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Fort Oštro and the first defensive line at the entrance to the Bay of Kotor - 19th century Austro-Hungarian military architecture

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Abstract

The Austro-Hungarian monarchy in the middle of the 19th century not only strengthened its defensive line toward the Ottoman territories in the hinterland of the Bay of Kotor, but also constructed a network of shoreline defences to safeguard its newly acquired territories from naval attacks. As part of the same initiative, the sea entrance to the Bay of Kotor, strategically very important part of the Adriatic coast at the time, was also fortified. Three forts were built as the first defensive line, one on the cape Ostro, one on the islet Žanjica, called Mamula, and the third one on the Cape Arza. Their bases were stone-built casemates with flanking guns and open mercer batteries placed on platforms. Unfortunately, they became obsolete very quickly because they could not meet modern defensive requirements. Given that they were very visible and therefore an easy target for increasingly sophisticated naval weapons, a number of minor and major adjustments were made over time that resulted in changes and adjustments to the building structure. With the end of the importance and political influence of Austria-Hungary, the fortification systems it built lost their value and deteriorated over time. Today, they not only reflect an important historical and political moment, the way of warfare and defence at that time, but also the monarchy's need for the appearance of forts to be a combination of certain architectural taste and military needs.

Keywords: Bay of Kotor, Prevlaka, Austro-Hungarian fortifications, 19th century.

1. Introduction

Fort Oštro is located on the Prevlaka Peninsula, today's southernmost mainland point of the Croatian coastline. It was built during the Austrian administration in the Bay of Kotor, according to plans drafted in 1850. During that period, due to frequent uprisings in the border regions of the Ottoman Empire, as well as domestic uprisings against the new administrative structures and authorities, systematic military fortification of the then Austrian possessions in Montenegro began (Lučić, Obad, 1994) with the aim of control, supervision, and management of the entire territory.

Oštro, along with the forts of Mamula and Arza, was one of the key defensive points at the entrance to the Bay of Kotor. It is a structure comprising four floors, with a total height of 50 meters, and cannon weaponry distributed in casemates and on terraces. Originally, it had all the facilities necessary for conducting combat activities as well as for the life, work, and training of the crew. Within the complex, there was a lighthouse, a signalling station, and military barracks, and below, on the cape's shore, a shipyard. The fort was later expanded, and a special, so-called mortar battery was subsequently built next to it.

2. The beginning of Austrian administration in the Bay of Kotor area and a plan to fortify Cape Oštro

For centuries in the possession of Republic of Ragusa until the end of 18th century, the Prevlaka Peninsula and its southern cape, Oštro, have held

an exceptionally important geostrategic position, ensuring control of the surrounding area and have been clearly marked on maps since the 17th century (Riđanović, 1969, Bojanić, 1999, Kapetanić, 2011). Thus, already in 1798 and again in 1804 Maximilian de Traux, a colonel in the Austrian army and a military engineer, emphasized the importance of the entrance to the Bay of Kotor and the need to fortify Cape Oštro (Pavićević, 2012, 17, AT-OeStA/KA KPS LB K VIIi 64 F). De Traux addressed the same topic in his extensive work on Dalmatian fortifications in 1805, particularly stressing the necessity of securing the entrance to the Bay of Kotor, despite its considerable remoteness and the substantial financial expenditures required. According to him, Austria needed to occupy this position, which had previously been under the control of the Republic of Ragusa, to secure the navigational route to Corfù and its dominance in the Adriatic Sea (Žmegač, 2016, 204).

Fig. 1- Fort Oštro (Lj. Gamulin, 2019)

During their governance of the Eastern Adriatic, the French initiated the fortification of Cape Oštro. Considering that in 1806, the then military commander of Dalmatia, General Marmont, orchestrated the transport of military equipment to the Cape, their commitment to the idea was undoubtedly genuine. However, owing to Russian pressures, the efforts to fortify were ceased (Pavićević, 2012, 20).

