

# Getty



## TECHNICIAN TRAINING FOR THE CONSERVATION OF MOSAICS

PART 3

THE CONSERVATION OF ARCHITECTURAL REMAINS AND THEIR DECORATIVE SURFACES



## Structures and decorative surfaces: their documentation during conservation interventions



Livia Alberti, Ermanno Carbonara, Thomas Roby



## STRUCTURE

Group of architectural elements designed to be occupied by people or to fulfill a variety of functions. A structure can be a building or a monument.

# Architectural elements of a **STRUCTURE**

## Wall

Construction in masonry, earth or other material, that is continuous in nature, rising vertically from the ground or a habitable floor and whose length and height are greater than its width.



Scott Warren 2011 © J. Paul Getty Trust



Livia Alberti 2006 © J. Paul Getty Trust

## Pavement

Part of a structure made up of a horizontal platform on the ground floor or a separation between two floors.



Ermanno Carbonara 2017 © J. Paul Getty Trust

## Vault

Curved construction that is a type of ceiling. A vault works under compression and distributes the weight that it supports to the weight-bearing elements.



Livia Alberti 2006 © J. Paul Getty Trust

## Arch

Curved construction that is the thickness of a wall. An arch works under compression by distributing the weight that it supports to the weight-bearing elements.



## Seating

Element composed of a riser and footer allowing spectators to be seated.



Scott Warren 2011 © J. Paul Getty Trust



## Stairway

Construction made up of a regular series of footers and risers or steps to move from one level to another, ascending or descending.



Scott Warren 2011 © J. Paul Getty Trust

## Column

Independent support element that is circular in section, fluted or composite, usually made up of a capital, shaft and base. The shaft can be monolithic or made of several blocks.



Ermanno Carbonara 2008 © J. Paul Getty Trust

## Pillar

Independent support element that is rectangular in section, square or composite. The shaft can be monolithic or made of several blocks.



Scott Warren 2011 © J. Paul Getty Trust



Livia Albert 2007 © J. Paul Getty Trust

# Different typologies of CONSTRUCTIONS



Livia Alberti 2006 © J. Paul Getty Trust

## Small stone work

Masonry made with small elements.

*Stone work:* Masonry made with elements that are placed not thrown, making up a construction.



Livia Alberici 2006 © J. Paul Getty Trust

## Large stone work

Masonry made with large elements.

*Stone work: Masonry made with elements that are placed not thrown, making up a construction.*



## Mixed stone work

Masonry made with elements that are very different in terms of their dimensions and role in the wall.

*Stone work: Masonry made with elements that are placed not thrown, making up a construction.*



Thomas Roby 2005 © J. Paul Getty Trust

## Irregular stone work

Masonry made with elements that are laid, not following regular courses.

*Stone work:* Masonry made with elements that are placed not thrown, making up a construction.





## Coursed stone work

Masonry made with a series of elements essentially placed on the same level, forming superimposed courses.

*Stone work:* Masonry made with elements that are placed not thrown, making up a construction.



## Wall core

Interior part of a wall between two **faces** made of small stones or stone fragments embedded in a layer of mortar.

*Faces* : Visible part that makes up the external layer of the wall.



Thomas Roby 2019 © J. Paul Getty Trust

## Blocage

Lime-based mortar (ancient cement) poured into a trench or temporary formwork which is removed once the mortar has set.



**Dry wall construction**  
No binder present.

**A CONSTRUCTION** is generally made up of:

## Elements:

construction unit

- Rubble stone
- Block
- Brick
- Ceramic elements

## Binders:

materials that hold together the construction elements

- Mortar
  - Lime-based
  - Earth-based
- Metallic elements

# Rubble Stone

- **Raw rubble**  
Rubble stone as extracted from the quarry.
- **Dressed rubble**  
Rubble stone with worked facing side.
- **Squared rubble**  
Rubble stone worked on several sides, sometimes all sides.



