THE HELLENISTIC GATE OF HISTRIA. REMARKS ON ITS FOUNDATION SYSTEM*

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Abstract: The Hellenistic enclosure of Histria (the west side) was discovered in 1950 and the results of research were published in 1966. From that moment on, it didn't make the object of any further research. The defective perception of the foundation system of the so-called "sewage complex" resulted in insufficient research and documentation of the monument, with implications on the interpretation of the functionality of the whole. The present contribution advances a new interpretation of the ensemble named up until now the "sewage complex". Its "troughs" are, within the present hypothesis, the imprints of a horizontal wood beam grid which played the role of a raft foundation. An important implication of this hypothesis is that the surface defined by the imprints of the wood grid raft foundation represents in fact the trace of a gate tower, unidentified until now. Thus, the gate of the Hellenistic enclosure was flanked by two rectangular towers, of which the south one identified during the 1951-1954 excavations and the north one reconstructed here by means of fresh interpretation of archaeological evidence.

Rezumat: Incinta elenistică a Histriei (latura vestică) a fost descoperită în anul 1950 și rezultatele cercetărilor au fost publicate în anul 1966. Din momentul publicării, aceasta nu a mai făcut obiectul vreunei cercetări arheologice. Percepția defectuoasă a sistemului de fundare al așa zidului „complex de canalizare" a avut ca rezultat o insuficientă cercetare și documentare a monumentului, cu implicații asupra interpretării funcțiunii ansamblului. Prezentarea de față propune o nouă interpretare a ansamblului denumit până acum „complexul de canalizare". „Canalele" acestui ansamblu sunt, în ipoteza propusă de noi, amprentele unei rețele de bârne orizontale din lemn care îndeplinea funcția structurală a unui radier. O implicație importantă a acestei ipoteze este că suprafața definită de amprentele rețelei-radier de lemn reprezintă de fapt amprenta unui turn de poartă neidentificat până în prezent. Astfel, poarta incintei elenistice era flancată de două turnuri rectangulare, cel de la sud, identificat cu ocazia cercetărilor din anii 1951-1954, și cel de la nord, reconstituit acum prin reinterpretarea mărturiilor arheologice.

The western side of the Hellenistic enclosure of Histria was discovered during the research campaign of the summer of 1950. Its research made the object of a monographic presentation in the volume Histria II.[1] The erroneous perception of the construction system of the so-called "sewage complex" resulted in insufficient research and, implicitly, documentation of the monument. Naturally, these deficiencies left their imprint upon the functional interpretation of the respective ensemble. [2]

The present contribution will focus on the foundation system of the Hellenistic enclosure in the area which the authors of the 1950's research called the "sewage system".

Description of the "sewage system".[3] In the authors' vision, the sewage system comprised a water pool, where four parallel troughs start westward; another group of four troughs develops northward from the junction point of the first group of troughs, and perpendicular to it. This second group, with no connection to the mentioned pool, meets at its north extremity a second supposed pool. This latter was a bend point to another bundle made of four troughs, extending westward and parallel to the first group (Fig. 1).

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1 Preda, Doicescu 1966.
2 *Ibidem*, cap. II, p. 324.
3 *Ibidem*, pp. 324-329.

Caiete ARA 2, 2011, p. 39-46, București.