3. The construction plans for the forts of Oštro, Žanjica (Mamula), and Arza in the mid-19th century

In 1850, during the second Austrian administration in the Bay of Kotor, four plans for the forts and their locations were designed by the Imperial Royal Engineering Directorate in Kotor (HR-HDA-902, Cartographic Collection, K VII and 69). The drawings, denoted as A, B, C, and D, not only feature detailed diagrams but also include a legend with explanations of the functions of individual rooms, as well as information about the garrison and armament.

The drawing marked with the letter A shows the fort on the islet of Žanjica (Xaniza, also sometimes referred to as Scoglio Rondoni), later named Fort Mamula. The fort was designed to accommodate 260 soldiers – 120 in artillery and 140 in infantry – appropriately equipped with various types of cannons. The estimated cost was 175,000 forints.

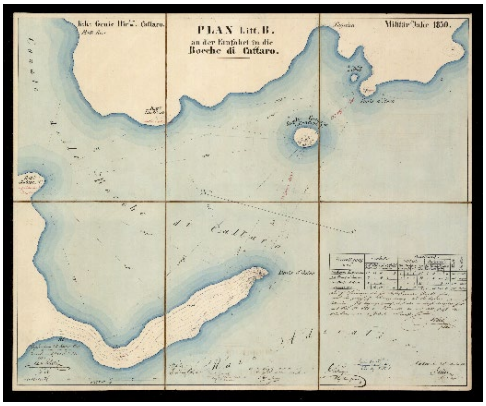

Fig. 2- Drawing B – map of the entrance to the Bay of Kotor, 1850. (HDA)

The second plan, marked with the letter B, is a map of the entrance to the Bay of Kotor, on which all three planned forts are indicated and depicted, along with an overview of the total projected costs per each specific category.

The drawing marked with letter C pertains to the plan for constructing a fort at Cape Oštro (Punta d'Ostro). It is accompanied by a legend that allows the reconstruction of the purpose of its individual parts, such as a bomb-proof living quarters, entrance to the living quarters platform, moat, bridge, stairs, battery, pathway, drawbridge, tower, a series of cannon chambers (casemates), communications/passageways, a ball-casting furnace, passageways connected to the gunpowder storage, and the gunpowder storage itself. The fort was designed to be equipped with 19 cannons, including 2 cannons with 30-pound shells, 10 iron cannons with 18-pound shells, 2 iron cannons with 12-pound shells, and 5 iron cannons with 6-pound shells. The garrison was planned to consist of 160

people, including 55 artillery and 105 infantry soldiers. A total estimated construction cost of 90,000 forints was also recorded. In addition to the fort's floor plan, two cross-sections were made, along with a floor plan of the designated residential area. This area was designed to consist of a kitchen above the cistern, a room for 30 soldiers, a hallway, a driveway, a food storage area, a guardhouse, rooms for troop and artillery commanders, soldier quarters, a staircase to the platform on the building below which there is a latrine, and a passageway leading to the cannon chamber.

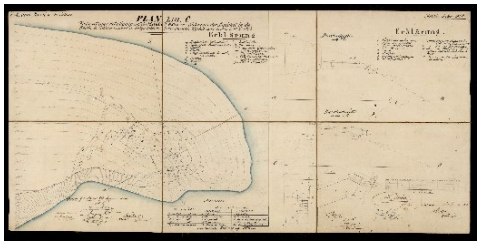

Fig. 3- Drawing C – Fort Oštro, 1850. (HDA)

The drawing marked with the letter D is the design of the fort at Cape Arza (Punta d'Arza). It shows room functions, a list of armaments and the garrison, and also includes an estimated construction cost totalling 60,000 forints.