Livia Alberti 2006 © J. Paul Getty Trust

***Rubble** : stone element either worked or not, fairly small in size able to be carried by a single man.*

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Thomas Roby, 2007 © J. Paul Getty Trust

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Aurora Ortega de Torre 2007 © J. Paul Getty Trust

***Rubble** : stone element either worked or not, fairly small in size able to be carried by a single man.*



# Block

- **Raw block**  
Block as extracted from the quarry.
- **Dressed bed block**  
Block with only the bed (horizontal) sides worked.
- **Ashlar block**  
Block worked on all sides.
- **Sculpted stone**  
Block worked in a decorative, artistic or symbolic way.



**Block:** stone element either worked or not, too large to be carried by a single man.

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Livia Alberti 2007 © J. Paul Getty Trust

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Livia Alberti 2007 © J. Paul Getty Trust



Livia Alberti 2007 © J. Paul Getty Trust

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Livia Alberti 2007 © J. Paul Getty Trust

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## Brick

Clay-based mix formed into a rectangular shape, then either fired or dried, and used in masonry.



Fired clay-based mix



Dried clay-based mix

## Ceramic elements

Clay-based mix that is made into various shapes, generally by hand, and fired.



Vaulting tubes





## Mortar

Combination of a binder (lime, etc.), aggregates (sand, gravel, etc.) and an appropriate amount of water.

- **Lime-based**

Mix of lime and aggregates used when still soft and malleable that fulfills its structural function when it sets and becomes hard.

- **Earth-based**

Mix of earth and aggregates used when still soft and malleable that fulfills its structural function when it dries and becomes hard.



Primo, Carbonara, 2017. © J. Paul Getty Trust

- **Lime-based**  
Mix of lime and aggregates used when still soft and malleable that fulfills its structural function when it sets and becomes hard.
- **Earth-based**  
Mix of earth and aggregates used when still soft and malleable that fulfills its structural function when it dries and becomes hard.



Livia Alberti 2007 © J. Paul Getty Trust



Thomas Roby 2007 © J. Paul Getty Trust

## Metallic elements

Metalwork in different shapes, generally made of iron or bronze, used to hold masonry elements in place.

# Metallic elements - cramp

Binders



Aurora Ortega de Torre 2007 © J. Paul Getty Trust

# Typologies of Roman **construction**

## Opus caementicium

Rubble work masonry made up of a mixture of mortar and stones poured and packed between two formworks or two facings.



Livia Alberti 2007 © J. Paul Getty Trust



Aurora Ortica de Torre 2007 © J. Paul Getty Trust

## Opus incertum

Rubble work masonry using small unworked stones, laid in irregular courses.



Livia Alberti 2020 © J. Paul Getty Trust



## Opus reticulatum

Rubble work masonry created with squared rubble stone laid at 45 degree angle.



Livia Alberti 2020 © J. Paul Getty Trust

## Opus mixtum

Name given to all masonry that mixes rubble and brick, or with parts in *Opus reticulatum* surrounded by parts in brick.



Livia Alberti 2020 © J. Paul Getty Trust



Scott Warren 2012 © J. Paul Getty Trust

# Opus testaceum

Masonry created entirely from fired brick.



