

CONSERVATION REPORT, PORTA NOCERA NECROPOLIS, POMPEII

TOMB PXXIV 13

OCTOBER 2023



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Tomb P XXIV 13 (PN_ES_3)



EXECUTIVE SUMMARY

This executive summary encapsulates a detailed report on the conservation and restoration efforts applied to a historical tomb, divided into three key sections.

Part I: Original Technology

This section delves into the original technology employed in the construction of the tomb. It examines the primary and secondary support structures, decorations, reliefs, and the paint layer, offering insights into the architectural and artistic elements intrinsic to the tomb's design.

Part II: Condition Glossary

A comprehensive glossary categorizes and elucidates the various conditions affecting the tomb. Ranging from losses and decohesion to macrobiological activity and previous interventions, this section provides a meticulous analysis of the tomb's current state.

Part III: Treatment/Interventions

The final part outlines the treatments and interventions aimed at preserving and restoring the tomb. It encompasses cleaning methodologies to address dust and dirt accumulation, plaster consolidation techniques to counteract decohesion, and grouting strategies to mitigate delamination. Each intervention is discussed in detail, including the materials used and application methods.

This executive summary provides a succinct overview of the report, emphasizing the importance of understanding the tomb's original construction, diagnosing its current conditions, and implementing tailored interventions for its long-term preservation.



Tomb P XXIV 13 (PN_ES_3)

BACKGROUND

In the final weeks of the Pompeii Sustainable Preservation Project 2023, the participants focused on conservation efforts, emphasizing practical applications and the protection of Pompeii's cultural treasures.

Part of the team were involved in the installation of clay moisture barriers at the Porta Nocera Necropolis East. Concurrently, the other half were engaged in the conservation of wall plasters within the

necropolis. This multifaceted endeavor encompassed comprehensive materials testing and the application of various conservation techniques.

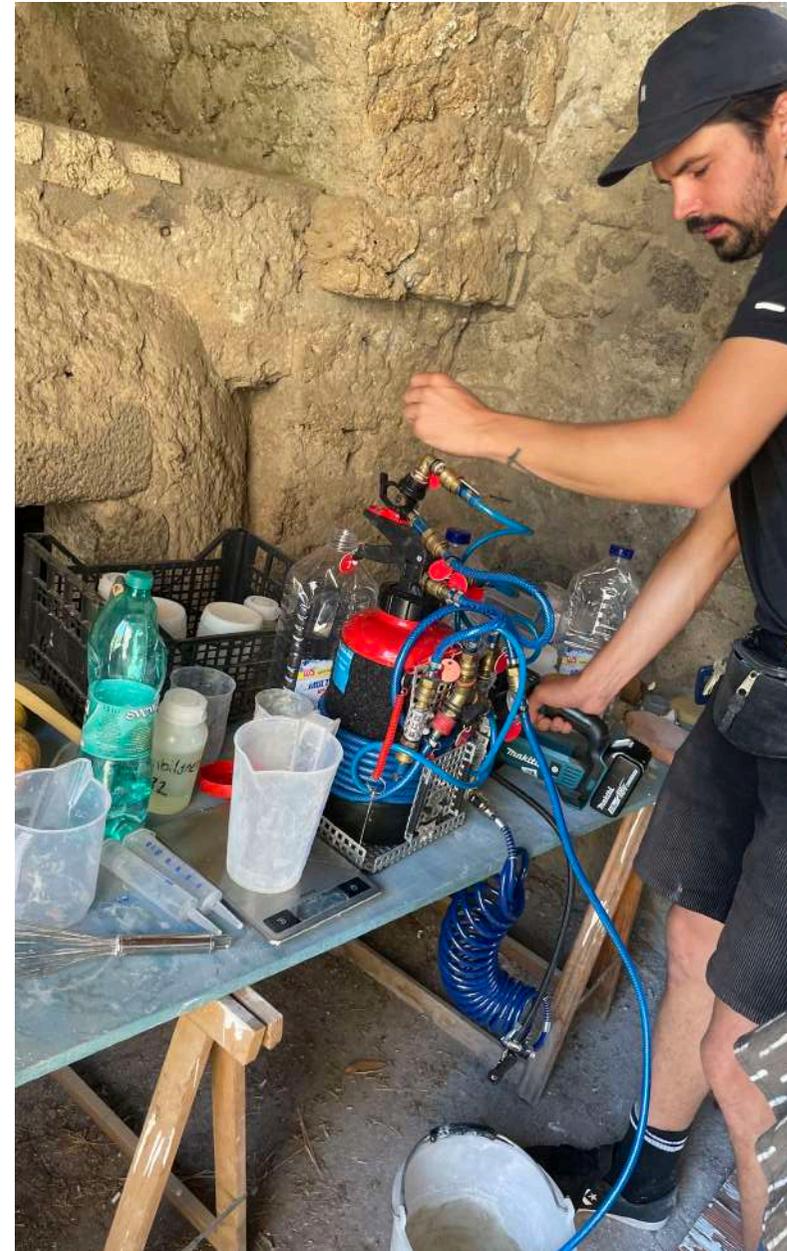
The examination and testing of materials empowered the team to make informed decisions about the most suitable methods for conserving and restoring the plaster surfaces. This facet of their work is pivotal in retaining the integrity of the wall plasters, serving as

tangible connections to Pompeii's illustrious past.

The commitment to the preservation journey remained unwavering, with an emphasis on the conservation of wall plasters. The expertise acquired through materials testing allowed the team to refine our approaches, ensuring that the conservation work adhered to the highest standards. Over these two weeks, the team of dedicated conservators collaborated closely, drawing upon collective knowledge and experiences to make informed decisions. Daily interactions and hands-on work solidified our

In the shadows of the iconic ruins of Pompeii lies a place of both historical significance and profound solemnity: the Porta Nocera Necropolis. Situated just beyond the city's southern gate, this necropolis offers a unique window into the burial customs and cultural heritage of ancient Rome.

bond as a team, united by a shared passion for safeguarding Pompeii's heritage.





INTRODUCTION

Tomb P XXIV 13 (PN_ES_3), a substantial tumulus tomb dating back to the late Republican / early Augustan period, is situated in the Southeast part of the Necropoli di Porta Nocera within the Pompeii complex. The tomb bears an inscription that reads, “Veia Barchilla, daughter of Numerius, (built this) for herself and to Numerius Agrestinus Equitius Pulcher, her husband,” adding a personal and familial dimension to the historical narrative of Pompeii.