All the plans were certified by Engineer Captain Wolter, who was well-informed about the defence needs of the entire region (AT-OeStA/KA KPS LB K I d, 1 F). Along with the drawings, he attached a detailed analysis of the geostrategic position's particularities, the circumstances of entering the bay, manoeuvring possibilities, as well as an analysis of the defensive capabilities of each fort. This included firing trajectories, movement systems, communications, supply and storage methods, conditions for the military personnel (arrangement, accommodation, food), additional fortification elements, scarps, trenches, standalone batteries, harbours, and necessary armaments. Considering the costs and potential savings, he also noted that between Cape Oštro and the islet of Žanjica lies the real and main entrance to the Bay of Kotor. Therefore, the strongest forces should be concentrated there to prevent more effectively the approach of the enemy. He described the deployment of all armaments and planned tactical directions. In conclusion, he stated that establishing the planned defensive line would require 325,000 forints and a garrison of 520 people, along with 67 cannons which he did not consider an excessive cost for military purposes given that it would mean securing a broader area (HR-HDA-902, K VIIi 69). In addition to Wolter's documentation from 1850, there is an appended comment on the presented fortification plan authored by Major General Lazar Mamula, the commander of the garrisons in Dubrovnik and Kotor (HR-HDA-902, K VIIi 69). Like his predecessors, Mamula agrees that, in pursuit of military, political, and trade interests, it is crucial to ensure control of the entrance to the Bay of Kotor near Cape Oštro and secure all three predefined points with strong forts. However, he also believed that the hinterland behind Cape Oštro must be better secured, extending all the way to the port of Molunat, approximately 10 kilometres to the north, as it could be used by enemies for troop landing. Mamula also suggests increasing the number of casemates and constructing additional towers and standalone batteries to cover a broader area in case hostile ships penetrate further into the interior of the bay.

All the reports and plans from the Imperial Royal Engineering Directorate in Kotor were forwarded to the Imperial Royal Engineering Inspection in Zadar and then to the Imperial Royal Main Naval Command in Trieste. They were approved with minor modifications, one of which involved replacing the originally planned cannons due to the accelerated development and modernization of military technology. Due to the significance of the entire project, an additional opinion was provided by General of Artillery Josip Jelačić, the Ban of the Imperial Royal Croatian-Slavonian-Dalmatian Military and Civil Government, reaffirming the earlier justifications (HR-HDA-902, K VIIi 69). He remarked that the planned storage facilities were small and that the additional space for the wounded and sick need to be provided within the forts. He also emphasized the need to procure new cannons suitable for combat against high-decked ships.

Evidence of the subsequent development of the initial project for the fort at Cape Oštro can be found in the plans created the following year, in 1851 (HR-HDA-902, K VIIi 195). The floor plan designates three sections of the fort: lower, middle, and upper batteries, along with a separate mortar battery. Staircases, living quarters for soldiers, and an ammunition storage area are

specifically marked on the plan, while the cross-section illustrates the planned building structures, the terrain, as well as the dimensions of rooms on various levels.

Despite the detailed project documentation, official correspondence, opinions, and justifications, it can be concluded that construction of the planned forts did not begin immediately, and the original project was further modified in comparison to the completed construction. The reason for these delays might be the substantial financial resources required for construction materials procurement and execution of the works, as well as a desire to achieve maximum efficiency and make the most of all additional options. However, the awareness of the crucial strategic position of the entrance to the Bay of Kotor and the constant threat of imminent enemy approach from the sea eventually led to the realization of the planned fortification system in the following years.

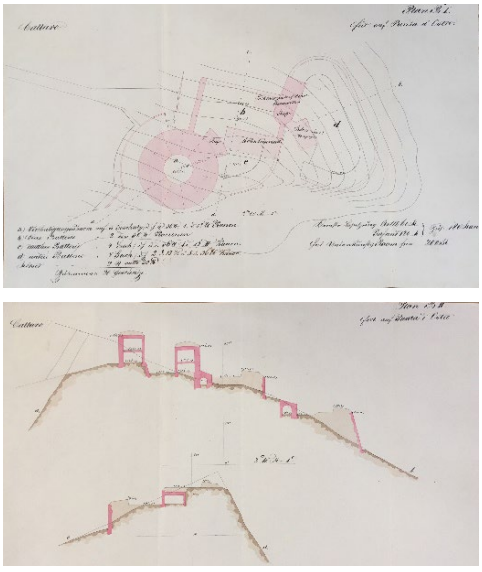

Fig. 4, 5- Plans of Fort Oštro, 1851. (HDA)

