# II. THE ARCHITECTURE OF SAV1 NORTH

*by Florence Doyen*[61]

## A Prologue

### A.1 The setting

During five excavation seasons by the Sai Island Archaeological Mission (2008–2012) more than one hundred brick wall segments were exposed within the nine 10m squares of the SAV1 North sector (Fig. 3).[62] The stratigraphic evidence here provided significant new information concerning the development of the town's northern sector, where five occupation levels were subsequently identified (I.3). The dating of these levels is the result of Julia Budka's study of the ceramic material from this area (see Chapter III).[63] The particular phase known as Level 3 – dated to the mid to late 18th Dynasty – attests to the period of the construction of Enclosure Wall N4[64] and five distinct building units, N24, N25, N12, N26 and N27. The latter are all described in further detail in the Sections B to F.

Within the SAV1 North area the buildings are modest in size, ranging from 23 to 30 square meters. None of the five identified structures complies with a standardised size, type of plan, design or arrangement of the rooms. These structures are thus not part of a modular plan, instead showing a loosely planned and individualised accommodation organisation. Despite this, each of the building units runs fairly parallel to the Enclosure Wall N4; this alignment indicates that their layout falls into the pattern of the settlement grid displayed in the southern sector of the Pharaonic town.

The lack of available space for a staircase and the narrowness of the mud brick walls, mostly half-a-brick thick, call into question the presence of an additional story. No ceiling features were unearthed, though this need not imply that smallest rooms were not, at least lightly, roofed. A facing of plaster covers some of the walls, but no decoration was apparent. Inside the building units, well-known installations such as storage bins, grinding equipment or fireplaces can be found, but there is no sign of mastabas[65] Together, these features suggest that SAV1 North's compounds were intended as temporary domestic spaces for the purpose of production/food-processing tasks, rather than for permanent residential housing.

Overall, the walls of the Level 3 structures are preserved to less than 1m in height, eliminating potential evidence for windows.[66] In most cases the walls were not set in foundation trenches,[67] instead built directly onto the natural gravel ground or over an earlier layer of occupation, made of backfill pebble or earlier brick courses. At Sai, it is usual for the narrow walls to be reinforced with pilasters.[68] Most of the half-a-brick thick walls were constructed using layers of staggered mud brick stretchers in the traditional running bond pattern, yet irregularities in the bricklaying are not uncommon in SAV1 North,[69] especially in the massive masonry of Enclosure Wall N4 or the bastions N3 and N2.

The site SAV1 North illustrates several aspects of the interrelationship between Pharaonic mud-

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62 See preliminary reports: Doyen 2009a; Devauchelle and Doyen 2009; Budka and Doyen 2013; Doyen 2014.

63 Budka 2011a, 29–31 and Table 3; Budka and Doyen 2013, 182, 192–193, 201.

64 See Budka and Doyen 2013, 178–179.

65 The lack of staircase and mastaba is particularly relevant to the interpretation of a building as a house or a workshop. See the discussion of "house versus workshop" in Kemp and Stevens 2010a, 492–496, esp. 492.

66 However, it has to be stressed that a window in the considerable low height of 0.26m above ground level was documented in House H3 in SAV1, the southern part of the New Kingdom town; it is the only known example from Sai; see Adenstedt 2016, 49.

67 See parallels at Amarna: Kemp and Stevens 2010a, 299, or at Deir el-Medina: Bonnet and Valbelle 1976, 320.

68 Kemp 2000, 88.

69 Kemp 2000, 88–92. Stretcher and header bricks are laid on their bed while bull headers are laid on edge. Occasionally, bricks are laid on end; see Tassie and Owens 2010, 254, fig. 96; Monnier 2013, 27–36.

brick architecture and the local topography. With the construction of the enclosure wall, the workers had to contend with the natural slope of the ground soil, which was composed of alluvial pebbles mixed with crumbled yellow sand. Inside the town itself, the lowest occupation layers demonstrated that some works of levelling were carried out in the area, by dumping pebbles as a backfill or by adjusting the irregular slope of the soil with a coating layer mixed with pebbles. However, it must be noted that it can be quite difficult to discern whether the pebble content of the ground is due to the process of intentional backfilling or the naturally gravelly geological environment, an issue already emphasised by Michel Azim.[70]

### A.2 Presentation of the architectural report of SAV1 North and conventions in use

The architectural report of SAV1 North will focus on five building units from the Level 3 phase of the town: N24, N25, N12, N26 and N27 (Fig. 3). The label of each building unit gives the number of the structure with the prefix "N", referring to the northern sector of the site SAV1 (Fig. 4). When another number follows the name, e.g. N12/2, this represents the specific room within the building unit. When a capital letter is added to the structure's name, e.g. N12D, this gives the designation of an installation.[71] This report is substantiated through analysis of building techniques such as bricklaying of walls and their buttresses, the size and bonding pattern of mud bricks, plastering of walls, and the coating of the floors. Each chapter begins with a description of both the perimeter and internal walls, and a presentation of the compound's installations. A description of the related coated floor surfaces follows next, identified using underlined format, e.g. N25Fl1W, and their intervening deposit written between brackets, e.g. (N12De2g). Finally, the account of the building phasing and flooring sequence is written with a hyphen and a small letter, e.g. N26-b. Additionally, this report also presents the description of the structures built outside the northern enclosure wall of the town (IIA.4).

The walls in sector SAV1 North are designated by a number according to the chronology of their respective exposure, and the adjoining letter N, E, S or W corresponds to the orientation of the individual wall. In case no additional letter was used, it means that the wall is an isolated segment showing no structural link with near brickwork. Because not all areas were excavated to the foundation (see in particular II.E), counting of brick courses is primarily made from the preserved top. Though counting may occasionally be taken from the bottom, it is reserved for cases when a basal course is visible above a preserved floor, while the lower footing course was not exposed.

Fig. 14 presents the building units' measurement data in accordance by the International System of Units.[72] All measurements of altitude recorded during the SIAM seasons relate to the temporary benchmark[73] situated at the southwest corner of the dig-house. Levelled at 160.306m, this benchmark has been designated as 0m.[74] Each altitude mentioned in the text keeps to this local system, and is thus an absolute altitude according to the benchmark reference.

### A.3 The mud bricks from SAV1 North

At the SAV1 North site, mud bricks from the building units assigned to Level 3 are composed principally of mud, without pebble or gravel inclusions. In contrast with this homogeneous raw material use, the size of the bricks is definitely not standardised. Many brick formats were documented (Figs. 5–7), ranging from the smallest at 32 × 15 × 8cm[75] to the largest, 45 × 18 × 9cm.[76]

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[70] See the final report at the end of Azim's four seasons of excavation in the southern part of the Pharaonic town: Azim 1975, 95–99. See also Budka and Doyen 2013, 178.