The inscription on the tomb reads as follows:

Veia N(umeri) f(ilia) Barchilla / sibi et / N(umerio) Agrestino Equitio / Pulchro viro suo.

‘Veia Barchilla, daughter of Numerius, (built this) for herself and to Numerius Agrestinus Equitius Pulcher, her husband.’



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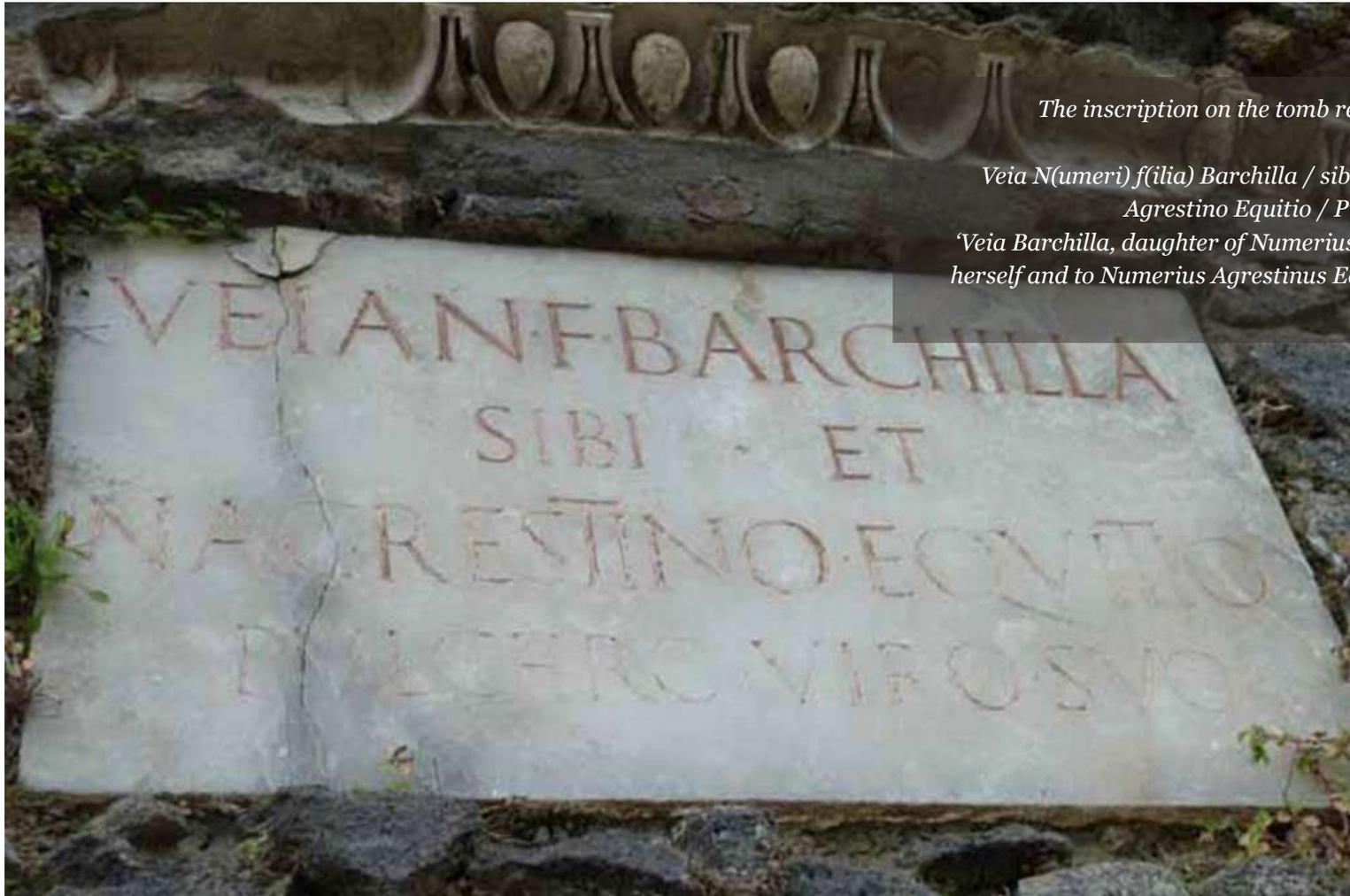
Tomb XXIV 13 stands as one of merely six funerary monuments that preserve their internal funerary chambers. Traditionally adorned with white stucco, these chambers, in certain instances, boasted murals, a feature visible in only three tombs — specifically, Tomb PN_ES_7, Tomb PN_ES_17, and Tomb PN_EN_2.

Regrettably, the external walls of Tomb XXIV 13 are in a state of disrepair, marked by extensive loss of plaster and overgrowth of vegetation. The inner chambers now languishes in darkness, beset by the presence of bats and lizards.

In the course of a hands-on conservation effort, we (Karma Yeshey and Hannah Leighner), collaborated with the broader conservation team to address the

external walls of Tomb P XXIV 13 (PN_ES_3). The comprehensive approach encompassed a thorough condition assessment, documentation, edge repairs, and grouting to reattach and stabilize the detached walls. This practical exercise represents a concerted endeavor to mitigate the impact of decay on this historically significant tomb, safeguarding its structural integrity and cultural value for future generations.

This report outlines the phases of conservation activities on Tomb PXXIV 13 in the Porta Nocera Necropolis, the methodologies employed in restoration, and the ongoing efforts to protect this remarkable testament to the past, ensuring that the Porta Nocera Necropolis remains a living testament to the enduring spirit of an ancient civilization.



The inscription on the tomb reads as follows:

*Veia N(umeri) f(ilia) Barchilla / sibi et / N(umerio)
Agrestino Equitio / Pulchro viro suo.*

*'Veia Barchilla, daughter of Numerius, (built this) for
herself and to Numerius Agrestinus Equitius Pulcher,
her husband.'*

PART I

ORIGINAL TECHNOLOGY

The original technology of each tomb is important to document as it defines the components assessed as part of the condition assessment. This process identifies the materials, composition, methods, and techniques used in constructing and finishing the

tomb monuments, which in turn contributes to the definition of each tomb's tangible and intangible value within the context of the Necropolis, differentiates original and nonoriginal materials, and guides the priority of remedial intervention.

