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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.



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.



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 Alberti 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 Alberti 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.

Block

- **Raw block**
Block as extracted from the quarry.
- **Dressed bed block**
Block with only the bed (horizontal) sides worked.
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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.



Bologna, 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.



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 Tonic 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.



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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

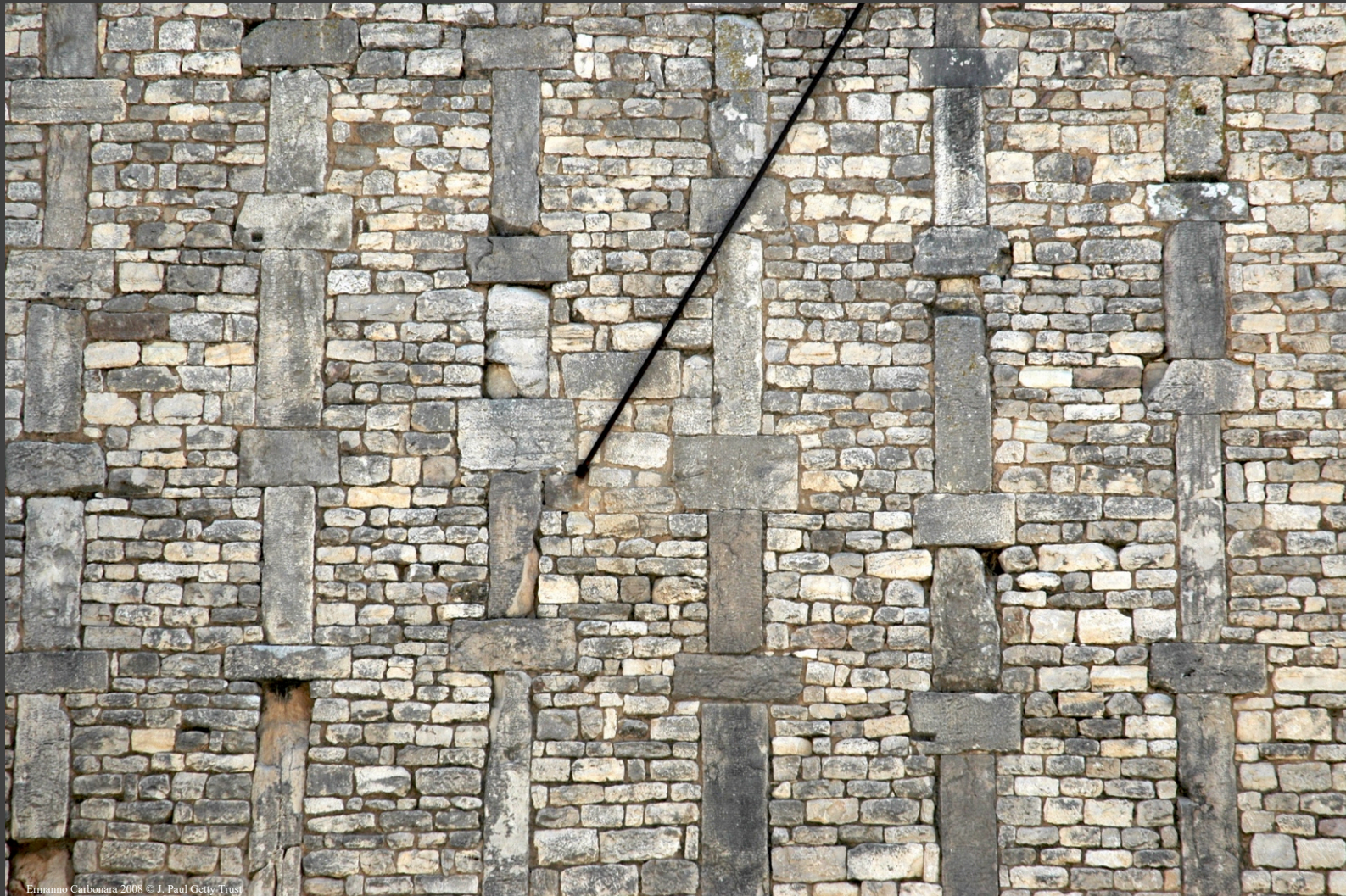
Masonry created entirely from unfired brick.



