

# Final Report on the Test Wall at Tell Mozan, ancient Urkesh

Giorgio Buccellati

with the collaboration of

Samr Abdel Ghafour, Sabah Kassem, Beatrice Landini, Marta Lorenzon

February 2007

## 1. Introduction

The initial intent of the Test Wall project, as described in the Initial Report (September 12, 2004), was to photographically monitor, every few months, the state of the walls. Samer Abdel Ghafour had planned on doing this, but unfortunately his new responsibilities within the Directorate General of Antiquities and Museums prevented him from continuing this beyond the initial photographic coverage done in October of 2004. However, his first set of photographs proved to be an excellent model, and this was followed in the fall of 2006 by Beatrice Landini and Marta Lorenzon, who had just joined the staff of the Expedition. They matched all the photos taken in 2004 by Abdel Ghafour, and provided a detailed set of observations, which are given below.

In addition, Sabah Kassem, the smith who had designed and implemented the entire iron scaffolding, proposed to use a system that he had designed in order to reduce the adverse impact of the longitudinal fissures that develop in the walls. The test walls seemed to offer a good opportunity for testing this system. Accordingly, it was decided to go ahead with the insertion of the wooden rods or wedges, properly documenting the whole procedure.

## 2. Procedures (B. Landini and M. Lorenzon)

The project started with the purpose of having a reconstructive model of the walls of the temple with a lithic foundation base (the original document) and the upper part made of mud bricks (the reconstructed part) following the example of the palace structures. The building of such walls and the production of the mud bricks was entrusted to the local workmen trying imitate techniques and materials similar to the originals.

It was felt that such model might let us observe directly the possible building techniques step by step. It would also give us a good monitoring test of the degree to which the wall might deteriorate and would allow us to test different approaches to conservation without the fear of damaging the original archaeological data in case of failure; on the contrary in case of good results that solutions can be applied in the future to the palace walls.

The walls have been covered with a mud plaster spread only in alternate bands, with a deeply incised triangle carved over the plaster.

In order to protect the mud brick structure a metallic cage was built covered by different types of tarps, like those used until last year in the palace.

By the beginning of the 2006 season the metallic structure had become unstable because of the wind during the winter, so we chose to take it off completely in order to prevent a subsequent collapse over the walls.

One problem that developed along the top of the walls consists of some longitudinal fissures parallel to the line of the mud bricks. In order to prevent a further opening of the cracks (causing the wall collapse on either side) we decided to lodge some bars in the north wall (with a method devised by Sabah Kassem) and a metal vice in the west wall [plate 16].

During the season we continued the photographic monitoring started in 2004 by Samer Abdel Ghafour, with overall views and zoom views of the triangles in order to document the degree to which the surface had washed away.

### 3. Results (B. Landini and M. Lorenzon)

#### 3.1. General observations

it is interesting to note that the wall faces exposed to east and south present a more evident deterioration than the others, so that in some areas the triangles are no longer visible because of the washing away of the plaster mud. This consideration correspond to the information given us by the inhabitants of the villages: the rain falls heavier from east to west, as confirmed by the vegetation growing on the easter sections in the excavation.

Moreover the deterioration is also related to the different kind of protective system used: 13 different types of protection had been set in place, each consisting of a 2m wall portion. The various type may be distinguished as follows:

1. no protection ( the wall portion is left unprotected),
2. cover draped on wall (a sheet of plastic is draped directly over the wall),
3. cover with two thread cotton tarp in different material (weathashade, nylon tarp, single thread cotton material, open weave material) for front panels, while the bottom is closed with metal bar, or
4. cover with double thread cotton canvas for the front panels (always in the same different materials), while the bottom is closed with springs.

3.2. The two key elements of the system, the rings at the top and the springs at the bottom, seem to have protected from the atmospheric agents the walls facing north, but it has not offered a sufficient protection for the most exposed wall portions in order to resist the impact of the wind during the winter.

### 3.3. Review of individual sections

To sum up, we have noticed that the state of conservation or deterioration depends on the combination of two factors, the atmospheric agents and the type of covering.

