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TECHNICIAN TRAINING FOR THE CONSERVATION OF MOSAICS

PART 2
THE CONSERVATION OF DETACHED MOSAICS



The conservation of mosaics kept in storage



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Often a large number of mosaics removed from their original site are stored in a repository. Mosaics can be stored on new supports or without any support on support structures. Sometimes mosaics are kept in storage without any type of support, simply rolled up on their facing fabric. In all cases, it is necessary to correctly preserve the mosaic sections or fragments, creating new supports for them and appropriate storage structures.



Patrick Blanc © 2010 Musée Départemental Arles Antique, Atelier de Conservation-Restauration

Mosaics kept in storage on new supports



Michel Lacanaud © 2010 Musée Départemental Arles Antique, Atelier de Conservation-Restauration

Honeycomb aluminum panel



Emmano Carbonara 2010 © J. Paul Getty Trust

Reinforced concrete panel

Mosaics kept in storage without supports, on support planks



On metal shelves



One on top of another

Mosaics kept in storage without a new support

Examples



Patrick Blanc © 2010 Musée Départemental Arles Antique, Atelier de Conservation-Restauration

Mosaics put in storage on metal shelves on plywood panels



Ermanno Carbonara 2015 © J. Paul Getty Trust



Livia Alberti 2015 © J. Paul Getty Trust

Mosaics put in storage one on top of another on particleboard panels



Thomas Roby © 1997 Thomas Roby

Mosaics put in storage one on top of another on plywood panels



Evia Alberti 2016 © J. Paul Getty Trust

Mosaics put in storage on a wooden plank panel



Thomas Roby 2008 © J. Paul Getty Trust

Mosaics put in storage without any support structure



Livia Alberti 2019 © J. Paul Getty Trust

Characteristics and functionalities of long-term storage installations for mosaics

- Rigidity and stability of materials to be used
- Dimensions appropriate for mosaic sections/fragments
- Adequate weight-bearing capacity of the structure
- Accessibility of mosaic sections/fragments
- Optimization of space to be used
- Sustainability of construction and maintenance costs of the structure

Materials used to support mosaic sections/fragments

Particleboard panels

ADVANTAGES

- Inexpensive
- Readily available

DISADVANTAGES

- Easily deformed in the short term
- Low stability to humidity
- Low weight-bearing capacity
- Maintenance needs



Emanno Carbonara 2020 © J. Paul Getty Trust

Materials used to support mosaic sections/fragments

Plywood panels

ADVANTAGES

- Inexpensive
- Readily available
- Good weight-bearing capacity

DISADVANTAGES

- Easily deformed in the medium term
- Low stability to humidity
- Maintenance needs



Materials used to support mosaic sections/fragments

Wooden planks

ADVANTAGES

- Readily available
- Good weight-bearing capacity

DISADVANTAGES

- Expensive
- Easily deformed in the medium term
- Low stability to humidity
- Maintenance needs



Materials used to support mosaic sections/fragments

Painted or galvanized iron

ADVANTAGES

- Good stability
- Not easily deformed
- Very good weight-bearing capacity
- Low maintenance needs

DISADVANTAGES

- Expensive
- Not readily available



Materials used to support mosaic sections/fragments

Aluminum

ADVANTAGES

- Stable
- Not easily deformed
- Very good weight-bearing capacity
- No maintenance needs

DISADVANTAGES

- Expensive
- Not readily available



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Materials used to support mosaic sections/fragments

Polyethylene

ADVANTAGES

- Stable
- Not easily deformed
- Good weight-bearing capacity
- No maintenance needs

DISADVANTAGES

- Expensive
- Not readily available



Primary deterioration phenomena of mosaics
kept in storage without a new support

Deterioration phenomena

- Deformation of sections
- Detachment of tesserae
- Growth of micro-organisms
- Tearing of the fabric/paper
- Disintegration of the fabric/paper

Deterioration causes

- Inappropriate support materials for sections/fragments
- Inappropriate storage structure
- High humidity



Emanno Carbonara 2018 © J. Paul Getty Trust

Deterioration phenomena

- Deformation of sections
- **Detachment of tesserae**
- Growth of micro-organisms
- Tearing of the fabric/paper
- Disintegration of the fabric/paper

Deterioration causes

- High humidity
- Presence of light (ultraviolet)
- Variations in temperature and humidity



