

**POMPEII SUSTAINABLE PRESERVATION PROJECT  
PSPP**

**NECROPOLIS OF PORTA NOCERA  
POMPEI**

**CONSERVATION OF THE ARCHITECTURAL  
SURFACES' and DECORATIONS**

**Emergency Campaign n. 5 and Summer Academy n. 2**  
September - October, 2018

**FINAL REPORT**  
by Monica Martelli Castaldi

Other Conservator-Restorers following the participants:  
Klaus Klarner – Jürgen Pursche - Marta Ebbreo - Lea Oetinger

## INTRODUCTION

The conservation activities of the PSPP project for the Necropolis of Porta Nocera started in 2014. Since then, **annual surveys, specialized training, conservation campaigns and research activities** have been organized every year.

The practical works in the Necropolis have progressed through emergency interventions on the decorative features and through different kinds of studies and researches covering a variety of subjects. Examples are: improvement on practical conservation, digitalization and documentation, clay barriers to reduce raising damp in the structures, modular covering roofs, the application of UV-C radiation to reduce the microbiological growth, and others).

One of the main interests of the PSPP, since its beginning, has been to train professionals for the specific and complex needs of archaeological sites.

The issue was addressed also in 2018, as a follow-up of the 2015 *1st PSPP Summer Academy*. In the 2018 edition, it was decided to integrate new concepts and approaches developed within the other research projects, defining a number of Work Priorities

## LECTURES, STUDIES, AND RESEARCH

The participants were welcomed by a series of lectures and visits introductory to the archaeological site and the area, given by the archaeologists Anna Anguissola, Riccardo Olivito, and Pia Kastenmaier. Also Prof Van Andrija gave an explanation about his specific excavation techniques on burial traditions. Filippo Ianniello led a visit to mount Vesuvius and the archaeologist Paolo Gardelli to the villas of Stabia, while M-Martelli gave a general talk about the Herculaneum Conservation Project.

Other lectures were given by Martin Michette, about the clay project for the reduction of rising damp in walls; Alison Heritage, from ICCROM, about the chemistry of salts and other processes useful for the practice of conservation interventions, and finally Anne Becker from the IMW one talk and one brief workshop about crowdfunding.

For this 2<sup>nd</sup> Summer Academy, the PSPP decided to include a more structured scientific segment. More specifically, this was devoted to the teaching of geophysics (techniques and use of instruments), as well as to digital documentation and 3D rendering (with **CNR-IBAM**, Sicily and **Oxford University**, England) to be used for possible documentation techniques to be applied and checked throughout the Summer school.

A module on training and application of natural science was included with Eberhard Wendler and his assistant Benjamin Hübner, for the identification of mortar compositions, for the analysis of salt presence and for the choice of consolidants.

Klaus Klarner and Jürgen Pursche gave lectures on techniques and methods for the consolidation, as well as for the creation of a foam mortar for the consolidation of very wide detachments.

Tests and samples for very fine mortars, for micro-filling of flaking surface finishing and for very fine cracks were also developed with Monica Martelli Castaldi.

As already done for the *PSPP Summer Academy 2015*, the following steps have been envisaged for the practical experience, with activities very similar to the ones needed in the reality of the management of an archaeological site, from the point of view of the conservation and preservation, and for the specificities of the decorative features.

The participants had to first understand how to get to know the site and learn from it, by carrying out a general survey. This survey was then compared with the previous surveys of the site, done by specialists, and a group of priority criteria was defined, to allow the identification of the final priorities for the site preservation and of the actions needed to accomplish them.

## SURVEY RESULTS and PLANNED INTERVENTIONS

The main intervention foreseen by the project for the Necropolis in 2018 concerned the conservation of decorated surfaces and the implementation of "emergency" interventions to reduce or stop degradation. All the works were to be carried out within the educational activities of the 2018 Summer Academy, and can be summarized in the following operations:

- consolidation of the decohesion and disintegration of mortars;
- re-adhesion of detachments of the internal preparatory layers;
- re-adhesion of detachments, micro-detachments and scaling of the surface finishings;
- filling and micro-filling of small cracks and larger gaps (to reduce entry of rainwater).