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**



Aurora Ortega de Torre 2007 © J. Paul Getty Trust



Thomas Roby 2005 © J. Paul Getty Trust



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

Painted wall plaster



Ermanno Carbonara © 2014 Ermanno Carbonara



Thomas Roby 2007 © J. Paul Getty Trust



Livia Alberici 2005 © J. Paul Getty Trust

Stucco



Cocciopesto - mortar with ceramic fragments



Zellij

PAVEMENTS



Cocciopesto - mortar with ceramic fragments



Mortar with stone fragments



Scott Warren 2011 © J. Paul Getty Trust



Livia Alberti 2015 © J. Paul Getty Trust

Documentation of Structures and Decorative Surfaces

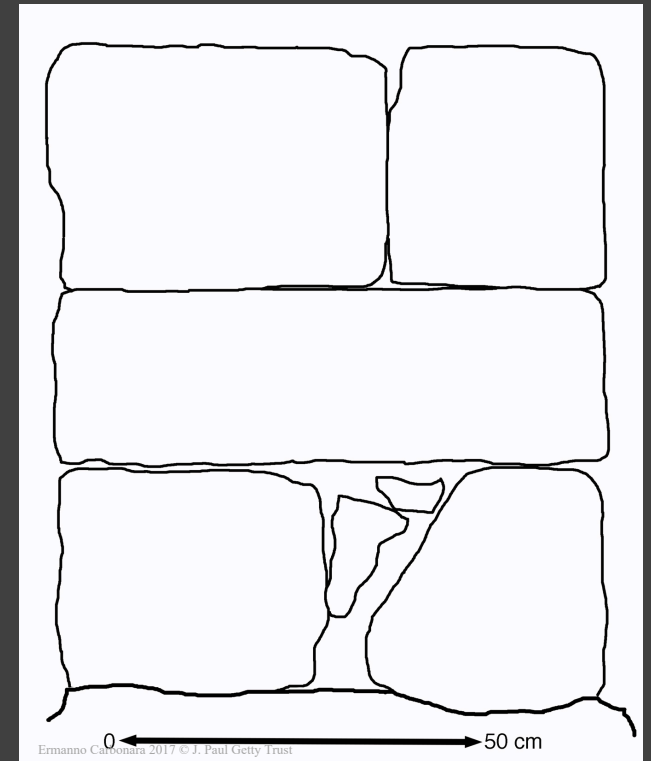
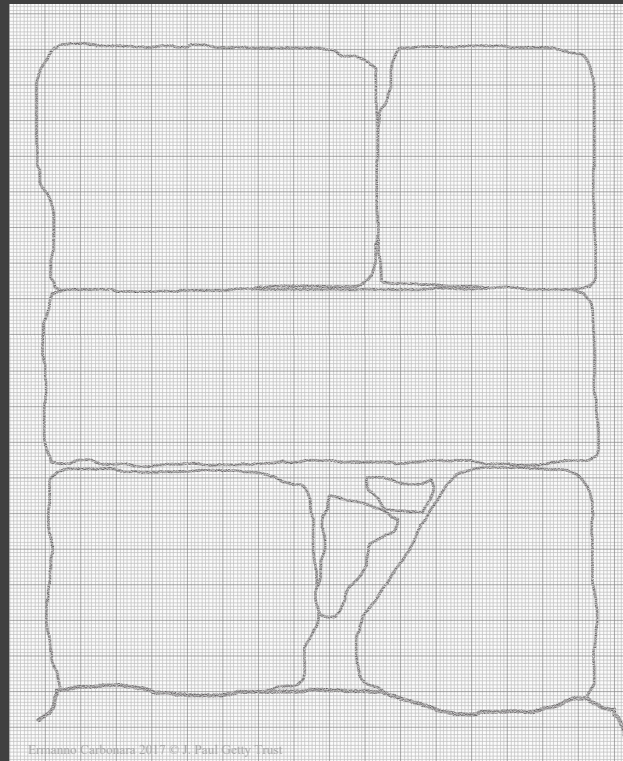
Graphic or photographic base

Drawing of the structure:

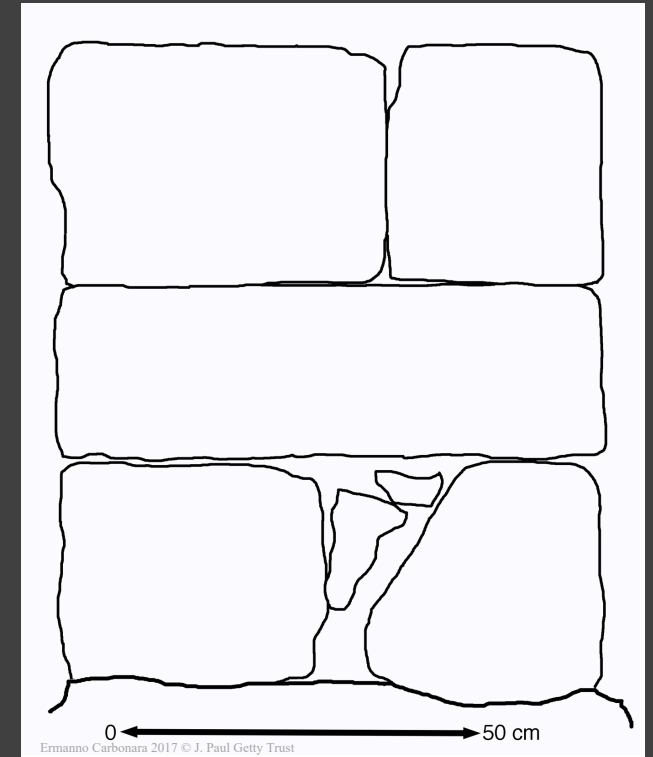
- Direct measured drawing
- Retracing on tracing paper from a photo

Photography of the structure:

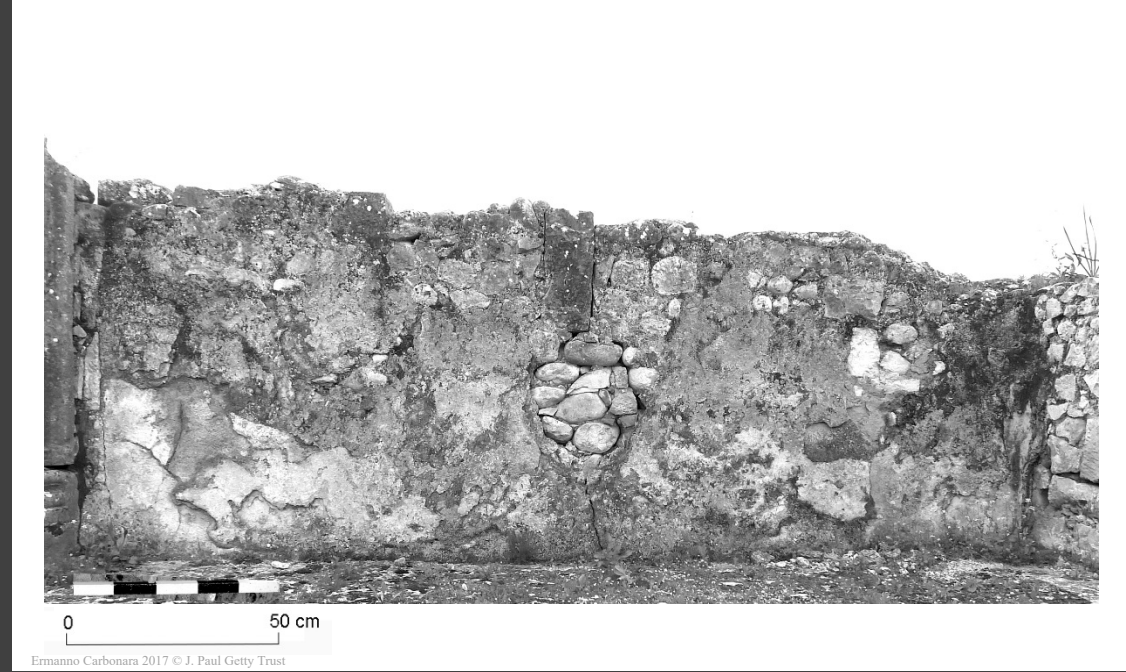
- Photograph of the structure in a single frame
- Photograph of the structure by area to create a photo montage by computer



