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Research paper

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THE RUBAS FORTIFICATION OF THE MID-SIXTH CENTURY: STRUCTURAL FEATURES OF THE WESTERN FACADE OF WALL 2

Abstract. The Rubas Fortification is a complex of stone military-engineering structures, uncovered in 2014 in the lower reaches of the Rubas River, 20 km south-west of Derbent, near the village of Kommuna, Derbent district of the Republic of Dagestan. According to its functional purpose, this archaeological site belongs to a series of monumental defensive structures erected in the Caspian Passage (Eastern Caucasus) by the Sassanid Iran with the financial aid of Byzantium in the 5–6th centuries, and preventing nomadic tribes from raids in the countries of Transcaucasia and the Middle East. Typologically and chronologically (6th century), the Rubas defensive complex is similar to the stone fortifications of Derbent. Excavations in 2014, 2016–2018, 2020 on a compact section of the left bank of the Rubas River with an area of 300 sq.m. revealed six separate military-engineering structures connected to each other by construction joints. The central position of this complex is occupied by the main Wall 2, oriented in the meridian direction (NW–SE). It has been uncovered for 28 m, is in a transverse position relative to the riverbed of the Rubas River, directed from west to east. All other revealed structures are located in the immediate vicinity of Wall 2, to the west and east of it. Structurally, Wall 2 is distinguished by its monumentality. The author describes in detail the design features of the western facade of Wall 2 and determines the functional significance of each section of the wall. A comparative analysis of engineering solutions of both facades of Wall 2 was conducted, the functional orientation of complex design solutions of a defensive nature was determined. The research methodology comprises a detailed analysis of the technological methods for the construction of the western facade of Wall 2, the reasoning behind the presence of sections of different construction types and the determination of a conditioned connection between the nature of the masonry of this facade and the strength of the entire structure.

Keywords: Rubas Fortification; Eastern Caucasus; Main Wall 2; structure of the western facade of Wall 2; Sasanian Iran.

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Исследовательская статья

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РУБАССКАЯ ФОРТИФИКАЦИЯ СЕРЕДИНЫ VI в.: ОСОБЕННОСТИ КОНСТРУКЦИИ ЗАПАДНОГО ФАСАДА СТЕНЫ №2

Аннотация: Рубасская фортификация – это комплекс каменных военно-инженерных сооружений, открытый в 2014 г. в низовьях р. Рубас, в 20 км к ЮЗ от г. Дербента, вблизи сел. Коммуна Дербентского района Республики Дагестан. По функциональной направленности данный археологический объект относится к серии монументальных заградительных сооружений, возведенных в Каспийском проходе (Восточный Кавказ) Сасанидским Ираном при финансовом участии Византии в V–VI вв., препятствующих набегам кочевых племен в страны Закавказья и Ближнего Востока. Типологически и хронологически (VI в.) Рубасский оборонительный комплекс сопоставим с каменными крепостными сооружениями Дербента. Раскопками 2014, 2016–2018, 2020 гг. на компактном участке левого берега р. Рубас площадью 300 кв.м. было выявлено 6 обособленных военно-технических сооружений, соединенных между собой строительными связками. Центральное положение в данном комплексе занимает магистральная стена № 2, ориентированная в меридиальном направлении (СЗ–ЮВ). Она раскрыта на протяжении 28 м, находится в поперечном положении относительно русла р. Рубас, направленного с запада на восток. Все другие выявленные сооружения расположены в непосредственной близости от стены № 2, к западу и востоку от нее. Стена № 2 конструктивно отличается монументальностью. В данной статье детально охарактеризованы особенности конструкции западного фасада стены № 2 и обусловлена функциональная значимость каждого строительного участка, входящего в его состав. Проведен также сравнительный анализ инженерных решений обоих фасадов стены № 2 и определена функциональная направленность сложных конструктивных решений оборонительного характера. Методика исследований включает детальный анализ технологических приемов возведения западного фасада стены №2, обоснование наличия разнотипных по конструкции участков и установление обусловленной связи между характером кладки этого фасада и прочностью всей постройки.

Ключевые слова: Рубасская фортификация; Восточный Кавказ; магистральная стена № 2; структура западного фасада стены № 2; Сасанидский Иран.

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The Rubas Defensive Complex (The Rubas Fortification) of the mid-6th century was accidentally discovered near the village of Kommuna, Dagestan, in the bank area of the River Rubas in 2014. Part of the site was destroyed by local residents, who had extracted massive stone blocks for constructing modern buildings. Thanks to the high civic responsibility of a number of residents of the villages of Kommuna and Rubas, as well as the prompt intervention of the Republican Heritage Protection Service, the directorate and employees of the Institute of History, Archeology and Ethnography of the Dagestan Federal Research Center of the Russian Academy of Sciences, the barbaric destruction of this unique cultural heritage object was stopped.

The reconnaissance carried out in 2014 (RFBR grant – Dagestan, 2012-2014) identified small sections of four monumental structures – Main Wall 2; Wall 3, built into the eastern facade of Wall 2; arched structures (reinforced passage to the site) and Wall 1 adjacent to it.

Stationary excavations of the site were carried out in 2016-2018 (RFBR grant) and 2020 (grant of the Head of the Republic of Dagestan, 2019) by the Rubas Archaeological Expedition of the Institute of History, Archeology and Ethnography of the Russian Academy of Sciences.

Currently, six military-engineering structures have been explored: 1) Main Wall 2 (oriented NW–SE); 2) round-shaped Wall 3, built into the eastern facade of Wall 2 on the southern section (orientation W–NE); 3) stepped Structure 6, attached to the eastern facade of Wall 2 from the north (orientation along the long side of NW–SE); 4) Structure 5 in the form of a platform located to the south of Wall 3 (orientation by the location of elongated blocks of the NEE–SWW); 5) arched structure (reinforced entrance to the site) located to the west of Wall 2 (orientation along the long side of SWW–NEE); 6) Wall 1, attached from the north side to the construction of the arched structure (orientation NW–SE) [Fig. 1, 1–6; 2, 1–4, 6–7][1, pp. 912–937].

The excavation area is over 300 sq.m with a thickness of soil of circa 3.0 m [Fig. 1; 2].

Research has established the functional purpose of this complex of military-engineering structures. The dating of the site was determined by analogy with the Derbent stone fortifications – the middle of the 6th century. The research has revealed the typological connection of this site with the construction activity of the Sasanian Iran on erecting defensive lines on the territory of the Caspian Passage. The high level of construction works and the uniqueness of engineering and design solutions were recorded [1, p. 920].

The originality of the layout of structures and the complexity of design solutions are also substantiated. Each military-engineering object of this complex has an individual layout, design and a set of technological building methods. According to research data, each object carried a certain functional purpose in the defensive system of the complex, which resulted in the peculiarity of its design solutions.

The uniqueness of the defensive complex on the Rubas River is due to two factors – 1) the presence of structures of different types in its composition and 2) the use of construction joints of various functional purposes that combine different types of buildings into a single object. The Rubas Fortification Complex has no analogues in the said region.

Excavations of this defensive object involved great difficulties associated with obtaining the necessary information about the chronology of the site and its cultural affiliation. The archeological object was overlapped by mudflow deposits (river gravel

and flour-like sandy loam), formed as a result of a series of earthquakes of magnitude 9 [2, p. 91–103; 3, p. 91–103] [Fig. 1, 7; 2, 5; 4, 5; 5, 5; 6, 3]. The thickness of the mudflow (pebble and sandy loam layer) within the excavation is 2.5 m. No objects of material culture of the time of the functioning of the defensive object (ceramics, weapons and household items) were revealed at the excavation site. Fragments of calcined bricks of rough dressing, both at the lower level of mudflow deposits at the base of structures, and at the upper and middle levels of soil deposits were uncovered. An analysis of the circumstances of finding the brick fragments indicates the introduced nature of these finds by mudflows. No brick inclusions were found in the structure of the Rubas fortifications. Paleoseismologists also recorded deformations of many sections of the defensive structures of this site occurred as a result of multiple earthquakes [2, pp. 95–96, Fig. 6–10; 3, pp. 95–96, Fig. 6–10].

The identified structures that make up the complex are the main source of obtaining the necessary information about the Rubas Fortification. The integrity of the structures is relatively good, despite the damage inflicted by the local residents in 2014. Traces of disturbance of soil by digs, carried out by the owners of the main gas and oil pipelines (the site is located in the protected zone), as well as disturbance associated with the development by local residents of the coastal territory for fruit and vegetable gardens, have been recorded.

Most of the structures of the Rubas fortification have been preserved at a height of 2–2.5 m due to natural conservation by mudflow deposits. The identified structures are distinguished by their individual layout and design, as well as the building materials used [Fig. 1, 1–6; 2, 1–4, 6–7].