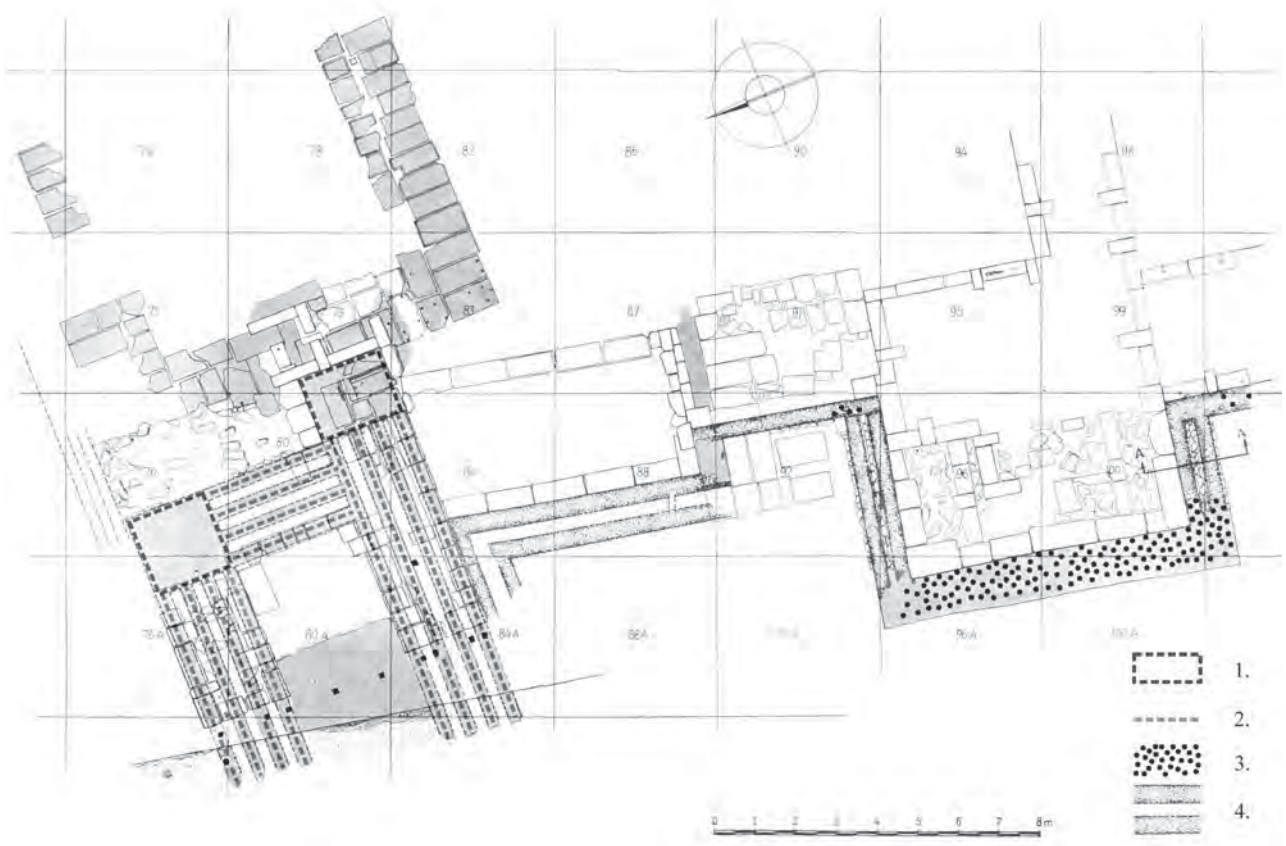

Fig. 1. Plan of the Hellenistic gate. "Reservoirs" (1) and "troughs" (2) of the "sewage system". The piles discovered in situ (3). The troughs of the sewage system (4) (after Preda, Doicescu 1966, pl. XX).

The technical details presented by the authors and the reasoning of the configurations do not justify identifying the described vestiges as a "sewage system". Nevertheless, the information they provide can be extremely useful for a more accurate understanding of the function of the elements which make up this *system*. Thus:

- *"both the pool and the troughs are not hermetically closed, in order not to allow them to be infiltrated by the rest of the waters, the level of which rises most of the time above the whole sewage complex"*;[4]

- the north side of the "pool" is made of five blocks laid in two courses, with large open joints between them which would have not permitted the container to stand as a reservoir;

- the walls of the trough are made of dry laid stone blocks, *"with no lime or clay mortar binding between them"*;[5]

- along the troughs, there is no slope recorded: *"regarding an inclination of the troughs in one direction or another, there is no such thing"*;[6]

Beside the "sewage system" thus presented, another system was intercepted, considered to have belonged

[4] *Ibidem*, pp. 327-328.
[5] *Ibidem*, p. 324.
[6] *Ibidem*, p. 327.