[71] This nomenclature was created while preparing this volume; the preliminary report from 2012 (Budka and Doyen 2013) and other papers (e.g. Budka 2016b) still give the original field labels; e.g. N17 (silo within N12) is here newly labelled as N12D; see Fig. 4 for the concordance of the designations.

[72] In Fig. 14 the reader will find decimal measurements converted into Egyptian units, *i.e.* cubits and palms. Since major building activities in the Pharaonic town of Sai are dated to the reign of Thutmose III (see Budka 2015a, 67 and Chapter I.3.3), it is assumed that the unit in use was the great royal cubit (52.5cm long), comprising seven palms (each 7.5cm long): see Carlotti 1995, 140, pl. I; Carlotti 2005, 190. Regarding the ancient Egyptian cubit, see Hirsch 2013 and related discussion and bibliography.

[73] The geographic coordinates of the bench mark are E= 30°19'53.90" and N= 20°44'19.69".

[74] GPS data collected by AcrossBorders illustrate that this local system is 35m (+/-5m) lower than the height according to the World Geodetic System 1984 (WGS84).

[75] In the western section of Wall 43N, building unit N26 (IIE.2.3) or in Wall 52W, building unit N12 (IID.2.4).

[76] In the northern segment of Wall 45E in N26 (IIE.2.2).

| SAV1N concordance list (installations and rooms) | | | | |
|---|---|---|---|---|
| | old N-name | new N-name | perimeter walls | internal walls |
| | | | | |
| **Building unit N24** | | | 08N, 08N, 07E, 03E, 03S | 08S, 07S |
| | | N24A (installation) | | |
| | | N24B (installation) | | |
| | | N24C (installation) | | |
| | | N24D (installation) | | |
| | | N24E (installation) | | |
| | N8A (installation) | N24F | | |
| | | | | |
| **Building unit N12** | | | 42N, 42E, 42S, 52W | 46W, 53E, 57 |
| | N16 (installation) | N12C | | |
| | N17 (installation) | N12D | | |
| | N19 (installation) | N12E | | |
| | N20 (installation) | N12F | | |
| | | N12/1 (front room) | | |
| | | N12/2 (central room) | | |
| | | N12/3 (rear room) | | |
| | | | | |
| **Building unit N26** | | | 43N, 45E, 47S, 44W, 47W | 44S, 43E, 47N, 47E, 44E |
| | | N26/1 (main larger space) | | |
| | N18 (north–western side room) | N26/2 | | |
| | N21 (south–western side room) | N26/3 | | |
| | N14 (room of N26-a, third building phase) | N26/4 | | |
| | | | | |
| **Building unit N27** | | | 33N, 35W, 54E, 36E, 34S, 33W, 31E | 39W, 38E, 36N, 34N, 34E |
| | | N27/1 (main larger space) | | |
| | N8 (western side room) | N27/2 | | |
| | N11 (eastern side room) | N27/3 | | |
| | N22 (installation) | N27A | | |

Fig. 4 SAV1 North concordance list: N-numbers (installations and rooms)

Three format categories – small, medium and large – have been arbitrarily established according to the total that results from the addition of the three sides' measurements: length + width + thickness. The bricks for which the total of the sides is less than 60cm fall into the small format category (Fig. 5); if the total ranges from 60cm to less than 65cm, the bricks fall into the medium format category (Fig. 6); if the total is equal to or greater than 65cm, the bricks fall into the large format category (Fig. 7). The frequency of these formats differs and from this classification it can be seen that bricks falling into the medium format category were the most often in at SAV1 North.

From the Middle Kingdom onwards, there is evidence of various finger marks in different types of mud brick masonry in Egypt and Nubia, such as pyramids, defensive walls of the fortresses, temples

| Small format category of bricks' size | Wall/ Pilaster | Length (cm) | Width (cm) | Thickness (cm) | Total l + w + t |
|---|---|---|---|---|---|
| | | | | | |
| **A. N3 bastion area** | | | | | |
| **Large Bastion N2** | | 32/35 | 13/15 | 8 | 55.5cm |
| | | | | | |
| **B. Building Unit N24** | | | | | |
| | | | | | |
| **C. Building Unit N25** | | | | | |
| **Perimeter walls** | 02N | 33 | 15 | 10.5 | 58.5cm |
| | 25W | 33 | 15/16 | 10 | 58.5cm |
| | | | | | |
| **D. Building Unit N12** | | | | | |
| **Perimeter walls** | 42S | 32/33 | 16 | 10 | 58.5cm |
| | N12Pil1 | 32 | 17 | 9 | 58cm |
| | N12Pil9 | 34 | 15/17 | 9 | 59cm |
| | 42N | 34 | 14 | 9 | 57cm |
| | 42N | 33 | 17 | 9 | 59cm |
| | N12Pil7 | 34 | 16 | 9 | 59cm |
| | 52W | 32 | 15 | 8 | 55cm |
| **Internal walls** | 46W | 32 | 17 | 9 | 58cm |
| | N12Pil5 | 34 | 16 | 9 | 59cm |
| | 53E | 33 | 15/16 | 8 | 56.5cm |
| | N12Pil11 | 34 | 15 | 10 | 59cm |
| | 42Sa | 32 | 15 | 10 | 57cm |
| | | | | | |
| **E. Building Unit N26** | | | | | |
| **Perimeter walls** | 43N (west. segment) | 32 | 15 | 8 | 55cm |
| **Internal walls** | 44S | 33 | 16 | 8 | 57cm |
| | | | | | |
| **F. Building Unit N27** | | | | | |
| **Perimeter walls** | 33N | 33 | 16 | 8 | 57cm |
| **Internal walls** | N27Pil2 | 35 | 16 | 7/8 | 58.5cm |

Fig. 5 Small brick format category

and settlements.[77] Some of the mud bricks from SAV1 North display different finger grooves that are sorted as follows:

- Type A: 1 central oblique groove
- Type B: 2 central oblique grooves
- Type C: 3 central oblique grooves
- Type D: 1 diagonal groove
- Type E: 2 diagonal grooves
- Type F: 2 finger holes
- Type Ga: 3 finger holes (fan)
- Type Gb: 3 finger holes (triangle)
- Type H: 5 finger holes (fan)
- Type J: 1 finger hole
- Type K: 2 central grooves (cross)
- Type L: parallel longitudinal grooves

[77] For selected parallels see Arnold 1979, 6, fig. 1 and pl. 2 (Deir el-Bahari, temple of Mentuhotep); Charlier 2012, 180, fig. 9.5 (Qaret el-Toub, Roman fort); Jaritz 1993, 112–113, pl. 25c (Gebel el-Granite); Lacovara 1990, 5 and pl. VIIIa (Deir el-Ballas, South Palace); Nicholson 1989, 68, fig. 3.4 (Amarna, building Q.48.4); von Pilgrim 1996a, 131, fig. 48 and pls. 31d–e (Elephantine, House H69); Seco Álvarez and Gamarra Campuzano 2015, 63–66, fig. 7 (Luxor West Bank, Thutmose III temple of Millions of Years).