Primary Support

The internal core structure of most of the buildings is mainly made of opus caementitium, a mixture of lava stones + brick fragments + a lime based mortar containing coarse and medium size volcanic sand

Opus caementitium

This building technique is generally diffused for the entire monument. It constitutes the inner core conglomerate composed by volcanic stones, fragments of stone or terracotta, sand (in coarse and medium granulometry) and lime.

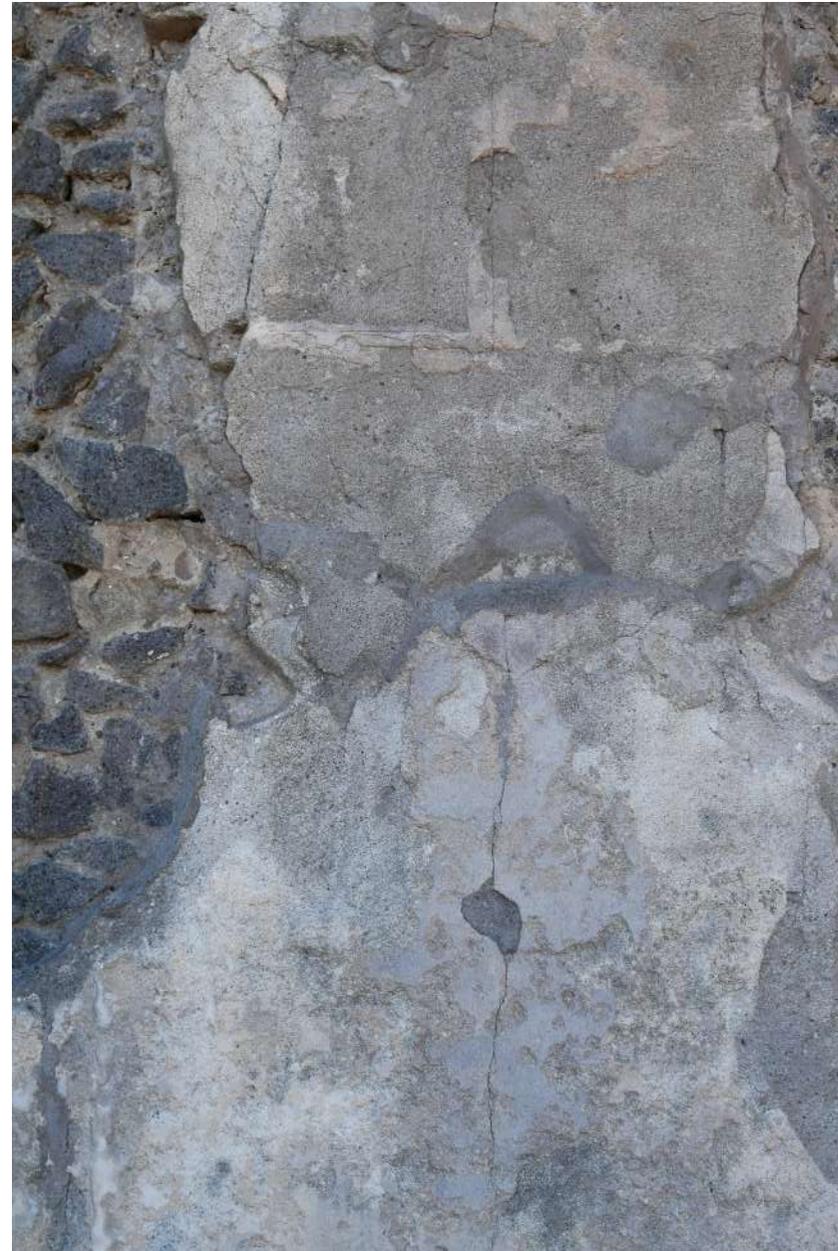


Secondary Support

The secondary plaster layers consist of a crudely applied, coarse, lime-based base coat, which supports a coarse plaster layer that is applied evenly and is lighter in color, however also contains larger, angular aggregates. The upper-most plaster layer is characterised by a thin, roughly 5mm plaster layer that is white in color; this top coat is applied to be smooth at the surface, as it originally supported a delicate fresco paint layer

Stucco Finishing

Stucco refers in this context to all plasters and 3 dimensional decorative elements, made from a light colored white mortar, that contains mainly lime and calcite particles.





*Stucco was applied as three dimensional decorative elements
in Tomb P XXIV 13*



Decorations and Reliefs

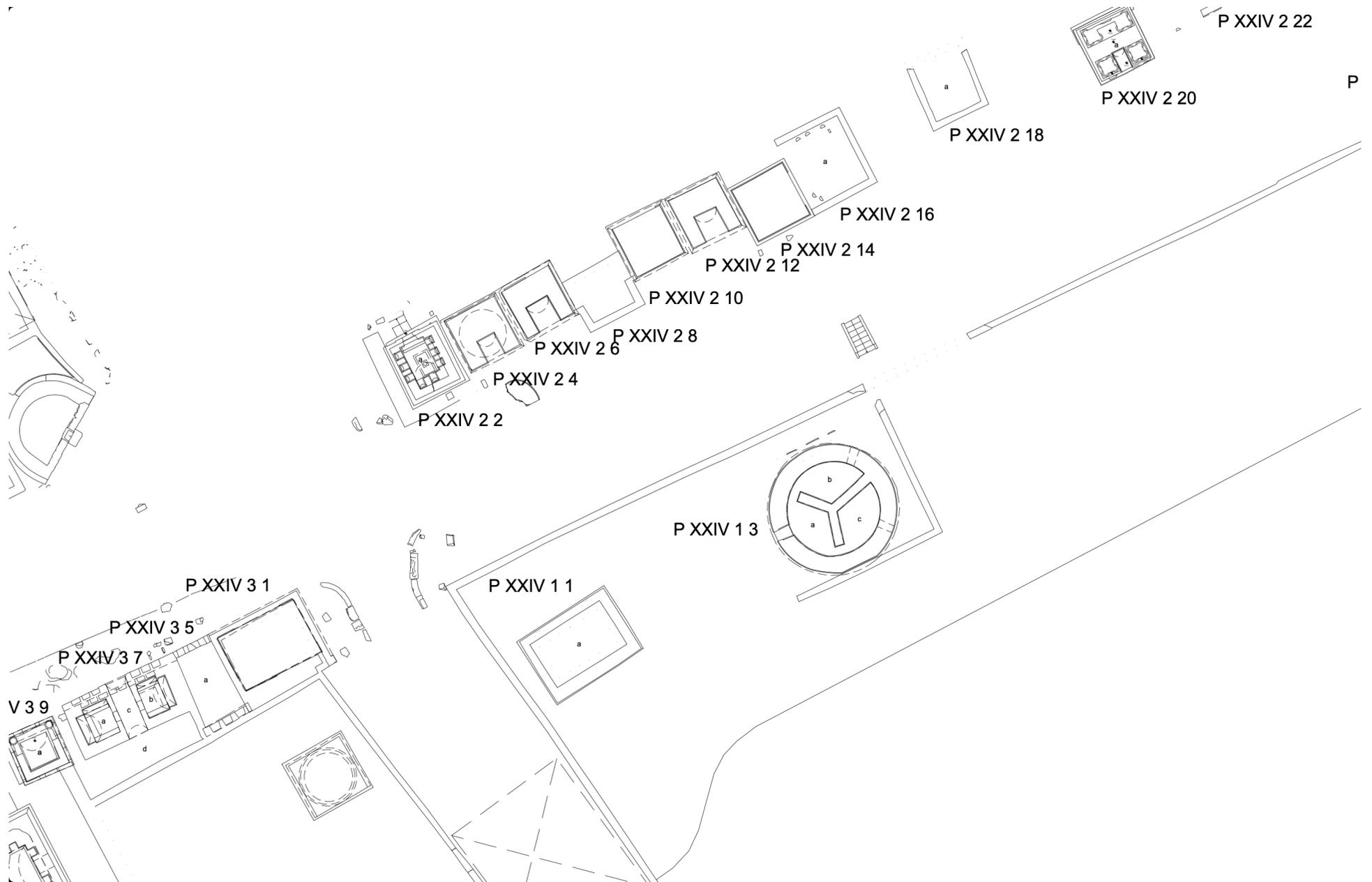
The plaster layer portrays a faux relief motif of large stacked masonry blocks. The top coat is mapped with preparatory techniques to include incised and snapped lines that guide the relief pattern. Also remaining on Tomb PXXIV 13, uniquely, are stucco friezes along the upper border of the tomb; featured here are complex designs of foliage, vines, and repeating images.