There are no known analogies to this complex neither in its composition, nor in the layout and design of structures.

The good preservation of the structures of the Rubas Fortification Complex makes it possible to conduct analytical studies of the design of each of them. It is the structural features of these objects that make it possible to determine the chronology of this site, to identify the conditionality of the diversity of their forms and the sources of borrowing construction methods and architectural solutions. It is also important to substantiate the presence of a variety of design features of defensive structures. We assume it is due to the need to strengthen the integrity of the structures, based on the nature of external threats and the destructive effects of natural phenomena (such as earthquakes). The assault practices by nomadic tribes should also be taken into consideration. It is also possible that the complexity of the defensive structures was used as protection of the main directions of their assault and weak points in the structure.

The excavations of the complex of defensive structures on the Rubas River in Southern Dagestan have not yet been completed. Despite the extensive work, none of the revealed structures has been fully uncovered [Fig. 1; 2]. According to the results of the 2020 excavations, the eastern facade of Main Wall 2 with a length of 17.5 m stretches in the north direction, its western facade with a length of 24 m – both in the south (towards the riverbed of the Rubas River) and in the north directions. Wall 3, embedded into the eastern facade of Wall 2, is oriented towards east. The original structure in a form of a multi-level platform (Structure 5) with an inclined surface has a continuation both to the south (towards the riverbed of the Rubas River), and to the east.

These circumstances do not yet allow us to fully characterize the design of each structure of the complex.

Based on the results of the 2020 excavations of the eastern facade of Main Wall 2, a detailed analysis of its structural structure has been carried out for the first time [1].

Monumental Wall 2 occupies a central position in the structure of the Rubas complex. It is oriented in the meridional direction. For the period of 2020, its maximum length was uncovered at the level of 28 m (total length) [Fig. 1, 1; 2, 1; 3, 1; 4, 1]. As noted, it has a continuation both towards the Rubas River (left bank) and in the north direction [Fig. 2, 1].

The width (thickness) of Wall 2 varies. On the southern section, at the place where Wall 3 adjoins it, it is 2.7 m. At the northern end, the width of Wall 2 increases to 3.3 m [Fig. 2, 1]. The difference in the parameters of the wall's width may possibly be caused by seismic activity [2, p. 91–103]. The shape of Wall 2 is distorted, which can be clearly seen on the western facade. In the central part, the facade has a concavity directed to the east; the northern and southern ends of the facade, on the contrary, have a bulge directed to the west [Fig. 2, 1; 3, 1; 4, 1].

There are 2 structures built into the eastern facade of Wall 2 – Wall 3 and a stepped Structure 6 [Fig. 1, 2, 4]. To the east of the southern section of Wall 2 is Structure 5 (platform), but its connection with Wall 3 and Wall 2 has not yet been found [Fig. 1, 3; 2, 6]. Through the western facade, Wall 2 is connected to the arched structure. Between them is Passage 2, overlapped by massive slabs, leading to the site [Fig. 1, 5; 2, 2].

The eastern facade of Wall 2 is bounded on the south side by Wall 3 built into it, which has a concave shape [Fig. 2, 4]. The southern part of the eastern facade of Wall 2 has not survived. It was destroyed by local residents during the extraction of stone blocks from its structure. In 2014, a pit measuring 9x7 m with a depth of more than 3 m was found on the place of the destroyed section of the eastern facade of Wall 2 [Fig. 2, 1; 4, 1]. It was filled with debris of stones of various sizes. The total length of the eastern facade of Wall 2, including the length of the northern extension (Structure 6) as at 2020 is 17.5 m (11.8 m + 5.7 m) [Fig. 2, 1, 7].

As noted, the analysis of the structure of the eastern facade of Wall 2 revealed 5 construction sections in it (sites A, B, C, D, E). Section C was built in a running bond masonry (also called stretcher bond, ashlar fine bond, *opus isodomum*) in a stepped manner. Sections B and D are built with the use of two technologies – alternation of “opus quadratum” and a running bond stepped structure. Sections A and E are built with the application of running bond masonry using wide steps [Fig. 16; 17] [1, pp. 916–919].

The inclusion in the eastern facade of Wall 2 of a stepped Structure 6, which adds a certain completeness to the architecture of the eastern facade, revealed the presence of typological identity of 4 sections of the facade out of 5 existing ones [Fig. 16]. Moreover, typologically identical sections occupied a symmetrical position relative to the central extended section, i.e. they were on both sides of it [Fig. 17]. This fact indicates that the stepped extension (Structure 6) is not a separate structure, but an essential part of the eastern facade of Wall 2. Analysis of the structure of the eastern facade of Wall 2 and the structure of the objects included in it demonstrates that their location is conditioned by specific defensive purposes [1, pp. 916–920].

The structures of the western and eastern facades of Wall 2 are different.

The western facade of Wall 2 has no extensions. According to the 2018 excavations, its southern end has a continuation to the south towards the left bank of the Rubas River. Its northern end breaks 4 m from the northern side of the excavation area of 2018. The total length of the revealed part of the western facade for the period of 2018 is 23.8 m [Fig. 2.1; 11; 12].

Three sections with different types of masonry in the structure of the western facade of Wall 2 visually stand out: northern (running bond masonry of elongated blocks of medium thickness); central (alternating layers of “opus quadratum” masonry with single-row running bond masonry); southern (running bond of thickened blocks) [Fig. 12, A', B', C'].

Their conditionality is partially covered in some publications, but no analysis of the design of the western facade of Wall 2 has been carried out, since further excavations are planned to determine its full extent.

No comparative analysis of construction solutions of both facades of Wall 2 has been conducted. It is necessary to identify the design features of the western facade of Wall 2 according to a single methodology, including a detailed description of the available database for each construction section.

The present paper considers construction features of the western facade of Wall 2, provides a comparative analysis of engineering solutions of the western and eastern facades, and shows the functional significance of complex design solutions in the development of defensive tasks of this complex. These studies were carried according to the state task of the IHAE DFRC RAS “Construction features of the Rubas fortification of the 6th century (Eastern Caucasus)”, planned for the 2022-2024 period.

Studies have found that the design solutions of both facades of Wall 2 were interconnected, complementing and strengthening the protective capabilities of the complex as a whole.

As mentioned, all identified structures of the Rubas Fortification have an individual design, the features of which are conditioned by their functional purpose. However, although emplecton (core-and-veneer) method was applied in the construction of Wall 2 (two walls of massive blocks with inner filling), each facade of Wall 2 (eastern and western) comprised sections with different construction technologies.

The analysis of the structure of the eastern facade of Wall 2 has revealed the presence of 5 distinctive sections varying in the masonry and construction types (sections A, B, C, D, E) [Fig. 17, A, B, C, D, E] [1, pp. 916–918].

The structure of the western facade of Wall 2 is also heterogeneous [Fig. 11]. There are 3 distinctive sections in it, varying in structure and building technology (sections A', B', C') [Fig. 12, A', B', C']. Various construction techniques were applied in the places of bonding. The structural features of these sites are due to the functional orientation of each of them. The objectivity of the conclusions on each of the sections of the western facade of Wall 2 implies a complete description of the available database (a number of blocks preserved on the site, their dimensions, features of their bonding in the masonry, a system of bonding of various blocks between the sections, etc.).

The main difference between the western facade of Wall 2 and its eastern facade is the absence of a stepped structure in it. The western facade throughout its whole length has practically smooth surface with well-fitted to each other stone blocks and, in all likeliness, the use of mortar in the places of bond of stone blocks [Fig. 5–10].

Section A'

Section A' was explored in 2016-2018. The section is located at the northern end of the western facade of Wall 2. The length is 9.0 m [Fig. 6, 1; 12, A'; 13]. Pebble stone debris of a mudflow with a maximum thickness of 1.5 m adjoins this section of the facade [Fig. 11; 12; 13]. The head section of the mudflow is located at the southern end of this section of the western facade [Fig. 1, 7; 2, 5; 3, 6; 4, 5; 5, 5; 6, 3].

The structure of Section A' is laid with a running bond masonry.

At the northern end of Section A', no traces of mudslide deposits on the three upper full rows of masonry and the lower incomplete row (Blocks 134, 136-140) were recorded. The height of the northern end of this section is 0.94 m [Fig. 13].

Ten rows of masonry (Blocks 14, 16, 63-64, 73, 77, 80, 83, 84-89) and 1 incomplete row (without No.) were revealed at the southern end of Section A' [Fig. 13]. The height of the southern end of Section A' is 2.3 m.