Livia Alberti 2015 © J. Paul Getty Trust

Deterioration phenomena

- Deformation of sections
- Detachment of tesserae
- **Growth of micro-organisms**
- Tearing of the fabric/paper
- Disintegration of the fabric/paper

Deterioration causes

- High humidity
- Presence of light (ultraviolet)



Livia Alberti 2015 © J. Paul Getty Trust

Deterioration phenomena

- Deformation of sections
- Detachment of tesserae
- Growth of micro-organisms
- Tearing of the fabric/paper
- Disintegration of the fabric/paper

Deterioration causes

- Inadequate removal procedure and materials
- Incorrect manipulation of sections during storage



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Deterioration phenomena

- Deformation of sections
- Detachment of tesserae
- Growth of micro-organisms
- Tearing of the fabric/paper
- Disintegration of the fabric/paper



Deterioration causes

- High humidity
- Presence of light (ultraviolet)
- Variations in temperature and humidity
- Inadequate removal materials and procedure
- Presence of animals in the repository



Treatments of mosaics kept in storage
without a new support

Intervention phases:

1. Documentation and cataloging of mosaic sections/fragments
2. Stabilization of the tessellatum
3. Creation of temporary support
4. Placement of sections/fragments in the storage structure

1. Documentation and cataloging of mosaic sections/fragments

- Identification of sections by creating a database and a data archiving system.
- Graphic and photographic documentation of the Condition Assessment of each mosaic section.

LOCATION : _____ INVENTORY OF MOSAIC FRAGMENTS/SECTIONS IN STORAGE DATE : ___/___/____

| | S001 | S002 | S003 | S004 | S005 | S006 | S007 | S008 | S009 | S010 | |
|--------------------------------|---|------|------|------|------|------|------|------|------|------|--|
| IDENTIFICATION | ID Mosaic | | | | | | | | | | |
| | Location in the storage room | | | | | | | | | | |
| | Temporary numbering | | | | | | | | | | |
| | Previous numbering - panel | | | | | | | | | | |
| | Previous numbering - facing | | | | | | | | | | |
| | Original location- site | | | | | | | | | | |
| | Original location- room/mosaic | | | | | | | | | | |
| Maximum dimensions (cm) | | | | | | | | | | | |
| Surface area (m ²) | | | | | | | | | | | |
| CONSTRUCTION TECHNIQUE | Tessera dimensions | | | | | | | | | | |
| | Material tessera color | | | | | | | | | | |
| | Material tessera color | | | | | | | | | | |
| | Material tessera color | | | | | | | | | | |
| | Material tessera color | | | | | | | | | | |
| | Material tessera color | | | | | | | | | | |
| | Density of the tesserae (no. in 20x20 cm) | | | | | | | | | | |
| | Interstices | | | | | | | | | | |
| PREVIOUS STATE | Type of facing used | | | | | | | | | | |
| | Type of adhesive used | | | | | | | | | | |
| | Other interventions | | | | | | | | | | |
| CONDITION | Resetable detached tesserae (no.) | | | | | | | | | | |
| | Loose non-resettable tesserae (no.) | | | | | | | | | | |
| | Deteriorated tesserae (no.) | | | | | | | | | | |
| | Presence of original bedding mortar | | | | | | | | | | |
| | Other | | | | | | | | | | |
| NEW STORAGE | Location in the new storage | | | | | | | | | | |
| | Photographic documentation folder name | | | | | | | | | | |
| | Graphic documentation folder name | | | | | | | | | | |