Paint Layer

Based on historic imagery and understanding of Roman plaster and decorative surfaces, Tomb PXXIV 13 would have boasted a fresco paint layer as part of its original technology. Although the paintings have been lost and are no longer interpretable, faint remains of the paint layer are observed in localised areas throughout the top coat plaster layer which maintains some orange, black, and red pigment.





PART II

CONDITION GLOSSARY

Tomb *PXXIV 13* is affected by various historic and active mechanisms of degradation. This section will discuss the observed conditions that affect the tombs of the Necropolis of Porta Nocera. This section will only identify the conditions of the non-structural components of the tomb; the structural integrity of each tomb is

mapped and assessed by other members of the team. Conditions are identified via photographic documentation, description of the phenomenon and affected location in order to define the degradation visible throughout the tombs of the necropolis.



Primary Support (Masonry and mortars)

Loss

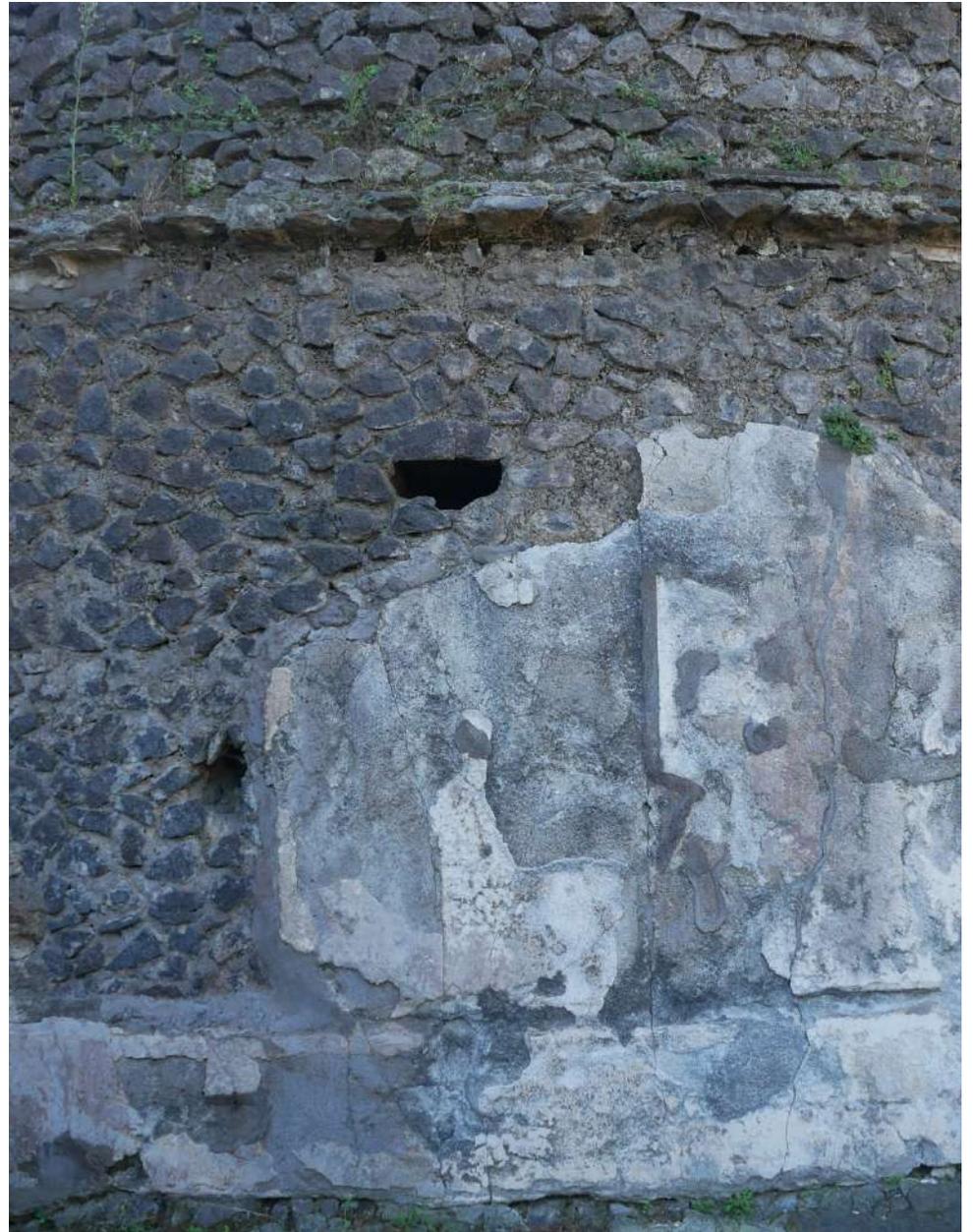
Loss of the primary support is characterised by loss of components or sections of the masonry and mortar construction.