The uncovered level of Section A' comprises 62 blocks: Blocks 1-14, 16, 51-89, 134-140. The first (upper) row consists of 2 blocks (1-2), the second row - of 6 blocks (134-135, 3-6), the third row - of 10 blocks (137, 136, 7-14), the fourth row - of 6 blocks (138, 51-54, 16), the fifth row - of 12 blocks (140, 139, 55-64), the sixth row - of 9 blocks (65-73), the seventh row - of 4 blocks (74-77), the eighth row - of 3 blocks (78-80), the ninth row - of 4 blocks (81-84), the tenth row - of 2 blocks (85, 86), the eleventh row - of 2 blocks (87-88), the twelfth row included 1 block (89), the thirteenth row also included 1 block (without No.) [Fig. 13].

The masonry of Section A' comprises 7 large blocks (Nos. 1, 4, 7, 16, 53-54, 138). They are installed in rows 1-4 of the masonry. Large Block 1 of the first row of masonry has dimensions of 1.66×0.3 m. Large Block 4 of the second row - 1,7×0,3 m. Large Block 7 of the third row - 1.66×0.24 m. The fourth row had 4 large blocks - Block 138 (1.66×0.2 m), Block 53 (2.0×0.14 m), Block 54 (2.2×0.2 m) and Block 16 (2.16×0.2 m) [Fig. 13].

Larger blocks were found in the fourth row of masonry (Blocks 53, 54, 16) with a length of 2.0 m, 2.2 m, 2.16 m, respectively. Moreover, they are laid side by side in the following sequence: Nos. 53, 54, 16. These blocks are the largest in length along the entire western facade of Wall 2.

The blocks of Section A' of the western facade of Wall 2 are finely dressed, installed without ledges. However, in the masonry we found some blocks of secondary use. In the 1st row, on the surface of Large Block 1 with a length of 1.6 m, there was a nonextant architectural detail at the northern end. One of the longest Blocks 16 is installed in the 4th row. Its upper level had defects with pointed protrusions in the southern half. The irregularities of Block 16 were smoothed with a layer of mortar to install Block 14 of the third row of masonry on it. The surface of Block 53 with a length of 2.0 m of the fourth row of masonry was also uneven. It was also smoothed with mortar [Fig. 13].

Section B'

Section B' was explored in 2016-2018, 2020. It is located in the central part of the western facade of Wall 2. The length of the section is 5.7 m. This section is built into the southern end of Section A' [Fig. 6, 2; 7-8; 9, 1; 14].

The structure of Section B' is laid with two types of masonry – running bond and “opus quadratum”. The running bond masonry served as inter-layers and overlaps between two rows of “opus quadratum” masonry [Fig. 14].

Seven full rows of masonry were uncovered on this site, and the upper levels of the blocks were revealed on the lower row.

The first and second rows of masonry are laid in a running bond (Blocks 15, 17–20), the third row – in the “opus quadratum” technique (Blocks 21–28), the fourth row – in the running bond (Blocks 30–35), the fifth row – in the “opus quadratum” technique (Blocks 90–93), the sixth and the seventh row of masonry – in a running bond (Blocks 94–102) [Fig. 14].

The height of the northern end of Section B' is 2.5 m, the southern end – 2.04 m.

The uncovered level of Section B' comprises 32 blocks: Blocks 15, 17–28, 30–35, 90–102. In the first row, one block (No. 15) is installed in a running bond method. The second row comprises 4 blocks (Nos. 17–20), which are also installed in a running bond. The third row consists of 8 blocks (Nos. 21–28) installed according to the “opus quadratum” technique. The fourth row comprises 6 blocks (Nos. 30–35) installed in a running bond. The fifth row consists of 5 blocks installed according to the “opus quadratum” technique (Nos. 90–94), supplemented by two rows of blocks installed in a running bond (No. 102–105, 111–112). The sixth and seventh rows include 8 blocks installed in a running bond (Nos. 94–102) [Fig. 14].

The masonry of Section B', installed according to the “opus quadratum” system, consisted of 6 header and 6 stretcher blocks. The stretcher blocks are laid vertically on a long side (Blocks 21, 23, 25, 28, 91, 93). The header blocks are installed with their long sides outwards (Blocks 22, 24, 26, 90, 92, 102) [Fig. 6-8; 9, 1; 14].

The stretcher blocks have various parameters: Block 21 – 1.9×0.7 m, Block 23 – 1.9×0.62 m, Block 91 – 1.82×0.6 m, Block 93 – 1.0×0.6 m, Block 25 – 0.8×0.6 m, Block 28 – 0.66×0.34 m.

The height of the header blocks corresponds mainly to the width of the stretcher blocks, next to which they were installed: Block 22 (height 0.68 m, thickness 0.3 m), Block 24 (height 0.62 m, thickness 0.18 m), Block 90 (height 0.6 m, thickness 0.2 m), Block 92 (height 0.6 m, thickness 0.2 m). The exception is the header Block 26, installed between the stretcher Blocks 25 and 28, which have different widths at the place of its installation. The header Block 26 has a height equal to the width of the stretcher Block 28. The missing height level, which corresponds to the width of Block 25, was increased by laying Block 27 on the upper level of Blocks 26 and 28, with the following parameters: length 0.7 m, thickness 0.1 m [Fig. 14].

The bonding of Sections A' and B', which have different methods of laying stone blocks (Section A' – running masonry, Section B' – alternation of running masonry and “opus quadratum”) was carried out in two methods. Block 21, laid with its long face on the edge, has two cutouts for bonding with the blocks of Section A', installed in a running bond. At the upper level of Block 21, there is a cutout 0.5 m long and 0.12 m high, into which Block 64 of the fifth level of the masonry of Section A' is installed. At the lower level of Block 21 there is a cutout 0.1 m deep and 0.2 m high, in which Block 80 of the eighth level of the masonry of Section A' is installed. In the second method, the height of the masonry of several blocks installed in a running bond masonry was adjusted to the level

of the height of the side of the block, installed on a long edge. Thus, the header Block 90 is bonded with a masonry comprising three blocks (Nos. 84, 86, 88), according to the total height corresponding to the height of the header Block 90 [Fig. 13–14]. Section B' consists of 3 large stretcher blocks with a length of 1.9 m, (Blocks 21 and 23) and 1.82 m (Block 91), respectively. Among the blocks, installed in a running bond, there are 3 large blocks – Block 34 (1.9 m long), Block 35 (1.56 m long), Block 95 (1.7 m long), Block 15 (1.6 m long) [Fig. 14].

The blocks of Section B' are finely dressed, especially large stretcher blocks. It is in this section where traces of using mortar in the space between two levels for laying blocks according “opus quadratum” were recorded. The mortar was applied to the surface as a plaster layer [7–9].

Section C'

Section C' was explored in the period of 2016-2018 and 2020. It is located in the southern part of the western facade. Its length is 9.1 m, based on the location of the stone Block 29, adjacent from the south to the stone Block 35 of the Section B' [Fig. 11, 12, 15].

Section C' has a peculiar structural design, despite the uniformity of technological methods of construction. This site is built in a running bond masonry of rectangular thickened blocks of approximately the same size. The masonry of its upper level was dismantled by local residents in 2014. It adjoins Section B' by the remaining levels [Fig. 9-10, 11-12, 15].

Structurally, Section C' consists of two parts – the northern and southern ones, since the southern segment is shifted to the east relative to the northern one by 0.8 m [Fig. 1, 1; 2, 1; 4, 1; 5, 1; 9; 15]. This design is caused by the need for the erection of defense elements in the form of metal gratings, for the dumping and lifting of which it was necessary to construct gutters and ensure the indentation of the section of the western facade from the general line by 0.8 m to the east [Fig. 4, 1, 3].

The northern part of Section C' comprises 26 stone blocks. Only 5 rows of masonry and the upper level of the lower row have survived. As noted, all rows of the masonry are laid in a running bond. The height of the northern end of this part of the section is 1.54 m, the height of northern end is 1.1 m. The length along the upper level of the facade is 3.8 m. This section of Wall 2 sustained the most significant damage in 2014. Here, the upper level of the masonry of the western facade with a total height of 0.5 m was dismantled [Fig. 15].

The northern part of Section C' comprises 26 stone blocks. The first row consists of Block 29, measuring 0.58×0.2 m. The second row consists of 4 blocks (Nos. 106, 36, 37, 38), measuring 0.64 ×0.26 m, 0.86×0.26 m, 0.9×0.24 m, 0.7×0.28 m, respectively. The third row consists of 5 blocks (Nos. 107, 108, 109, 110, 39), measuring 0.7×0.34 m, 0.7×0.32 m, 0.8×0.36 m, 0.88×0.36 m, 1.29×0.36 m, respectively. The fourth row consists of 6 blocks (Nos. 112, 113, 114, 115, 116, 117), measuring 0.86×0.26 m, 0.7×0.24 m; 0.9×0.26 m; 0.72×0.26 m; 0.68×0.3 m; 0.86×0.3 m, respectively. The fifth row consists of 5 blocks (Nos. 123, 124, 125, 125A, 12b), measuring 0.9×0.36 m, 1.56×0.5 m, 1.0×0.54 m, 0.61×0.34 m, 1.24×0.34 m, respectively. The sixth row consists of 6 blocks

(Nos. 141, 142, 143, 144, 145, 14b). As we mentioned, only the upper levels of these blocks with a thickness of 0.06–0.1 m were cleared; their lengths are 0.8 m, 1.0 m, 1.1 m, 0.84 m, 1.0 m, 0.74 m, respectively [Fig. 15].