All the north side of the north wall is well preserved with every kind of covering thanks to his protected position as we can see from the triangles that are still very well visible, there's only a little bit of superficial erosion in some of them.

A more detailed analysis related to the type of covering shows us that the best preserved surface is the one covered with weathashade (fig ZCWx3003 X30v03, ZCWx3003 X30v03t).

The south side of the same wall, instead, has suffered from a major erosion of the surfaces, as we can observe in the triangles figures almost deleted (ZCWx3021 X30v21t, ZCWx3022 X30v22t, ZCWx3023 X30v23t, ZCWx3024 X30v24t): also in this case the major responsibility belongs to the atmospheric agents and the most exposed position of the wall at them.

In this side of the wall the worst preserved portion are ZCWx3022 X30v22t and ZCWx3024 X30v24t that were protected with plastic, whereas the best preserved is the one in the corner (ZCWx3025 X30v25, ZCWx3025 X30v25t), covered with cotton material but also protected by his own position.

The west side of the west wall is in good conditions but the surface is less well preserved than the north side of the north wall. Given that also this wall presents a protected position we can explain the different deterioration only with the type of covering employed.

As the erosion has partially deleted all the triangles in this side (fig ZCWx3008 X30v08t, ZCWx3009 X30v09t, ZCWx3011 X30v11t, ZCWx3012 X30v12t a-b) obviously the type of material used is not as important as the system employed even if the triangle in fig ZCWx3010 X30v10t, almost deleted and the less preserved, it was covered with nylon, the worst possible solution.

So the system used in this side the wall (wall covered with double thread cotton canvas for the front panels, while the bottom is closed with springs) is less successful than the other one employed (wall covered with two thread cotton tarp in different materials for front panels, while the bottom is closed with metal bar). The latter looks like the winning solution.

The surfaces of the east side of west wall are badly preserved (ZCWx3028 X30v28-t, ZCWx3029 X30v29-t, ZCWx3030 X30v30-t, ZCWx3031 X30v31-t, ZCWx3032 X30v32-t), the triangles are all almost deleted, hardly invisible (above all ZCWx3030 X30v30t and ZCWx3032 X30v32t).

This is due in particular to the atmospheric agents (in winter the rain fall strongly from east to west and hit this side of the wall), the precarious position and not only to the types of protections.

On the contrary the altar wall is completely preserved without traces of damage because in this case the structure had been reburied, always the best possible solution for the conservation with the disadvantage that the archaeological document is no more visible.

## 4. The longitudinal fissures

### 4.1. Measurements

We have noticed the presence of different fissures on the upper surface of the wall [plate XX] so started a monitoring system that will keep track of developments in the future. These measurement have been taken from some fixed point (i.e. for fissure 1 every 2 m). We have put two nails, one on each side of the fissures so as to measure the distance between these two nails, retaining every year the same references to take the measurement.

### 4.2. West wall, measures taken from south to north

fissure 1

m00 = 2 cm
m01 = 0.7 cm
m 02 = 2.5 cm
m 03 = 2.8 cm
m 04 = 3.5 cm
m05 = 2.2 cm
m06 = 0.9 cm
m07 = 1 cm
m07.35 = 0.6 cm

fissure 2

m00 = 3 cm
m01 = 1cm
m02 = 4.5 cm [larger because there isn't plaster and the mud brick has moved]
m03 = 1.5 cm
m04 = 1cm
m05 = 2 cm
m06 = 0.6 cm
m 06.1 = 0.6 cm

#### 4.3. North wall west part, measures taken from east to west

fissure

m02 = 0.7 cm
m04 = 1.8 cm
m06 = 7.5 cm
m07.41 = 1.5 cm

#### 4.4. North wall east part

Fissure 1

east side = 1.5 cm
west side = 5 cm

fissure 2

1 cm all along
----------------

#### 4.5. Remedies

In the eastern part of the north wall we lodged obliquely four wooden rods or wedges [plate 7], two in the north front and two in the south front. This was the system designed and developed by Sabah Kassem. In the west part of the same wall, instead, we have preferred to use two metal vices [plate 14] in order to estimate next year which one of the two solutions is the most successful. Following is a detailed description of the pertinent illustrations.