Loss (Contd.)



Decohesion: Mortar

Mortar decohesion refers to areas where the mortar has been eroded or is actively decohesive in between the brick or stone masonry components.



Secondary Support (Plaster Layers)

Loss

Loss of the secondary support refers to areas where the plaster layer has been lost to reveal the layer below. This can affect one or multiple layers of the plaster, exposing the supporting plaster layer or primary support.



Exposed Edges

Exposed edges refer to the perimeter of remaining plaster layers where loss has occurred. Exposed edges reveal the remaining plaster layers that are now unsupported and vulnerable as they are no longer secured to the primary support.



Detachment

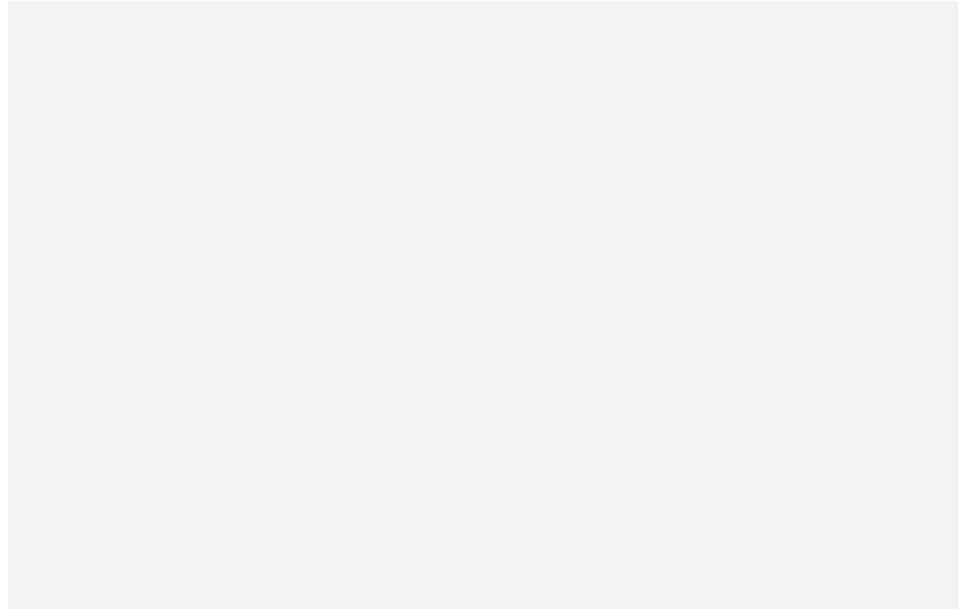
Detachment refers to the full separation of the base coat plaster layer from the primary support. Detachment is often observed as a visible gap between the plaster layer and the stone masonry at an exposed edge or area of loss, however may occur within a plaster layer as determined through tap and feel sounding.

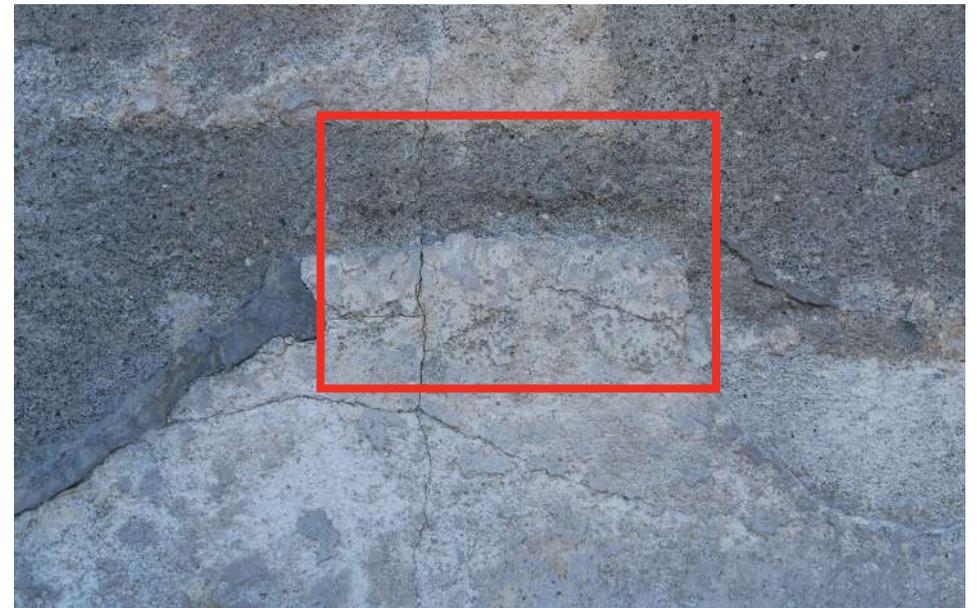




Delamination

Delamination refers to separation between plaster layers. This may occur between the first, second, and/or top coat plaster layers, and results in visible or sounded space between layers.







Deformation

Deformation is associated with detachment and delamination, as it refers to the existence of a void between layers, however is specifically detachment or delamination that results in bulging or movement of the plaster out of plane.

Cracks

Cracks in the plaster are visible as open cracks (affecting multiple plaster layers together where space between the crack is clearly visible) or hairline cracks (small cracks that affect one plaster layer)



Decohesion

Decohesion refers to powdering, crumbling, and general loss of cohesion of a plaster layer, resulting in delocalisation of the aggregate from the binder.





Macrobiological Activity

Macrobiological activity refers to the growth of plants on various structures within the archaeological site. Over the centuries, Pompeii has experienced the natural colonization of vegetation, including plant growth on architectural elements, walls, and other surfaces.

