University of Applied Sciences and Arts of Southern Switzerland

SUPSI

SWISS CONSERVATION-RESTORATION CAMPUS

Restoration Report

Restoration of

The Vestibule in Villa Medici of Merignano

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1. **Introduction**

Between September 20 and November 24, 2023, an extensive conservation campaign was carried out to restore the 16th-century wall paintings in the vestibule of Villa Medici di Marignano, located in Frascarolo, Italy. The initiative represented a collaborative effort between the property owners, Gian Giacomo Medici and his family, and the University of Applied Sciences and Arts of Southern Switzerland (SUPSI). The project aimed not only to stabilize the structural integrity of the murals but also to restore their visual clarity and historical value. The conservation team employed a combination of diagnostic methods to thoroughly assess the condition of the artworks. Non-invasive techniques, including UV-light imaging and X-ray fluorescence (XRF) photography, were used alongside invasive analytical tools such as Fourier-transform infrared (FTIR) spectroscopy. These techniques provided critical insights into the materials used in the original paintings, the nature of previous restoration interventions, and the extent and causes of degradation.

The initial phase of the restoration addressed several pressing issues that threatened the murals integrity. Cracks and fractures in the plaster, areas of detachment, and flaking paint were carefully examined and treated. To address accumulated surface contamination, layers of whitewash and dirt that obscured the paintings were meticulously removed. This cleaning process utilized ammonium carbonate compresses, which were applied strategically to soften and lift stubborn deposits without damaging the underlying paint layers. As a result, the team was able to restore the aesthetic coherence of the murals, minimizing the visual disruptions caused by decades of surface buildup.

A second phase of conservation took place between September 16 and October 28, 2024, building on the progress achieved during the first campaign. This phase focused primarily on the structural stabilization of the painted surfaces. The restoration team addressed voids and gaps in the plaster by injecting grout to fill these spaces, ensuring a more cohesive and durable substrate. Areas of broken plaster were repaired using a combination of rough and fine mortars, carefully selected to match the texture and composition of the original materials. These consolidation efforts were crucial in re-adhering and re-integrating the damaged sections of the artwork.\n\nIn addition to structural work, the conservation team undertook a detailed process of pictorial integration to enhance the visual presentation of the murals. The retouching phase employed the Tratteggio technique, a method characterized by the application of fine, parallel lines of water based pigments to recreate lost or damaged areas. This approach allowed for a visually coherent restoration while maintaining clear distinctions between the original artwork and the modern interventions. By carefully matching the pigments and tones to the original palette, the team successfully revived the painting's aesthetic harmony while ensuring that the restoration remained reversible and easily identifiable for future conservation efforts.

2. History of the Castle

Fig. 1 - Current Facade & Entrance of the Villa

The Castello di Frascarolo, now known as Villa Medici di Marignano, has ancient origins, though they are uncertain and poorly documented.
It is plausible that during the Roman era, there was already a fortification in this area, related to a road that connected "Castrum Castrorum" to other watchtowers, extending as far as Switzerland. However, there are no specific documents confirming the presence of such a fortification from this period.

Evidence indicates that a fortification existed during the early Middle Ages, as the medieval road to the Valganna Valley passed through this area. The first definitive mention of a fortified structure in Frascarolo dates back to 1160, when Archbishop of Milan Umberto I used it as a military base during conflicts with the Comaschi and the pro-Barbarossa Milanese nobles. Additionally, a document from September 26, 1264, drawn up in Frascarolo, confirms the existence of a building linked to the Monastery of Ganna (actum apud domos de Frascarolo que sunt dicti monasterij). During the late Middle Ages, the castle was associated with the Monastery of Ganna and later came under the ownership of the Medici family of Marignano.

In 1540, it was purchased by Giovan Battista Medici, brother of the condottiero Gian Giacomo Medici (known as “Medeghino”) and Pope Pius IV. In 1543, it was converted into a residential villa by Gian Giacomo Medici, reflecting the Renaissance tastes of the period.

Several facades of the castle were frescoed in the mid-1500s with decorative styles popular at the time, inspired by classicism and generally attributed to the Campi brothers' school in Cremona. Originally designed as a military and defensive structure, like many medieval castles, the Castello di Frascarolo served several primary functions.

The location of Frascarolo was pivotal, positioned along a road connecting Varese to Switzerland, bypassing the lakes. This route was crucial for travelers heading toward the Alpine passes. The fortification protected the area from incursions and ensured territorial defence control over a strategic passage for both military and commercial purposes. Initially, the castle served as a fortified post for local troops, evidenced by the presence of Lombard arimanni and its use during the 12th-century Milan-Como conflicts.