Ermanno Carbonara 2019 © J. Paul Getty Trust



Ermanno Carbonara 2019 © J. Paul Getty Trust

## Opus latericium

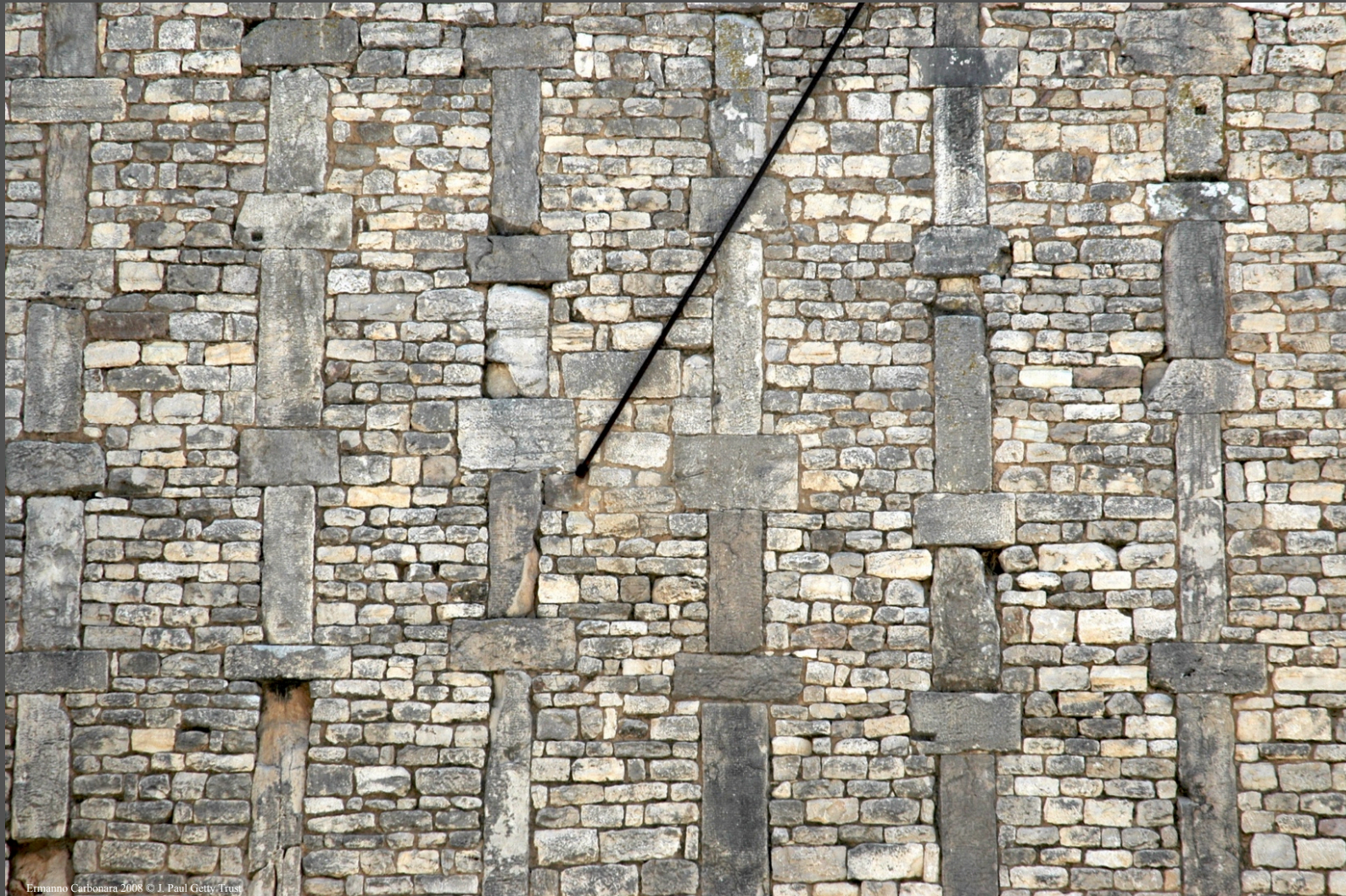
Masonry created entirely from unfired brick.



Ermanno Carbonara 2017 © J. Paul Getty Trust

## Opus africanum

Masonry composed of vertical chains of large ashlar blocks connected by rubble stone work.