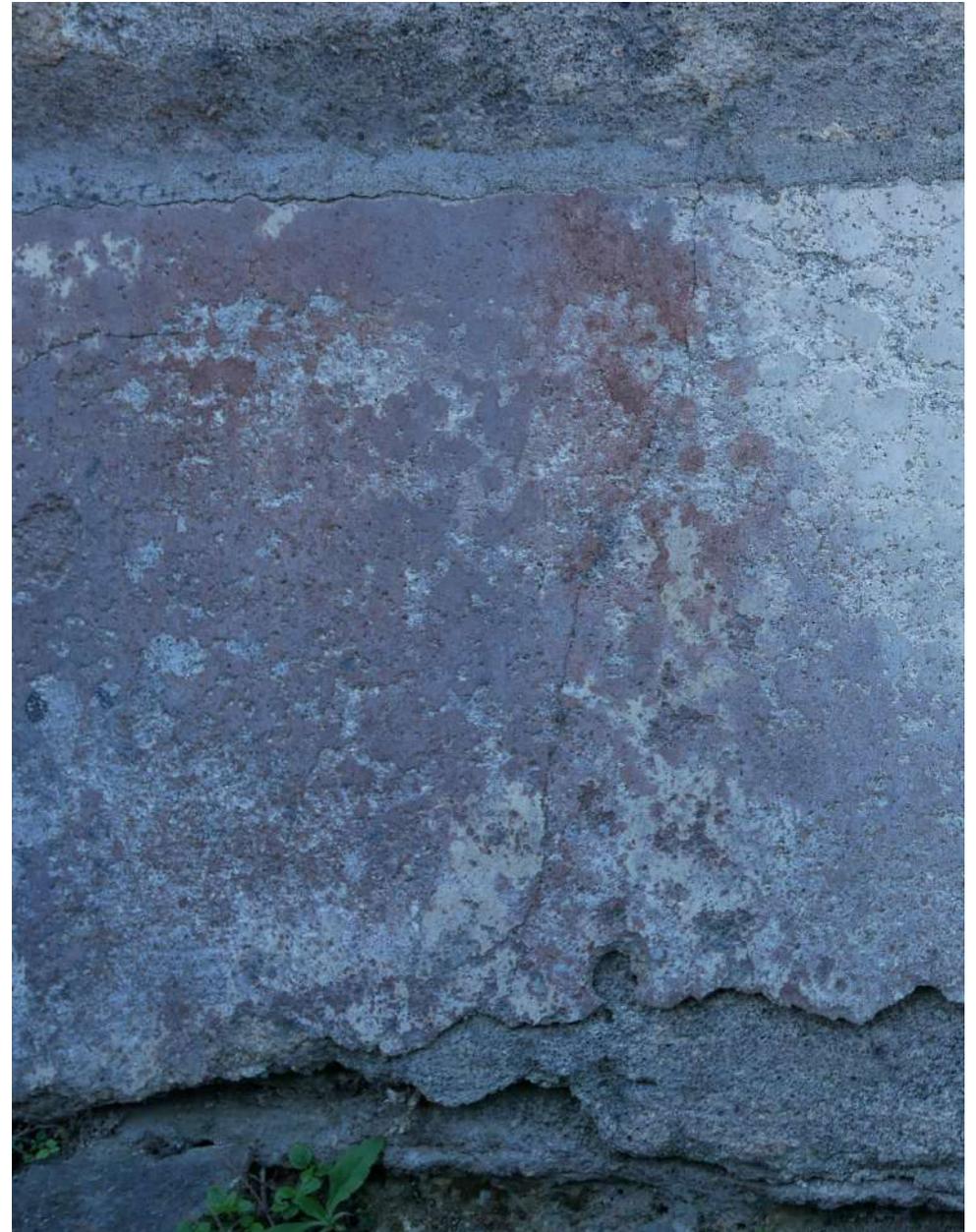
Previous Intervention

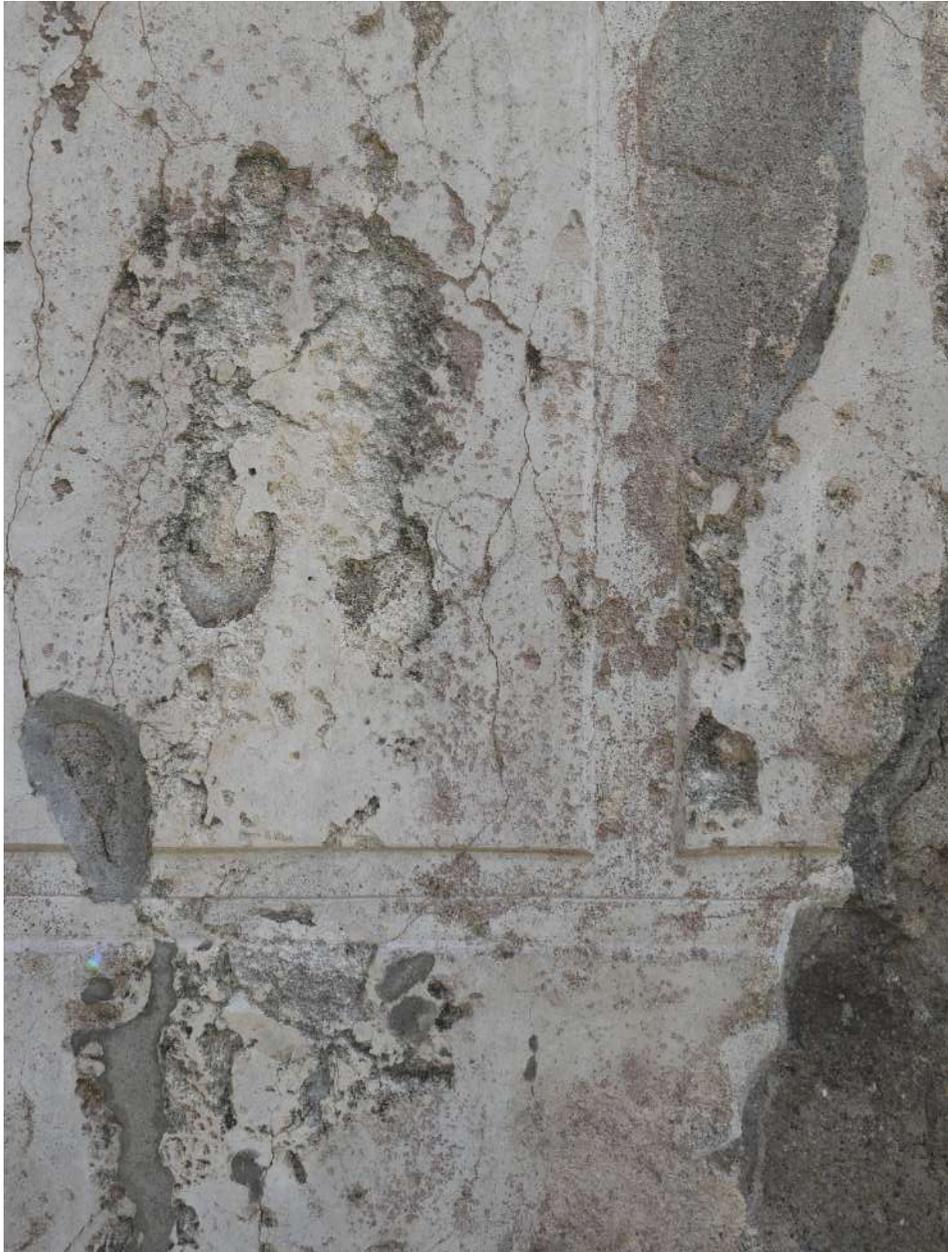
Various repair materials have been employed across the Necropolis to address issues such as cracks, losses, and damaged edges. These repairs likely took place at different points in time, possibly spanning various periods since the initial excavation.