With its purchase and restructuring in the 16th century under the ownership of the Medici family of Marignano, the castle gradually lost its defensive role and was transformed into a villa, aligning more with aesthetic and representative needs.
It became a Renaissance villa with representative, residential, and agricultural functions, embracing the concept of a place of pleasure and harmony with its surroundings.
The castle remained in the possession of the Medici family of Marignano until today, except for a brief period between 1840 and 1901, when it was inherited by the Crivelli family.
In 1848, it was occupied by Austrian soldiers, who whitewashed the decorated walls.
In 1901, the residence was returned to the Medici family of Marignano, who began the first restoration efforts, including work on the towers and repainting of the villa’s exterior walls.

Fig 2 - North Facade of the Villa

3. The Vestibule

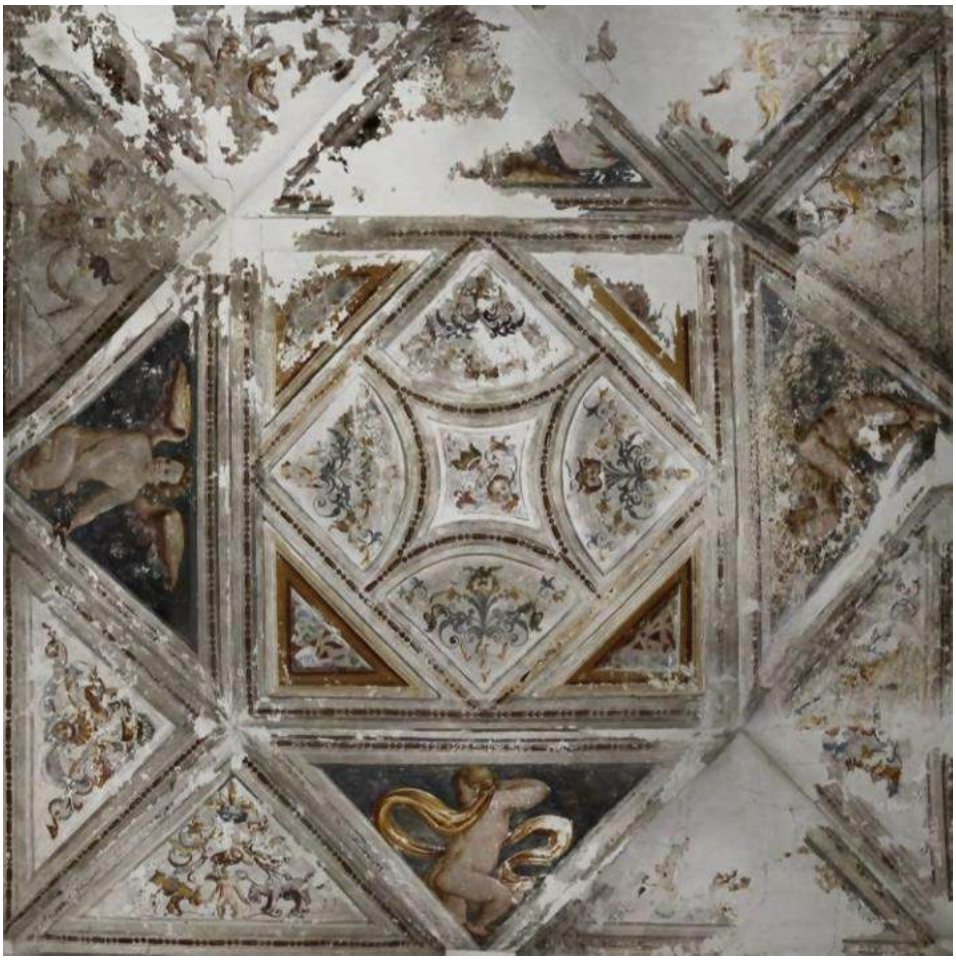


Fig 3 - The Vestibule Vault, before restoration intervention

The vestibule is a small, rectangular room located in a part of the villa that once served as the rear of the building but now functions as the main entrance (Figure 3). The walls of the vestibule are arranged as follows:

The vestibule's walls are positioned to create a distinct flow between different areas of the villa. The north-west wall features the entrance portal, granting access to the room, while the south-west wall offers a view of the internal courtyard, connecting the vestibule to the villa's inner spaces. On the south-east side, the wall adjoins the church, linking the vestibule to the sacred section of the villa. Lastly, the north-east wall separates the vestibule from a staircase room, which is adorned with grotesque motifs that echo the decorative style found within the vestibule itself.