Most of the blocks in the northern part of Section C' have average length (0.6–0.9 m). Only 4 blocks with a length of 1.0 m or more were revealed. The largest is Block 124 of the fifth row of masonry, the length of which is 1.56 m. Three more blocks are relatively large – Blocks 125 (1.0 m), 126 (1.24 m) of the fifth row of masonry, as well as Block 39 (1.28 m) of the third row of masonry [Fig. 15].

The largest blocks in length and thickness, including Block 124 with a length of 1.56 m, are located in the lower, fifth row of masonry, i.e. at the base of the facade.

On the northern segment of Section C', specific techniques of combining and adjusting stone blocks were applied. The upper part of Block 106 is cut; the cut has a length of 0.26 m and a depth of 0.06 m. In Block 35 adjusted to it, a recess of the same length, but 0.04 m deep, was cut in its lower part. In order to adjust Block 38 of the second row to Block 110 of the third row, a recess of 0.14 m in length with a depth of 0.04 m was cut at the upper level of the latter. When adjusting Block 36 of the second row to Block 109 of the third row, a recess with a length of 0.54 m at a depth of 0.04 m was also cut at the upper level of Block 109 [Fig. 15].

Technical recesses on the outer surfaces of some blocks of the northern part of Section C' were recorded. Block 116 (4th row of masonry) has a recess (indent, or socket) of a quadrangular shape with a size of 0.15×0.09 m at a depth of 0.1 m, in which a wooden bar for locking the bi-fold gate was fixed. A similar socket of a slightly different shape was found at the same level on the eastern facade of Base-support 1 of the arched structure. The wooden bar-lock was first inserted by sliding it into the socket of Block 116. From the constant sliding of the bar to Block 116, a deep curved dent formed on top of Block 39. A similar dent was revealed on the upper block of the eastern facade of Base-support 1 [Fig. 15].

As noted, at the end sections of Blocks 39, 117, 126 there were sockets with a width of 0.22 m, designed for lowering and lifting metal gratings, also used to lock the passage between the eastern facade of Base-support 1 and the western facade of Wall 2 [Fig. 2, 1; 4, 1] [2, pp. 477–478].

Under Block 126 there was a stone block (a slab?) No. 146 (6th level of masonry), which protruded beyond the limits of Block 126 above by 0.36 m. This block (the full thickness has not yet been determined) was intended for fixing the locking metal grating in the lowered position [Fig. 4,1].

The southern part of Section C' is uncovered for 5.3 m. It is adjusted to the northern part of Section C'. Its uncovered end goes under the southern side of the excavation trench towards the left bank of the Rubas River [Fig. 1, 1; 2, 1; 15].

The southern part of Section C' consists of 27 stone blocks. Only 5 complete rows of masonry (rows 2–5), the upper level of the lower row and a fragment of the block of the first row have survived. The masonry is laid in a running bond. The height of the southern part of Section C' is 1.84 m. The length of this part of Section C' along the lower level of the masonry is 5.3 m.

The southern part of Section C' consists of 27 stone blocks. The first row includes a fragment of Block 50, measuring 0.44×0.26 m. The second row includes 2 blocks (Nos.

48 and 49), measuring 0.66×0.24 m and 0.32×0.26 m, respectively. The third row consists of 3 blocks (Nos. 45, 46, 47), measuring 0.8×0.24 m, 0.8×0.24 m, 0.6×0.22 m, respectively. The fourth row consists of 5 blocks (Nos. 40, 41, 42, 43, 44), measuring 0.54×0.38 m, 0.68×0.34 m, 0.66×0.36 m, 0.6×0.4 m, 0.7×0.36 m, respectively. The fifth row consists of 4 blocks (Nos. 118, 119, 120, 121), measuring 0.72×0.24 m, 1.28×0.26 m, 0.8×0.28 m, 0.8×0.32 m, respectively. The sixth row consists of 5 blocks (Nos. 127, 128, 129, 130, 131), measuring 0.66×0.34 m, 0.9×0.3 m, 0.74×0.28 m, 1.0×0.26 m, 0.6×0.32 m, respectively. The seventh row consists of 7 blocks (Nos. 147, 148, 149, 150, 151, 132, 133). As mentioned, only the upper levels of these blocks with a thickness of 0.12 m were cleared [Fig. 11; 12; 15].

Most blocks in the southern part of Section C' have average length (0.6–0.8 m). Only two blocks have a length of 1.0 m or more (Nos. 119 and 130). The largest block (1.28 m) is Block 119 of the fifth row of masonry. Block 130 of the sixth row of masonry is also relatively large (1.0 m) [Fig. 15].

The longest blocks are in the lower rows of masonry (rows 5, 6), i.e. at the base of the facade. The thickest blocks are in the fourth row of masonry (0.34–0.4 m) (Nos. 40–44).

In the southern part of Section C', a technological feature of the lower 7th level masonry was revealed. The upper level of the seven blocks of the lower row (Blocks 147–151, 132–133) is located above the upper level of the lower row of the northern part of Section C' (Blocks 144, 145, 146) by 0.06 m. In order to adjust the blocks of the sixth row (Blocks 128–133) of the southern part of Section C' with the blocks of the fourth level (Blocks 125, 125A, 126, 127) of the northern part of Section C', the north side of Block 147 was cut to a depth of 0.06 m for 0.34 m. This procedure was needed to install Block 127 with a thickness of 0.36 m in the masonry and adjust it to Block 128 with a thickness of 0.3 m. All subsequent blocks of the 6th level of masonry of the southern part of Section C' (Blocks 129–131) had a similar thickness (0.3 m). The cut of Block 147 resulted in the equal level of the upper part of the 6th row of masonry [Fig. 11; 12; 15].

On the visible part of the side faces of some blocks of the western facade of Section C' (southern part) there are grooves/sockets of rectangular shape for the installation of fastening brackets (Blocks 50, 48, 49, 47, 131). We recorded six of such grooves [Fig. 1; 2]. On the surface of the fragment of Block 50 (1st row of masonry), the groove is on the southern (intact) face. On Block 48 (2nd row of masonry), which underlays Block 50, the groove is also on the southern face. On Block 49 (2nd row of masonry), adjacent to the side of Block 48 from the south, there are two grooves – on the northern and southern faces. The groove on the northern face is adjusted to the groove of Block 48. On Block 47 (3rd row of masonry), which underlays Block 49 of the 2nd row of masonry, the groove is on the southern face. On Block 131 (6th row of masonry), the groove is on the southern face. All the grooves are oriented with the long side in the N–S direction. We identified the parameters of 3 grooves: Block 49, southern groove – 0.1×0.06 m, depth 0.07 m; Block 47, southern groove – 0.13×0.07 m, depth 0.06 m; Block 131, southern groove – 0.14×0.09 m, depth 0.07 m. The parameters of some grooves could not be identified, since they were filled with small pebbles and mortar (Block 48, southern groove; Block 49, northern groove).

Although Sections A' and C' of the western facade of Wall 2 are typologically similar in structure (running masonry), they are essentially different. The masonry of Section A'

includes mainly blocks of small thickness (37 blocks are 0.2–0.26 m thick). The maximum thickness of the blocks of this section is 0.3 m, which are represented by only 6 copies. The masonry of Section C' includes 21 blocks 0.3–0.38 m thick, 6 blocks 0.4 m thick and 4 blocks 0.28 m thick [Fig. 13; 15].

The difference between sections A' and C' is also due to the fact that most of the blocks from Section A' are elongated, while blocks from Section C' are shortened [Fig. 11; 12; 13; 15].

Visually, a certain pattern can be seen in the structural design of the western facade of Wall 2. The central position is occupied by Section B', laid in “opus quadratum” masonry of massive blocks of increased size with a layer of blocks installed according to the running bond system in one row [Fig. 11; 12].

The presence of three different sections in the structure of the western facade of Wall 2 is undoubtedly due to practical necessity.