Through an update of the previous Conservation Surveys of 2014 and 2015, three tombs were identified as priorities for 2018:

- **Tomb EN-04:** with a very damaged external surface in stucco, on all walls (N-S-E-O) and a very serious detachment of the large cornice on the East side (a very important element, because is the only one in the entire necropolis that still preserves most of the details of the decoration in relief);
- **Tomb EN-02:** with external surfaces in stone and internal burial chamber with one of the few mural paintings decoration remaining in the Necropolis. The work to be done on the stone surface was foreseen only as an evaluation and first pilot test of the work necessary to reduce the entry of rainwater to the burial chamber, through the joints between the stone elements (work to be carried out later by skilled masons);
- **Tomb OS-29:** with external surface in stucco, quite detached, on all N-S-E-O walls.

Upon specific request of the General Director of PAP, Prof. Massimo Osanna, a last tomb was added to these three tombs:

- **Tomb OS-31:** with external surfaces in stone, only for a rapid operation of cleaning of pigeons and birds' *guano* covering the upper part of two stone lions carved on the top of the monument.

## WORKSITE INTERVENTIONS PERFORMED

It was only partially possible to complete what we planned, because once the scaffoldings were assembled, it was found that the conditions of the stucco surfaces of Tomb EN-04 were much more serious than what was estimated during the preliminary survey.

For this reason, the work of the participants to the *PSPP Summer Academy 2018* had to concentrate only on the 4 walls of the tomb and on the cornices S and N, temporarily giving up what was expected for the other tombs, despite the fact that the scaffolding had already been prepared on all the four monuments mentioned above.

In the tomb EN-04, two other interventions were needed, which were not related to the stucco surfaces. These interventions were very long and complex:

### a) large cornice of the East wall:

- cleaning and filling of the severe detachment of the cornice;
- new structural safety anchorage;
- new protection of the upper surface from rainwater;

### b) large cornice of the South wall:

- cleaning with removal of unsafe reconstructions and plasterings;
- consolidation of the original, detached stone and stucco elements;
- new protection of the upper surface from rainwater.

Some **pilot interventions** and **tests** were also carried out, preparatory to subsequent interventions, such as:

#### 1. water collector between the Tombs EN-04 and EN-06:

- essay of archaeological removal of the plaster fragments fallen in the channel, to identify an adequate

methodology to complete the work quickly;

- securing of fragments (fragments of original plaster that have come to light after the cleaning and removal)

- consolidations, re-adhesions, fillings and micro-fillings;

- surface protection from rainwater for the new exposed part.

## 2. **S wall, in stone, of Tomb EN-02:**

- pilot consolidation of scales and micro-scales at risk of falling;

- micro-filling with an inorganic consolidant, to evaluate the possibility to do this type of intervention at the same time of the consolidation for the crumbling areas. In general, this operation involves a reaction time of the consolidant of about 2 weeks, during which it is better not to do micro-fillings with a water based lime mortar.

## 3. **External surfaces of the Tomb EN-02:**

- removal of plants, cleaning of earth and inconsistent residues from the surface and from cavities;

- sample test of the work necessary to improve the stability of decayed brick and stone elements, and to reduce the entry of rainwater into the burial chamber. Water leaks through the joints between the stone elements and through cracks and voids between *cocciopesto* roofing covering layers.

For each of the interventions a detailed technical report has been prepared, accompanied by graphic and photographic documentation.