The vestibule's floor level is slightly raised compared to the exterior, with three steps leading up to the entrance. The only window in the room is located on the south-west wall. Additionally, an arched opening on the south-east side of the vestibule connects it to the church.The visible decorations in the vestibule focus on the ceiling and the upper parts of the walls, while the lower sections, now covered in whitewash, may have originally been decorated. The decorative elements include:

- **Lunettes**, two per wall, each enriched with landscapes that provide visual interest and add to the room's aesthetic appeal.
- **Spandrels**, positioned above the lunettes, are decorated with intricate grotesque designs, contributing to the overall ornamentation of the space.
- **Pendentives** feature putti in various poses, each holding symbolic items such as fruits or a drapery, adding a playful and symbolic element to the decor.
- The **ceiling** is adorned with a geometric coffered pattern at the center, with each section enriched by grotesques and framed by beadwork, creating a detailed and visually striking feature.

Fig 4 - Close-up of Decoration of the Spandrel

The artist behind these decorations remains unknown, but it is speculated that it could be the same individual who worked on the decorations of another villa, Villa Cicogna Mozzoni. This hypothesis is supported by similarities in the depicted scenes, the color palette, and the painting technique.

Fig 5 - Villa Cicogna Mozzoni, Bisuschio (VA)

Fig 6 - Villa Medici of Miragnano, Frescarolo (VA)

Fig 7 - Villa Cicogna Mozzoni, Bisuschio (VA)

Fig 8 - Villa Medici of Miragnano, Frescarolo (VA)

Although the vestibule lacks direct references in historical documents, it is believed to have been created during the period of major renovations commissioned by Gian Giacomo Medici (1543–1555), as indicated by the 16th-century style of the decorations. Originally, the vestibule may have served as part of a residence for a caretaker or security staff, given its proximity to the staircase and the rich ornamental details.

Later, when the Church of the Immaculate Conception was built between 1725 and 1727, the room likely underwent a change in function and became an antechamber for the church. During the Austrian occupation in 1848, some of the rooms in the villa were whitewashed, which concealed the lower-level decorations that remain hidden to this day.

4. Execution Techniques

The composition of the support material is identifiable due to small gaps that have formed over time, exposing the underlying material, which corresponds to brick. This is visible even in the attic, where the formation of the wall support can be clearly seen. Therefore, it can be concluded that this brickwork also serves as the support for the vault and the north-east, south-east, and south-west walls. In contrast, the north-west wall is likely made of stone.

Fig 9 - View of the support of the vault staircase over the Vestibule

Fig. 10 - View of the vault of the staircase over the Vestibule

Fig 11 - Loss in plaster layer with view of brick of the support

Fig 12 - View of brick of the support

The bricks of the vault are covered with several layers of mortar. The final layer of plaster is particularly smooth, with barely perceptible aggregates. In the degraded areas, numerous calcinaroli are clearly visible. These stones, due to their greater rigidity, have contributed to the formation of shrinkage cracks. The abundant presence of calcinaroli suggests the use of a magnesium-based air lime, which, over time, causes cracking in the mortar due to its expansion.

The plaster was applied in "giornate" (layers), as evidenced by visible marks in certain areas. These signs indicate that the application followed the contours of the lunettes and frames. Once the surfaces were prepared, the scenes and various designs were transferred using different techniques, which remain evident today.

The frames below the lunettes, the quadrature to the left of the window, and the central line of the lunettes were outlined using cord impressions. Some impressions were made on fresh plaster, leaving visible traces, while others were created on a partially dried surface, using a cord soaked in red pigment, leaving color splatters still visible.

The wave pattern beneath the lunettes was executed with the aid of stencils, as indicated by the presence of a central engraved line in the middle of the elements and slight smudges along the edges, likely caused by the removal of the stencils.

Fig 13 - Red pigment soaked cord splatter

Fig 14 - Evidence of the use of stencils

Additionally, in elements such as the decorative motifs of the lunettes or the spandrels depicting grotesques, the artist defined them through direct incisions on partially dried plaster, likely using the back of a brush, given the rounded shape of the incisions.

