# Logardan Trench D: Stratigraphy and Architecture 

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The excavations have been carried-out during 4 weeks in October 2016 in the aim to identify the whole stratigraphy of Logardan on its western edge. In this area, the top of the hill is badly disturbed by several recent large illegal excavations. First, a $10 \times 10 \mathrm{~m}$ trench was opened, but this initial sounding has been progressively enlarged to assure a better understanding of the architectural remains, especially of those of Levels 3 and 4. At the end of the 2016 campaign, Trench D had a surface of about $250 \mathrm{~m}^{2}$, excavated on 4 levels with a height difference of about 5 m between the surface and the deepest vestiges. This extensive excavation allowed us to recognize different phases of occupation between the beginning of the $4^{\text {th }}$ and the second half of the $3^{\text {rd }}$ millennium $B C$ at the top of the site. The size of some structures requires further widening of the investigated area during the next campaign.

- Level 4 is represented by two distinct architectural phases of a monumental early Uruk complex (Fig. 1). The presence of such early and massive architectures in central-northern Mesopotamia is an unexpected discovery, which opens completely new perspectives on the so-called Uruk expansion. Indeed, it is the first time that in this area monumental buildings are discovered associated to early $4^{\text {th }}$ millennium ceramic materials belonging to a south- Me sopotamian tradition. An important early $4^{\text {th }}$ millennium southern Uruk presence in the Qara Dagh region was documented since the discovery, in 2015, of the complex pottery kilns in the basal levels of Trench C at Girdi Qala. But architectures as ancient and important as those of Logardan Trench D Level 4 are an unforeseen discovery which, for the moment, has no parallel north of Tell Uqair. The northern and western sectors of the complex are severely damaged, both by the reuse of the structures in later levels 3 a and 3 b , and by the strong erosion on the slopes. Therefore, an enlargement of the excavated surface is needed in the next campaigns to better understand the structural organization of the monumental area.


Fig. 1 - Plan of level 4.

During a first phase (Sub-level 4b), it is possible to recognize the west wing of a large complex built on a terrace in mud-bricks (652) laying on a quite flat floor (688). The construction of a terrace on the edge of Logardan constitutes in itself a significant architectural work, whose aim is not simply to create a basement for the construction of the building, but also to level the entire area. The main walls $(656,657,671,636 \text { and } 682)^{1}$, with foundation trenches dug deep into the mud-brick terrace, are between 80 cm and 1 m thick and are made of largesized flat stones (Fig. 2 and 3). They define the west wing of a roughly north-west - south-east oriented complex. It is difficult to offer an accurate reading of this construction both because of the poor state of preservation of the northern and western structures, and because of the impossibility during this campaign to push further east the eastern limit of the excavation by removing Level 2 structures. In this sense, it is not yet clear whether Wall 636 and 682 are connected or whether Wall 636 simply forms an angle with Wall 671 and does not continue towards the south. Likewise, the kilns of Level 3b have almost completely erased the segment of Wall 656 south of its angle with Wall 671 . The enlargement of the trench during the next campaigns could offer a different overview because if Walls 656 and 636 do not continue to the south, the monumental complex could consist of two separate buildings. The considerable thickness of wall 671 could also be considered as a clue in this sense. Nevertheless, for the moment, some evidences suggest that it is reasonable to consider the architectural complex as one large edifice. First of all, even if Wall 656 is not preserved in its southern sector, its


Fig. 2-Level 4 - loc 636.

1. Walls 656 and 657 were observable in their second stage (Level 4 a, see below) even if their emplacement and foundation trenches were the same than in Level 4 b .