## **COMPLETION of the INTERVENTIONS**

According to what above described, following the first estimate of priorities and considering the unexpected amount of work required to complete the Tomb EN-04, the PSPP project planned 10 extra working days (after the end of the worksite). The goal was to complete and conclude what the participants of the *PSPP Summer Academy 2018* did and to integrate the works originally planned for the campaign for the tombs where scaffoldings had already been built. All the interventions were conceived to leave in safety as much as possible of the decorated surfaces considered as Priority 1.

Unfortunately, PSPP could not accomplish the programmed works, due to a decision by the Director General of the PAP, prof. Massimo Osanna, who, on the 25th of October 2018 (just after the last presentation session, given by the participants for their final conclusions), ordered the immediate disassembly of the scaffoldings and therefore the conclusion of all operations in the Necropolis:

- Tomb OS-31 (with two stone lions to be cleaned from the bird-droppings)

- Tomb OS-29 (with two collapsing fragments on the North wall)

- Tomb EN-02 (with the underground funerary chamber, at the corner with Via di Porta Nocera)

Following his precise request, the scaffoldings were “immediately” dismantled by *Aedilia* firm, on the Saturday 27th of October 2018<sup>1</sup>,

Furthermore, during the night of the 29th of October, an impressively strong wind destroyed the covering of the remaining scaffolding (Tomb EN-04). The torn plastic covers have been removed manually on the next morning, 30th of October, by Monica Martelli and Marta Ebbreo.

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<sup>1</sup> Even if this anticipated dismantling will cause a double cost for PSPP (because of the need of an extra day of work to remove the last scaffolding on tomb EN-04), we are, however, very grateful to the firm *Aedilia*, as they kindly decided to leave the last scaffolding for 2 more weeks without any extra cost, as the weather conditions were very bad and there were also 2 holidays on the 1st and 2nd of November.

## Description of the final works as decided after the PAP requests

Following what already described in the 20th of October 2018 document (In *Appendix I*), here are summarized the few works PSPP was allowed to conclude:

### FINAL UPDATED SUMMARY of the PSPP 2018 ACTIVITIES foreseen / done / to be done

More detailed technical information follows in the next pages.

Foreseen activities	Work <b>DONE</b> during the Summer Academy 2018 and work <b>TO BE DONE</b>	
<b>1. Tomb EN-04</b> a) emergency interventions on the 4 <i>stucco</i> wall surface decoration;  b) consolidation of the East wall <i>stucco</i> cornice; + protection on the upper covering  c) consolidation of the South wall <i>stucco</i> cornice; + protection on the upper covering  d) <i>stucco</i> fragments laying in the ground between this tomb and the tomb EN-06  e) protection of the excavated area from rain erosion (where the original surface has been exposed).	Surface securing <span style="color: red;">The 20% of the surfaces will remain un-secured.</span>  First consolidation Structural consolidation (brackets) Covering protection  First consolidation Light structural consolid. Covering protection  Removal of the collapsed fragments  <span style="color: red;">100% of the newly exposed surfaces will remain un-protected.</span>	<b>DONE</b> partially (70 % of the surface). <span style="color: red;"><b>Still TO BE DONE</b> by PSPP &lt; update</span> Done only small very collapsing areas and very open cracks, to avoid water-penetration.  <b>DONE</b> <b>DONE</b> (external specialist)  <b>DONE</b> (external specialist)  <b>DONE</b> <b>DONE</b> (external specialist) <b>DONE</b> (external specialist)  <b>DONE</b> only for a demonstration area (80 cmsq)  <b>TO BE DONE</b> <span style="color: red;"><b>PAP said they will do it</b></span>
<b>2. Tomb EN-02</b> <b>External surfaces</b> a) filling of cracks and joints between the stones (on the top of the tomb and in the vertical surface of the 3 walls) <b>Internal surfaces</b> b) Securing of a strongly bulged <i>mural painting</i> detachment in the South wall		<b>DONE</b> (only for a demonstration area)  <b>TO BE DONE (very urgent!)</b> <span style="color: red;">by PSPP ? &lt; update</span>
<b>3. Tomb OS-29 + OS-27 few fragments</b> Emergency interventions on the <i>stucco</i> surfaces of the 4 walls	Blocking of the collapsing fragments on North wall  Emergency interventions on the rest of the wall	<b>TO BE DONE (very urgent!)</b> <span style="color: red;"><b>By PAP. They said they will do it</b></span>  <b>TO BE DONE by PAP ?</b>
<b>4. Tomb OS-31</b> Quick surface cleaning of the 2 lions <i>stone</i> sculptures, to remove the bird droppings.	Small preliminary tests Surface cleaning	<b>DONE</b> <b>TO BE DONE by PAP</b> <span style="color: red;"><b>They said they will do it</b></span>