4. Proposal for additional fortification of Cape Oštro in 1856

Even during the construction of the three above-mentioned forts or shortly after their completion, discussions continued regarding the effectiveness of their defensive role. In 1856, Lazar Mamula, now serving as a confidential advisor and the deputy of Ban Jelačić in Zadar, once again emphasized the need to improve existing plans for additional fortification of Cape Oštro and explained how he believed this should be carried out (HR-HDA-902, K VIIi 70). To support and further substantiate his opinion, in the introductory part of his letter, Mamula gives examples ofa series of attacks on coastal fortifications, from the shores of the Eastern Mediterranean, Central America, the West Coast of Africa, and Northern Europe. He analyses attacks by warships on the castle of San Juan de Ulúa overlooking the Port of Veracruz in Mexico, the fort of St. Jean d'Acra on the coast of Asia Minor, as well as the ports of Tangier and Mogador on the West Coast of Africa. According to Mamula, these attacks highlighted the necessity of additionally securing and strengthening coastal forts by fortifying their hinterland, not just the sea-facing part. This was confirmed in battles at Caorle, Eckernförde, and Odessa, as well as at Bomarsund and Sevastopol, which were essentially conquered from the land, not by naval fleet attacks.

In his thorough assessment of the fort at Cape Oštro, Mamula analyses its defence possibilities: "The fort built on Cape Oštro is very robust on the seaside, and together with the other forts at the entrance to the bay, it will most certainly be able to repel any fleet attack. However, it lacks defence with cannons towards the hinterland, and if it is attacked from that side, it will quickly succumb." He thus suggests that reinforcement should also be conducted in the hinterland, atop one of the surrounding hills. The final choice of the elevation to be fortified, according to his opinion, is conditioned by the main fortification principles according to which it is unlikely for all parts of the fort to be simultaneously attacked, but at the same time, all positions should be interconnected, and it must be possible to spot the enemy from the fort at all times. After analysing all the appropriate options, he narrowed down the choice to three nearby peaks, with the first one being too close to the fort and having a lighthouse built on it. The second position was located too far from the point where enemy landings were possible, making it unable to effectively defend that area. The third central peak dominated the terrain and thus met all the requirements. Given the impossibility of approaching the land between the peak and the fort due to high, steep cliffs, it was ideal for constructing the necessary additional fortification. This new structure was

equipped with six cannons and two long-range heavy mortars. In the event of fort abandonment, it was decided that explosive mines should be strategically placed to ensure its destruction. Otherwise, the enemy could exploit the casemates and barracks for launching an attack on Cape Oštro Fort. A project was drafted for the construction of this supplementary fort. Despite finding the initial lighthouse peak unsuitable for fort construction, a project was also prepared for it, but was eventually abandoned due to prohibitively high costs.

5. The second half of the 19th century

The construction of forts at the entrance to the Bay of Kotor began in the early 1850s, simultaneously with the construction of the entire Austro-Hungarian defensive fortifications system.

The considerations of the military administration in Vienna in mid-1859 regarding to the defence needs of the long Dalmatian coastline led to the conclusion that controlling of the entire coastline effectively would not have been possible. As a result, strategically crucial points requiring security were identified. One of such points was the city of Kotor in the Bay of Kotor. This region was deemed highly important due to its location between two potential threats. On one side, there was the potential for a formidable naval attack from the sea, while on the other, there was the risk of raids from Montenegro on the land side. Given the narrow coastal strip, defending this area was challenging and mainly relied on fortified positions. At that time, the established fortifications in the Bay of Kotor included *Cattaro, Trinità, Gorazda, Puzzola, Traste, Perasto (St. Croce St. Giorgio), Budua, Stefano, Dragal, Presicka, Copac, Spiridione, Stagnevich, Punta d'Ostro, Scoglio Rondoni, Punta d'Arza, Lustizza, Cabala, Porte Rose, Prevlacca, Spagnol* and were armed with a total of 239 pieces of light and heavy artillery (HR-HDA-1704, box 14). In certain locations, there were larger or smaller forts, while some places only had batteries constructed, such as at *Prevlacca* or in *Porte Rose* (AT-OeStA/GPA Inland CIII a) Castelnuovo 9 Litt A; compare also: Lalošević, Pavićević, 2013, 43). As far as the forts at the bay's entrance are concerned, it was believed that they could withstand even the most intense attacks, provided that they were adequately equipped with heavy artillery. However, due to insufficient armament, it was proposed to bolster the defence in case of an attack with two frigates and one corvette, which would further prevent the penetration of enemy vessels (HR-HDA-1704, box 14).