Fig. 3 - Level 4 - loc 671.
foundation trench continues south of the angle with Wall 671 . Moreover, the western façade of the mud-brick terrace was reinforced by a series of regularly spaced large ( $1,6 \mathrm{~m}$ thick) buttresses and, despite the erosion of the slope, a slight trace of one of these buttresses has been identified exactly where Wall 656 probably formed an angle with Wall 682 . Not only the presence of a buttress at this place would be coherent from an architectural point of view, but it also respects the regular distance between the buttresses. Therefore, it seems that, for the moment, the complex can be interpreted as a bi-partite building. To the north, the main room of the west wing (686) has an internal size of about $7 \mathrm{~m} \times 3,5 \mathrm{~m}$. The structures of Level 3 (especially the stone pavement made reusing the masonry of Wall 656 - see below) have erased any kind of floor of Room 686, but an external foor ( 663 , associated to the foundation trench of Wall 657) laying on Terrace 652 and connected to the building has been identified north of Wall 657 (Fig. 4). This one constitutes


Fig. 4- Level 4 - loc 663.
the northern façade of the edifice even east of its angle with Wall 636. Despite the limited surface excavated in this central sector of the building, it has been possible to recognize Wall 681 (with 8 layers of stones for a $1,6 \mathrm{~m}$ of preservation): it is roughly parallel to Wall 657 and connected to Wall 636 (Fig. 5). The space defined by these three walls is paved with stones (669) amongst which some in-situ early $4^{\text {th }}$ millennium ceramic materials have been recovered.
South of Room 686, the space between Walls 671 and 682 (Fig. 6) is very poorly known for


Fig. 5 - Level 4 - loc 681.


Fig. 6 - Level 4 - loc 682.
the Sub-level 4b. However, even if the later Wall 672 overlaps it and makes difficult to verify its connections, Wall 682 is associated to a southern paved space delimited by the northsouth oriented Walls 677 and 685, as well as by the east-west oriented Wall 684. No trace of the mud-brick Terrace 652 has been identified south of Wall 682. Therefore, the forecourt paved with large-sized stones between Walls 677,684 and 685 seems to represent the southern limit of the architectural complex in this sector. Since the different orientation between the paved forecourt and the building respects the shape of the hill in this area, it is not a problematic element in itself. Anyway, it confirms that for the moment our understanding of the first stage of Level 4 is quite partial.
In a second moment (Sub-level 4a), the whole complex was restructured. Walls 656 and 657 are erased. Then, on the whole surface of the sector north of Wall 671, Terrace 652 was partially stripped and rebuilt by replacing 4 layers of bricks. On the western face of Terrace 652 a clear distinction is visible between its basal floor (688) and the base of the four layers of bricks added in Sub-level 4 a (Floor 689). Starting from this level (689) the masonry of the western buttresses, which in Sub-level 4 b were leaned against the terrace, is intertwined with the terrace itself. Because of the atmospheric erosion and the very strong slope, it is impossible to know whether a similar renovation also occurred north of wall 657: the mud-brick terrace extends beyond this wall, but any kind of structures (or possible buttresses) on its northern face is definitely lost. Once restructured the terrace, Walls 656 and 657 were rebuilt upon it using both bricks and large-sized rounded stones: for this reason their masonries, even if absolutely solid, are visibly different from Walls 636 and 671 , which remained unchanged. East of Wall 636, Wall 681 and the paved room 669 seem to have not been affected by the renovation. On the contrary, the entire space south of Wall 671 has undergone a dramatic transformation. The mud-brick terrace was almost completely dismantled over several layers of bricks without being rebuilt. Wall 682 was destroyed and replaced by another roughly eastwest oriented and thick wall (672), which is built without a foundation trench and simply lays on what was left of Terrace 652. It is likely that the new east-west oriented Wall 672 and the reconstructed north-south oriented Wall 656 did not form an angle because of an access door crossing through Wall 656 in its closest segment to Wall 672. In this area, a big stone used as pivot for a door could be in its primary deposition context (Fig. 6). Actually, the southern room of the west wing becomes a transit zone within the complex because the forecourt delimited by Walls 677, 684 and 685 becomes a monumental staircase (683) (Fig. 7). The orientation of this space remains unchanged (i. e. north-south oriented, divergent if compared to the rest of the edifice and defined by Wall 672 and the cornerstone facing it), but the steps of the staircase go east and progressively change their orientation. Each of them is formed by some elongated stones: the first and lower one is perfectly aligned with Wall 672, the second step turns slightly to the east, the third one turns in an even more pronounced way and so on. In the next campaigns, it will be necessary to verify if the staircase leads to an upper terrace.