As listed, there is a very serious situation, in the :

## **BURIAL CHAMBER OF THE TOMB EN-02**

The surfaces of this burial chamber have one of the very few, surviving mural paintings' decoration of the entire Necropolis. On the South wall of the chamber, a very thin, but also very large, fragment of stucco finishing, (with remains of a mural painting decoration), is seriously raised, open and detached.

We have been evaluating (also discussing with the PAP restorers), whether it would be possible to proceed with a re-attachment or, instead, if a detachment intervention is advisable, because any temporary protection with gauze would only lead to a rapid growth of microorganisms that would quickly damage the protection itself, invalidating the application.

**IMPORTANT:** no intervention was carried out on this very fragile surface, because of the mandatory order of dismantling the scaffoldings and closing the worksite.

### **NOTE on the reattachment of the fragment inside the Tomb EN-02**

This bulged and detached portion of *mural painting* can very well resist in place or can also suddenly fall down (from one day to the other). No one knows and we have been very lucky until now.

Considering that any kind of facing or support will resist in the heavily bio-deteriorated environment, there are 2 possibilities to save it, which I believe are both feasible:

#### **1. Direct reattachment**

- 1.1. Light facing with Ciclododecane and cotton gauze  
(this operation is a risk, as any weight added to the thin layer of plaster could provoke its sudden crumbling down).
- 1.2. Cleaning of the inside of the bulged area
- 1.3. Injection or application of a very creamy fine hydraulic mortar
- 1.4. Wetting of the detached surface
- 1.5. Slow reattachment using a flat wooden tablet (with soft plastic protection), starting from the central part and going towards the external sides (appropriately opened or cut, if necessary).
- 1.6. Eventual cut of excess of surface.

#### **2. Detachment and later reattachment**

- 2.1. Light facing with Ciclododecane and cotton gauze
- 2.2. Detachment by cutting along the line of the cracks
- 2.3. Unbending/relaxing of the fragment by resting upside down on a flat humid surface
- 2.4. Calculation of the dimensions
- 2.5. Reattachment with the same modalities as above

## **ADDITIONAL NOTE on ROOFS REPAIRS – IMPORTANT**

### **To consolidate and secure decorative features in case of leaking roofs**

It is necessary to reiterate that, in order to guarantee the duration of the emergency interventions that the PSPP project is carrying out on the stucco surfaces, it is necessary to provide for the repair of the covering of the tombs, or for *any other kind of temporary protection* that will reduce the great amount of rainwater that enters the structures today and that re-emerges through the plasters' surfaces.

The evaporation of water leads to the crystallization of salts over (or just a few millimeters under) the surface, next to or below the consolidated parts.

For *interventions alternative* to the repair of the top coverings of the tombs, we mean possible punctual repairs of the major cracks, and a subsequent treatment with a waterproofing layer, or the construction of temporary protective roofs).

It is certain that these are expensive intervention, not easy to plan.

But it must be repeated that **the lack of such works on the roofs and covering of the tombs**, is the cause of possible new points of degradation of the plasters, near or coinciding with the interventions carried out today.

Moreover, when a roof has been repaired or implemented over a monument, the structure of the wall will start to slowly dry. This means that in a close future the amount of salts present in the water, and inside the components of monument itself, will start to crystallize while the water evaporates.