| Medium format category of bricks' size | Wall/ Pilaster | Length (cm) | Width (cm) | Thickness (cm) | Total l + w + t |
|---|---|---|---|---|---|
| | | | | | |
| **A. N3 bastion area** | | | | | |
| **Enclosure Wall N4** | | 38 | 17 | 7/8 | 62.5cm |
| **Structure N28** | 12 | 34/36 | 15/18 | 8.5 | 60cm |
| | 01W | 36 | 17 | 8.5 | 61.5cm |
| | | | | | |
| **B. Building Unit N24** | | | | | |
| **Perimeter walls** | 03S | 38 | 16/18 | 8 | 63cm |
| | 03E | 38 | 16/18 | 8 | 63cm |
| | 08N | 35 | 17/18 | 8 | 60.5cm |
| | 08N | 36 | 17 | 10 | 63cm |
| | 08W | 36 | 17 | 10 | 63cm |
| | N24Pil4 | 37 | 17 | 8 | 62cm |
| **Internal walls** | 07S | 35 | 17 | 8 | 60cm |
| | 08S | 34/38 | 16 | 8 | 60cm |
| | N24Div2 | 38? | 16 | 10 | 64cm |
| | | | | | |
| **C. Building Unit N25** | | | | | |
| **Perimeter walls** | 02E | 35 | 16 | 10.5 | 61.5cm |
| | N25Pil1 | 35 | 16 | 10.5 | 61.5cm |
| | N25Pil2 | 35 | 16 | 10.5 | 61.5cm |
| | | | | | |
| **D. Building Unit N12** | | | | | |
| **Perimeter walls** | 42S | 36/37 | 17 | 10 | 63.5cm |
| | N12Pil3 | 34 | 16 | 10 | 60cm |
| | N12Pil4 | 37 | 15 | 10 | 62cm |
| | 42E | 36 | 16 | 10 | 62cm |
| | N12Pil8 | 35 | 17 | 9 | 61cm |
| **Internal walls** | N12Pil6 | 35 | 17 | 9 | 61cm |
| | N12Pil10 | 34 | 17 | 9 | 60cm |
| | N12Pil2 | 34 | 16 | 10 | 60cm |
| | | | | | |
| **E. Building Unit N26** | | | | | |
| **Perimeter walls** | 47S | 36 | 15 | 10 | 61cm |
| | 45E (south) | 35 | 15/16 | 10 | 60.5cm |
| | 44W | 35 | 16 | 9 | 60cm |
| | 47W | 36 | 15 | 10 | 61cm |
| **Internal walls** | 43E | 35 | 15/16 | 10 | 60.5cm |
| | 44E | 35/37 | 16/17 | 9/10 | 62cm |
| | 47E | 33/35 | 18 | 10 | 62cm |
| | 47N | 35/37 | 18 | 10 | 64cm |
| | | | | | |
| **F. Building Unit N27** | | | | | |
| **Perimeter walls** | 34S | 38 | 16 | 7/8 | 61.5cm |
| | 35W | 35 | 17 | 8 | 60cm |
| | 33W | 35 | 17 | 10 | 62cm |
| | 31E | 36 | 18 | 9 | 63cm |
| **Internal walls** | 38E | 36 | 18 | 9 | 63cm |
| | 39W | 36 | 18 | 9 | 63cm |
| | N27Pil1 | 36 | 18 | 9 | 63cm |
| | 34N | 38 | 16 | 7/8 | 61.5cm |
| | 34E | 38 | 16 | 7/8 | 61.5cm |
| | 36N | 38 | 16 | 7/8 | 61.5cm |

Fig. 6 Medium brick format category

| Large format category of bricks' size | Wall/ Pilaster | Length (cm) | Width (cm) | Thickness (cm) | Total l + w + t |
|---|---|---|---|---|---|
| | | | | | |
| **A. N3 bastion area** | | | | | |
| **Enclosure Wall N4** | | 40<br>44 | 20<br>16 | 11<br>10 | 71cm<br>70cm |
| **Small Bastion N3** | | 40 | 20 | 11 | 71cm |
| **Structure N28** | 01S | 38 | 20 | 9.5 | 67.5cm |
| | | | | | |
| **B. Building Unit N24** | | | | | |
| **Perimeter walls** | 07E | 39 | 18 | 8.5 | 65.5cm |
| | N24Pil1 | 40 | 17 | 9 | 66cm |
| | N24Pil2 | 38 | 17 | 10 | 65cm |
| | N24Pil3 | 38.5 | 19 | 9/10 | 67cm |
| **Internal walls** | N24Div1 | 39 | 17 | 10 | 66cm |
| | | | | | |
| **C. Building Unit N25** | | | | | |
| | | | | | |
| **D. Building Unit N12** | | | | | |
| **Perimeter walls** | 42E | 38 | 18 | 10 | 66cm |
| | | | | | |
| **E. Building Unit N26** | | | | | |
| **Perimeter walls** | 45E (north. segment) | 45 | 18 | 9 | 72cm |
| | 43N (east. and central segments) | 38 | 19 | 9 | 66cm |
| | | | | | |
| **F. Building Unit N27** | | | | | |
| **Perimeter walls** | 36E | 37 | 18 | 10 | 65cm |

Fig. 7 Large brick format category

For the walls and structures under investigation – *i.e.* assigned to the Level 3 phase of the mid-18th Dynasty – it is possible to identify only four of these types:

- Type A, in building unit N26's perimeter walls 47S and 44W (see Fig. 45)
- Type B, in building unit N24's perimeter wall 08N (see Fig. 25),

  in building unit N25's perimeter walls 02E, 02N and 25W (see Fig. 29)
- Type F, in small Brick Tower N3 (see Fig. 8)
- Type L, in Enclosure Wall N4 (see Fig. 8)

  in building unit N24's perimeter walls 03E and 07E (see Fig. 25)

  in building unit N27's internal wall 36N (see Fig. 50).

In the southern sector of the New Kingdom town on Sai Island, Azim documented up to twenty types of digital grooves.[78] His Type 06[79] corresponds to our Type L, and his Types 04 and 08[80] are identical to the SAV1 North Types F and B respectively. So far, it has not been possible to define a comprehensive pattern of distribution of the walls where the bricks display a grooved feature.

## A.4 The N3 bastion area

### *A.4.1 Introduction*

Outside the northern Enclosure Wall N4, the N3 bastion area includes the following structures, described below: small Brick Tower N3, large Brick Tower N2 and Structure N28.