Fig. 2. The piles discovered under the outline of the drainage system, in the vicinity of the south tower of the Hellenistic gate (after Preda, Doicescu 1966, p. 328, fig. 82)

to an analogous sewage system, comprising two adjacent, parallel troughs, built of stone bound with lime mortar and finished with watertight mortar; these follow the outline of the south tower of the gate and further on, the so-called sewage system. Below these troughs a dense network of piles has been discovered (Figs. 1, 2).

Construction system of the enclosure wall foundations. Paradoxically, in spite the discovery of elements of soil strengthening (piles and horizontal beams) spread locally,[7] within the outline defined by the elements of the "sewage system", which the authors recognize as necessary to foundation and despite them acknowledging the role and importance of such structures,[8] they fail to interpret correctly the foundation structure of the enclosure wall, settling for a very restricted reading of it. Given the clear description of the presence of the 'raft bed' – made of large stone slabs – which sustains the enclosure wall, it is hard to understand the erroneous reading of the way it is set on the foundation bed, considered to be laid "straight on the sand".[9] This interpretation of the vestiges is even more surprising, since in the case of the "sewage system" the authors recognize the necessity of soil strengthening with piles and horizontal wood beams.

Hypothesis on the foundation system of the Hellenistic wall of Histria (the gate area). Before presenting our interpretation on the foundation structure of the Hellenistic gate, we'll review briefly the general principles of a type of foundation specific to unstable grounds – valid whatever the chronologic sequence – which we believe was applied in the case of Histria's Hellenistic wall, too. Ground strengthening with wood elements is a widely spread construction technique, both geographically and chronologically. In case of unstable soils – marshy or sandy – the foundation made of a simple masonry structure is inefficient, because, unless provided with a supplemental structure to stabilize the ground, it would slip or sink under its own weight. Therefore, the foundation solution in such cases introduces a supplemental structure, aimed at consolidating the ground. This is made by battering a dense cluster of vertical wood piles. The higher the piles density, the more the consolidated surface is able to sustain the weight of the construction rising above.[10] However, in some cases this system is not sufficient. The nature of the foundation ground may differ essentially from one area to another, even along the same wall. Certain areas may sink more than others, generating shifts that may endanger the stability of the construction. When the soil is highly unstable (sandy

7 *Ibidem*, p. 326, 327, Pl. XX.

8 "The presence of wood piles, set as foundation for the pool could be explained by the very fact that above rose the precinct, the weight of which needed to rest on a solid foundation.", *Ibidem*, p. 327.

9 *Ibidem*, p. 300.

10 The friction between piles and soil is stronger, and the surface of the soil thus strengthened cannot be exceeded by the building weight.