Fig 15 - Incisions on the Lunette

Fig 16 - Incisions on the Spandrel

Regarding the grotesques, the design was transferred using various techniques, such as incision, powder traces in some areas, and visible brushwork, especially in the depiction of faces. Some elements, particularly in the lunettes, were painted with overlapping layers; for example, the different landscape components, such as trees and buildings, were rendered with a uniform background wash. In contrast, the grotesque images have a consistent white layer applied as a preparatory base.

Fig 17 - Indentation from a support stick used on damp plaster

Fig 18 - Background wash

The pendentives, however, do not show overlapping layers. Based on these observations, it can be hypothesized that the painting technique used for these decorations is lime tempera, due to the typical opacity of the washes and the substantial brushstroke texture, especially noticeable in the landscapes.

However, diagnostic procedures using UV light and FT-IR® analysis have revealed the presence of organic binders as well. Most of the washes appear to have been applied dry, as evidenced by the greater loss of paint layers and the overlap of layers. However, exceptions exist in the backgrounds, likely applied on still-moist plaster, and in the figures of the putti, which seem to have been painted using a different technique.

The binders used appear to belong to two main categories: lime milk and an organic binder.

The pigment study, conducted using non-invasive techniques such as portable microscopy, IRfc photography, XRF, and FT-IR, primarily identified iron-containing earth pigments, including ochres, greens, reds, violets, and oranges. These pigments, compatible with lime, were likely applied dry for the grotesques and on damp plaster for the landscapes and putti. Additionally, pigments incompatible with the alkalinity of lime were found, such as a yellow pigment containing mercury (possibly a repaint) and a red pigment containing mercury and lead (Cinnabar), applied dry with an organic binder.

The study also detected a blue pigment, identified as Smaltino, commonly used in the 16th century. This pigment was likely applied dry with an organic binder in the grotesques and with lime milk (on plaster not yet fully dry) in the lunettes and pendentives. XRF analysis confirmed the presence of this pigment, detecting nickel, arsenic, and bismuth.

Fig 19 - Smaltino pigment washes

Fig 20 - Cinnabar pigment washes

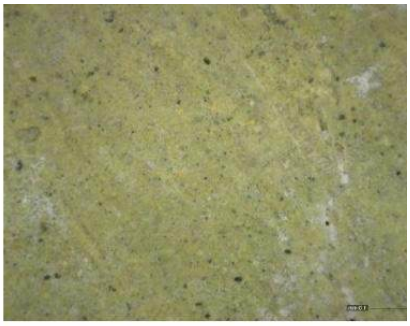
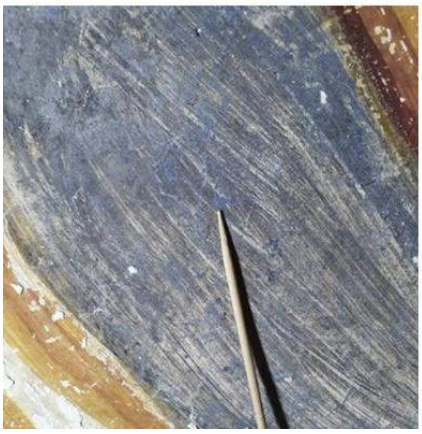


Fig 21 - Yellow pigment washes



5. Previous Interventions

As mentioned, there is no documentation regarding the sequence of interventions carried out in the vestibule over time. Generally, the interventions involved the application of layers of whitewashing, stucco work, and some architectural modifications.

Initially, the room was in a critically deteriorated state, with significant layers of whitewash covering the entire decorated area. Early restoration efforts revealed that the oldest layer of whitewash is a semi-transparent white coating found only on the walls beneath the lunettes. The vault, on the other hand, is covered with a yellow whitewash, likely applied due to a change in aesthetic taste (as the grotesques may not have been suitable for a religious Christian setting), as well as to "repair" the degradation.

Fig 22 - Oldest Semi-transparent whitewash layer

It is clear that the whitewash layer also appears within abrasions and shrinkage cracks. This layer may have been applied during the construction of the church (1725-1727), when the arched passage in the southeast wall was created, and possibly when the capitals were removed. It is also likely that the door connecting the vestibule to the rear staircase was sealed at the same time.

Fig 23 - Removed capitals for unknown reasons

Fig 24 - Thick multiple layers of whitewash on the South-East wall above the entrance to the Chapel

Fig 25 - Different layers of whitewash

The thick layer of dirt on top of this whitewash suggests a long period of time passed before the next layer was applied. This next layer consists of a thick whitewash, probably from the Austrian occupation, with an additional white coat applied on top. At an unknown point in time, an initial de-whitewashing intervention was carried out, which left several scratches and marks on the surface due to an inappropriate restoration technique.