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

Graphic documentation map attached

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

CONDITION ASSESSMENT

Graphic documentation map attached

<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

CURRENT INTERVENTIONS

Graphic documentation map attached

<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 <input type="checkbox"/> Resetting in place of detached stones <input type="checkbox"/> Other interventions on the structure:		Mortar compositions:
<input type="checkbox"/> Repair of the surface decoration with mortar (in-filling/edging repair) <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 :		Mortar compositions:

PREPARED BY

DATE

Conservation Data Form for the documentation of Structures and Decorative Surfaces

DATA FORM – CONSERVATION OF STRUCTURES AND DECORATIVE SURFACES

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<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

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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

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Site



Scott Warren 2011 © J. Paul Getty Trust

Building/Monument



Ermanno Carbonara 2018 © J. Paul Getty Trust

Room/Space



Ermanno Carbonara 2018 © J. Paul Getty Trust

Elevation/Top



Ermanno Carbonara 2018 © J. Paul Getty Trust

Section

DATA FORM – CONSERVATION OF STRUCTURES AND DECORATIVE SURFACES

STRUCTURE/DECORATIVE SURFACE ID: _____ / _____ / _____ / _____ / _____
Abbreviations / building / room / elevation / section
 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 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	<input type="checkbox"/> <i>Graphic documentation map attached</i>
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CONDITION ASSESSMENT

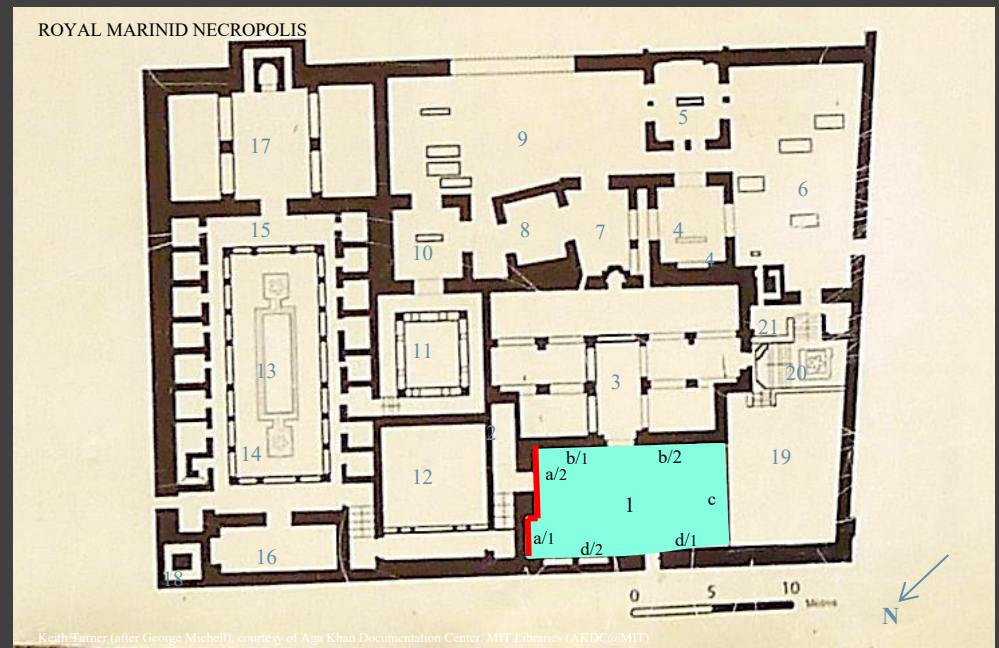
<input type="checkbox"/> Loss of stones or mortar of the structure	<input type="checkbox"/> Cracks
<input type="checkbox"/> Detached stones of the structure	<input type="checkbox"/> Deformations (bulge or depression)
<input type="checkbox"/> Vegetation	<input type="checkbox"/> Loss of surface decoration 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
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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 :		

PREPARED BY _____

DATE _____



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



DATA FORM – CONSERVATION OF STRUCTURES AND DECORATIVE SURFACES

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

TYPE OF SURFACE DECORATION

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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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CONDITION ASSESSMENT

<input type="checkbox"/> Loss of stones or mortar of the structure	<input type="checkbox"/> Cracks
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<input type="checkbox"/> Reintegration of area of loss with:		
<input type="checkbox"/> Other treatment of the surface decoration :		

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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.