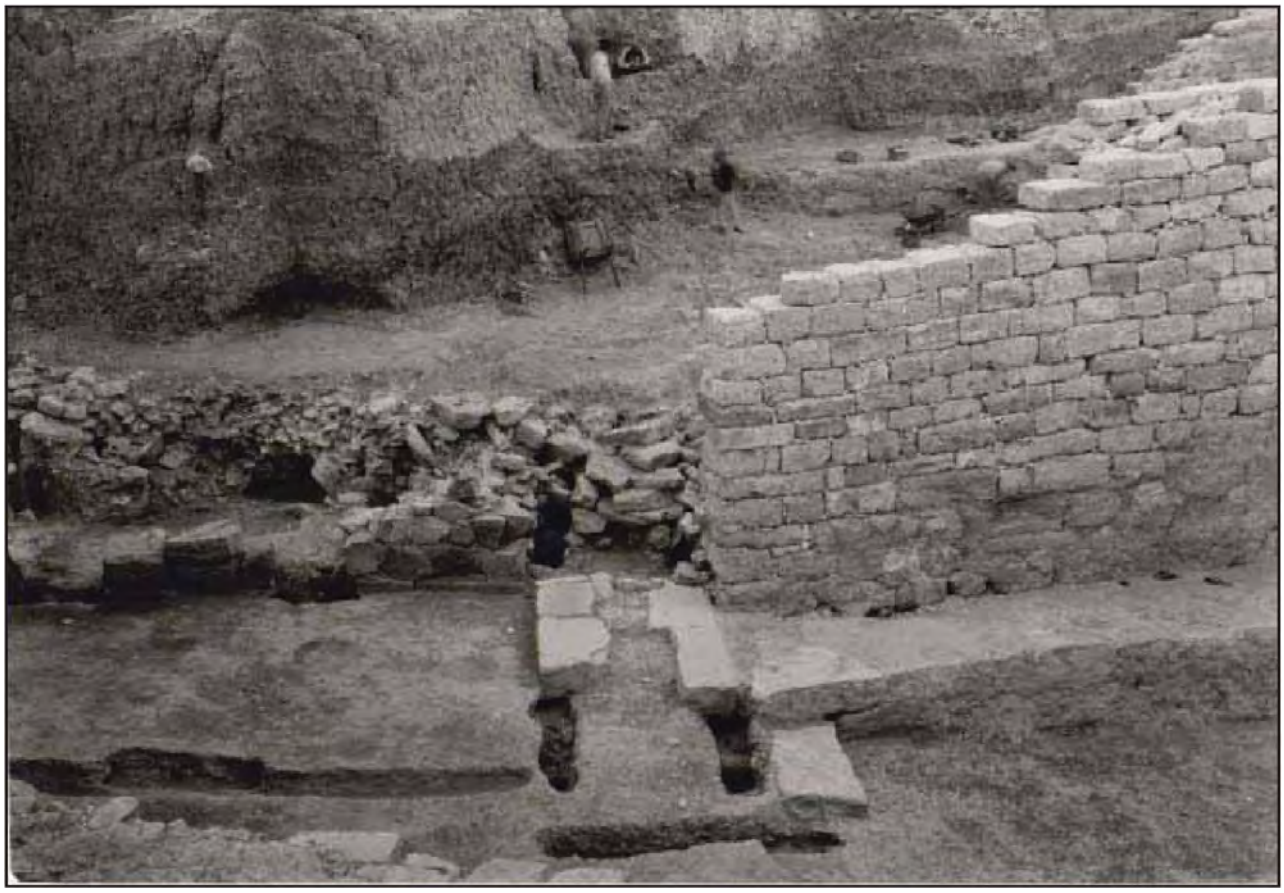

Fig. 3. The imprint of the horizontal wood beam foundation of the North Court of the Phrygian Gate at Gordion (photo 1955); Young 1960, p. 4, fig. 1.

or marshy grounds) the technique of *raft foundations* is used. This structural element (the raft) has to function as an even, non-deformable ensemble in order to be able to dissipate evenly the efforts from the weight of the building: a raft made of large stone slabs and/or wood beams set as a grid is laid at the contact of the wall and the consolidation piles. The solution with the raft made of slabs and wood beams grid is used for highly unstable soils. The slabs are meant to distribute the weight of the elevation (the weight of the construction) while the wood beams dissipate the loads into the soil, while maintaining the raft surface level, opposing deformations.

The perishable nature[11] of the wood used in such substructures makes it difficult to identify in archaeological excavations. Nevertheless, the number of such discoveries is impressive.[12] Among them we recall here just a few examples. A very early case (9th Cent. BC) is the North Court of the Phrygian Gate at Gordion (Fig. 3), where a raft-type foundation with horizontal wood beams emerged during the campaign of 1950.[13] At Histria, the city's 4th Cent. AD expansion to the south,[14] toward the water, had the new enclosure

[11] Generated, among other reasons, by the changed conditions of humidity and by the contact with air, once the elements are excavated.
[12] Consolidation of unstable grounds in Greek and Roman Antiquity was described by Vitruvius as well (Vitruvius, III, 2; V, 12); for an exhaustive presentation of historic ground consolidation systems by clusters of piles or by composite systems with wood raft, discovered on the territory of Germany see Borrmann 1992.
[13] Young 1960.
[14] Florescu 1954, p. 302.