# Different typologies of **DECORATIVE SURFACES**





Livia Alberti 2005 © J. Paul Getty Trust



Livia Alberti 2005 © J. Paul Getty Trust

Wall mosaic





Thomas Roby 2007 © J. Paul Getty Trust

## Wall Plaster



Ermanno Carbonara 2008 © J. Paul Getty Trust



Ermanno Carbonara © 2014 Ermanno Carbonara

## Painted wall plaster



Thomas Roby 2007 © J. Paul Getty Trust



Livia Alberti 2005 © J. Paul Getty Trust

Stucco



Cocciopesto - mortar with ceramic fragments



Zellij

# PAVEMENTS

## Mortar flooring



Cocciopesto - mortar with ceramic fragments



Mortar with stone fragments

# Stone slabs



Scott Warren 2011 © J. Paul Getty Trust



Livia Alberti 2015 © J. Paul Getty Trust



# Documentation of Structures and Decorative Surfaces

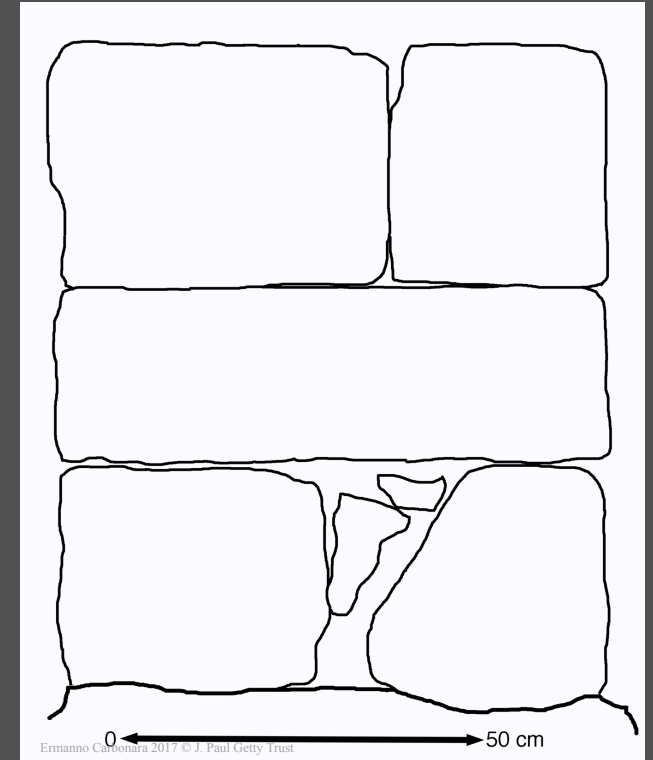
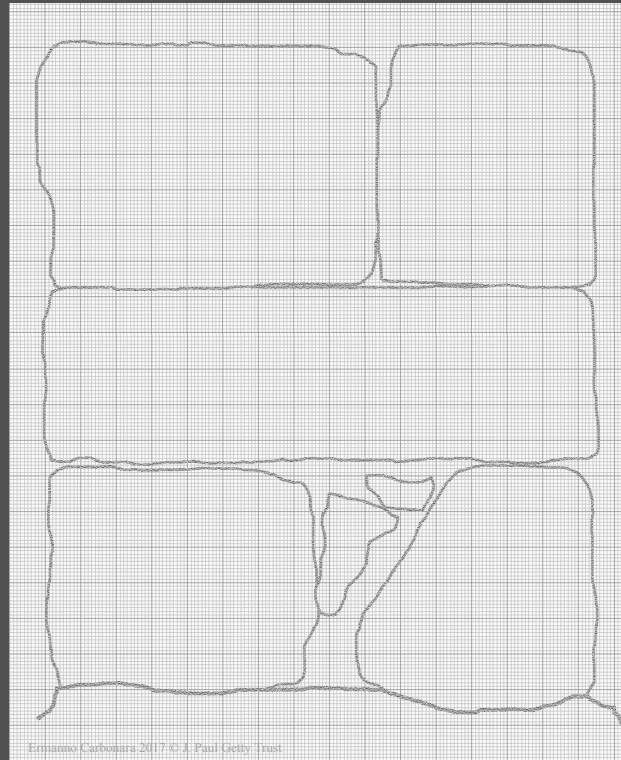
## Graphic or photographic base