Their position was first recorded on the maps from the 1850s. On the 1859 map covering the area from Dubrovnik to Kotor, the locations of the forts at the bay's entrance were marked (HR-HDA-1704, box 14), a practice that continued in later years (HR-HDA-902, K VIIi 72; AT-OeStA/KA KPS LB K VIIi, 74 E). All the forts were well-equipped. Fort Oštro had a total of 42 cannons, howitzers, and mortars, while there were 45 of these on the islet and only 10 at Cape Arza. Due to their monumental size and commanding presence, they were also noted by travel writers. For instance, in 1870, Valentino Lago remarked that this once bare and abandoned site was now articulated with numerous defensive structures (Lago, 1870, 7). Emperor Franz Joseph I also commented on the densely built defence system during his visit to the coast in 1875, remarking on the entrance to the bay that it is an enchanting view protected by numerous fortifications (*1878, 241). It was during this time that the Austrian court painter Anton Perko created a painting depicting Cape Oštro – the fort and the lighthouse from the southwest.

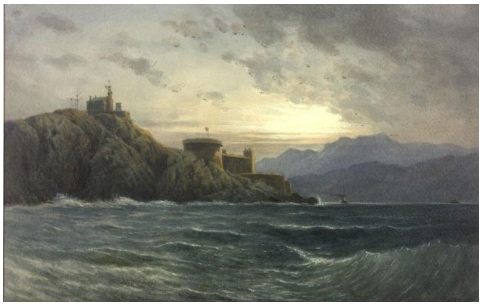

Fig. 6- Fort Oštro (A. Perko, 19th century)

However, there was rapid development in artillery weaponry. In Austria, the first rifled mortars with calibres of 179mm and 210mm were introduced in 1873. By 1880, these were replaced by three new types with calibres of 90, 150, and 210mm. Later, a much more powerful mortar with a calibre of 240mm was introduced, surpassing the earlier models (Pavićević, 2012, 40). As a result, over time, the entire defence system constructed by the Austro-Hungarian Empire in the Bay of Kotor lost its effectiveness. The defensive significance of Fort Oštro

diminished due to its size, visibility, and weak resistance, no longer aligning with the modern naval armament of the enemy, which was equipped with large-calibre cannons and explosive shells.

6. The condition of Fort Oštro according to the plans from 1890 and 1898

In 1890, an as-built of the fort on Cape Oštro was created, and a bit later, in 1898, two more plans were made (Pavićević, 2012; AT-OeStA/GPA Inland CIII a) Castelnuovo 14, 1890). By comparing these with the plans from 1850, it is evident that significant changes had occurred. Some alterations were influenced by the terrain on which the fort was constructed, as well as technical modifications during the construction process. Others resulted from the reconfiguration of original spaces and communications due to new defence requirements and weapon advancements. The condition depicted in the 1890 sketch, given its detailed representation, can be considered relevant for determining all subsequent interventions, while distinguishing between the original structures and those created immediately after construction, in the period between 1853 and 1890, is much more challenging. It is possible to assume that most of the later modifications occurred during the changes in artillery equipment.