From 16–19 December 1973, Azim undertook a brief survey of the location SAV1A, on the east-

78 Azim 1975, 102–105, pls. VI and VII.

79 Azim 1975, 102, pl. VI (top left).

80 Michel Azim, personal communication, 29 Oct 2012.

ern part of the Pharaonic town's northern enclosure wall. The French architect explained his preliminary observations as follows: *Le mur nord de la ville, totalement invisible sur le terrain, a pu également être retrouvé par sondage. Un de ses redans a été dégagé: il est identique à ceux du mur sud, mais enrobé ultérieurement par un bastion plus grand fondé sur des briques tombées. Le mur nord au moins a donc été détruit, puis restauré et renforcé*.[81] His entire excavation took place in four days, barely enough time to document findings (Pls. 5a, b and c).[82] Following the approval of Azim, the Sai Island Archaeological Mission decided to continue the fieldwork from where he left off. The fieldwork thus resumed on 16 January 2008 at the place of the earlier dig (Pl. 5d). During the dig hiatus, this area was progressively refilled with modern construction or organic waste, leaving only a few rows of mud bricks still visible at the surface by 2008. At the end of the first season at SAV1 North, one of the distinct outcomes reached by the SIAM excavation was to have completed the clearance of the entire large Brick Tower that had been only partially exposed during the 1973 survey.

A 20m long section of the northern enclosure wall was cleared for the second time by the SIAM. This city wall, N4, is 4.26m wide and features regular bonding of mud brick courses composed of headers and stretchers in alternating layers.[83] One may also find bricks laid in various irregular positions – bull headers or bricks in fishbone patterns – to adjust the masonry to the undulating natural gravel substratum. Furthermore, it is worth noting that in this sector of SAV1 North, the ground soil is uneven and characterised by two distinct downward slopes from east to west or from south to north.[84] Hence, it can be assumed that no major levelling work was completed prior to the building of the enclosure wall and that the setting of the masonry courses thus served to suit the irregular gravel soil. As a consequence of this distinctive feature, the coated floor covering the fill of the foundation trenches is also slightly inclined (IIA.4.3.2).

### *A.4.2 Description of the structures from the N3 bastion area*

#### A.4.2.1 The Brick Tower N3 (Fig. 8 and Pl. 6)

This external Bastion N3 abuts the northern face of Enclosure Wall N4 and is preserved up to a maximum height of 1.45m or eleven mud brick courses.[85] N3's emplacement footprint covers the ground with a roughly square outline (2.20 × 2.61m)[86] that corresponds to the type and proportions of the Brick Towers exposed along SAV1's southern enclosure wall.[87] N3 is made of bricks that are 40 × 20 × 11cm in size (see Figs. 7 and 12). Some of these bricks feature two fingertips holes.[88] N3's brickwork consists of alternating courses, with five rows of headers running north–south and six stretchers running east–west. The Brick Tower N3 was an original part of the masonry of the enclosure wall itself – and thus contemporaneous – as can be seen from N3's western, southern and eastern faces, where brick courses are unevenly bonded to Wall N4. The adjacent Wall N4 is 4.26m thick at its base, both of its facings are bonded, and its core is composed of ten north–south running rows of mud brick headers of at least three different sizes (Fig. 12): 40 × 20 × 11cm, 44 × 16 × 10cm (Fig. 7) and 38 × 17 × 7/8cm (Fig. 6).[89] In addition, it can be noted that some of the smaller bricks show longitudinal prints that may correspond either to finger marks printed in the brick or grooved in the horizontal bed mortar.[90]

In contrast to the straight vertical eastern face of N3, the five lowest courses of the western face, up to 60cm high, project outward (Pl. 6a). From the west side of the small Brick Tower, it can also be observed that the base of N3's footing course coincides with the base of Enclosure Wall N4. The base

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81 Azim 1975, 122.

82 After a meeting held in June 2007 between Azim and the author, the Sai Island Archaeological Mission was granted several photographs and sketches from Azim's unpublished personal collection of field notes and documents.

83 Budka and Doyen 2013, 178.

84 Regarding the south–north slope below the footing course of small Brick Tower N3, see Fig. 11.

85 The top of the upper course is levelled at 160.83m and base of the N3's northeastern corner at 159.38m.

86 The sides of N3 are slightly battered. The top course's outline measures 2.00 × 2.48m.

87 Azim 1975, 122; see quotation above.

88 This finger mark falls into the Type F category = Azim Type 4 (IIA.3).

89 See Azim 1975, 120 regarding the southern enclosure wall: "les parements sont fondés dans la terrasse de gravier plus profondément que la masse centrale." This statement is verified in the case of the northern enclosure wall, see Pl. 3.