The exterior of the western facade of Main Wall 2 (the smoothness without ledges of the outer surface of the western facade and the thoroughness of laying stone blocks) gives an impression of the structure's magnificence. Along it, there might have been an entrance road leading to two passages (Passages 1–2) to the territory of the complex, formed by a fortified arched structure (Passage 1) and located in the space between the western facade of Wall 2 and the arched structure (Passage 2). It was likely the main and therefore the front entrance to the territory of the defensive complex. Each passage was protected by gates with locks and metal grilles lowering from the height of the second level of the structures. The passages had overlaps of 4 massive slabs. The length of the passages is 2.8 m with the width of Passage 1 in the space of 2 bases-supports equal to 1.3 m and Passage 2 in the space between the western facade of Wall 2 and the base-support 1 equal to 1.6 m [Fig. 1, 1, 5; 2, 1, 2].

However, despite the elegant design of the western facade of Wall 2 and its magnificence, the presence of 3 massive sections with different types of structural design is hardly an accident. Of particular importance is the increased strength of the central section of the western facade of Wall 2 (Section B'), in the structure of which 2 types of combined masonry were used – “opus quadratum” and single-row running bond. Moreover, in the construction of this section of the western facade, massive blocks with a length of 2.06 m (No. 23), 1.9 m (No. 21, No. 34), 1.7 m (No. 95) were used [Fig. 11, 12, 14].

Most likely, the functional orientation of the different types of sections of the western facade of Wall 2 is directly related to the design of the eastern facade of Wall 2, on which 5 separate sections (A, B, C, D, E) are distinguished [Fig. 16, 17].

It is important to establish the relationship between the structural sections of the western and eastern facades of Main Wall 2 in order to clarify the functional orientation of this structure in the general system of the defensive complex on the Rubas River.

Conducting a comparative analysis of the structural sections of the eastern and western facades of Main Wall 2 is complicated by a number of circumstances. The length of the uncovered part of the eastern and western facades of Wall 2 for the research period of 2020 is different. The length of the eastern facade of Wall 2, according to research in 2020, is 17.5 m. The length of the western facade in the same period is 23.8 m [Fig. 11; 12; 16; 17].

As we mentioned, the southern section of the eastern facade of Wall 2 was lost as a result of the 2014 destruction by local residents. At its place was a pit with a depth of 3.5 m [Fig. 1, 1; 2, 1].

The remnants of the southern part of the eastern facade have survived at the intersection of Wall 3, built into the eastern facade of Wall 2. The length of the eastern facade of Wall 2 is fixed within Block 3 (southern end) and Block 151 (northern end) [Fig. 16].

The length of the western facade of Wall 2 is fixed within Block 134 (northern end) and Block 133 (southern end) [Fig. 11-12].

A comparative analysis of the structures of the western and eastern facades of Wall 2 is possible within the sections A'–B' of the western facade [Fig. 12] and sections B–C of the eastern facade [Fig. 17]. These sections were erected using the same type of construction technologies. Eastern facade: Section C – running bond (7.1 m); section B – alternation of “opus quadratum” and running bond masonry (2.1 m). Western facade: section A' – running bond (9.0 m); section B' – alternation of “opus quadratum” and running bond (5.7 m).

On the eastern facade, the integrity of the section with the running masonry (Section C) is complete, since it is located in the central part of the facade and from south and north is limited to sections of a different technology of bonding [Fig. 17].

On the western facade, the southern end of the section with a running masonry (Section A') has remained undisturbed, the northern end ends at the northern side of the excavation trench [Fig. 12].

Visually, the southern ends of the sections with the running masonry of the western and eastern facades are symmetrical one relative to the other (Block 14 of the western facade and Block 20 of the eastern facade) [Fig. 18, 1–2]. This fact is confirmed by the fault line of the structure of Wall 2, formed as a result of an earthquake with a magnitude of 9 [2, p. 95; Fig. 3]. Blocks 14 and 15 of the western facade of Wall 2 shifted relative to each other at an angle [Fig. 2, 1]. The space between Blocks 19–20 of the eastern facade also shifted [Fig. 2, 1].

These data indicate that Sections A' of the western facade of Wall 2 and B of the eastern facade were erected synchronously using the same type of technology (running bond). Moreover, the length of the sections with the running bond technique in the western and eastern facades of Wall 2 is approximately the same (the eastern facade – 7.1 m, the western facade – 9.0 m). A small difference could have formed as a result of a significant deflection of the western facade of Wall 2 in the place of a seismic impact (Blocks 15–14) [Fig. 18, 1–2]. The structure of the running bond sections of the eastern and western facades is somewhat different. The blocks of the western facade of Section A' are laid without ledges, the blocks of the eastern facade of Section C are laid in a form of steps with a tendency of a decreasing width from the southern end to the northern end.

The sections of the eastern and western facades, which are laid in the “opus quadratum”, are undisturbed and intact. Section B' of the western facade with a length of 5.7 m is located in the central part. Its northern end adjusts Section A', its southern end connects to section C'. Along the upper level of the western facade, the “opus quadratum” section is located within Blocks 15–28 [Fig. 12].

Section B of the eastern facade with a length of 2.1 m is between sections A and C. Its northern end connects to Section C, its southern end adjusts Section A. On the upper level of the eastern facade, Section B of the “opus quadratum” masonry is within Blocks 18–19 [Fig. 17].

The difference in the length of both sections, including the “opus quadratum” masonry, is 3.6 m. The section of the eastern facade is much smaller in length. The presence of interlayers of stretcher blocks on the upper and lower levels of blocks installed according

to the “opus quadratum” system is common for their design. The only difference is that on the western facade there are 2 rows of “opus quadratum” masonry with an interlayer and an overlap of blocks laid in one row of running masonry, and on the eastern one there is 1 row of “opus quadratum” masonry, overlapped from above by three rows of running masonry and underlaid by four rows of stretcher masonry.

It is possible that the section with the “opus quadratum” masonry of the eastern facade of Wall 2 also included Section A, consisting of running bond blocks, but in a stepped manner. In this case, the length of Sections B' (5.7 m) and A–B (4.7 m) was approximately the same.

This section (A–B) of the eastern facade of Wall 2 was complicated by Wall 3 built into it. The materials of the 2020 excavations revealed a semicircular layout of its northern facade, which was built into the eastern facade of Wall 2 at sites A–B with the western end [Fig. 2, 4]. This circumstance might have caused the design features of sections A–B. The damage inflicted by local residents on this site in 2014 does not yet allow us to clearly reconstruct the structure of the objects located on this section of Wall 2.

The fact that the construction of Section B' of the western facade of Wall 2 is more powerful than the construction of Sections A–B of the eastern facade is noteworthy. The western facade of Wall 2 on Section B might possibly serve a function of strengthening not only Sections A–B of the eastern facade, but also Wall 3 built into it. Hence the inclusion of large blocks in Section B', both in the “opus quadratum” masonry and in the interlayers between the rows.

Analysis of the structure of the western facade of Wall 2 of the Rubas Fortification and the structural design of the objects included in its composition demonstrates that their location in the system of the western facade of Wall 2 is due to specific tasks of a defensive nature. The construction of both facades of Wall 2 not only complemented the resistance of each of the facades to enemy assaults, but also enhanced its power as a whole. As noted, engineering solutions for the construction of Main Wall 2 are of an original nature, not recorded in the practice of other regions (Caucasus, Crimea, Transcaucasia) [7, pp. 39–46; 8, pp. 267–287; 9, pp. 441–465; 10, pp. 357–390; 11, pp. 227–246; 12, pp. 170–200].

Conclusions

1. Analysis of the structure of Wall 2 (western and eastern facades) shows that, despite the monumentality of this site, it has a certain magnificence. The stone blocks of the western facade were finely dressed and neatly installed. In some sections of the western facade of Wall 2, the masonry was smoothed with the use of lime mortar.

2. Each section of the western facade of Wall 2 is built from the same type of blocks. Section A' is built of narrow elongated blocks; Section B' – of super massive blocks with a polished surface for “opus quadratum” masonry; Section C' – of thickened blocks of shortened length.

3. The stepped masonry, widely used in the eastern facade of Wall 2, was not used in its western facade.

4. The main task in the construction of the western facade of Wall 2 was to strengthen the power of the structure and its resistance to enemies' assault. For this purpose, the emplekton technique of Wall 2, its increased thickness (3.5 m) due to massive facade blocks and extensive filling made of fragmental material, pebbles of different sizes and compacted soil were applied.

5. The presence of a small Section B' of the western facade of Wall 2, in the construction of which 4 large blocks installed according to the “opus quadratum” were used, indicates a shortage of such building material in the Eastern Caucasus. As mentioned earlier, secondary building materials from destroyed structures of the Caspian region were also used when building this facade.

6. Functional orientation of the monumental Wall 2 of the Rubas fortification has not been clearly determined. Undoubtedly, in the structure of the defensive complex on the Rubas River, Wall 2 is the main architectural and military-engineering object. Wall 2 is connected by constructional bonds with several structures – Wall 3, Stepped Structure 6 and Arched Structure, in which Wall 1 is built into.