6. Initial Conservation State

The artwork exhibits a significantly compromised initial state of preservation, with numerous degradation phenomena that required targeted interventions. However, no active deterioration processes were detected. The entire surface was covered by a loose layer of deposits that obscured the visibility of the decorations, and more importantly, by layers of whitewash that almost entirely covered the vestibule.

Fig 26 - Lunette Area LNE3

Fig 27 - Area LNW1

The plaster layers show widespread detachment and fractures. These discontinuities are likely caused by structural stresses related to the construction of the church adjacent to the vestibule. The detachment is particularly evident in areas where it overlaps with fractures, especially in the lunettes, suggesting a correlation between the two phenomena. In some instances, the fractures had been previously filled with stucco, but the detachment persists, indicating the need for consolidation interventions.Moreover, the presence of significant dust and dirt within these fractures suggests that they are not recent.

A first assumption was that there might have been wallpaper on the lunettes at some point in the past which was then removed and left glue and fibre residues, but the removal of wallpaper presumably would have caused damage to the wall paintings underneath, which there were no traces of. As these first two layers are only present on the lunettes, a change of the owner who covered the landscape depictions presumably in the 16th century is a possible hypothesis.

Fig 28 - Detail of second whitewash with fibers on lunettes, LNW3

The walls surrounding the window on the southwest side exhibit a noticeable difference in paint color, appearing beige, in contrast to the grey tones of the lunettes' frames (Fig. 41 and 43). Since the infillings of the removed capitals show no signs of retouching and the walls were covered with at least the most recent whitewash, it is likely that this alteration occurred before the capitals were removed. The yellow whitewash and beige-painted window frame could represent a new color scheme applied by a potential new owner of the Villa, likely in the 17th century.

Fig 29 - Yellow whitewash layer on vault and lunettes, VNE1

Fig 30 - Colour difference of frame of the window and lunette

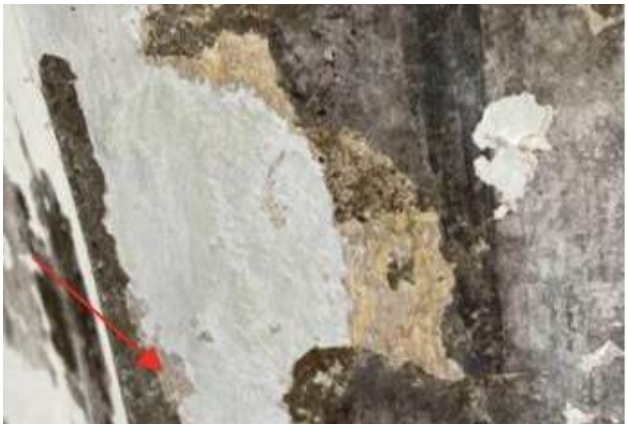


Fig 31 - gray whitewash, VSE2

Fig 32 - Reverence point of gray whitewash, VSE2

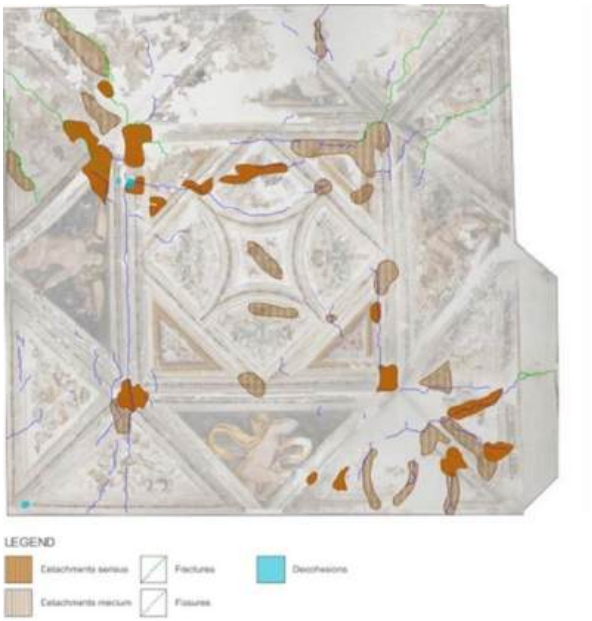


Fig 33 - Mapping of detachment, fractures, and de-cohesions

The artwork initially exhibited a combination of degradation phenomena affecting both the plaster layers and the paint layer. Among these were widespread fractures, some of which can be traced back to past structural interventions, while others resulted from the worsening of shrinkage cracks. These fractures are often accompanied by abrasions that have caused localized losses of plaster and paint, further exacerbated by past water infiltration. The water facilitated the solubilization of binders and the introduction of soluble salts, contributing to material disintegration and loss.The paint layer appears patchy and is still partially covered by layers of whitewash. Additionally, through UV light and Dino-lite examination, an organic carbonaceous deposit, likely soot, was detected on the paint layer. This is probably a result of the use of a stove when the vestibule was used as a living space

Fig 34 - Shrinkage cracks and material loss.