90 This finger mark falls into the Type L category = Azim Type 6 (IIA.3).

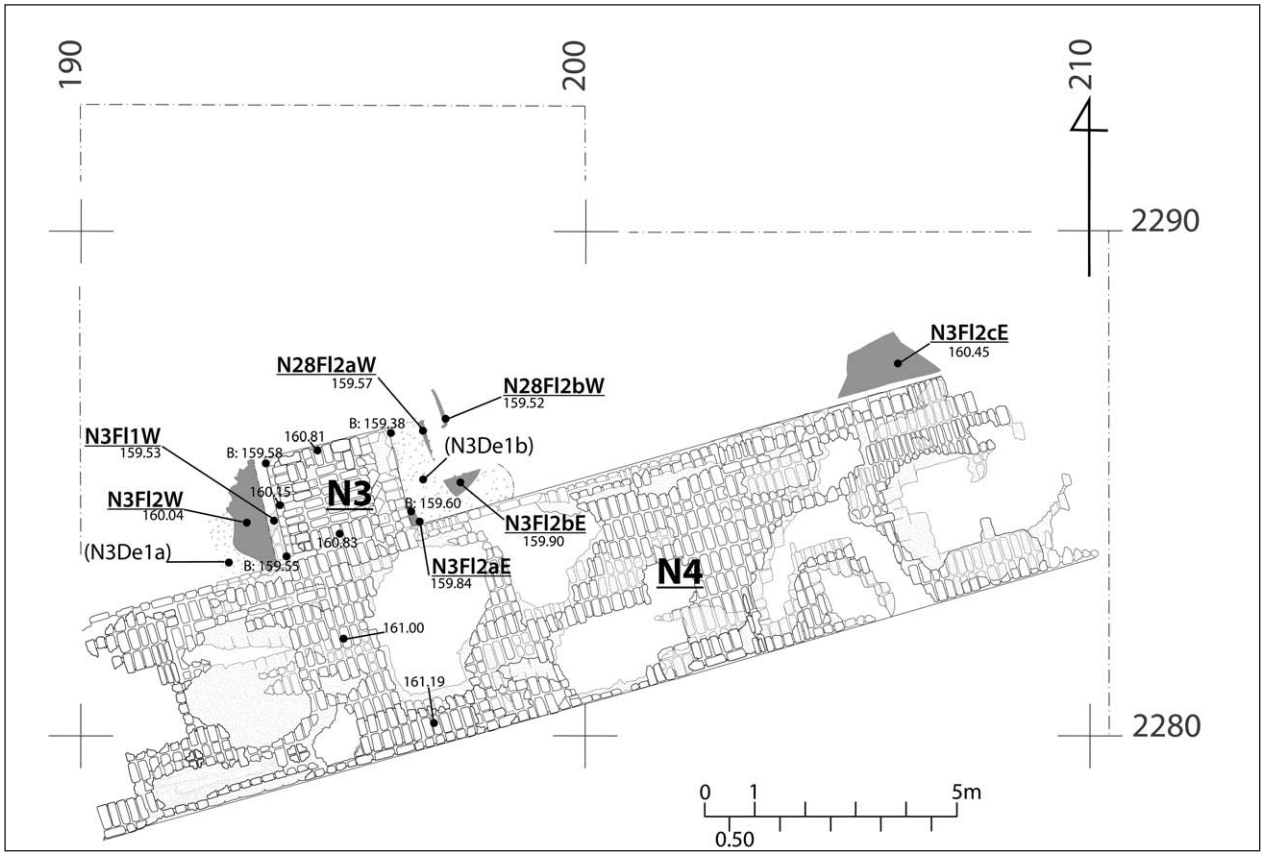


Fig. 8 Plan of Phase N3-b: levels of Structures N3, N4 and associated floors

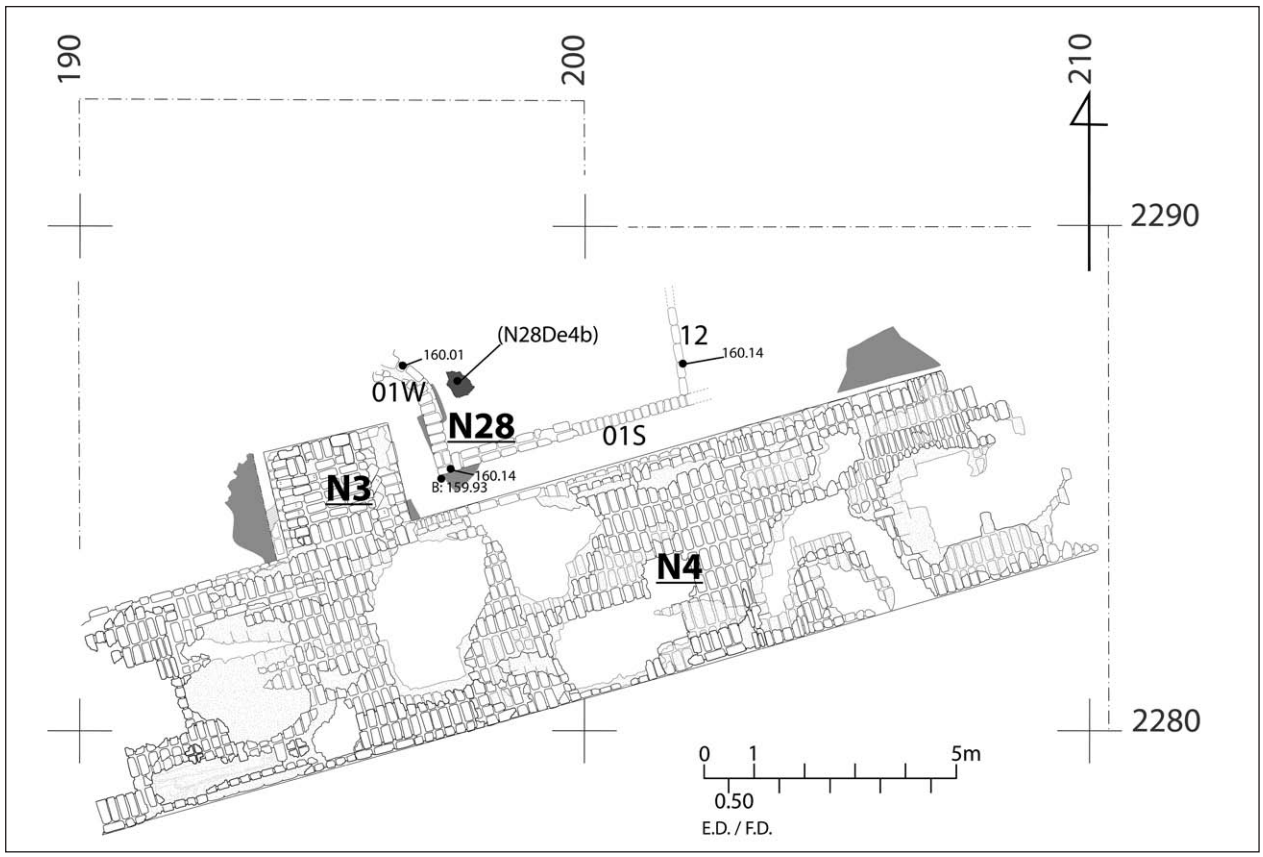


Fig. 9 Plan of Phase N3-a: levels of Structure N28

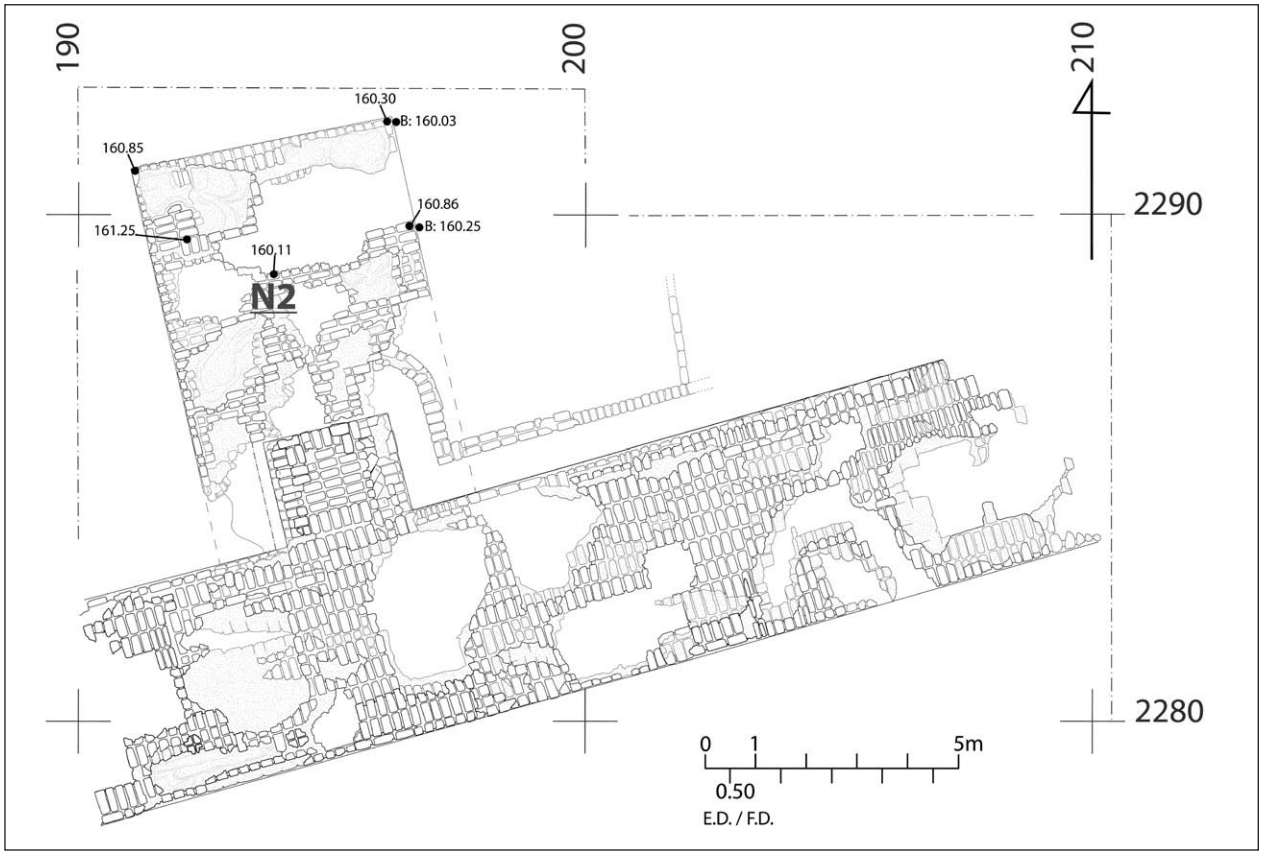


Fig. 10 Plan of N3 including Structure N2

of N3's southwestern corner, abutting the northern facing of N4, is levelled at 159.55m while the baseline of its opposing northwestern corner is measured at 159.58m. On the eastern side of N3, the baseline of the footing course follows the downward sloping ground (Fig. 11) and has two distinct level measurements. At its southern end, in the corner joining N3's eastern face and N4's northern facing, the footing course of the Brick Tower is levelled at 159.60m.[91] At its northern end, the baseline of the opposing northeastern corner is measured at 159.38m.

From the western face of N3, at the fifth course from the top (Pl. 6b), it can be seen that one stretcher brick bonds the Brick Tower N3 to Enclosure Wall N4. On the eastern side of N3 at the same level, here the third course from the top, there is also a brick showing the same bonding character (Fig. 11).

As was previously observed by Azim (IIA.4.1), the small Brick Tower N3 was found partially covered by a larger Brick Tower running north of N3, i.e. N2 (Pl. 5b). The northern edge of N3[92] was hidden by the masonry of Structure N2 while part of the broken mud brick rubble underlying this masonry covered the damaged northeastern corner of N3.