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2. The illustrations were prepared with the assistance of Yu.A. Magomedov.

3. Aerial photography in 2020 of the Rubas Defensive Complex was carried out by B.H. Gadzhiev.

4. The drawing documentation of the sites of the Rubas Fortification was made by A.M. Abdulaev and Z.Z. Kuzeyeva.

5. The full profile of the eastern facade of Wall 2 was drawn by L.B. Gmyrya and Yu.A. Magomedov.

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Fig. 1. The Rubas Fortification of the 6th c. 1 – Wall 2; 2 – Wall 3; 3 – Structure 5 (Platform); 4 – Structure 6 (Extension); 5 – Arched Structure; 6 – Wall 1; 7 – mudflow deposits. View from the north. Drone photography, 2020

Рис. 1. Рубасский оборонительный комплекс сер. VI в. 1 – стена № 2; 2 – стена № 3; 3 – сооружение № 5 (платформа); 4 – сооружение № 6 (пристройка); 5 – сооружение арочной конструкции; 6 – стена № 1; 7 – отложения селя. Вид с севера. Аэрофотосъемка беспилотным летательным аппаратом 2020 г.

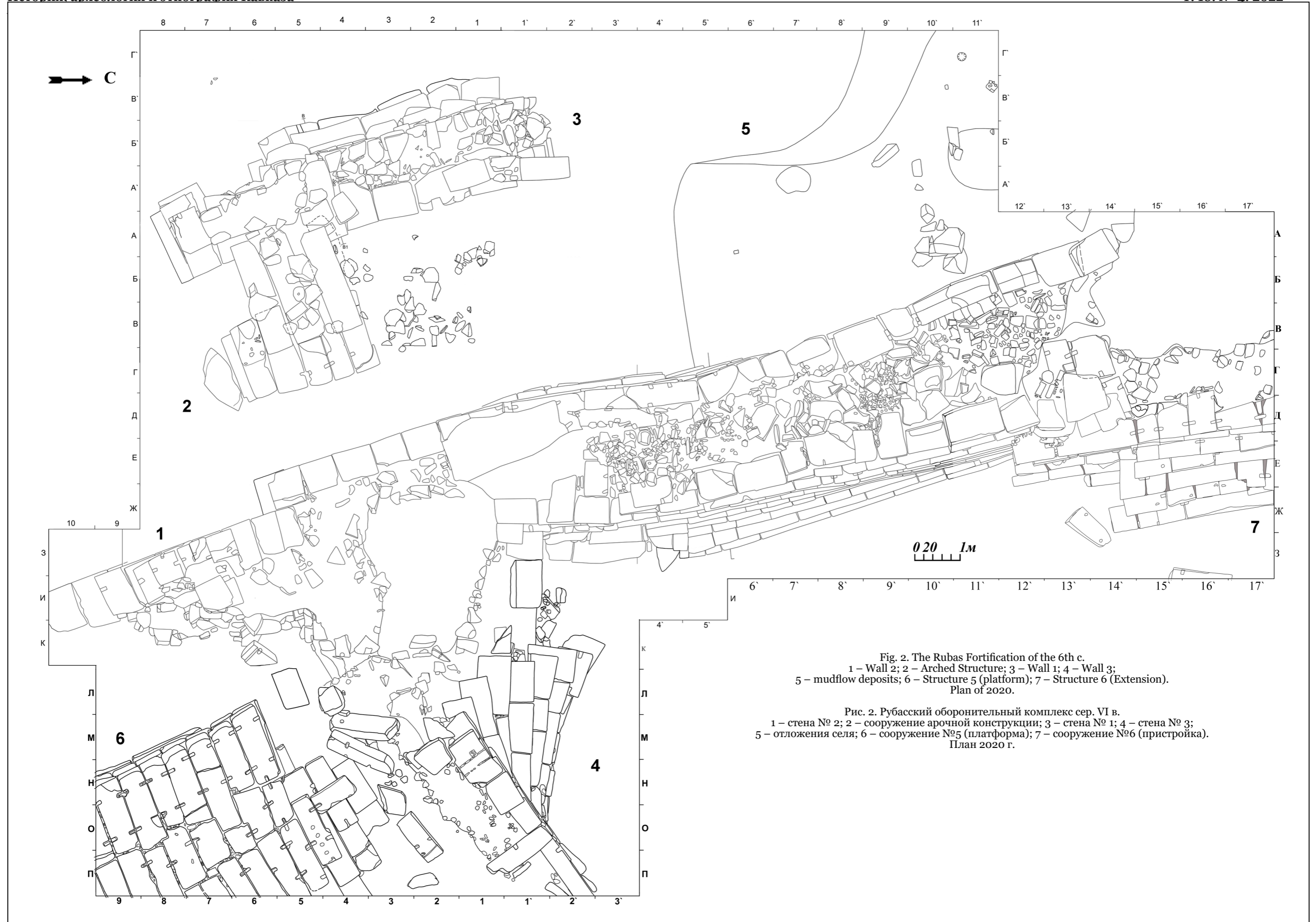


Fig. 2. The Rubas Fortification of the 6th c.
 1 – Wall 2; 2 – Arched Structure; 3 – Wall 1; 4 – Wall 3;
 5 – mudflow deposits; 6 – Structure 5 (platform); 7 – Structure 6 (Extension).
 Plan of 2020.

Рис. 2. Рубасский оборонительный комплекс сер. VI в.
 1 – стена № 2; 2 – сооружение арочной конструкции; 3 – стена № 1; 4 – стена № 3;
 5 – отложения селя; 6 – сооружение №5 (платформа); 7 – сооружение №6 (пристройка).
 План 2020 г.



Fig. 3. The Rubas Fortification of the 6th c. 1 – Wall 2; 2 – Wall 3; 3 – Structure 5 (Platform); 4 – Arched Structure; 5 – Wall 1; 6 – mudflow deposits. View from the north. Photo of 2020

Рис. 3. Рубасский оборонительный комплекс сер. VI в. 1 - стена № 2; 2 - стена № 3; 3 - сооружение № 5 (платформа); 4 - сооружение арочной конструкции; 5 - стена № 1; 6 - отложения селя. Вид с севера. Фото 2020 г.



Fig. 4. The Rubas Fortification of the 6th c. 1 – Wall 2; 2 – Wall 3; 3 – Arched Structure; 4 – Wall 1; 5 – mudflow deposits. View from the south. Photo of 2020

Рис. 4. Рубасский оборонительный комплекс сер. VI в. 1 – стена № 2; 2 – стена № 3; 3 – сооружение арочной конструкции; 4 – стена № 1; 5 – отложения селя. Вид с юга. Фото 2020 г.

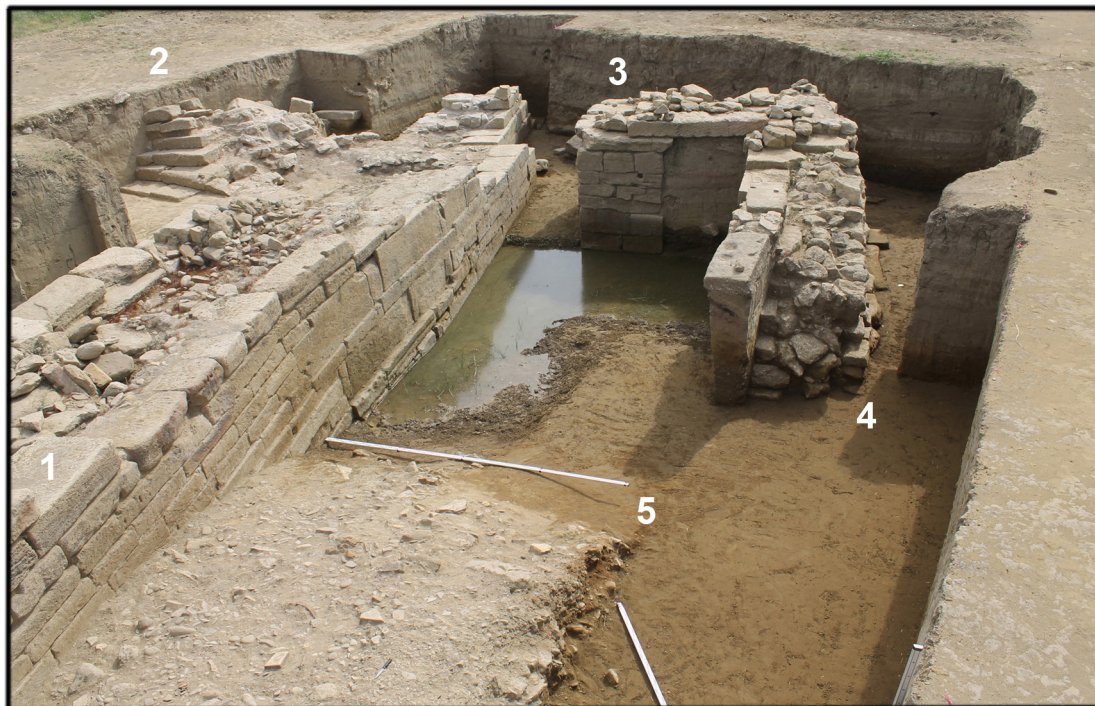


Fig. 5. The Rubas Fortification of the 6th c. 1 – Wall 2, western facade; 2 – Wall 3; 3 – Arched Structure; 4 – Wall 1; 5 – mudflow deposits. View from the north. Photo of 2018

Рис. 5. Рубасский оборонительный комплекс сер. VI в. 1 – стена №2, западный фасад; 2 – стена №3; 3 – сооружение арочной конструкции; 4 – стена №1; 5 – отложения селя. Вид с севера. Фото 2018 г.