Therefore, the presence of the PSPP project in the necropolis will be very important, if the PAP decides to make these repairs to the roofs. This is because in the first 1-2 years (sometimes even more) after the reduction of rainwater entry, the crystallization phenomena over the surface or under the skin of the monument increase (while the structure slowly dries, seeking for a new balance).

It is precisely during this time that it is essential to ensure a regular presence of restorers on the site, to act immediately, over the new salt crystallizations and consequent rapid degradation of the surfaces.

## **WATER COLLECTOR FOUND BETWEEN Tomb EN-04 and Tomb EN-06**

### **Technical detail of the possible and adopted solutions for protecting the original surface from rainwater falling**

The removal of the fragments fallen from the walls of the two tombs, over the water collector, brought to light an original surface of well compacted and polished plaster with a smooth finishing of white stucco. The surface is shaped to collect the water along a gentle slope toward the back of the monument; the sides of the small drainage channel carefully climb over the surface of the two perimetral walls, to be sure that the water can flow easily.

The plaster is very compact and well preserved, even if detached from the walls and from the pavement layers.

This new surface is so well preserved that it is extremely important to protect it from the dripping and falling of the rainwater, which comes directly from two large cornices above, at the top of the East walls of Tomb EN-04 and West of tomb EN-06. This dripping can also be very violent, in the case of heavy rains.

Two solutions have been proposed, to which we arrived after a careful study of the surfaces and discussions with an Italian archaeologist, participant in the course.

#### **a) Traditional coverage used during the archaeological excavations**

1. Thick layer of geo-textile in multiple layers, to protect the stucco surface from abrasion and other damages.

2. Thick layer of well-washed river sand, to protect against falling water.

To prevent the sand from being washed away (in a very short time) by the flow of the water, it is necessary to contain the sand, by building a small "wall" at the end of the drainage channel (towards the N side).

This containment would rest on parts of the original wall structure and could be made with stones found on the spot, mounted together with a mortar very poor in lime and therefore very easy to be removed in the future. Small openings should be left for excess water to escape.

#### **b) More durable cover**

1. Thick layer of geo-textile in multiple layers, to protect the stucco surface from abrasion;

2. If necessary, another layer of a different soft absorbent material;

3. Application of a layer of light mortar, made with a small amount of lime, very light aggregates (lapillus, pumice), with the addition of polypropylene fibers and a semi-rigid

internal net. The mortar will be well compacted and smoothed, to facilitate the flow of water towards a predetermined point.

This layer of mortar will protect the original surface from the falling of the rainwater from the two large cornices above, or from any other material that could damage the delicate stucco surface.

Being applied over the geo-textile, the layer of mortar will be easily removable, to check the conditions of the original layer, and (if thick enough) it can even be repositioned on site.

The final solution was going to be a mix of the above two proposals, but the PAP decided that their restorers would do the protection of the surface, according to the current methodology applied in other excavations in the archaeological site.

## **TOMB EN-04, East and South CORNICES**

### **DETAILED DESCRIPTION of THE OPERATIONS DONE AS EMERGENCY MEASURES, for the structural anchoring and for the protection from rainwater**

by Monica Martelli Castaldi and Ugo Giordano - 15 novembre 2018

#### **Structural anchorage and protection of the cornice of Tomb EN-04 - East wall:**

**1. Removal of previous cement covers and remains of soil and plant's roots**  
(finishing the work started by the participants).

**2. Application of a new layer of light mortar, armed with a fiberglass net (Armatek),**

The functions of this layer were:

- to consolidate moving stones,
- to close the irregularities of the surface after the previous cleaning operations,
- to create a slope for the rain
- to distribute the load in case of movement or detachment
- to create an even surface for the stainless steel brackets

The composition of the mortar used, was:

- 1 part of slaked lime putty
- 2 parts of volcanic *pozzolana* sieved 4mm
- 2 parts of volcanic *lapillo* sieved 4 mm

To this, according to the needs, some aggregate of larger granulometry were inserted, where empty parts and cracks needed to be filled in.