### A.4.2.2 The Brick Tower N2 (Figs. 10 and 12)

To restore the smaller Brick Tower N3, a roughly rectangular shaped new bastion, N2, was built with a larger scale and proportions. The structure, measuring at the base c. 7.85 × 5.30m, significantly enlarges N3 by slightly more than to seven times.[93] Severely damaged by large holes dug into it,[94] the remaining perimeter of the Structure N2 is partial.[95] Brick tower N2 culminates at 161.25m and is preserved up to six layers of mud bricks that are 32/35 × 13/15 × 8cm in size (Fig. 5). The altitudes of its northwestern and northeastern corners are measured

[91] The baseline in this corner was not cleared completely. The base of the adjacent Enclosure Wall N4's footing course is levelled at 159.84m.

[92] The top of N3's northern edge is levelled at 160.81m.

[93] Budka and Doyen 2013, 178.

[94] The date of the digging activity remains uncertain.

[95] The Brick Tower N2 surrounds the original small Bastion N3 and was possibly abutting Enclosure Wall N4.

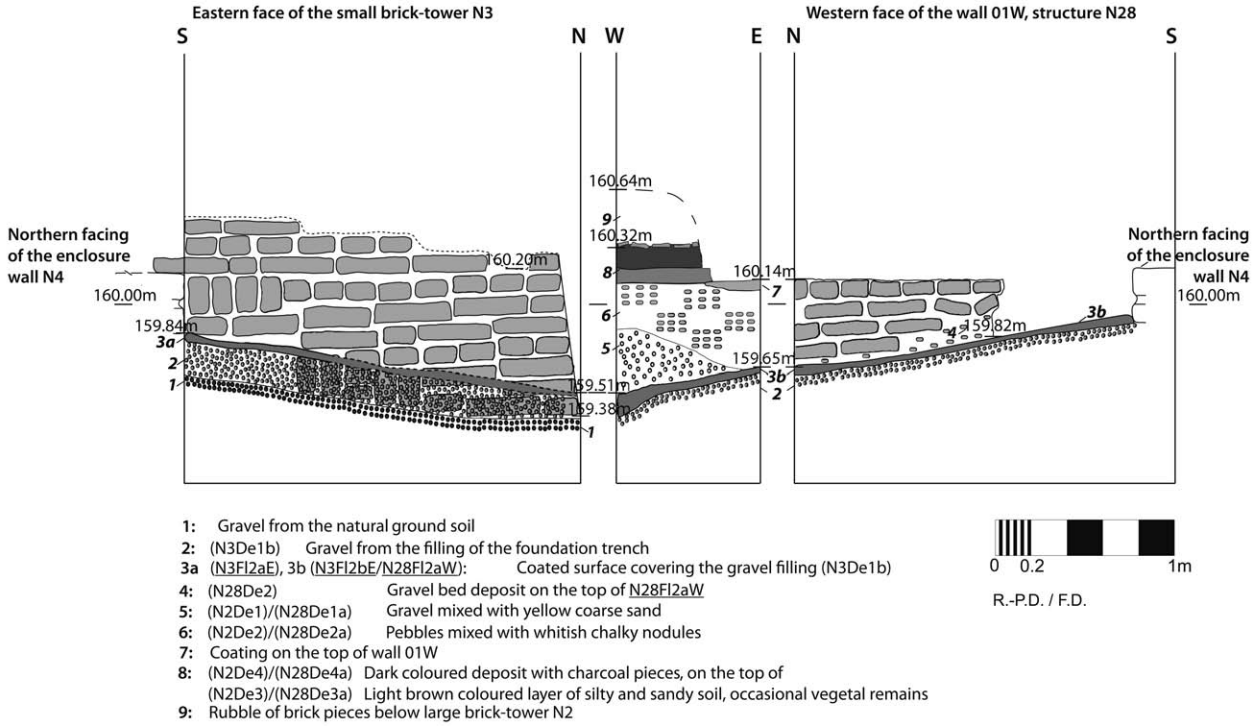


Fig. 11 Section drawing 007/2008 (east face of Brick Tower N3 and west face of Wall 01W)

| **N3 bastion area** | | Length (cm) | Width (cm) | Thickness (cm) | Total l + w + t | *Format* |
|---|---|---|---|---|---|---|
| | | | | | | |
| **Enclosure Wall N4** | | 40 | 20 | 11 | 71cm | *large* |
| | | 44 | 16 | 10 | 70cm | *large* |
| | finger mark Type L | 38 | 17 | 7/8 | 62.5cm | *medium* |
| | | | | | | |
| **Small Bastion N3** | finger mark Type F | 40 | 20 | 11 | 71cm | *large* |
| | | | | | | |
| **Structure N28** | 01S | 38 | 20 | 9.5 | 67.5cm | *large* |
| | 01W | 36 | 17 | 8.5 | 61.5cm | *medium* |
| | 12 | 34/36 | 15/18 | 8.5 | 60cm | *medium* |
| | | | | | | |
| **Large Bastion N2** | | 32/35 | 13/15 | 8 | 55.5cm | *small* |