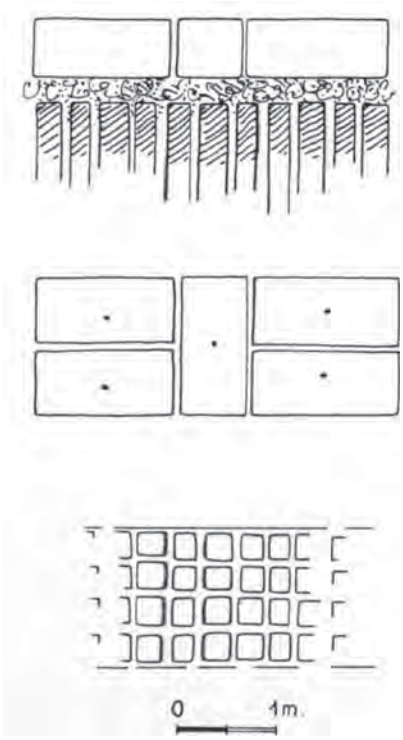

Fig. 4. Dense cluster of piles overlapped by a raft of large stone blocks, at the enclosure wall of Tungrorum; Mertens 1983, p. 46, fig. 46

wall built over a foundation bed consolidated with horizontal wood beams.[15] The amplitude that such a foundation system can reach is well illustrated by the works along some tracts of the Roman fortifications at London[16] or Tongres,[17] with pile clusters made of large (30 x 30 cm) rectangular stakes, driven in a very tight grid. Even if the wide piles may appear to suit the structural needs, this dense network was complemented in the case of Tongres, at foundation level, with large prismatic stone blocks, set as a raft atop the piles (Fig. 4). In cases of highly unstable grounds, such as those situated close to bodies of water, the use of complex foundation systems is much more frequent. The Roman wharves[18] at Vaison[19] or Geneva[20] have provided evidence of foundation systems made of piles and horizontal beams with large stone slabs laid on top of them, just as it happened, we believe, in the case of the Hellenistic wall of Histria. On the territory of Dobrudja the wood raft associated to a raft-platform of stone slabs was documented at the Byzantine fortification of Păcuiul lui Soare (9th Cent. A.D.), at the south segment of the east curtain.[21]

At Histria the whole complex of elements necessary in order to build a foundation on unstable (sandy) ground was documented by archaeological research: the piles (under the "sewage system"), the horizontal beams (under the so-called "reservoir"). Therefore, we believe that the structure interpreted up until now as a "sewage system" represents in fact the remnant of the foundation of the Hellenistic wall. The "troughs" which make the so-called "sewage system" are in fact the vestiges of a raft foundation, made of horizontal wood beams set atop of or intercalated by wood piles driven into the sandy ground (Fig. 5). Above this wood foundation system lay the stone slab raft which sustained the curtain wall. *According to this hypothesis, the surface defined by the imprints of the wood raft-network represents the second gate-tower of the Hellenistic precinct and by no means a sewage system. Therefore, the Hellenistic gate was flanked by two rectangular towers and not by only one, as it was believed up until now* (Fig. 7).

The existence of the drainage system (considered of Roman origin)[22] comprising the two parallel, adjacent troughs – built of stone bound with lime mortar, which follow the outline of the gate's south tower – sustains this hypothesis regarding the existence of a second (north) gate-tower. In other words, if the rectangular perimeter of the outline of the two drainage troughs is determined by its adjacency to a tower (south) we can infer the same about the rectangular outline situated to the north: it represents the trace of the drainage system which followed the perimeter of the second tower of the gate.

It is clear that the possibility of deriving a conclusion, such as the one presented here, which advances a new interpretation of the field evidence corresponding to the Hellenistic enclosure in the gate area, requires further field research in order to correctly identify and correlate the information regarding the relations between the structural elements under discussion. Among these, it appears highly necessary to verify on the scene

[15] M. Dabâca, *Noi cercetări arheologice în sudul cetății Histria*, paper read at "Vasile Pârvan" Institute of Archaeology, Bucharest, on February 26, 2009.
[16] Malony 1983, p.113, Fig. 111.
[17] Mertens 1983, pp. 43-47, figs. 44, 45, 46.
[18] Platforms built along bodies of water, used for docking ships, as well as for sustaining buildings.
[19] Sautel 1948.
[20] Blondel 1925.
[21] O. Damian, M. Mărgineanu Cârstoiu, V. Apostol, inedited research (Păcuiul lui Soare).
[22] Preda, Doicescu 1966, p. 329.