During the last phase, the space between Walls 671 and 672 (Room 700, with different floors as 702 ) laying on what was left of Terrace 652 , has been divided by the construction of two little walls. The first one (670) is perpendicular to Wall 671 (Fig. 3), while the other one (674) is parallel to the big wall 671 . They delimited a little room (687) whose floor (675) has


Fig. 7-Level 4-staircase 683.


Fig. 8 - Level 4 - floor 675.
yielded some in-situ bowls (Fig. 8). The construction of this closed space dates back to the same period of the construction, along Wall 671, of a solid wall in bricks and stones (692). All these walls laid on Floor 702 without any foundation trench and were associated to an external 8 cm thick grey floor (676) representing the later phase of occupation of Room 700. Floor 676 was also associated to Staircase 683, which is still in use in this phase (Fig. 7). But it seems evident that the presence of these domestic or craft structures, devoted to a merely functional use partially cluttering the area in front of Staircase 683, indicates the beginning of the re-use of the monumental complex following the loss of its primary function.

- Level 3. Since the erosion of the slope had erased the structures of Level 2 on the western portion of the initial $10 \times 10 \mathrm{~m}$ trench, two sections have been cut deep into the filling layers east of the preserved structures of Level 2. It allowed us to uncover the remains of Level 3.

First (in Sub-level 3c - Fig. 9), two medium-sized sub-circular kilns (659 and 660) were built close to the ruined Wall 657 (Fig. 10). Both these firing structures were two-storey up-draught kilns: even if they were independent from each other (initially 659 had a praefurnium pit on its northern side, while the mouth of 660 was on the southern side), they shared a portion of their external wall and a subterranean duct to evacuate the smokes. This channel was physically connected to Kiln 660 and emerged from underground with a chimney resulting from the reuse of the ruined Wall 657.


Fig. 9 - Plan of levels 3b and 3c.


Fig. 10 - Level 3c - Kilns 659-660.
Later (Sub-level 3b) a massive wall (637) was built on the southern side of Kilns 659 and 660. Likewise, the northern portion of Wall 656 was also rebuilt. Wall 637 is a roughly eastwest oriented and almost 1 m large structure, built of bricks and reused stones (of Level 4). Even if it overlaps the southern portion of Kilns 659 and 660, they are restructured and remain in use, with firing chambers covered by domes recessed into the northern face of Wall 637. Therefore, this sector becomes a closed workspace (661) defined by three walls $(656,657$ and 637). But the architectural transformations in Level 3b are not limited at the northern sector of Trench D. On the contrary, this phase is represented by a generalized reuse of the ruins of Level 4 (particularly Walls $671,672,636,681,657$ and the northern portion of 656) to create a huge workshop for firing ceramics. The strong erosion and the very steep slope on the northern and western sides have severely damaged the firing structures, but the architectural and functional organization of the workshop is clear. The firing structures were aligned along the exterior sides of the ruined building of Level 4 to facilitate the evacuation of the fumes along the edge of the hill, while inside the ancient building of Level 4 the space was used to manufacture and dry the vessels. To the north, besides the restructured kilns 659 and 660 in the room 661, a one chamber oval kiln (668) was associated to a production unit located east of the Wall 636. To the west, several kilns (664-665, 666, 667, 678,679 ) were arranged in a row along ancient Wall 656 of Level 4 (Fig. 11). The ruins of this wall,