Fig. 6. The Rubas Fortification of the 6th c. 1 – Wall 2, western facade, northern section; 2 – Wall 2, western facade, central section; 3 – mudflow deposits. View from the south. Photo of 2017

Рис. 6. Рубасский оборонительный комплекс сер. VI в. 1 – стена №2, западный фасад, северный участок; 2 – стена №2, западный фасад, центральный участок; 3 – отложения селя. Вид с юга. Фото 2017 г.



Fig. 7. The Rubas Fortification of the 6th c. Wall 2. Western facade. Central section. View from the west. Photo 2017

Рис. 7. Рубасский оборонительный комплекс сер. VI в. Стена №2. Западный фасад. Центральный участок. Вид с запада. Фото 2017 г.



Fig. 8. The Rubas Fortification of the 6th c. Wall 2. Western facade. Central section. View from the west. Photo 2017

Рис. 8. Рубасский оборонительный комплекс сер. VI в. Стена №2. Западный фасад. Центральный участок. Вид с запада. Фото 2017 г.



Fig. 9. The Rubas Fortification of the 6th c. 1 – Wall 2, western facade, central section; 2 – Wall 2, western facade, southern section. View from the northwest. Photo of 2017

Рис. 9. Рубасский оборонительный комплекс сер. VI в. 1 – стена №2, западный фасад, центральный участок; 2 – стена №2, западный фасад, южный участок. Вид с северо-запада. Фото 2017 г.



Fig. 10. The Rubas Fortification of the 6th c. Wall 2. Western facade. Southern section. View from the west. Photo 2017

Рис. 10. Рубасский оборонительный комплекс сер. VI в. Стена №2. Западный фасад. Южный участок. Вид с запада. Фото 2017 г.

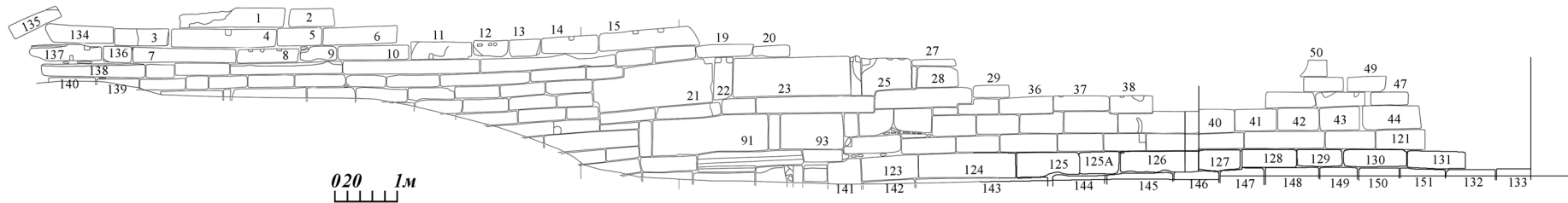


Рис. 11. Рубасский оборонительный комплекс сер. VI.
Стена №2. Западный фасад. 2020 г.

Fig. 11. The Rubas Fortification of the 6th c.
Wall 2. Western facade. 2020

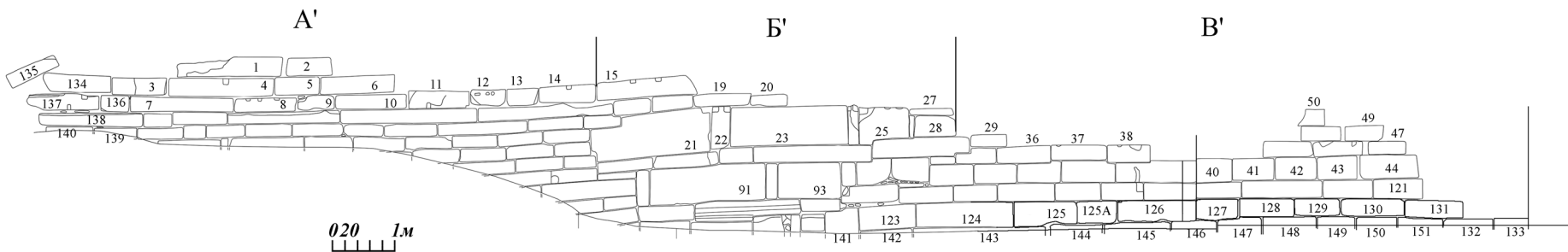


Fig. 12. The Rubas Fortification of the 6th c.
Wall 2. Western facade. A', B', C' – architectural sections. 2020. Published for the first time

Рис. 12. Рубасский оборонительный комплекс сер. VI.
Стена №2. Западный фасад. А', В', В' – архитектурные участки. 2020 г. Публикуется впервые

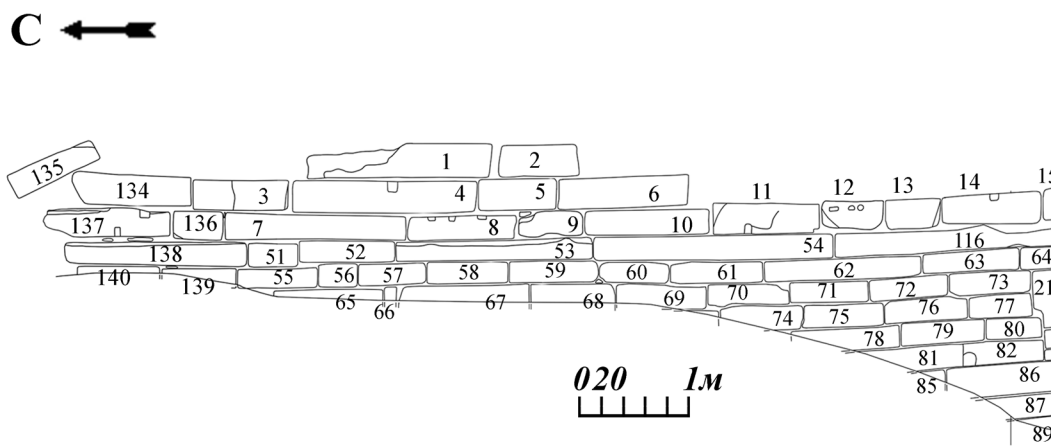


Рис. 13. Рубаский оборонительный комплекс сер. VI. Стена №2. Западный фасад. Северный участок

Fig. 13. The Rubas Fortification of the 6th c. Wall 2. Western facade. Northern section

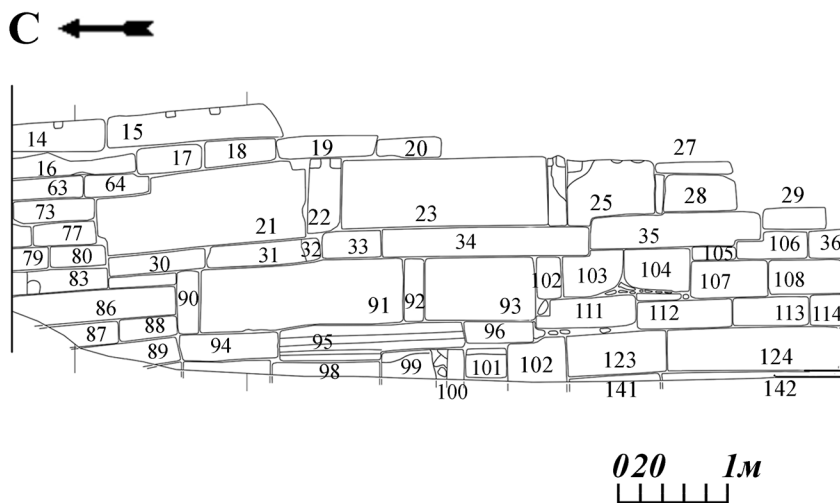


Рис. 14. Рубаский оборонительный комплекс сер. VI. Стена №2. Западный фасад. Центральный участок