- Perforation of the wall made by Sabah Kassem with a drill [plate 1], the hole penetrates into the wall to a depth of 70 cm, more than the length of two mud bricks (considering that the size is like that of the ancient bricks – 40 x 40 x 10, the thickness varies in antiquity from 8 to 11 cm) [plate 2]. The angle of the hole is 30° measured roughly.
- Washing of the hole with water and mud with a small pump [plate 3-4] and positioning of the rod by hammering [plate 5-6].
- Putting some mud mixed with straw [plate 8] in order to seal the rod and the hole [plate 9].
- Closing of the fissures along the top of the eastern part of the north wall by mud prepared with sifted earth [plate 10] (preferably red earth) and Kenya fiber: first of all the fissure is wet and washed, then the fiber is put in a zig-zag way wet with water and some mud, finally a second layer of fiber is put straight and covered with mud [plate 11-13].

The west wall and the remaining part of the north wall have been closed with mud mixed with simple straw [plate 15]. We also decided to uncover the altar and the small wall next to it in order to verify the conditions of conservation that result excellent [plate 17],

strengthen the opinion that the backfill is the best protecting system with the only fault of hiding totally the archaeological document and of needing time and labour to removing it. During next winter the altar and the wall will be left uncovered in order to experiment the development of fissures and the deterioration of the wall's surfaces [plate 18].

## 5. Detailed description of views (B. Landini and M. Lorenzon)

### 5.1. The walls

Note. The first number (e.g. ZCWx3001) is the number of the photo, the second (e.g. X30v01) is the number of the view

<b>Number of photo and of view</b>	<b>orientation</b>	<b>wall description</b>	<b>type of deterioration</b>	<b>type of covering</b>
ZCWx3001 X30v01	S	N wall east part	not evidence of deterioration, 2 holes made by Sabah, due to conservation experiment	no protection: it is separated by a 25 cm gap from the rest of the wall, to allow for the metal trellis of the protected portion to cover the side of the wall that adjoins the unprotected wall.
ZCWx3002 X30v02	S	N wall east part	not evidence of deterioration, 2 holes made by Sabah, due to conservation experiment	Cover draped on wall: a sheet of plastic is draped directly over the wall: several incisions are applied to allow for some air circulation. A tarp is then placed directly over the plastic, to keep the plastic from ripping.
ZCWx3003 X30v03	S	N wall east part	not evidence of deterioration, 1 hole made by Sabah, due to conservation experiment	Weathashade for front panels, bottom with metal bar, upper part with 2 thread cotton tarp
ZCWx004 X30v04	S	N wall east part	not evidence of deterioration, except for mortar erosion	nylon tarp for front panels, bottom with metal bar, upper part with 2 thread cotton tarp
ZCWx3005 X30v05	S	N wall west part	not evidence of deterioration, except for mortar erosion	single thread cotton material for front panels, bottom with metal bar, upper part with 2 thread cotton tarp
ZCWx3006 X30v06	S	N wall west part, corner	not evidence of deterioration, except for mortar erosion	open weave material for front panels, bottom with metal bar, upper part with 2 thread cotton tarp
ZCW3001 X30v01t	S	N wall east part	the triangle is still very well visible, there's only a little bit of superficial erosion	no protection: it is separated by a 25 cms gap from the rest of the wall, to allow for the metal trellis of the protected portion to cover the side of the wall that adjoins the unprotected wall.
ZCWx3002 X30v02t	S	N wall east part	the triangle is still very well visible, there's only a little bit of superficial erosion	Cover draped on wall: a sheet of plastic is draped directly over the wall: several incisions are applied to allow for some air circulation. A tarp is then placed directly over the plastic, to keep the plastic from ripping.

5.2. The Altar

ZCWx3101 X3101 t-A	W	altar wall	not evidence of any deterioration	backfill
ZCWx3102 X3102 t-B	S	altar wall	not evidence of any deterioration	backfill
ZCWx3103 X3103 t-C	E	altar wall	not evidence of any deterioration	backfill