkich obiektów fortyfikacyjnych i składów położonych na terytorium Obozu Warow. Kraków a stanowiących własność skarbową, nadających się w razie demobilizacji na składy dla materiału wojennego*, Kraków 16. XI. 1920. CAW Warsaw, file ref. D.O.K. I.371.5.271.

<sup>57</sup> Historical data after: J. Stipanović, J. Solnitzky, *op. cit.*; M. Zaliński, *Military Engineering and Sappers Unit in Kraków, Wýkaz budowli fortyfikacyjnych z podaniem ilości i rodzaju budynków, powierzchni zabudowanej w metrach, stanu konserwacji, materiału konstrukcyjnego, ewentualnych instalacji i oszacowania z uwzględnieniem % zużycia*, Kraków, 9 January 1920. CAW Warsaw, file ref. D.O.K. I.371.5.271.

<sup>53</sup> *Dienstreglement...*, pp. 224-225.

<sup>54</sup> After: K. u. k. Geniedirektion in Krakau/Nr. 3195/am das k. u. k. Kriegsministerium in Wien, 31. 5. 1918. Copy in the collection of dr Reinfrid Vergeiner.



“Bielany” guardhouse (located at 65 Księcia Józefa street) and “Wola Justowska” (at Królowej Jadwigi Street, near the building No. 124). Over the years, with all the changes of subsequent owners, the ground mounds from the front and on the flat roofs were liquidated. Furthermore, the loopholes were transformed into secondary window openings. The “Wola Justowska” guardhouse lost its steel sentry guard and a section of the retaining wall. Both guardhouses are covered with a form of preservation maintenance – the “Bielany” guardhouse is included in the register of historic sites (entry No. A-876 dated 22.03.1991), whereas the “Wola Justowska” guardhouse is included in the municipal register of historic sites (No. 2902),<sup>60</sup> the structures are

used as commercial premises, and they are in quite a good technical condition.

Both the “Bielany” and “Wola Justowska” guardhouses are located near very busy intersections and well displayed. Nevertheless, in the collective awareness of the city residents and tourists they are, however, absent.

It is no longer appropriate to repeat after the captain of the Royal and Imperial Engineering Directorate, Emanuel Czech, that the gates of the Kraków Fortress do not represent any historic value. Even adaptation for utilitarian purposes does not seem as significant as keeping the testimony to a certain era in the city’s development, when Kraków was at the threshold of the civilization leap towards modernity. Hence the idea of restoring the knowledge on the initial functions of these inconspicuous buildings, with rich and original history.

<sup>60</sup> Municipal list of historic sites (online): [http://www.bip.krakow.pl/?dok\\_id=57315](http://www.bip.krakow.pl/?dok_id=57315) (date of access: 2014-04); Register of historic sites (online): [http://www.wuoz.malopolska.pl/images/2013\\_rejestr/rejestr%20krakowski\\_aktualne.pdf](http://www.wuoz.malopolska.pl/images/2013_rejestr/rejestr%20krakowski_aktualne.pdf) (date of access: 2014-04).

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