Fig. 12 Structures of N3 bastion area: brick sizes

at 160.85m and 160.30m respectively. The base of the latter corner was exposed during the 2008 season and subsequently measured at 160.03m. The damage caused by pitting exposed the inner core of the large bastion, which was made further accessible through the excavation of a trench cut through the eastern side. This trench, located north of the smaller Brick Tower N3, revealed that N2 was built upon a layer of rubble composed of mud brick crumble (Pls. 10a, b, c).[96] This layer in turn overlies a blackened deposit that once covered and concealed the earlier Structure N28 (IIA.4.3.5).

[96] Against the northern face of N3, the rubble layer is *c.* 0.30m thick, lying between 160.61m and 160.30m (Fig. 11: 9).

A.4.2.3 The Structure N28
(Figs. 9 and 12)

Structure N28 is composed of two walls: Wall 01S (east–west oriented and running parallel to Wall N4) and Wall 01W (running north and slightly curving to the west, on the east side of Brick Tower N3).

Wall 01S is only preserved up to a maximum height of two courses of mud bricks that are 38 × 20 × 9.5cm in size. This wall is *c.* 5.20m long (around 15 stretcher bricks) and runs 0.68m parallel to the northern facing of N4. Its footing course is mostly made of header bricks while its current top course is mainly composed of stretchers, resulting in a one-brick-thick wall masonry.

Wall 01W is also one brick thick and is bonded at right angle to the western end of Wall 01S. It is preserved up to four brick courses and the bricks used for the construction of Wall 01W are, exactly like Wall 12, of a slightly smaller format than 01S, at 36 × 17 × 8.5cm.[97] This wall extends 1.60m long, running 0.72m from and parallel to the eastern face of Brick Tower N3. At the northern end of its rectilinear segment, Wall 01W curves westwards and stretches around the northeastern corner of the small bastion and alongside its northern face (Pls. 10b, c).

Further east, the much eroded footing course of Wall 12 lies less than 5.00m from the western end of Wall 01S. This wall, of which only five footing stretcher bricks have been exposed, is half-a-brick thick, *c.* 1.80m long and runs perpendicular to the inner/northern face of Wall 01S. These brick remains are of a smaller size, 34/36 × 15/18 × 8.5cm. At the southern end of Wall 12, the footing brick abuts the masonry of Wall 01S; though it is adjacent, the absence of visible bonding features may indicated that Wall 12 does not belong to the layout of N28.

Structure N28 was built upon fill deposit, overlying a coated surface that floors the gravel fill of the N3 and N4 foundation trenches (IIA.4.3.4). The setting of Structure N28 thus belongs to Phase N3-a, a different and subsequent phase than the foundation of Enclosure Wall N4 and its external Brick Tower N3. N28 might be tentatively interpreted as a rampart wall lining the town enclosure and surrounding its original bastion.[98]

Before constructing the later larger Brick Tower N2[99] over the smaller Brick Tower N3 and the Structure N28, levelling works were carried out in the area. Once out of use, former Structure N28 was levelled and the gap between the western wall of this structure and N3's northeastern face was filled with gravel (Figs. 11:5 and 6) (IIA.4.3.5).

*A.4.3 Coated surfaces associated with the structures from the N3 bastion area*
(Fig. 13)

A.4.3.1 On the west side of Brick Tower N3
(Fig. 8)

From the base of the uppermost projecting course of N3 (*i.e.* the fifth course from the base), a mud-coated floor lips out from both N3's western face and N4's northern face (Pl. 6b). This 3–4cm thick surface, N3Fl2W,[100] lies on the path outside the city enclosure and tops the gravel deposit (N3De1a),[101] which is itself likely the rubble of gravel filling the foundation trenchs of both the Bastion N3 and Enclosure Wall N4. The gravel deposit (N3De1a) thus conceals the basal courses that project out from the western face of N3.

Underlying Deposit (N3De1a), there is a remaining patch of another flooring surface, lying against the base of N3's footing course. This floor, N3Fl1W, is levelled at 159.53m and was laid in N3's first building phase of Level 3 of N3, namely N3-b.

A.4.3.2 On the east side of Brick Tower N3
(Figs. 8 and 11)

To the east of Brick Tower N3, there are also remnants of a coated surface, N3Fl2E, which may correspond to Floor N3Fl2W identified on the opposite side of N3. The surface N3Fl2E also overlies Deposit (N3De1b), *i.e.* the gravel that fills the foundation trenches of both N3 and N4. Against the eastern face of N3 and further east on the path outside the northern Enclosure Wall N4, additional pieces of the 4cm thick Floor N3Fl2E were also documented:

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97 At the southern end of Wall 01W, where this wall is bonded to Wall 01S, the top of the upper course is levelled at 160.11m. In the exposed segment running westwards, the top of 01W is levelled at 160.01m and the base of the footing course at 159.59m.

98 See Budka and Doyen 2013, 178 and n. 73; Monnier 2013, 203 and 246, n. 383.

99 For the ceramic material from the filled area below the Brick Tower N2 and its possible dating by Budka, see Budka and Doyen 2013, 178.