Biodeterioration

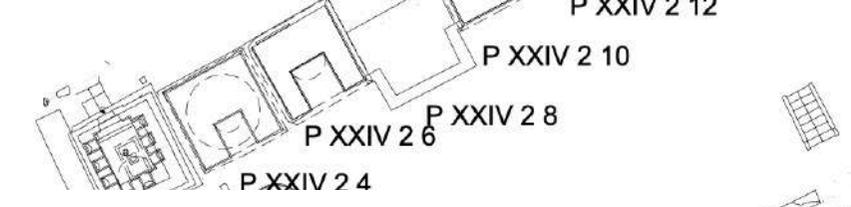
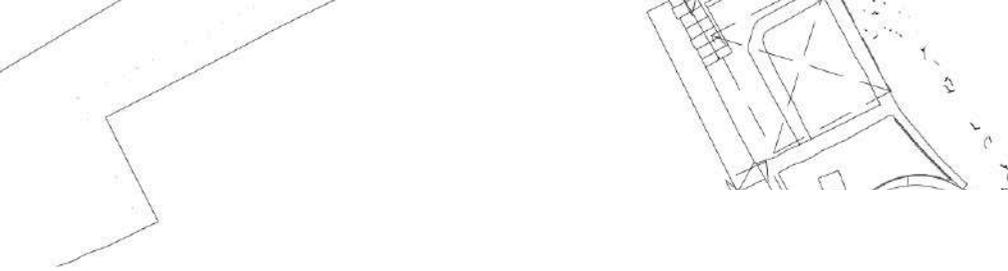
A reddish-pink substance, a type of microbiological growth, has infested numerous surfaces of the tomb. This growth is evident on sections of intonacco and stucco. The occurrence of this growth is expected, considering the tomb's exposure to the elements. It is evident that rainfall plays a role in promoting this microbiological growth, particularly observed in areas of plaster that are partially sheltered. The presence of similar growth is also noted on Tomb XXIV 24.





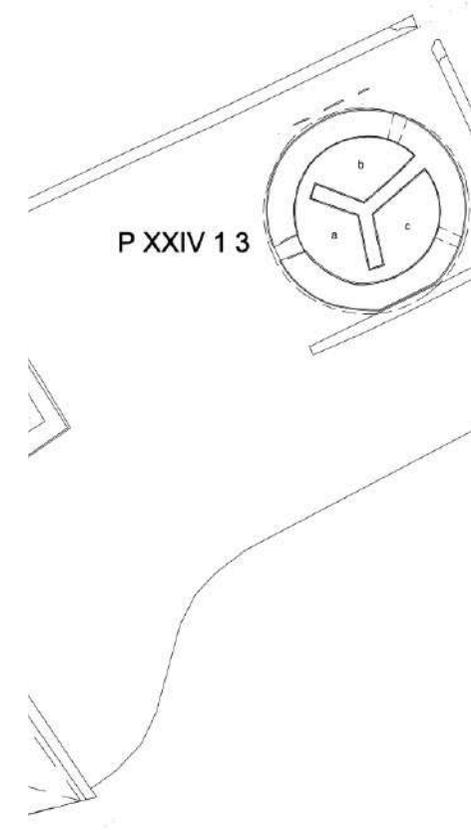
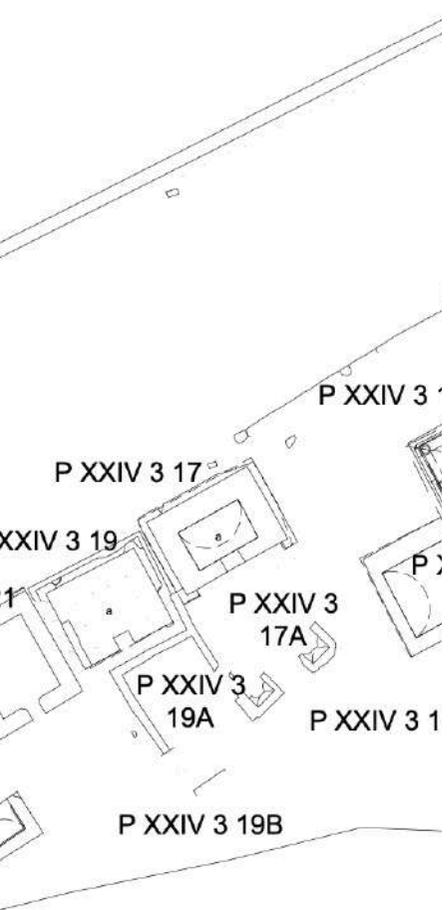
The presence of reddish-pink substance, a type of microbiological growth is also noted on Tomb XXIV 24.





PART III

TREATMENT/INTERVENTIONS



The last phase of conservation is centered on the crucial task of stabilizing deteriorating plaster layers. This dedicated team has built upon the knowledge gained from previous material trials, skillfully adapting past recipes for mixtures to address edge repairs and plaster restoration.

A comprehensive conservation initiative was implemented on this tomb, encompassing surface cleaning, the consolidation of decohesive plaster layers, and predominantly, edge repair treatments. Cleaning(dry) aimed at removing the accumulated dirt and impurities on the wall surface. Simultaneously, the consolidation process focused on reinforcing and stabilizing the decohesive plaster layers, ensuring their longevity and integrity.

However, the primary emphasis of the conservation efforts centered on the edge repairs. This involved the restoration of damaged or deteriorated edges, with a focus

on both structural and aesthetic considerations. By addressing vulnerabilities along the edges, the conservation team aimed to fortify the overall structural stability of the tomb while preserving its visual coherence.