### Drawing of the structure:

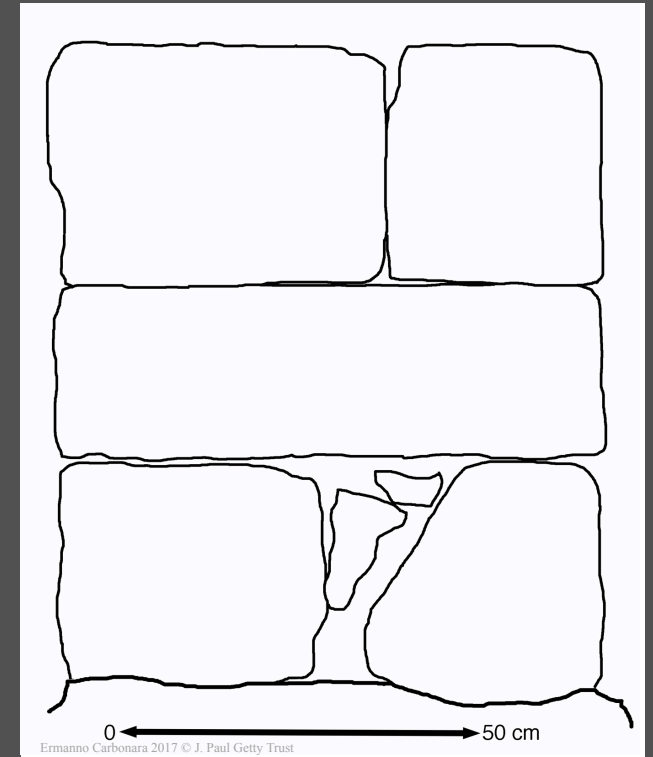
- Direct measured drawing
- Retracing on tracing paper from a photo

### Photography of the structure:

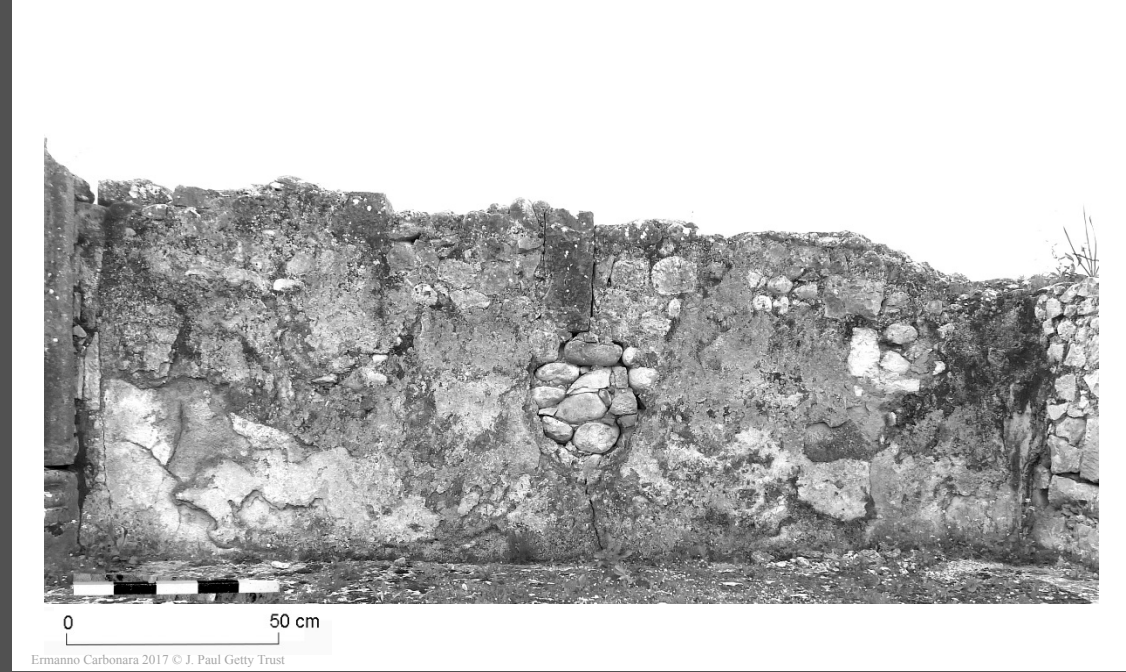
- Photograph of the structure in a single frame
- Photograph of the structure by area to create a photo montage by computer



Measured drawing



Retracing on tracing paper from a photo



Photograph of the structure in a single frame



Photograph of the structure by area to create a photo montage by computer

# DATA FORM – CONSERVATION OF STRUCTURES AND DECORATIVE SURFACES

STRUCTURE/DECORATIVE SURFACE ID: \_\_\_\_\_  
Abbreviations / building / room / elevation / section  
 space top

*This form should be accompanied by an overall photograph of the structure or surface decoration before and after conservation treatment, and by a plan of the building, indicating the location of the room. Mark also the location of the wall elevation if the object is a vertical surface.*