Fig 36 - Organic soot-like material on the surface LNE3

7. First Restoration Intervention

The initial phase of restoration took place between September 20–21, 2023, and October 3–November 24, 2023, focusing on the vault and walls up to the wave-patterned cornice, with the aim of ensuring uniformity across the artwork.

The first step involved removing the whitewash, followed by cleaning and consolidating the areas with detached paint. Several cleaning and d-ewhitewashing tests were carried out in different sections of the work. To effectively remove consistent deposits, a saturated ammonium carbonate solution was used, applied as a poultice made from Arbocel® cellulose pulp (1:1 ratio of Arbocel BW40 and Arbocel BC20024) (Figure 31). In cases where the paint film was fragile, Japanese paper was placed for protection. The poultice was left for 30 minutes to an hour, depending on how stubborn the deposit was. Once the poultice was removed, the surfaces were thoroughly rinsed using warm demineralized water with sponges or brushes or by applying low-pressure hot steam to remove any organic residue.

Upon removing the poultice, yellowish marks appeared on the surface, likely from organic materials within the support. To address this, further poultices of demineralized water mixed with sepiolite and cellulose pulp (1:1 ratio) were applied with two layers of Japanese paper, left to dry completely, and repeated when needed.

Fig 37 - Arbocel poultice used for removing cohesive deposits

Fig 38 - Mechanical removal of whitewash with scalpel

The removal of the whitewash was carried out using different methods depending on the layer's composition and location (Figure 32). The main techniques for de-whitewashing were: Mechanical dry removal using scalpel and/or chisel and hammer, Abrasive mechanical dry removal using a multifunction tool (Dremel®) and softening with a poultice of saturated ammonium carbonate solution and cellulose pulp (1:1 ratio), left for 30 minutes to 2 hours, followed by mechanical removal with a scalpel.

In cases where whitewash layers were particularly stubborn, a cationic ion-exchange resin was applied directly to the whitewash to preserve the original layer.

A focused intervention was carried out to secure the weakened paint film, which had been strongly adhered to the whitewash. Areas at risk of losing the paint were carefully stabilized with the precise application of acrylic dispersion (Dispersion K52®) drops, using a syringe. The consolidation process was then continued in the subsequent phase of restoration.

8. Second Restoration Intervention

The second phase of restoration, conducted from September 16 to October 28, 2024, continued and completed the work initiated during the first intervention. The primary aim was to systematically address the stability and aesthetic recovery of the artwork.

Thanks to previous restoration efforts, the artwork is in good condition, with the painted surface being well-fixed and stable, showing no signs of further structural degradation. However, the painted surface is visibly worn, and there are significant lacunae in some areas, which affect the overall readability of the piece. A key point of focus was the partial removal of the whitewash on the lunettes identified as VNW1, which had been addressed in prior interventions. Due to the strong adhesion of the whitewash to the painted surface, a complete removal was not possible. As a result, traces of whitewash remain in certain areas, particularly in more fragile spots or where removal is more difficult.

Fig 39 - Surface Highly Abraded, Loss of Artwork Legibility

Fig 40 - Pigment loss

Before commencing the intervention, an updated photographic campaign was carried out to document the current condition of the artwork. Both diffuse and raking light were used to provide a detailed analysis of the surface's condition. This approach highlighted abrasions, lacunae, cracks, and deformations, offering a comprehensive view of the issues that needed to be addressed.

Next, a thorough assessment of the detachment areas was carried out, using acoustic tests (knock tests) manually conducted with the knuckles. This method allowed for the identification of any new detachments compared to those noted in previous mapping, and these were precisely updated. The careful identification of detached areas provided the necessary data for planning targeted and effective consolidation interventions.

These preliminary analysis and documentation stages were crucial for understanding the condition of the artwork and for accurately planning subsequent interventions.

9. Interventions Performed

- **Consolidation**

The initial phase of the second restoration intervention focused on deep consolidation of areas that had not been addressed in the first intervention. A systematic assessment of the detachments was carried out to identify the regions that still required consolidation.