Fig. 11 - Level 3b-Kiln 667.
was reused to sustain the domed roofs of the kilns. The largest amongst them (the enormous structure 664-665, with a diameter of about 4 m ) was covered by a double dome reusing an external buttress of the Level 4 building. In the same way, to the south, Kilns 678 and 679 reused the Wall 672 to sustain their domes (Fig. 12). The presence of different typologies of potter's


Fig. 12 - Level 3b - Kiln 678. kilns confirms the complexity of the ceramic workshop. Despite their architectural and dimensional differences, furnaces $659,660,664-665,666,667$ and 678 were two-storey up-draught kilns, with a lower partially buried heating chamber and an upper domed firing chamber ${ }^{2}$. On the other hand, kilns 668 and 679 were one chamber firing structures with a domed roof covering a space dedicated both to the fuel and the ceramic materials ${ }^{3}$. East of this row of furnaces, the ruins of the previous level were adapted to define different production units. South of the Room 661, the space between Wall 671,636 and 637 was carefully paved with large stones taken from the ancient Wall 656 (which was rebuilt in stones and bricks in Level 4a). Its northern portion was restructured, but the large majority of its stone masonry was reused to build Wall 637 and make the


Fig. 13 - Level 3b-loc 673. stone Floor 673 (Fig. 13). South of this room, between Walls 671 and 672, there was another production unit that, unlike the paved space 673, had an ashy clay soil. Probably, this architectural difference depends on the different functions of the two units. Indeed, several potter's

[^0]tools - especially scrapers, spherical stone pestles and shells - come from the southern space, while some little complete vessels (as the little painted jar LOG_D.243.1) come from the stone-paved northern unit (Fig.14). It could suggest that the southern room was used for operations inherent to the shaping, while the northern space was rather dedicated to finish, dry, decorate and


Fig. 14 - Level 3b-loc 649 - painted jar. store the pottery.

Sub-level 3a (Fig. 15) represents a later occupation that occurred after an abandonment of the workshop. When the area was reoccupied, the profile of the hill, determined by the accumulation of the previous structures of Levels 4 and 3c-b, was very sloping, both towards the north and the west. Instead of levelling the whole sector, the artisans of level 3a chose to adapt their new workshop to the topography: they reused some parts of previous structures and built new kilns adjusting the slope. To the north, Room 661 and its kilns (659-660) of Level 3b were replaced by a smaller space with just one medium-sized kiln (651). Like the earlier kilns in this same area, this firing structure is partially recessed into the wall 637: two thin walls ( 653 and 654 ) built with recycled materials close a room whose southern corner is formed by walls 636, 637 and 656. Actually, the upper part of 637 is further restructured in Level 3a, while the northern portion of Level 4 Wall 656 is the only segment still existing of it. The absence of the Level 4 large walls, which were reused in Level 3b, determines a total change of the previous structural organization of the workshop. To the north, in the area previously occupied by the stone floor 669 and Wall 681, the 3 m large Kiln 650 is associated to a workbench along Wall 637 and uses the corner between Walls 636 and 637 (as well as the ancient Level 4 Wall 681) to sustain its domed roof. This sub-circular structure is built in a sector of the hill where the steep gradient is very strong and the traces of the dome in the eastern section of the trench show that this kiln was about $3,5 \mathrm{~m}$ high. It would be a very important size even for a two-storey kiln with two superposed chambers separated by a pierced sole. But Kiln 650 did not have any sole and its chambers were not perfectly built one on the other, but they formed a sort of stairs. A wall (658) runs through the structure and constitutes a $1,30 \mathrm{~m}$ high step between the lower chamber and the upper one. Therefore, this firing structure is not an up-draught kiln, but rather a furnace where draught was almost horizontal. Although with a lower internal slope, the kilns inside the space delimited by walls 636 and 637 were built according with the same criterion on the stone-paved space 673 . In this sense, structures as 634