Fig. 14. The Rubas Fortification of the 6th c. Wall 2. Western facade. Central section

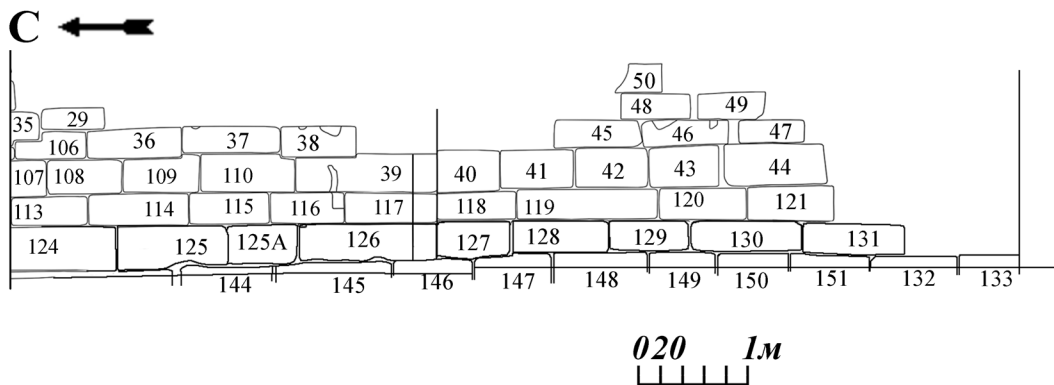


Рис. 15. Рубаский оборонительный комплекс сер. VI. Стена №2. Западный фасад. Южный участок

Рис. 15. Рубаский оборонительный комплекс сер. VI. Стена №2. Западный фасад. Южный участок

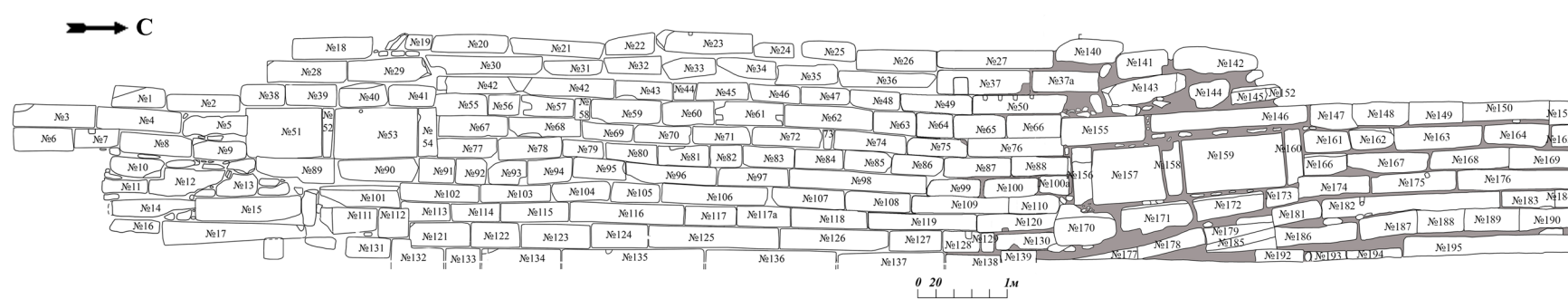


Рис. 16. Рубасский оборонительный комплекс сер. VI в.
Стена №2. Восточный фасад

Fig. 16. The Rubas Fortification of the 6th c.
Wall 2. Eastern facade

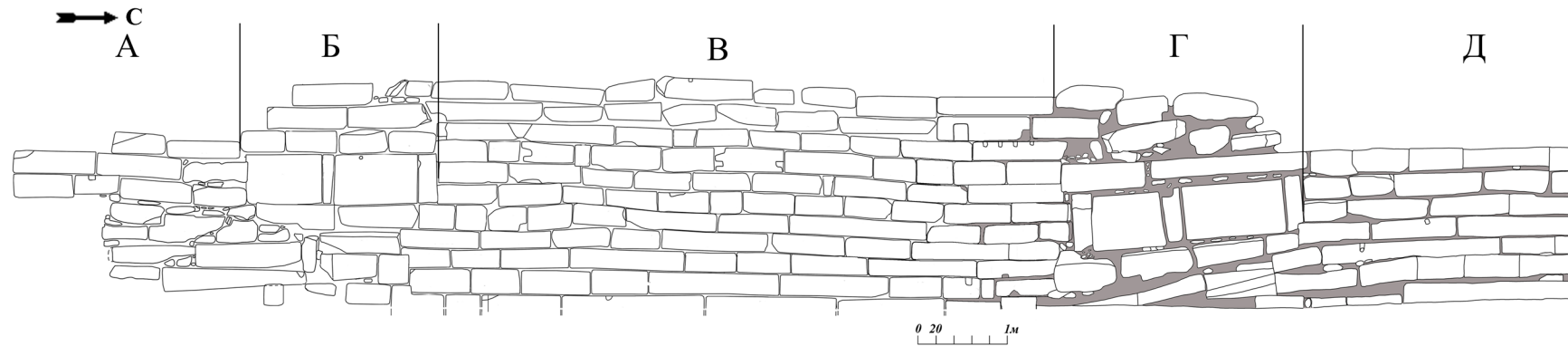


Fig. 17. The Rubas Fortification of the 6th c.
Wall 2. Eastern facade. A, B, C, D, E – architectural details

Рис. 17. Рубасский оборонительный комплекс сер. VI в.
Стена №2. Восточный фасад. А, Б, В, Г, Д – архитектурные детали

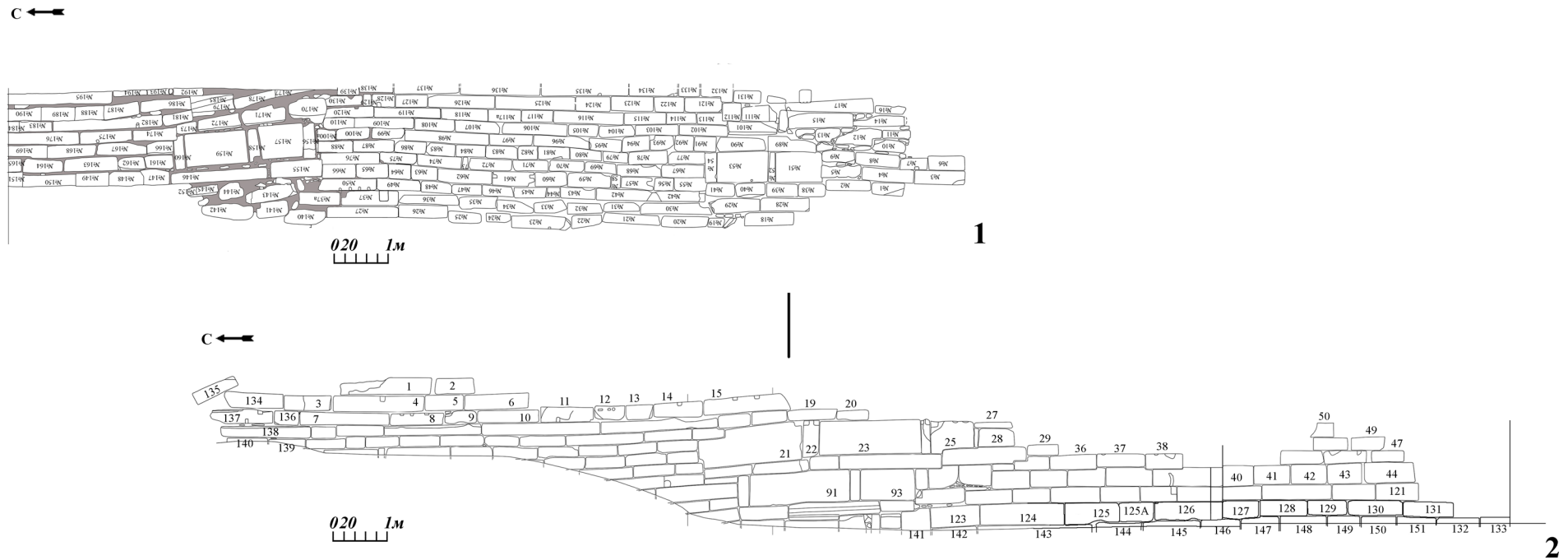


Fig. 18. The Rubas Fortification of the 6th c. Wall 2.
Combined facades. 1 – eastern facade; 2 – western facade

Рис. 18. Рубасский оборонительный комплекс сер. VI в. Стена №2.
Совмещенные фасады. 1 – восточный фасад; 2 – западный фасад

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