The consolidation of detached layers was achieved through the injection of a premixed hydraulic mortar, specifically chosen to ensure the long-term stability of the artwork. The mortar used was PLM-AL® (C.T.S.), prepared by mixing 100 g of powder with 100 g of demineralized water, creating a 1:1 ratio.

Before the mortar injection, a hydroalcoholic solution (1:1 v/v, demineralized water and ethyl alcohol) was introduced into pre-existing cracks or holes, or newly made ones where necessary. This preliminary step allowed for the cleaning of the channels and helped identify their direction, facilitating the even distribution of the mortar.

Fig 40 - Insertion of PLM-AL® (C.T.S.), prepared in a dilution of 100 g of powder in 100 g of demineralized water

The mortar was injected precisely using a syringe, ensuring penetration between the detached layers. Extreme care was taken to avoid excessive pressure that could compromise the stability of the artwork. After injection, extraction poultices were applied to the treated areas to absorb substances dissolved by the water (Figure 36). The poultices consisted of demineralized water, sepiolite, and Arbocel BW40® cellulose pulp (1:1 v/v ratio).

Fig 41 - Absorbent poultice of Sepiolite and Arbocel BW40® on double layer of Japanese paper, 1:1 ratio

The poultices were left in place until completely dry to ensure effective extraction of impurities, and were carefully removed to avoid leaving any residues. This intervention successfully restored the internal cohesion of the artwork.

- **Removal of Whitewash**

Fig 42 - Vault LNW1, before and after the mechanical descialbo performed with a scalpel.

The whitewash removal was completed on the Vault LNW1. The surface exhibited a particularly fragile painted film, necessitating an extremely careful intervention. The whitewash layers were removed mechanically using scalpels, applying a meticulous and delicate technique. This approach was chosen to ensure the preservation of the original painted film, avoiding any risk of damage or color loss. The intervention required great precision and attention to maintain the integrity and aesthetic value of the artwork

- **Filling and Repairing**

The next phase involved filling the gaps and discontinuities present on the surface. An air lime mortar was used to fill the deeper gaps, in a 3:2 (aggregate/binder) ratio, with careful preliminary wetting of the openings.

Fig 43 - Before and after filling

Several tests were conducted to identify the most suitable mortar in terms of consistency and color. In areas where sections were missing, it was necessary to completely reconstruct the affected areas.

Fig 44 - Before and after reconstruction of a corner

For the final layer, a mortar was used in a 2:1 ratio of fine marble powder and slaked lime, which ensured the desired effect for the surface, maintaining the aesthetic and material characteristics of the original artwork.

Great care was taken to achieve visual and structural continuity without compromising the authenticity of the object. The fillings were carried out precisely to create a uniform base, preparing the surface for the subsequent painting retouching.

Fig 45 - Final Filling

In areas where no painting retouching was applied, the mortar was pigmented with special colors to visually unify the heavily abraded areas. However, the effectiveness and appropriateness of permanently adopting this technique remain under evaluation, with the goal of achieving the best balance between aesthetic needs and preserving the authenticity of the work.

Fig 46 - Filling tests with pigmented mortar

- **Retouching**

The final phase focused on the painting touch-up, essential to restore the visual integrity of the artwork. Reversible watercolor paints were used, chosen for their compatibility with the original paint layer and for their ability to allow future interventions without difficulty.

The touch-up was performed using glazing techniques in the abraded areas, where part of the original paint layer had been lost, enhancing the readability of the image without altering its historical nature.

For the touch-up of the stucco work, a chromatic selection method was applied. This method involves the overlay of thin, parallel lines made with pure colors, which combine optically to recreate the desired tone, thus making the intervention recognizable. A range of pure colors compatible with the original hues of the artwork was selected, including earth tones, ochres, cobalt blue, and ivory black.

Fig 47 and 48 - Before and After Chromatic Re-Integration

The touch-up was evaluated from different distances to ensure optimal aesthetic results, while maintaining the legibility of the intervention.

Initially, very diluted glazes of ivory black pigment were applied. This color choice allowed for a subtle uniformity in the treated areas, maintaining a transparency that prevented complete coverage of the original traces. The dilution of the pigment achieved a soft, non-invasive visual effect, crucial for enhancing the grotesque decorations without overwhelming them. Subsequently, where necessary, glazes in undertones were applied to fill in the abrasions and visually balance the surfaces. These underglazes served the dual purpose of integrating the most abraded areas and avoiding excessive concealment. The calibrated use of glazes, with particular attention to tone and transparency, allowed for the enhancement of the existing decorations while fully respecting the principles of reversibility and recognizability.