Fig. 15 - Plan of level 3a.
and 635 were not independent furnaces, but parts of one sloping kiln (Fig. 16 and 17). The oval fireplace 635 was used for the fuel, as indicated by its praefurnium pit on the western side. During the firing cycles, the heat rose-up towards Chamber 634, where vessels were stacked on two different levels. In fact, this chamber incorporates a segment of wall 636 using this Level 4 ruins as an internal step to facilitate the draught. On the western side, both the chambers ( 634 and 635) of this horizontal-draught complex kiln were connected to a bench in mud-bricks built around a vertical chimney which centralizes the evacuation of the smoke. To the south, another structure composed of different chambers (638-640) works in the same way (Fig. 18). Combustion began in a western praefurnium full of ashes; the fuel was loaded in an oval structure (638), whose floor, hardened and cracked by the heat, has been rearranged several times (internal floors 643 and 644); then heat attained another higher chamber (640), where vessels were fired. Given the size of the lower chamber (638), it is even possible that several upper firing chambers were connected to it. The two complex furnaces of this workspace (635-634 and 638-640) lay on the same external floor (648), worked during the same period and abandoned at the same time (as demonstrated by Floor 627,


Fig. 16 - Level 3a - Kiln 634.


Fig. 17 - Level 3a -Kiln 635.


Fig. 18 - Level 3a - Kiln 638. which covers the ruins of this late Level 3 occupation). Horizontal-draught kilns are documented in Mesopotamia since the Halaf-Ubaid transition at Tell Ziyada (Buccellati and Buia 1991: fig. 6), but they represent an extremely rare typology and become better documented
since the $2^{\text {nd }}$ millennium $\mathrm{BC}^{4}$. Therefore, the kilns of Level 3a in Trench D offer a unique documentation about the evolution of this firing technology and allow to fill the absence of any archaeological record for the mid and late $3^{\text {rd }}$ millennium $\mathrm{BC}^{5}$.

- Level 2 is clearly separated from Level 3 by a thick and regular clay floor (629, visible in section - Fig. 19) laying on the destruction of the previous structures. This level is represented by a ceramic workshop devoted to the firing of the vessels (Fig. 20). The explored area (about $48 \mathrm{~m}^{2}$ ) constitutes a little portion of a much larger complex, as suggested by the dimensions of some firing structures. In particular, it has been possible to identify a 3.6 m large workspace (611) delimited by three walls: 602,603 and 703. The roughly north-south oriented Wall 602 is conserved on 5 layers of bricks, but its width is unknown because of the proximity of the


Fig. 19 - Level 2 - floor 629.
eastern limit of Trench D , which allows to recognize only the western side of Wall 602. The northern Wall 603 is 1.5 rows of bricks wide and visible over 5 layers of bricks in its eastern portion (where 2 of these layers belong to a later reconstruction in Level 1) and over just one layer of bricks to the west, where the slope is much more exposed to the atmospheric erosion. On the southern side of the workspace 611, Wall 703 has the same east-west orientation of Wall 603. The entire space was carefully built. Walls 602 and 603 were reinforced by internal

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Fig. 20 - Plan of levels 1-2


Fig. 21 - Levels 1 and 2 -duct 628.
buttresses (604 and 605) probably used as benches for drying and pre-firing vessels during the firing cycles, when the temperature inside the workspace 611 was high (Fig. 21). Both walls 603 and 703 were clay-coated on their inner face up to the ground and Wall 603 was well plastered on the exterior side. Indeed, to the north, the thick layer of green clay plaster applied to Wall 603 and the poorly preserved floor 609 suggest the existence of an open area, where an external pillar ( 606 , corresponding to the inner buttress 605) defines two different working spaces ( 608 and 607). But the clearest proof that Room 611 was very carefully built is offered by the walls themselves: not only the masonries of 602,603 and 703 were intertwined (i. e. designed and built as a single structure), but at this stage Wall 703 was constituted by yellowish $40 \times 40 x 8 \mathrm{~cm}$ well baked bricks (Fig. 22). The absence of plaster on its southern face suggests that, south of the workspace 611, there was another closed room.