## PART OF THE STRUCTURE

<input type="checkbox"/> Wall	<input type="checkbox"/> Vault	<input type="checkbox"/> Steps	<input type="checkbox"/> Cistern/Basin	<input type="checkbox"/> Pavement
<input type="checkbox"/> Other:				

## CONSTRUCTION MATERIALS

<input type="checkbox"/> Dry Stone	<input type="checkbox"/> Stone and lime mortar	<input type="checkbox"/> Stone and earthen mortar	<input type="checkbox"/> Brick
<input type="checkbox"/> Earth	<input type="checkbox"/> Other:		

## TYPE OF SURFACE DECORATION

<input type="checkbox"/> Wall Plaster	<input type="checkbox"/> Painted Wall Plaster	<input type="checkbox"/> Crushed Ceramic Mor.	<input type="checkbox"/> Marble Plaque
<input type="checkbox"/> Stone Slabs	<input type="checkbox"/> Tile/Zellij	<input type="checkbox"/> Stucco/gyps. plaster	<input type="checkbox"/> Other:

## PREVIOUS INTERVENTIONS

<input type="checkbox"/> Repairs of the structure		<input type="checkbox"/> Repairs of the surface decoration of wall or pavement
---	--	--

*Graphic documentation map attached*

## CONDITION ASSESSMENT

<input type="checkbox"/> Loss of stones or mortar of the structure	<input type="checkbox"/> Cracks
<input type="checkbox"/> Detached stones of the structure	<input type="checkbox"/> Deformations (bulge or depression)
<input type="checkbox"/> Vegetation	<input type="checkbox"/> Loss of surface decoration of wall or pavement
<input type="checkbox"/> Micro-organisms	<input type="checkbox"/> Detachment of surface decoration of wall or pavement
<input type="checkbox"/> Incrustations	<input type="checkbox"/> Deteriorated surface decoration
<input type="checkbox"/> Efflorescences	<input type="checkbox"/> Deteriorated previous interventions

*Graphic documentation map attached*

## CURRENT INTERVENTIONS

<input type="checkbox"/> Vegetation removal	<input type="checkbox"/> Cleaning	<input type="checkbox"/> Removal of modern repair mortars
<input type="checkbox"/> Repair of the structure with mortar and/or stones	Mortar compositions:	
<input type="checkbox"/> Resetting in place of detached stones		
<input type="checkbox"/> Other interventions on the structure:		
<input type="checkbox"/> Repair of the surface decoration with mortar (in-filling/edging repair)	Mortar compositions:	
<input type="checkbox"/> Grouting voids below the surface decoration		
<input type="checkbox"/> Removal and resetting in place of parts of the surface decoration		
<input type="checkbox"/> Reintegration of area of loss with:		
<input type="checkbox"/> Other treatment of the surface decoration :		

*Graphic documentation map attached*

PREPARED BY

DATE

# Conservation Data Form for the documentation of Structures and Decorative Surfaces

# DATA FORM – CONSERVATION OF STRUCTURES AND DECORATIVE SURFACES

STRUCTURE/DECORATIVE SURFACE ID: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
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## PART OF THE STRUCTURE

<input type="checkbox"/> Wall	<input type="checkbox"/> Vault	<input type="checkbox"/> Steps	<input type="checkbox"/> Cistern/Basin	<input type="checkbox"/> Pavement
<input type="checkbox"/> Other:				

## CONSTRUCTION MATERIALS

<input type="checkbox"/> Dry Stone	<input type="checkbox"/> Stone and lime mortar	<input type="checkbox"/> Stone and earthen mortar	<input type="checkbox"/> Brick
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## PREVIOUS INTERVENTIONS

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<input type="checkbox"/> Other treatment of the surface decoration :		

PREPARED BY \_\_\_\_\_

DATE \_\_\_\_\_



Site



Building/Monument



Room/Space



Elevation/Top



Section



# DATA FORM – CONSERVATION OF STRUCTURES AND DECORATIVE SURFACES

STRUCTURE/DECORATIVE SURFACE ID: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
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<input type="checkbox"/> Other:				

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### TYPE OF SURFACE DECORATION