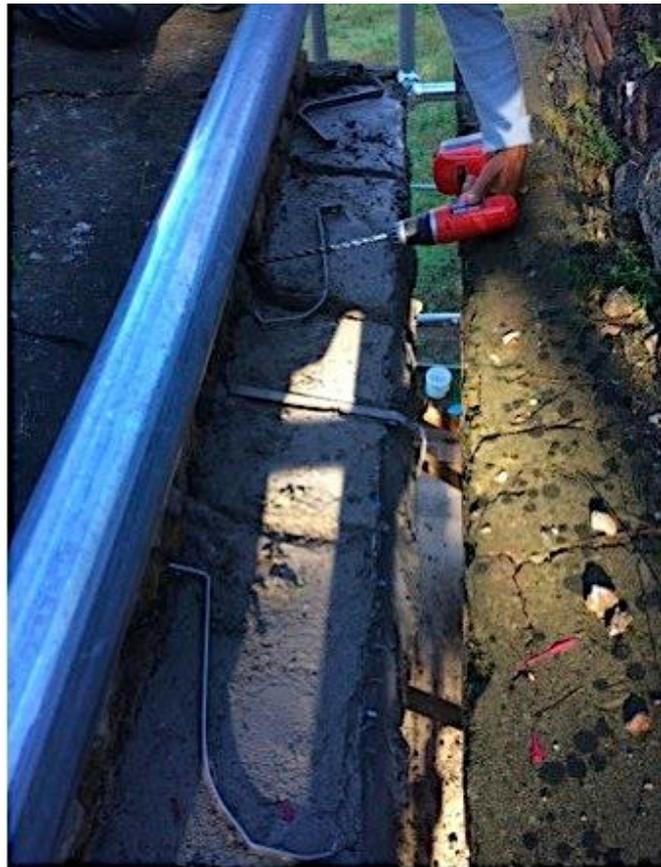
The fiberglass net had a large-wide of 30 mm, to obtain a good connection between the overlaying and underlaying mortar.

### 3. Creation of the holes in the brick structure

The holes were drilled 2-3 cm above the first protectione mortar, looking for solid attachment points between the original bricks and volcanic stones.

It was necessary to drill the holes with a drill without percussion so as to be delicate and not cause vibrations or cracks. Holes were drilled slightly inclined downwards, for a better hold.

The depth of the holes is about 200 mm, with 12mm in diameter.



### 4. Insertion of n. 7 6mm stainless steel AISI 316 threaded bars by means of an epoxy resin (*Hilti HIT-RE 500 V3*).

Insertion of the bars into the holes, by means of an ad hoc mixing gun, of the *Hilti HIT-RE 500 V3 Injection system*, a special high-strength resin that catalyses in a humid environment. (see attached technical sheet).

The bars have been inserted as following

- diameter of the holes: 10/12 mm,
- diameter of the inserted bars: 8/10 mm.
- head of the bar protruding from the hole for about 20 mm.

#### PLEASE NOTE THAT:

The resin foreseen in the estimate (*Hilti Hit-HY 200* type) proved to be unsuitable because of the presence of moisture, due to the several days of intense rain.



5. **Pre formation of stainless-steel brackets to hook the cornice from above:**

- n. 6 brackets **INOX 304** of 20 mm x 2/3 mm thickness, made of stainless steel strips
- manually folded on place, to follow the shape of the overlying part of the cornice masonry and to hook it on the outer edge.
- perforated flap at the top of each bracket, then fixed to the pins (threaded bars) previously placed
- each bracket will be slightly tensioned at the end, by means of the locking nut.

The brackets were cut at the right measure, preformed in the workshop, and then adjusted on site directly in place. Holes were also pre-made on each bracket.