The tratteggio technique was employed to visually integrate areas of loss while maintaining the distinguishability of the intervention. Fine, parallel lines of pure colors were applied using watercolors, carefully recreating the original tones and textures. The tratteggio was executed with precision, ensuring that the lines blended optically when viewed from a distance, while remaining discernible upon close examination. This approach achieved a balance between aesthetic integration and ethical restoration principles, preserving the authenticity of the piece while ensuring the intervention could be easily identified and reversed if necessary in the future.

Fig 49 and 50 - Before and after application of Tratteggio

Fig 51 and 52 - Close -up of Tratteggio application

Fg 53 and 54 - Before and After Chromatic Integration of the ceiling

10. **Final Conclusions and Recommendations**

This second restoration intervention marked a crucial step in the recovery and preservation of the artwork, completing and refining the operations initiated during the first phase. The consolidation, filling, and retouching work restored structural and visual stability to the piece, improving its readability and aesthetic coherence. At the same time, the interventions were carried out with meticulous adherence to the principles of reversibility and recognizability, preserving the authenticity of the artifact and ensuring the work performed remains evident.

Despite the progress made, the restoration cannot yet be considered entirely complete. Significant challenges remain, such as the completion of the descialbo on the lower walls and the treatment of the capital outlines. These elements require careful analysis to determine interventions that respect their aesthetic and structural features while maintaining the integrity of the original work. Any further decisions will, of course, require approval from the Project Management and the Heritage Authority to ensure a collaborative and compliant approach to preservation.

For the capitals, one potential solution could involve maintaining the visibility of their original shapes, using materials and tones that blend harmoniously with the surrounding plaster while remaining distinguishable. This approach would preserve the historical memory of these architectural elements without excessive mimicry that might compromise the intervention's transparency. However, this method also poses challenges, such as the complexity of selecting appropriate materials and tones that might not fully align with aesthetic expectations.

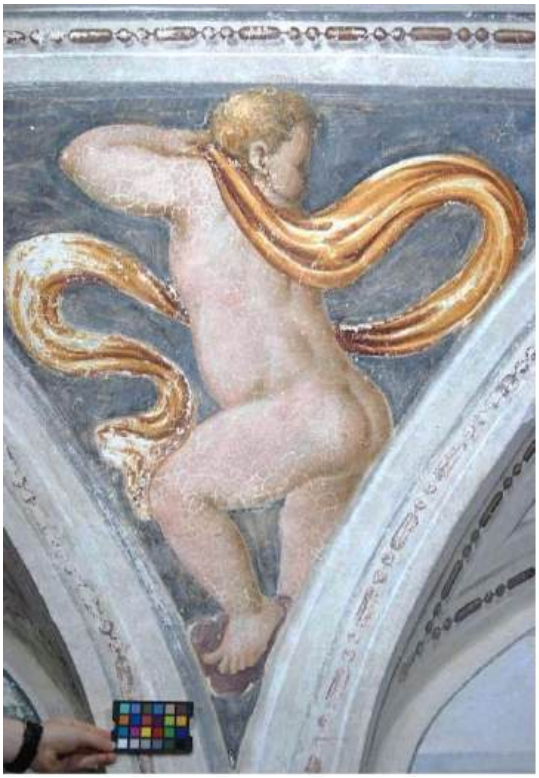
A key aspect for ensuring the long-term success of the interventions will be the implementation of a regular monitoring program. This should begin some time after the conclusion of the work, enabling a more accurate assessment of the environmental conditions' impact on the restored areas. Additionally, the detailed documentation of every phase of the restoration process—including mappings, photographs, and technical reports—will serve as an essential resource for the future management of the artifact. This documentation not only facilitates subsequent interventions but also builds a complete and accurate historical record of the conservation journey undertaken.

In conclusion, the work completed thus far provides a solid foundation for safeguarding and enhancing the artwork, paving the way for future interventions conducted with the same care and dedication. Restoration is not merely a technical process but a gesture of respect for history and art, requiring a delicate balance between aesthetic needs, material conservation, and the transmission of memory across time.

11. **Photographic Documentation**

LNE3 Before

LNE3 After



VNW2 Before

VNW2 After

Before Intervention

After Intervention

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6. Historical extracts (from Gian Giacomo Medici)