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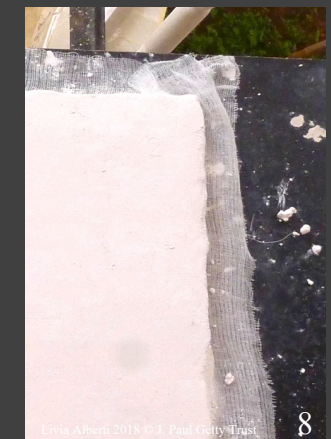
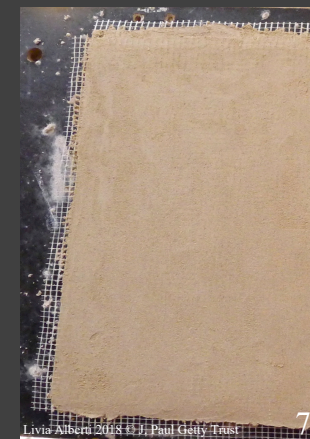
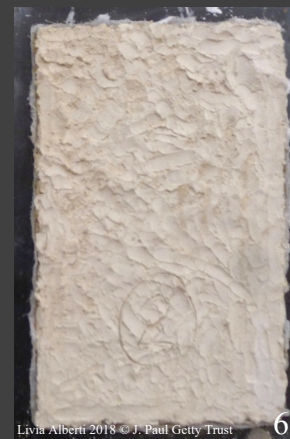
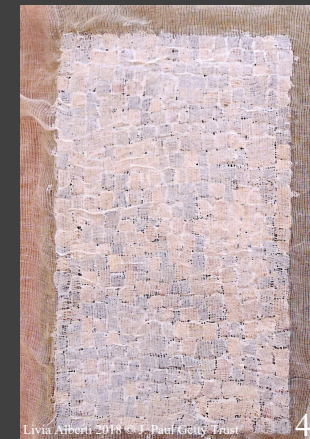
2. Stabilization of the tessellatum

- Collect and keep tesserae that are no longer in their original position in a small container.
- Clean the back of the tesserae with a brush and vacuum cleaner, avoiding the detachment of tesserae from the facing fabric/paper.
- Reattach the detached tesserae to the facing with an adhesive, keeping their original position and orientation.



3. Creation of a new temporary support

- Apply a layer of clay to the back of the sections/fragments and invert them (Photo 1).
- Dissolve the facing adhesive with an appropriate solvent, depending on the type of adhesive used and remove the facing fabric, verifying that the tesserae do not detach from the clay bedding layer (Photo 2, 3).
- Apply a new facing fabric layer (one or more) to the surface of the mosaic using an appropriate adhesive (Photo 4).
- Invert the mosaic sections/fragments and remove the clay layer (Photo 5).
- Apply an initial layer of a weak lime-based mortar to the back of the tesserae (Photo 6).
- Apply a second layer of mortar reinforced with natural fibers (hemp, cotton, horse hair) or synthetic fibers (polyester, carbon) (Photo 7).
- Apply a layer of wide weave natural fabric (cotton gauze or fabric) or synthetic fabric (polyester) with an adhesive (acrylic or vinyl) with aggregates, if necessary (Photo 8).



4. Placement of sections/fragments in the storage structure

- Dissolve the facing adhesive with an appropriate solvent, depending on the type of adhesive used and remove the fabric, verifying that the tesserae do not detach from the bedding layer.
- Store the sections/fragments with an identification code corresponding to the previously created catalog.



Documentation for mosaics kept in storage

Inventory of mosaic fragments/sections in storage

LOCATION : _____

DATE : ___/___/_____

| IDENTIFICATION | ID Mosaic | | | | | | | | | | |
|------------------------------------|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Location in the storage room | | | | | | | | | | |
| | Temporary numbering | S001 | S002 | S003 | S004 | S005 | S006 | S007 | S008 | S009 | S010 |
| | Previous numbering - panel | | | | | | | | | | |
| | Previous numbering - facing | | | | | | | | | | |
| | Original location- site | | | | | | | | | | |
| | Original location- room/mosaic | | | | | | | | | | |
| | Maximum dimensions (cm) | | | | | | | | | | |
| Surface area (m ²) | | | | | | | | | | | |
| CONSTRUCTION TECHNIQUE | Tessera dimensions | | | | | | | | | | |
| | Tessera dimensions | | | | | | | | | | |
| | Material tessera color | | | | | | | | | | |
| | Material tessera color | | | | | | | | | | |
| | Material tessera color | | | | | | | | | | |
| | Material tessera color | | | | | | | | | | |
| | Material tessera color | | | | | | | | | | |
| | Material tessera color | | | | | | | | | | |
| | Density of the tesserae (no. in 20x20 cm) | | | | | | | | | | |
| Interstices | | | | | | | | | | | |
| Note on the construction technique | | | | | | | | | | | |
| PREV. INTERV. | Type of facing used | | | | | | | | | | |
| | Type of adhesive used | | | | | | | | | | |
| | Other interventions | | | | | | | | | | |
| CONDITION | Resettable detached tesserae (no.) | | | | | | | | | | |
| | Loose non-resettable tesserae (no.) | | | | | | | | | | |
| | Deteriorated tesserae (no.) | | | | | | | | | | |
| | Presence of original bedding mortar | | | | | | | | | | |
| | Other | | | | | | | | | | |
| NEW REFERENCES | Location in the new storage | | | | | | | | | | |
| | Photographic documentation folder name | | | | | | | | | | |
| | Graphique documentation folder name | | | | | | | | | | |