Fig. 5. Wood piles discovered in relation to the "sewage system", between the "troughs" (after Preda, Doicescu 1960, p. 326, fig. 80)

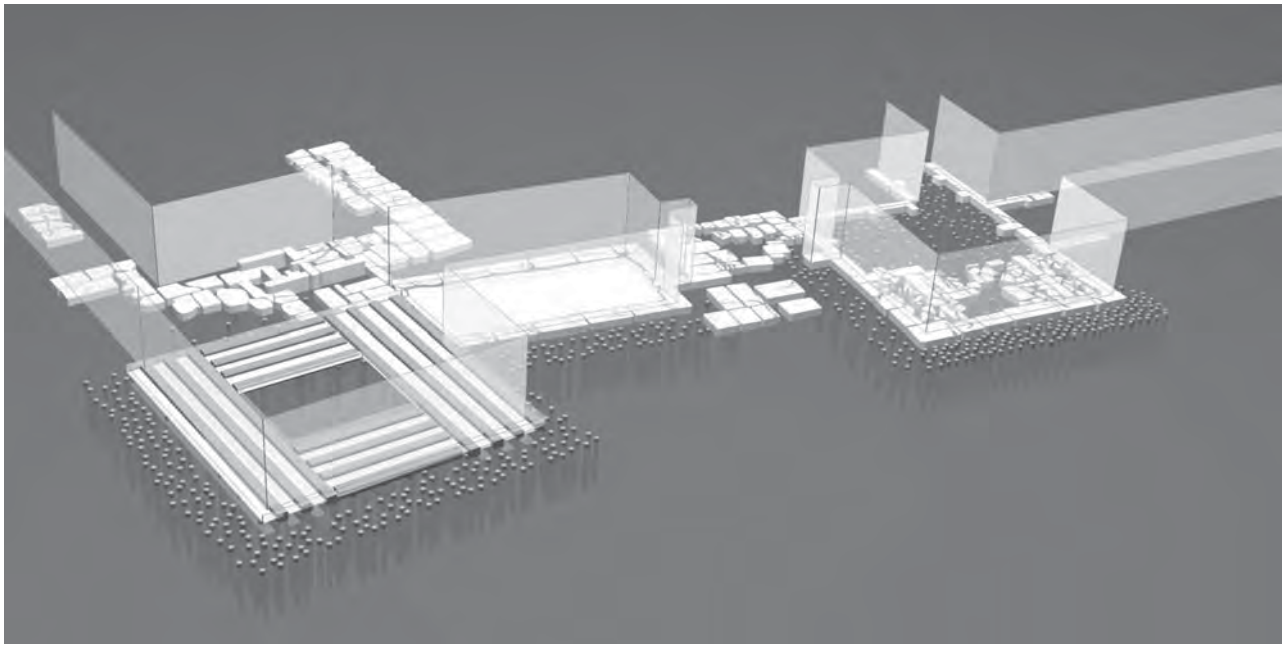

Fig. 6. The Hellenistic gate. Hypothesis regarding the amplitude of the ground consolidation system