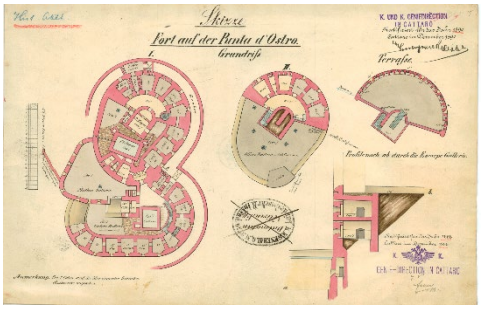

Fig. 7- Plans of Fort Oštro, 1890 (AT-OeStA)

The plans from 1890 provide insight into a more detailed layout and functions of individual rooms, positions and types of openings in the wall structure (loopholes, windows, gun openings, doors), and the shaping of certain parts, such as the now abolished battlement of the upper terrace. The same situation, albeit poorly visible, is also evident in Franz Thiard de Laforest's photograph depicting Fort Oštro and Ludwig Hans Fischer's sketch illustrating the Oštro and Mamula forts from the late 19th century, where the lighthouse above the fort is also visible.

The fort's documentation made in 1898 (Pavićević, 2012; Lalošević, Pavićević, 2013), reveals that at the end of the 19th century, the fort was armed with six batteries of various calibres, including three in casemates and three on platforms. It had 21 cannons of 80mm from 1863, 3 cannons of 150mm from 1861, 9 cannons of 120mm, 1 cannon of 190mm from 1859, and 4 cannons of 150mm. The garrison consisted of 245 people in peacetime and 405 in wartime, including 5 officers and 225 soldiers with various specialties (artillerymen, signalmen, engineers). The capacity of the cistern is also noted, with a total water capacity of 440,000 litres. Additionally, above the fort, a mortar battery built in 1875 is shown, with four cannons of 210mm.

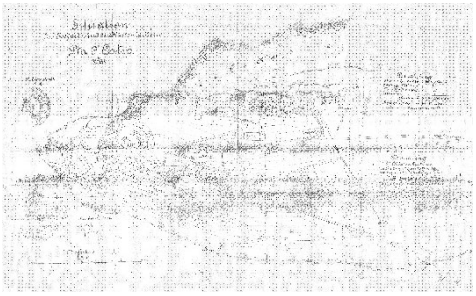

Fig. 8- Cape Oštro, 1898 (Pavićević, 2012)

In the same year, 1898, and in the early part of 1899 documentation was also prepared for the fort at Cape Arza and authenticated at the Imperial Royal Subsidiary Military Construction Department in Kotor (HR-HDA-1699, document 1416).

7. World War I, the Attack on Oštro and events until the beginning of the 21st Century

In 1914, at the beginning of World War I, the fort was armed with 4 M-1880 model 210mm mortars, 4 outdated 90mm cannons, 4 80mm cannons, and a lighthouse. The French fleet attacked Fort Oštro three times on 1 September, 19 September, and 17 October 1914. In the first attack led by Vice Admiral Lepeyer, there was no significant damage. Afterward, a fake battery and a signalling station were built on the outer side of the cape to deceive the enemy. This proved useful during the subsequent attack when Rear Admiral Senes, with a second, stronger, light division of ships hit the fort with several shells. Even in the

third attack, during which 37 heavy shells from ship-mounted 305mm cannons were launched towards it, the fort was not heavily damaged. The lighthouse was hit, as well as the observation terrace, while the remaining shells landed in the immediate vicinity without reaching the fort itself (Pavićević, 2012, 136).

Fig. 9- *Punta d'Ostro*, F. T. de Laforest, end of the 19th century (HDA)

Until the end of World War I, the fort did not suffer further attacks. After 1921, it was taken over by the army of the Kingdom of Yugoslavia. In 1943, the fort suffered significant damage by the German army but continued to be used as part of a Yugoslav People's Army military complex. It primarily served as a testing ground for new artillery weapons and ammunition. Different military facilities were expanded and upgraded as needed, eventually becoming an important hub for radar systems, missile bases, and anti-aircraft defence (Lučić, Obada, 1994).

In 1992, during the Croatian War of Independence, the Konavle area, including Prevlaka, was liberated. However, by virtue of international agreements, Prevlaka was designated a demilitarized zone under UN supervision—a status that remained in place until 2002 when it was fully integrated into the Croatian coast (Macan, 1998). Recognizing its natural and historical significance, a revitalization program for the Prevlaka peninsula was launched (Mavar et al., 2004). Today, Fort Oštro is safeguarded as an individual immovable cultural heritage, overseen by the Society of Friends of Dubrovnik Antiquities (Božinović Drobac et al., 2019).