100 The top of N3Fl2W ranges from 160.01m to 160.05m.

101 Deposit (N2De1) is 0.47m thick between 160.00m and 159.53m.

| West of N3, north of N4 | East of N3, north of N4 | North of N3 | N28, Wall 01W | West of N28's Wall 01W | N2, north of Wall 01W | East of N28's Wall 01W | **Building phases of N3's area** |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | Brick pieces rubble | | | | **Large Bastion N2 building phase** |
| | | | (N2De4) | (N28De4a) | (N2De4) | (N28De4b) | |
| | | | (N2De3) | (N28De3a) | (N2De3) | (N28De3b) | |
| | | | | | N2Fl3N | | |
| | | | | (N28De2a) | (N2De2) | (N28De2b) | |
| | | | | (N28De1a) | (N2De1) | (N28De1b) | |
| | | | **01W/N28** *(N28De2)* | | | | **N3-a Second building phase** |
| N3Fl2W | N3Fl2E | N3Fl2N | N28Fl2W | N28Fl2aW | | N28Fl2bW | **N3-b First building phase** |
| (N3De1a) | (N3De1b) | | (N3De1b) | | | | |
| N3Fl1W **N3–N4** | **N3–N4** | **N3** | | | | | |
| Natural ground | | | | | | | |

Fig. 13 Structures of N3 bastion area: floors, fills and building phases

- N3Fl2aE (Fig. 11:3a) is a small patch of floor lying in the area of the corner joining the eastern face of Bastion N3 to the northern face of Wall N4. This patch, levelled at 159.84m, abuts both the base of Wall N4's footing course and the base of N3's sixth course from the top.
- N3Fl2bE (Fig. 11:3b) levelled at *c.* 159.90m, projects out the southern side of Wall 01S and is about 0.2m in surface area. To the south, the connection of the patch N3Fl2bE to N4's footing course is truncated, while to the north, it can be clearly seen that this patch of flooring material underlies the southwestern corner of Structure N28 (IIA.4.3.4).
- N3Fl2cE (Pl. 7) is a larger section of flooring, preserved up to 2m in surface area. It is levelled at *c.* 160.45m and lies next to the outer facing of N4, 8.60m away from the corner joining the eastern face of N3 and the northern facing of Wall N4.

A.4.3.3 On the north side of Brick Tower N3 (Pl. 9)

A further piece of flooring abuts the footing course of the northern face of Brick Tower N3, N3Fl2N. This patch of floor is levelled at 159.42m[102] and might have been related to the coated surfaces mentioned above, N3Fl2aE and N3Fl2bE. Actually, patch N3Fl2aE belongs to a surface documented during the 2008 season that was truncated during the excavation on the eastern side of N3 (Fig. 11). This surface gradually sloped downward to the

[102] The base of N3's northeastern corner is levelled at 159.38m (IIA.4.2.1).

north, where it once might have been connected to Floor N3Fl2N. Despite the truncation between the floor pieces N3Fl2aE, N3Fl2bE and N3Fl2N, it can be assumed that these pieces were part of a single flooring surface, topping the gravel fill of N3's foundation trench.

A.4.3.4 Below the Structure N28

At the second building phase (N3-a) Structure N28 was built upon a 6–10cm thick gravel bed, Deposit (N28De2), which overlies a patch of flooring material. The patch N3Fl2bE (IIA.4.3.2) that projects out the N28's southwestern corner, is part of a mud-coated surface, N3Fl2bE/N28Fl2W, underlying Deposit (N28De2) of Wall 01W (Fig. 11). Floor N28Fl2W gradually slopes downward to the north. Two pieces of flooring, N28Fl2aW and N28Fl2bW protrude slightly from below each side of Wall 01W's straight segment, and are levelled at 159.57m and 159.52m respectively. The patches labelled N3Fl2bE, N28Fl2W, N28Fl2aW and N28Fl-2bW are thus part of a single surface, recognised below Structure N28's western Wall 01W (Pl. 5 and Fig. 8). It can be assumed that this surface once joined the Floors N3Fl2aE and N3Fl2N, built atop the gravel filling the foundation trenches of the Bastion N3 and Enclosure Wall N4. These floors therefore belong – like N3 and N4 – to the first building phase (N3-b) and predate Structure N28 of the second building phase (N3-a).

A.4.3.5 Below the Brick Tower N2
(Fig. 11 and Pl. 8)

As mentioned above, later construction of the larger Brick Tower N2 required some levelling works levelling in the area of N3 and N28. The former Structure N28, in particular, was dismantled down to its foundation courses and the gap between the Wall 01W and Bastion N3's northeastern face was filled. This backfill, identified on either side of N28's Wall 01W, consists of two layers of deposit: the lower (N2De1) is composed of abundant gravel mixed with coarse yellow sand,[103] while the upper (N2De2) is characterised by frequent pebbles mixed with a number of whitish chalk nodules.[104]

Over the backfill concealing the northern face of Wall 01W's curved segment was subsequently laid the mud-coated Floor N2Fl3N, which may originate from the time of N28's dismantling. Because this surface, levelled at 159.98m, was hidden and protected below the later large Brick Tower N2, it was found intact (Pl. 10b). On top of Floor N2Fl3N, two successive layers of occupational deposit developed, overlying the area of the Structure N28 and covering the bricks of Wall 01W. The lowest deposit (N2De3) consists of a light brown layer of silty and sandy soil, mixed with occasional vegetal remains.[105] This deposit underlies the loose upper deposit (N2De4), characterised with a dark colour, abundant charcoal pieces and occasional ashy lenses.[106] It can be assumed that the two layers of deposits, (N2De3) and (N2De4), match with the final phase of occupation assigned to Level 3. Following this stage, the area was concealed below the broken mud brick rubble underlying the masonry of the later Brick Tower N2 (Pl. 10a).

## B Building unit N24

### B.1 Introduction

Located in the northern part of SAV1 North, next to Enclosure Wall N4, building unit N24 (Pl. 11) is delineated by Walls 08N and 08W to the west and Walls 07E, 03E, and 03S to the east. All of these walls were constructed using layers of mud brick stretchers in the traditional running bond pattern, generally half-a-brick thick. Although none of these five walls is preserved to its full extension or height, the two opposing intact corners of the building unit remain: to the northwest, the bonding of Walls 08N and 08W and to the southeast, the bonding of Walls 03S and 03E.

The walls of building unit N24 were reinforced by four pilasters. Each of the opposing north–south

[103] This *c.* 30cm thick deposit corresponds to Deposit (N28De1a) whose top is levelled at 159.86m to the west of Wall 01W, and to Deposit (N28De1b) whose top is levelled at 159.80m to the east of the same wall (Pl. 8).

[104] The thickness of Deposit (N2De2) varies from 15cm (from 159.96–159.80m to the east of Wall 01W, *i.e.* Deposit (N28De2b), Pl. 8) to 40cm (from 160.10–*c.* 159.70m to the west of Wall 01W, *i.e.* Deposit (N28De2a)).

[105] The thickness of Deposit (N2De3) varies from 8cm (from 160.20–160.12m to the west of Wall 01W, *i.e.* Deposit (N28De3a), Pl. 8) to 20cm (from 160.16m–*c.* 159.96m to the east of Wall 01W, *i.e.* Deposit (N28De3b)).

[106] Deposit (N2De4) varies from 5–15cm in thickness. West of Wall 01W, it corresponds to Deposit (N28De4a) levelled between 160.34–160.20m. On the other side of the same wall, the corresponding Deposit (N28De4b) is levelled between 160.21–160.16m (Pl. 8 and Fig. 9).