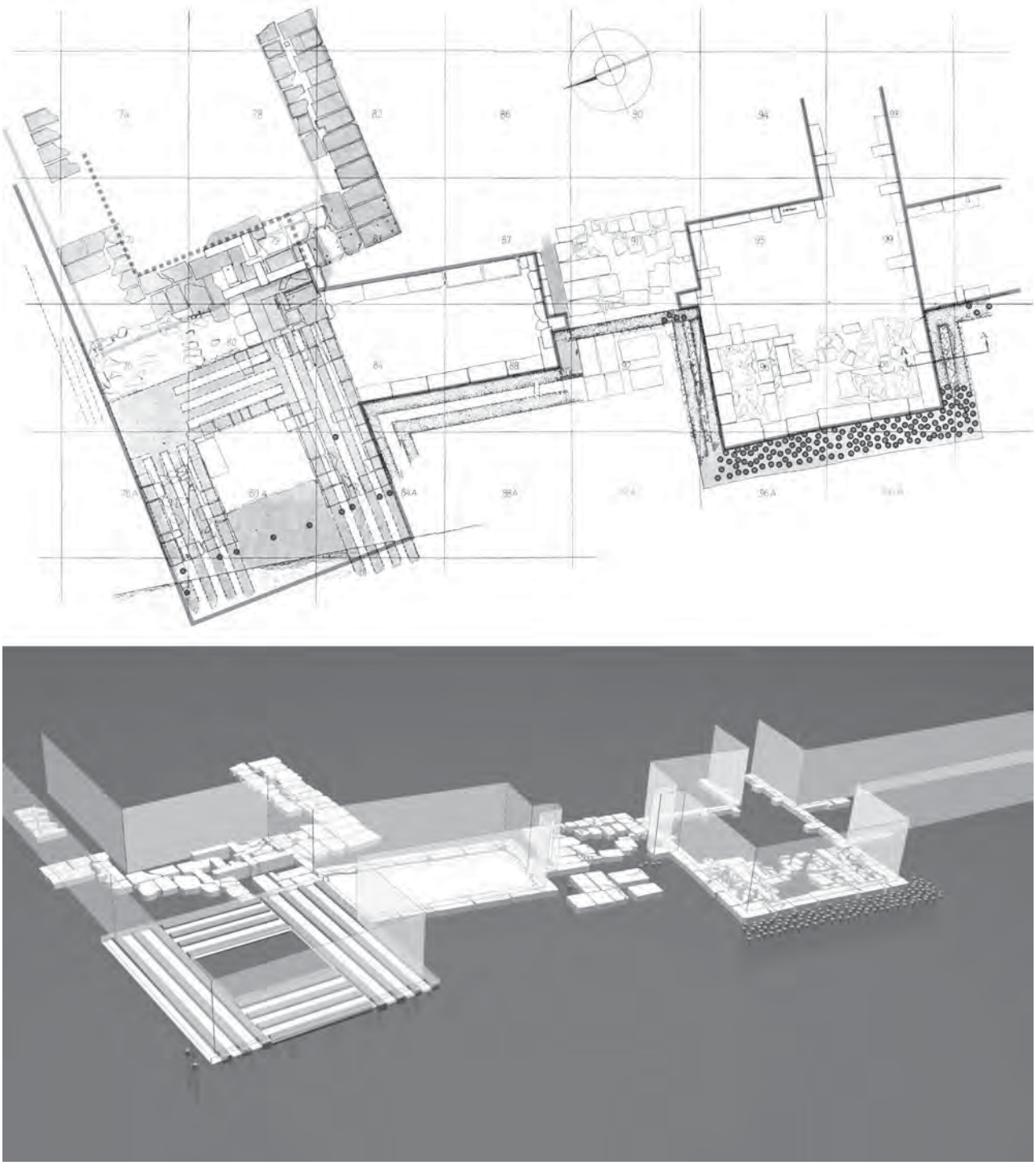

Fig. 7. The Hellenistic gate flanked by two rectangular towers - plan and perspective view (hypothesis)

the possibility that the piles discovered in the foundation of the perimeter drainage system might represent the traces of in-surface consolidation of the ground beneath the area of the Hellenistic gate,[23] and not the foundation system of a trough, the weight of which would have been rather negligible (Fig. 6). Furthermore, it is important to verify whether the stone raft of the Hellenistic precinct is really laid directly over the level of the wood piles. All these details, fundamental for the interpretation of the structure of the Hellenistic enclosure, have not been documented in previous publications.

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[23] Usually the surface consolidated with piles exceeds the surface occupied by the construction above.