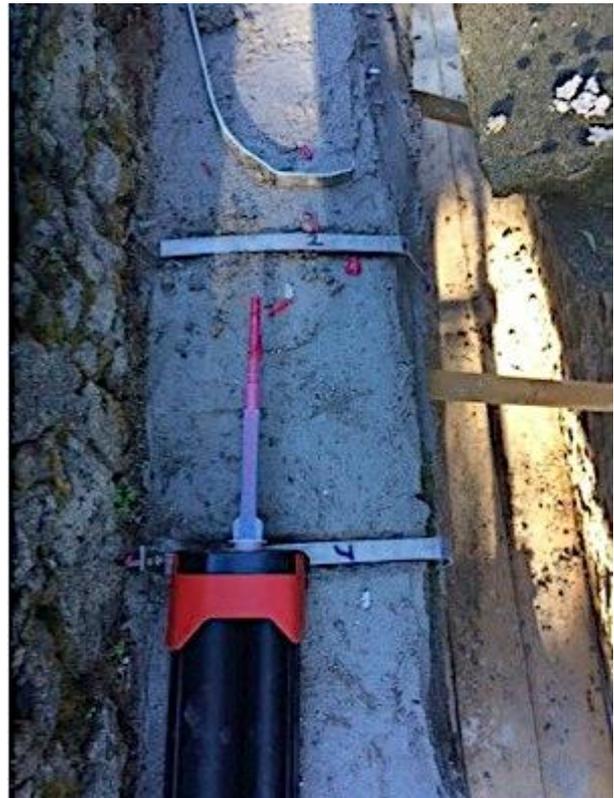
Adjustments were then made in place according to the irregular shape of the surface, trying to follow as much as possible the external line of the cornice.



6. **Insertion of the stainless-steel brackets**

The brackets were then applied over the surface of the cornice, inserting them in small *trenches* in the first layer of covering mortar (to remain solidly fixed under the second layer of finishing protection).

Each one of them was then fixed to the bars with nut and locking washer.



7. **Application of a final layer of light mortar**, along the whole cornice upper surface:

- to re-finish the slope,
- to avoid water stagnation
- to convey the rainwater and cover the stirrups
- 

Proportions of the mortar:

- 1 part slaked lime
- ½ part hydraulic lime
- 2 parts volcanic pozzolana sieved 4mm
- 2 parts volcanic lapillo sieved 4mm

After half drying of the surface, the covering layer was treated with a dark tone of pigment in water, to reduce the light color that the lime will get when drying.



The whole system will be completely removable at any time, with the exception of the resin locking the threaded bars, which will remain inside the wall.

The wooden props used to hold in place the cornice during the consolidation works were removed

### **Protection of the cornice of Tomb EN-04 - South wall:**

1. Removal of previous cement covers and remains of soil and plant's roots (finishing the work started by the participants).
2. Application of a preparatory layer of light mortar, armed with a fiberglass net (Armatek), with the following functions:
  - to consolidate moving stones,
  - to close the irregularities of the surface after the previous cleaning operations,
  - to create a slope for the rain
  - to distribute the load in case of movement or detachment.

## **CONCLUSION OF THE CAMPAIGN**

### **1. HOUSE-DEPOSIT and MATERIALS**

As planned, on the 25th of October 2019, after the final conference of the participants (held in the room of S. Paolino), the materials which had been prepared in the small atrium and in the garden of the domus, were transported to the van and, on next day, they left for Germany.

The materials needed for the conclusion of the works remained in the two closed rooms of the domus.

In the same rooms are preserved also the crates with the fragments removed from the ground and from the drainage channels around the tombs (collected in 2015 and 2018).

A short report is foreseen with the indications for recognition and following what already delivered for the fragments of 2015 and 2017)

*Lea Oetinger is responsible for the final documentation done by the participants.*

Dr. Iadanza and Dr. Toniolo from PAP have been informed.