This area is occupied by the large Kiln 615 (Fig. 23). This rounded structure close to the eastern limit of Trench $D$ has been excavated in its western portion: it has a diameter of about 2 m , and it was visible over 3 layers of bricks on its exterior side (above Floor 621). Its lower chamber was dug deep into the soil and lined with bricks, while the pierced sole (whose fragments were sustained by a stone lintel and have been recovered in the lower chamber) was located at the same height than the exterior floor (621). Even if quite thin (only 1 brick large), the exterior wall is reinforced by two little pilasters, one on the interior side and the other (616) used as an external workbench. However, it seems that this area was strongly sloping, as it is still the case. Kiln 615 was dug deep into a filling layer used to level the ground and an 80 cm large stone wall (622)


Fig. 22 - Levels 1 and $2-\operatorname{loc} 703$ and 614.


Fig. 23 - Levels 2 - Kiln 615.
separated this workspace from Kiln 617. It confirms that the whole workshop has been carefully built by means of considerable works.
The better evidence for massive dimensions and care for architectural details comes from Kilns 617 and 613 . Kiln 617 is a huge roughly circular structure which was completely obliterated by the atmospheric erosion in its western portion. Based on the excavated sector, Kiln 617 had a diameter of about 8 m , with an internal space (619) constituted by a 8 cm thick clay floor (624) hardened by the heat. Its 1.5 bricks large external wall was reinforced by internal buttresses $(632,631)$. Some of these buttresses were hollowed structures used as chimneys to evacuate the smoke. Because of the enormous dimensions of kiln 617 , the system of aeration and evacuation constituted a critical element both from the architectural and the physical point of view. The excavated surface allows us only a partial understanding of this extremely complex system. Kiln 613 is an example in this sense (Fig. 24). On the one hand, it is a medium-sized (internal diameter of about 80 cm ) two-storey kiln, with a pierced sole separating the chambers and supporting the vessels during the firing cycles. But, on the other hand, it was also used as a way to evacuate the


Fig. 24 - Level 2 - Kiln 613. smoke of Kiln 617. In fact, under the pierced sole, the heating chamber of kiln 613 was not intended to contain the fuel: it was occupied by the intersection of two evacuation channels. Two little internal chimneys (about 20 cm of diameter) had the function of conveying the smoke outside from the firing chamber (the upper one) of Kiln 613. But the most impressive structures were represented by the system connected to Kiln 617. North of the Kiln 613, a north-south-oriented 20 cm large duct (628) formed an underground (under floor 623) conduit lined and covered by bricks that passed under Wall 603 and carried a part of the fumes to the outside (Fig. 21). South of kiln 613, this same duct was connected to a chimney. Likewise, a west-east oriented duct connected Kilns 617 and 613. It seems evident that the fumes passing through this channel were incandescent: to isolate this pipe, the connection between Kilns 617 and 613 is constituted of bricks hardened by the heat, laid sideways and separated by thick layers of clay mortar. This same structure continues to the east of the kiln 613 and passes under the wall 602 , suggesting that other firing structures or chimneys were connected to kiln 617. The entire system - kilns 613-617, as well as the ducts 626-612 and 628 - was conceived and constructed as one huge structure, as demonstrated by the fact that masonries of kilns and channels were embedded to each other. Moreover, it is not occasional that the mouth through which the furnace 617 was supplied with fuel and vessels is located between Wall 703 and the channel (626) connecting Kilns 617 and 613. The hardened (or rather baked) bricks of the floor 625 constituted the entrance of the inner space of Kilns 617 and represent an additional evidence of the fact that the entire workspace 611 has been built to organize firing structures working together.