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<input type="checkbox"/> Stone Slabs			
<input type="checkbox"/> Tile/Zellij			
<input type="checkbox"/> Stucco/gyps. plaster			
<input type="checkbox"/> Other:			

### PREVIOUS INTERVENTIONS

<input type="checkbox"/> Repairs of the structure	<input type="checkbox"/> Repairs of the surface decoration of wall or pavement	<input type="checkbox"/> <i>Graphic documentation map attached</i>
---	--	--

### CONDITION ASSESSMENT

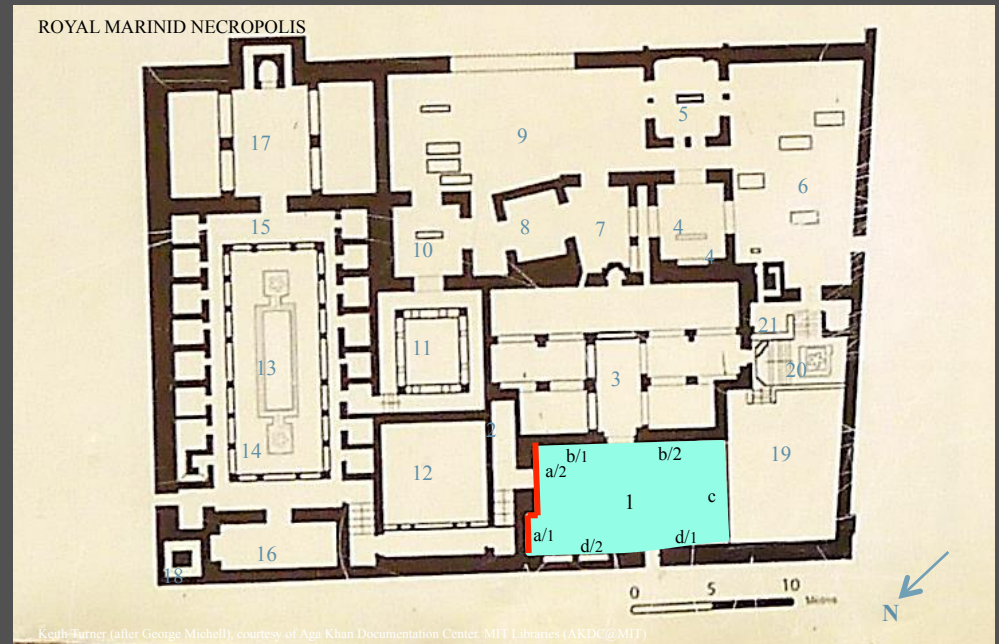
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<input type="checkbox"/> Reintegration of area of loss with:		
<input type="checkbox"/> Other treatment of the surface decoration :		

PREPARED BY \_\_\_\_\_

DATE \_\_\_\_\_



ID : Ch / NRM / 1 / a / 1-2



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STRUCTURE/DECORATIVE SURFACE ID: Ch / NRM / 1 / a / 1-2  
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 space top

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## PART OF THE STRUCTURE

<input type="checkbox"/> Wall	<input type="checkbox"/> Vault	<input type="checkbox"/> Steps	<input type="checkbox"/> Cistern/Basin	<input type="checkbox"/> Pavement
<input checked="" type="checkbox"/> Other: <i>Portal</i>				

## CONSTRUCTION MATERIALS

<input type="checkbox"/> Dry Stone	<input checked="" type="checkbox"/> Stone and lime mortar	<input type="checkbox"/> Stone and earthen mortar	<input type="checkbox"/> Brick
<input type="checkbox"/> Earth	<input type="checkbox"/> Other:		

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<input type="checkbox"/> Stone Slabs	<input checked="" type="checkbox"/> Tile/Zellij	<input type="checkbox"/> Stucco/gyps. plaster	<input type="checkbox"/> Other:

## PREVIOUS INTERVENTIONS

<input type="checkbox"/> Repairs of the structure		<input type="checkbox"/> Repairs of the surface decoration of wall or pavement
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PREPARED BY

DATE



Ermanno Carbonara 2015 © J. Paul Getty Trust



Ermanno Carbonara 2015 © J. Paul Getty Trust

# Getty



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.