Glossary of inventory of mosaic fragments/sections in storage

| | | GLOSSARY |
|------------------------|--|---|
| | ID Mosaic | to establish according to the original location of the fragment/section (site - building - room - no. of the fragment/section) |
| IDENTIFICATION | Location in the storage room | shelf (S) and panel (P) of the storage structure; refer to a drawing or photo of the structure where the numbering is shown (shelves from left to right, panels from below up), ex. S02-P08 |
| | Temporary numbering | consecutive numbers |
| | Previous numbering - panel | if marked on the panel |
| | Previous numbering - facing | if marked on the facing |
| | Original location- site | if known |
| | Original location- room/mosaic | if known |
| | Maximum dimensions (cm) | the largest dimensions that can be measured on two orthogonal axes. |
| | Surface (m ²) | to be calculated |
| CONSTRUCTION TECHNIQUE | Tessera dimensions | choose among the following categories: 0-6 mm (A), 6-10 mm (B), 10-15 mm (C) and > 15 mm (D) |
| | Tessera dimensions | " |
| | Material tessera color | choose among the following materials: Stone/Marble (S/M), Ceramic (C) and Glass (G), or Not Identifiable (NI) and following colors: White (W), Beige (Be), Grey (G), Black (B), Yellow (Y), Green (G), Red (R) and Other(O) |
| | Material tessera color | " " |
| | Material tessera color | " " |
| | Material tessera color | " " |
| | Material tessera color | " " |
| | Density of the tesserae (no. in 20x20 cm) | number of tesserae in a square of 20 x 20 cm |
| Interstices | choose among the following categories: 0 mm (A), 0-1 mm (B), 1-2 mm (C) and > 2 mm (D) | |
| PREV. INTERV. | Type of facing used | choose among the following materials: Gauze (Ga), Fabric (F), Paper (P) and Other (O) |
| | Type of adhesive used | choose among the following materials: Vinyl adhesive (V), Acrylic adhesive (Ac), Animal glue (A), or Not Identifiable (NI) |
| | Other interventions | note other types of interventions |
| CONDITION | Resettable detached tesserae (no.) | number of detached tesserae which are still in their place on the facing |
| | Loose non-resettable tesserae (no.) | number of detached tesserae which have lost their place on the facing |
| | Deteriorated tesserae (no.) | number of fractured, disaggregated, eroded tesserae |
| | Presence of original bedding mortar | yes / no |
| | Other | note other types of deterioration |
| NEW REFERENCES | Location in the new storage | shelf (S) and panel (P) of the new storage structure; refer to the numbering present on the structure and on the drawing or photograph of the storage, ex. S1-P12 |
| | Photographic documentation folder name | |
| | Graphic documentation folder name | |

LEGEND - CONDITION AND CURRENT INTERVENTIONS MAP 1 BACK OF THE TESSELLATUM

Mosaic fragment/section ID : _____

- Loss of tesserae within the fragment/section
- Presence of original mortar preparation layers
- Presence of roots
- Deteriorated tesserae consolidated with:
- Detached tesserae re-adhered to the facing with:
- Tesserae reset on a reinforced facing (fabric, paper or gauze) with:
-
-

PREPARED BY : _____

DATE : _____

LEGEND - CONDITION AND CURRENT INTERVENTIONS MAP 2 FRONT OF THE TESSELLATUM

Mosaic fragment/section ID : _____

- Area of loss in the old fabric/paper facing
- Loose tesserae (kept in a container)
- Tesserae reset on clay
- Infilling of lacunae with:
- Filling of interstices with:
- Reference lines present on the old facing

PREPARED BY : _____

DATE : _____

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MOSAIKON is a partnership of four institutions: the Getty Conservation Institute, the Getty Foundation, ICCROM, and ICCM. The aims of the project are to strengthen the network of professionals concerned with the conservation, restoration, maintenance, and management of mosaic heritage in the southern and eastern Mediterranean region; provide training to a variety of individuals involved in mosaics conservation and, more generally, with the management of archaeological sites and museums with mosaics; work with national and international bodies to provide a more favorable legislative, regulatory, and economic environment for the conservation of mosaics in the Mediterranean; and promote the dissemination and exchange of information.

