

## 4. BUILDING TECHNIQUE

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As is common for Egyptian settlement architecture, the walls of the buildings of SAV1 are throughout composed of mudbricks, with only two different brick formats: smaller ones at  $33 \times 15 \times 10$ cm and larger ones at  $40 \times 19 \times 9$ cm. The larger bricks prevail in the governor's palace SAF2 and the town enclosure, while the smaller ones were used for the simpler domestic buildings. As a rule, the two formats were not used within one and the same wall. However, an exception to this rule can be observed in the area of the storage rooms, where the walls consist of various brick formats, which seems to stem from restructuring work on the walls. During the excavation in the 1970s Azim noted 20 different markings on the large rectangular surface of the bricks, such as double or triple, oblique or parallel lines or impressions with fingertips.<sup>48</sup> Unfortunately due to the long exposure of the walls to the natural elements, these markings cannot be seen anymore today. However, during the excavation of SAV1 North similar marks were observed.<sup>49</sup>

The applied brickwork always follows a similar pattern (Pl. 13), in that one course of bricks consists of a row of facing stretchers followed by a number of headers according to the thickness of the respective wall, which ranges between 0.54 and 1.56m. In the alternating course, the row of stretchers was placed on the opposing side of the wall. The horizontal joints filled with mortar are throughout 2–4cm thick, while the vertical joints differ considerably; sometimes large gaps of up to 10cm were left between the bricks. These holes were either filled with mortar or left open and they probably enabled an adjustment of the wall thickness due to irregular

brick lengths.<sup>50</sup> The wall plastering was very uniform as well, with remains of a mud plastering observed throughout the entire area of the settlement, while no traces of wall painting or whitewashing of the walls could be detected.<sup>51</sup>

As for the foundation of the walls, in most cases no special foundation seemed to have been applied. An exception is the massive enclosure wall, where the excavations in 2012 revealed that the two to four lowest layers of bricks jut out for 6–8cm, forming a foundation step.<sup>52</sup> Together with this step, a filling composed of a dense packing of mudbricks, covering the projecting brick courses, was observed. Additionally, broken or complete mudbricks were dumped into the foundation trench along the inner facing of the enclosure wall.<sup>53</sup> In contrast, little attention seems to have been given in the preparation of good foundations for the interior structures of the settlement, where mudbrick walls were usually built directly on the ground surface.<sup>54</sup> In this regard, a means of steadying the wall was observed in the southern part of the storage area SAF5, where a mixture of plaster and rubble was applied at an angle to the lower part of the wall (Pl. 14.1). If this method was also employed at other places is not known, although it seems to at least have been the case at Building A in SAV1 East.<sup>55</sup>

In a few cases, bricks standing on edge could be detected, mostly in the lowest regions of the wall, but occasionally higher up (Pl. 14.2). This was usually a means of levelling, either of the uneven ground surface or of uneven brick courses resulting from irregular bricks.<sup>56</sup>

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<sup>48</sup> AZIM 1975, 105.

<sup>49</sup> Cf. DOYEN 2009, 19, pl. 3.

<sup>50</sup> Cf. KEMP 2000, 90.

<sup>51</sup> Cf. AZIM 1975, 105. In contrast, whitewashing and wall-painting could be detected throughout the remains of Amara West. Cf. SPENCER 1997. Whitewashing of the walls, especially on the outside, was also detected at Deir el-Medina. See SNAPE 2014, 78. Some of the inside walls of Kahun were painted dark in the lower regions and yellow in the upper parts. See CORREAS-AMADOR 2013, 399.

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<sup>52</sup> BUDKA/DOYEN 2013, 178; a parallel can be found at the Middle Kingdom fortress at Buhen. See EMERY/SMITH/MILLARD 1979, 67, fig. 37.

<sup>53</sup> BUDKA/DOYEN 2013, 178.

<sup>54</sup> Cf. SPENCER 1979, 120, 163, for similar observations at Amarna.

<sup>55</sup> Personal communication by J. Budka.

<sup>56</sup> Bricks standing on edge are also commonly used for structural reasons, such as the reinforcement at the top and bottom of windows and the top of doors, or also as a method of making the steps of a staircase. Cf. KEMP 2000, 90, fig. 3.5; CORREAS-AMADOR 2013, 83.

Three different types of floors were detected in the area of SAV1. For the most part, the floors consisted of mud pavements, only in the case of the so-called governor's residence, SAF2, brick floors were found in the main rooms of the building (Pl. 15.3). These were composed of two different brick formats and were laid in a special pattern in even rows with aligned joints.<sup>57</sup> The bricks were set in a hard, pink-colored mortar bed. Finally, floors consisting of irregular schist slabs were observed in two of the storage rooms in SAF5 (Pls. 29.2 and 56). It is not known if all of the magazines were formerly equipped with this kind of pavement, or only a few that were perhaps intended for a special usage.<sup>58</sup>

As for sandstone elements, apart from those architectural pieces belonging to temple architecture, several sandstone thresholds (Pls. 15.1–2) and two sandstone column bases are still *in situ* in the governor's residence SAF2. In addition, some of

the storage rooms in SAF5 are also equipped with sandstone thresholds, as well as House H4 in the domestic quarter. In the more simple dwellings the thresholds presumably only consisted of bricks or a raised mud sill. For the most part, the lowest courses of a wall were laid without the doorways being marked and the thresholds commonly lay on one to two courses of bricks.

Not a single ceiling or roof has survived, though one can assume flat roofs of mud laid over wooden beams and straw mats.<sup>59</sup> For larger rooms, the cross beams of the roof must have been supported by columns – by comparison the roofs at Amarna were usually not more than about 3.5m across.<sup>60</sup> For the magazines in SAF5, remains in two of the storage rooms point to vaulted roofs, which was generally common for these kind of rooms (Pl. 15.4).<sup>61</sup> In order to create a flat surface above the adjacent vaults, the intervening spaces were filled with bricks or rubble.<sup>62</sup>

<sup>57</sup> Cf. Chapter 10.

<sup>58</sup> Several magazines in Amara West were also equipped with schist or sandstone slabs, reflecting the value of objects stored here and perhaps intended to reduce the effects of rodents or insects. Cf. SPENCER/STEVENS/BINDER 2014, 19.

<sup>59</sup> Azim observed remains of a roof or ceiling in House H3. See AZIM 1975, 118. Cf. ENDRUWEIT 1994, 46; KEMP 2000, 93, 94, fig. 3.8.

<sup>60</sup> Cf. KEMP 2000, 93; VON PILGRIM 1996a, 201–202, assumes that the maximum width that can be spanned without supporting columns is 4.0m.

<sup>61</sup> As can be observed throughout Egypt. See for example the magazines at the Ramesseum. Cf. ARNOLD 1992, 142–144, fig; WILKINSON 2000, 183, figs. 1 and 2; KEMP 2006, 258, pl. 6; 259, fig. 94. Vaulting is also attested for the magazines surrounding the temple at Amara West. See SPENCER 1997, 53–74.

<sup>62</sup> Cf. KEMP 2000, 93–95.