From a typological point of view, Kiln 615 (and Kiln 613, if considered as an isolated furnace) is an up-draught two-storey firing structure, a well-known kind of kilns since the Halaf phase in the $6^{\text {th }}$ millennium BC (Hansen Streily 2000) ${ }^{6}$. Kilns with one chamber used both for the fuel and the vessels are also well documented in this period ${ }^{7}$. But the system constituted by kilns 617 and 613 is rather a cross-draught (or horizontal draught) kiln, where air flowed horizontally, from Kiln 617 through the duct 626-612 and kiln 613. Given the enormous dimensions of kiln 617 (more than adequate for a brick kiln) ${ }^{8}$, able to contain hundreds of pots, the draught was not provided by a fan. On the contrary, the air movement was caused by the draught created by the chimneys. In this sense, the firing system of Level 2 offers a unique perspective on a firing technology that was not documented until now for the $3^{\text {rd }}$ millennium.

Level 1 is represented by the reconstruction of walls 602,603 and 614 . The latter, whose first stage (Level $2-703$ ) was in baked bricks, was rebuilt in $49 \times 35$ large mud-bricks (Fig. 22). The masonries of the three walls are embedded to each other as in Level 2 , which suggests that Level 1 corresponds to a general reconstruction of the ceramic workshop. In the eastern corner of the excavation, both Walls 602 and 603 show regular fillings of mortar between some bricks, according to the same technique used in Level 2 for the isolation of the aeration duct 626-612. In the next campaign, it will be interesting to check if it is inherent to another firing structure further east.

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[^0]:    2. For Early-Dynastic Two-storey kilns see at Tell Hazna (Bader, Merpert and Munchaev 1997-98: fig. 6), Tell Banat (Porter and McClellan 1998: fig. 2-4), Uch-Tepe-Tell Razuk Level VB (Gibson 1981: pl. 27), Tell Madhhur (Killick and Roaf 1976: Abb 183), Khafajah (Delougaz 1940: plan IV, VII; Delougaz 1942: plan VII, fig. 17.i; Delougaz 1967: plan. VII, 8, 9), Abu Salabikh (Postgate and Moon 1981: fig. 7), Tell Barri (Pecorella 2004: fig. p.18).
    3. For Early-Dynastic one chamber kilns see for instance at Tell Banat (Porter and McClellan 1998: fig. 5), Tell Chuera (Moorgat and Moorgat-Correns 1976: Abb. 27), Khafajah (Delougaz 1942: fig. 21.a-b), Tell Barri (Pecorella 2004: fig. p.15).
[^1]:    4. See for instance at Qatna (Middle Bronze I Furnaces SU1574-1576, or Middle Bronze II furnace in area J Morandi Bonacossi 2003: fig. 5, fig. 11), Tell Barri (Mitannian Kiln 470 - Pecorella 1998: fig. pag. 81).
    5. The only early $3^{\text {rd }}$ millennium sample of horizontal-draught kiln is documented at Tell Karrana 3 (Wilhelm and Zaccagnini 1993: fig. 16).
[^2]:    6. During the second half of the $3^{\text {rd }}$ millennium, similar two-storey kilns are widely attested, as at Tell Jigan (Kiln k3 - Fuji 1985: fig. 5), Tell Brak Area FS (Oates, Oates and McDonalds 2001:64), Tell Bia-Tuttul (Strommenger and Kohlmayer 2000: Taf. 76.1-76.2).
    7. See for instance at Tell Barri (Kiln 1140 - Pecorella 2004: fig. p.20), Tell Jigan (Kiln 2 - Fuji 1985: fig. 5), Tell Bi’aTuttul (Strommenger and Kohlmeyer 2000: Taf. 50.3-50.4)
    8. Nevertheless, the entire area yielded exclusively large amounts of ceramic slags. Moreover, the rarity of burnt bricks in this period makes it unlikely the hypothesis that 617 was a brick kiln.