8. Conclusion

The Austrian Empire and, from mid-19th century onward the Austro-Hungarian Monarchy, did not focus only on its land fortification architecture (Mörz de Paula, 2006, 37; Rolf, 2011, 43), but simultaneously enhanced its navy, developing a system of coastal fortifications. In the process, attention was given to the significance of specific coastal areas, the assessment of the most favourable positions for fleet bases, and the geopolitical situation. To fortify the maritime entrance to the Bay of Kotor in the mid-19th century, under the supervision of General Lazar Mamula, forts were constructed on Cape Oštro, the islet of Žanjica, and Cape Arza. The foundation of these forts consisted of stone-built casemates with flanking cannons and open mortar batteries placed on platforms. Unfortunately, all three forts quickly became outdated as they could not adapt to contemporary defence requirements. Additionally, they were conspicuous and vulnerable to the increasingly modern naval weaponry of the time.

The first required renovation of the forts at the entrance to the Bay of Kotor occurred in the 1860s when the existing defence system became vulnerable to the capabilities of new rifled artillery, which increased the range and destructive power of enemy weapons, leading to the loss of role and usefulness of the forts (Kaufman, 2014, 138). The invention of the brisant grenade filled with explosives in 1885 led to another change in warfare, which had an impact on the entire system before World War I, during which circular forts completely lost their importance and were replaced by more contemporary and powerful elongated polygonal fortifications, embedded in the terrain, with more lethal long-range weaponry (Krizmanić, 2009, 47; Stevenson, 2012, 829-859). Therefore, in the area of the Bay of Kotor, fort modernization had to be implemented. (Kaufman, 2014, 161). At the turn of the 20th century, Austria-Hungary's perspective on the military-strategic role of the Bay of Kotor underwent significant changes. Several advanced, strong, and independent fortifications were constructed around the Bay, forming defensive lines that gradually transformed the existing defence system into a belt fortress, one of the largest fortification systems of its kind in the Monarchy (Mörz de Paula, 2006, 73; Lalošević, Pavićević, 2013, 8).

The architecture of Fort Oštro reflects the above-mentioned changes. Its construction was overseen by the military construction directorate in Kotor, as a branch of the Central Military Construction Directorate in Zadar, with all the interventions additionally approved in Trieste and Vienna. Primarily, attention was given to fulfilling its function, in accordance with the principles of warfare and the needs of artillery weaponry. At

the same time, there was a deliberate avoidance of excessive decoration, with clean geometry, or volume, becoming the fundamental ornament of the architectural form (Krizmanić, 2009, 49-53). The range of decorative elements underwent significant reduction and simplification. Carved features, predominantly crafted from massive stone blocks, were simplified, occasionally accentuated with simple profiles.

The preserved project for Fort Oštro from 1850, as well as the details from 1851, were already altered during construction and adapted to the rugged terrain. Later modifications, on the other hand, resulted from the repurposing of original spaces and communication routes due to new defence needs and advancements in weaponry (Pavićević, 2012; Zsupanek, 2009), which occurred rapidly after the completion of construction in the 1860s and thereafter in the 1880s. Therefore, the as-built fort plan from 1890 can be considered relevant for defining the elements of the entire first phase of fort construction. In the period spanning from the mid-19th century, when the fort was constructed, to 1890, there was notable improvement in Austro-Hungarian fortification architecture. This phase reflects a blend of changes that contributed to a significant architectural defence complex, making it challenging to pinpoint specific alterations. Subsequent modifications typically did not bring any new value and were not the result of thoughtful and carefully planned interventions.

With the decline in importance and political influence of Austria-Hungary, the fortification systems constructed by the monarchy lost their value and gradually fell into neglect. Today, they are largely in a state of ruin. Due to their historical significance as evidence of past events and conflicts and defence strategies, along with their architectural expression that reflects the blend of architectural preferences and military needs, it is important to valorise their significance (Neumann 2017) and to safeguard remaining examples.

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