## **CONDITIONS OF THE AREA after the Summer Academy 2018**

(after the sudden order to dismantle the PSPP scaffoldings on the 10th of november 2018)

### **Tomb OS-31**



*Front and back of the tomb. Remains of plastic and dirt still on the floors (even after a general cleaning done by PSPP before the mounting of scaffoldings)*

### **Tomb OS-29**

*Front, sides and back of the tomb*





### Area before the las tombs of the necropolis

**IMPORTANT!** – this area was recently excavated by Prof. Van Andringa and his team. We have informed the PAP that the grass is growing again and will cover the difference in level, due to the excavation, as the ground surface is not levelled anymore, There is a heavy risk of falling in a large hole.



**Tomb EN-02 e Tomb EN-04**



## **Work priorities 2018 for the conservation of the site:**

### **1. Conservation surveys, plus control of the last conservation treatments:**

- 1.1 Review and update of the maps and technical documentation, related to conservation issues and produced in the previous surveys.

In the 2018 survey, the focus has been to understand if, where and how the different phenomena of decay have developed, or if they are still stable.

Please see new Survey June 11<sup>th</sup> --> 15<sup>th</sup> 2018

for the Necropolis of Porta Nocera and for the Fondo Pacifico.

- 1.2 Revision of the conditions of the areas intervened in 2015:

to confirm the materials and the methodologies defined in the previous years.

(see results in June 2018 survey report)

- 1.3. Identification of the areas in need of emergency consolidation:

from top to bottom of the monuments, both from for the structural point of view and for the surface decorations.

### **2. Practical conservation activities:**

- 2.1 Collection of the fragments of original plaster around the tombs:

activity described as one of the main priorities, but connected to the problem of storage rooms, to be solved by the PAP.

- 2.2 Consolidation of large and collapsing voids by conservation foam-mortars, as researched in laboratory.

- 2.3 Implementation of masonry / plaster conservation works.

### **3. Research and study projects for concrete application in the conservation practice:**

- 3.1 Research program for the consolidation of surface flaking, bubbling and exploding of the paint layer or the stucco surface finishing.

- 3.2 If possible study of the surviving graffiti (with techniques able to enhance the surviving writing and drawings).

3.3 Scientific segment devoted specifically to the teaching of the techniques and the mastering of instruments and knowledge on geophysics, as well as digital documentation and 3D rendering (with **CNR-IBAM**, Sicily and **Oxford University**, England), for possible documentation techniques to be applied and checked throughout the Summer school.

3.4 Training and application of natural science in the Conservation Summer Academy, for the identification of correct mortar composition and for the analysis of salt presence.

**SUMMARY of the PSPP 2018 ACTIVITIES  
not done / done**

(see info sent on the 20 of October 2018)

<b>OBJECT</b>	<b>WALLS</b>	<b>NOT DONE</b>	<b>DONE</b>
<b>Tomb EN-04</b>	- walls N-S-E-W, surfaces in stucco	- consolidation and micro-filling of the lower part of the surface	
	- big upper cornice of the East wall		- structural safety anchoring;
			- new upper protection from rainwater;
	- big upper cornice of the South wall		- new upper protection from rainwater;;
	- canaletta con Tomba EN-06:		- surface protection from rainwater, for the newly exposed surfaces.
NB:	in addition to this intervention, it was foreseen also ----->	the consolidation of a portion of very fragile plaster in <b>Tomb EN-06</b>	
<b>Tomb OS-29</b>	- N wall, surface in stucco	- securing of two large fragments of plaster, very unstable;	
	- S-E-W walls, surfaces in stucco	- securing of major detachments;	
NB:	in addition to this intervention, it was foreseen also ----->	Consolidation of small portions of very detached plasters on <b>Tomb OS-27</b>	
<b>Tomb OS-31</b>		- rapid cleaning of birds excrements on the 2stone lions on top of the tomb, as promised to prof. Osanna	