The amalgamation of these treatments reflects a holistic approach to tomb preservation, where each intervention is carefully tailored to enhance both the structural resilience and the aesthetic authenticity of the historical artifact

The subsequent pages detail the interventions carried out in the concluding phase of the Pompeii Sustainable Preservation Project (PSPP). Each section provides a comprehensive overview of the specific condition(s) targeted for intervention, offering insights into the materials selected and the methodologies employed during the conservation efforts.





Condition: dust and dirt accumulation

The walls, exposed to the elements, have accumulated layers of dust on their surfaces, and the gaps between the loosened plaster layers have become filled with dirt. Furthermore, these walls have become host to the growth of plant vegetation. The combined impact of exposure to weathering, accumulation of dust, and the infiltration of dirt in the interstices has contributed to the degradation of the wall surfaces.

Materials and application methods

The initial step involved the delicate removal of superficial dirt using a soft brush. Subsequently, with a thorough assessment confirming the stability of the plaster layer, a puffer was utilized to systematically dislodge and remove any loose debris lingering on the surface and within the detached layers. This approach not only addressed surface grime but also prioritized the preservation of the plaster's stability, ensuring a comprehensive removal of any residual loose particles and contributing to the overall enhancement of its structural integrity.



Plaster consolidation

Condition: plaster decohesion

The breakdown of internal cohesion within plaster layers results in a fragile material that is susceptible to loss. The separation of plaster layers, known as plaster decohesion, can be linked to the presence of salt efflorescence and/or elevated ion content within these plaster layers. The compromised integrity of the plaster, exacerbated by these factors, contributes to its friability and increases the likelihood of material loss. Addressing these issues is vital for preserving the structural stability and aesthetic qualities of the plaster surfaces.



Condition: plaster decohesion

Calosil E 25 was considered due to compatibility with the original lime-based technology and in order to avoid solubilization and mobilization of salt-forming ions within the stratigraphy. To explore its effectiveness, four different proprietary calcium hydroxide dispersions, each with varying concentrations, were subjected to trials.

In these trials, decohesive plaster fragments from the complex served as test specimens to evaluate penetration and the rate of evaporation. Additionally, sand was incorporated to assess the cohesive strength of the consolidant system.

The trial results revealed that Calosil E 25 exhibited the most favorable penetration without resulting in surface accumulation, a phenomenon often associated with lower evaporation rates. The optimal application methodology involved multiple applications using a pipette or syringe, coupled with the mitigation of evaporation by covering treated areas. These findings underscore the potential of Calosil E 25 as a suitable consolidant, offering insights into its application to address specific challenges within the conservation context.





Plaster consolidation

Condition: exposed edges of the plaster layer

The exposed edges of the plaster layer present a notable concern in the current state of the archaeological site. The condition is characterized by sections where the protective layer of plaster has worn away or eroded, leaving the underlying structure vulnerable to environmental elements. These exposed edges are susceptible to further degradation, including potential damage from weathering, microbial growth, and other environmental factors.

Materials and application methods

In addressing the restoration of exposed edges, our approach is rooted in the selection of materials and proven application methods. The edge repairs were executed using materials that underwent thorough testing in the past, demonstrating both compatibility with the existing structure and their efficacy in similar conservation scenarios.

Preservation efforts include the application of consolidants, edge repairs, and grouting in some cases, to fortify the plaster layer and mitigate the risk of ongoing deterioration. Effectively addressing the condition of exposed edges is crucial for the long-term conservation of the site, ensuring the safeguarding of its historical and cultural value.



Preservation efforts include the application of consolidants, edge repairs, and grouting in some cases, to fortify the plaster layer and mitigate the risk of ongoing deterioration. Effectively addressing the condition of exposed edges is crucial for the long-term conservation of the site, ensuring the safeguarding of its historical and cultural value.



Grouting

Condition: delamination

The observed condition of delamination manifests across a spectrum, encompassing a diverse range of areas within the studied context. Delamination is identified as the separation or detachment of layers, and in this instance, it occurs at various locations within the plaster stratigraphy.

This widespread phenomenon points to the intricate nature of the degradation, as distinct regions exhibit instances of layer detachment, contributing to the overall complexity of the conservation challenge. The occurrence of delamination at different locations underscores the need for a nuanced and targeted approach in addressing and mitigating this specific condition within the conservation efforts.





Plaster consolidation

Materials and application methods

The treatment for delamination involved the grouting process utilizing a specialized foam mortar. The targeted application of this foam mortar proved instrumental in addressing and rectifying delamination issues within the affected structure.

For delamination with narrow access and of smaller nature, a micro grout was prepared using the same material mixture, albeit with finer particles. This micro grout, designed to penetrate even the minutest spaces, complemented the overall grouting strategy, ensuring a comprehensive and thorough treatment for delamination.

The utilization of both foam mortar and micro grout exemplifies a nuanced approach to conservation, employing tailored solutions to address specific challenges in the preservation process.

ACKNOWLEDGEMENT

We extend my sincerest appreciation to Pia Kas-
tenmeier, Monica M. Castaldi, and Leo Borgata
for their remarkable dedication to organizing the
Pompeii Sustainable Preservation Project 2023.

We would also like to extend our thanks to Ralf
Kilian of the Fraunhofer Institute for Building
Physics IBP, and other participating institutions:
the Archaeological Park of Pompeii, the Interna-
tional Centre for the Study of the Preservation and
Restoration of Cultural Property (ICCROM), Oxford
University, the Institute of Heritage Science of the

Italian National Research Council (ISPC-CNR), the
University of Catania (Department of Humanities
- School of Specialization in Archaeological Herit-
age), and the Otto Friedrich University of Bamberg
for their support and collaboration in making this
project possible.

Their collective efforts have been instrumental in
enriching our experiences and advancing the field
of conservation. I am truly grateful for the opportu-
nity to participate in this transformative project.

An aerial photograph of a park area. A paved road runs diagonally from the top right towards the bottom left. To the left of the road is a large, open grassy field with scattered trees and a stone wall. To the right of the road is a dense forest of green trees. In the bottom right corner, there are several buildings, including a large white warehouse-like structure and a smaller building with a brown roof. A street intersection with crosswalks is visible in the bottom right. The overall scene is bright and sunny, with long shadows cast across the grass.

THANK YOU

Катяна Яценко