



Technical conservation plan for an architectural detail in the Khan El Faranj

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1. Introduction

- The objective of this work is to prepare a technical conservational plan for an architectural detail in Akko's Khan El Faranj
- The methodology oof the work includes an overview of the Khan El Faranj, the general survey of the architectural elements in the Khan, a choice of a specific architectural element, the graphic information of the element, the state of preservation and the causes, as well as the proposed solutions

2. Background in historical research

- The site where the Khan now sits was first developed in 1110 when King Baldwin I of Jerusalem granted Venice a quarter within the Crusader city. They established a guest house for travelling merchants that followed the architectural style of the Levant the caravanserai, or Khan. Nothing from this era still stands

- Later, the French dominate the trade through Akko and in 1610, Khan Franj (the French Khan) was the hub for the cotton trade in the Holy Land

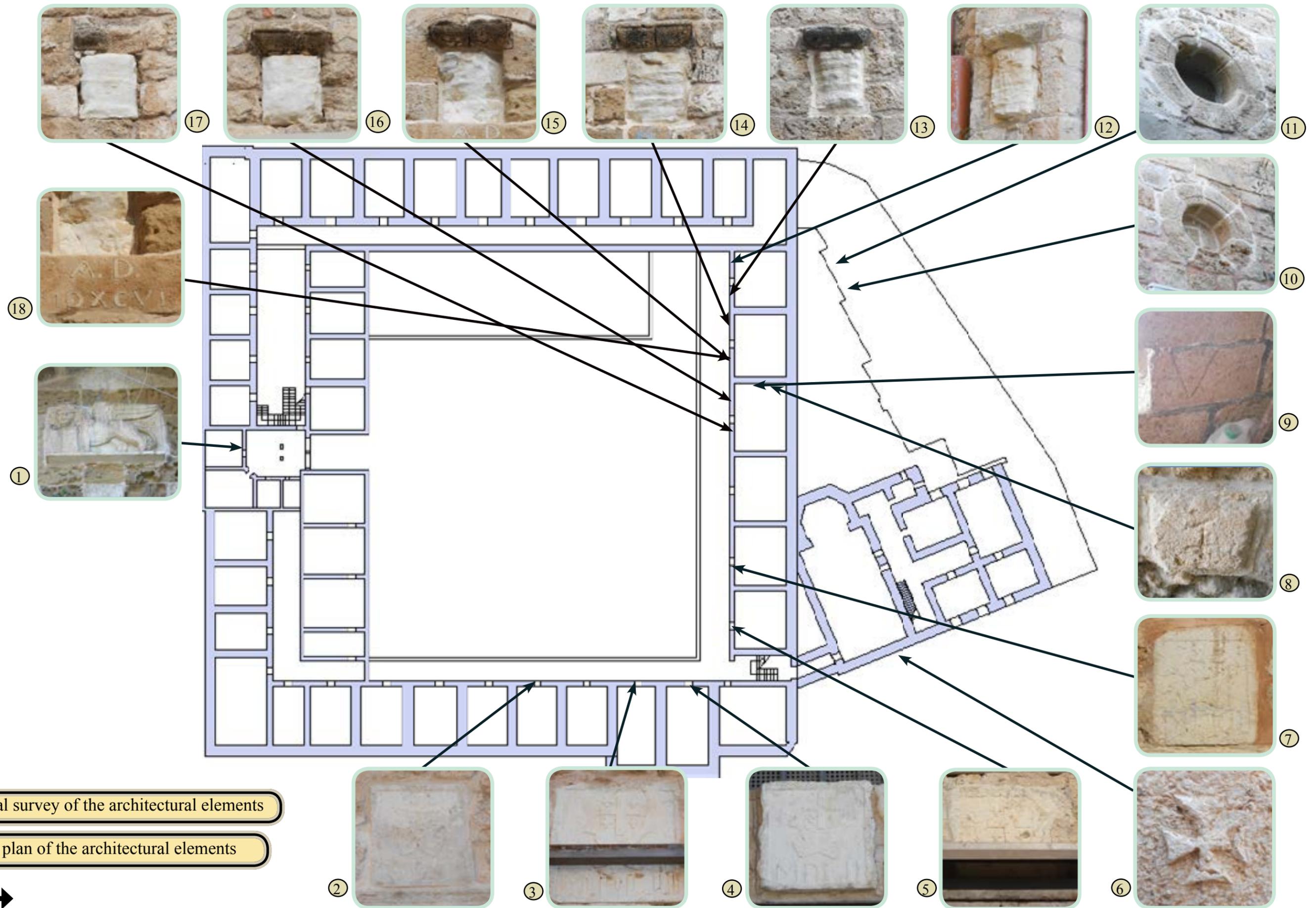
- By the mid 17th century, the Khan was known as the Khan of Ambassadors. The upper floor served as the residence for consuls from around Europe, while the bottom floor retained its commercial use as storage and storefronts

- In the 18th century the European traders no longer operate in Akko

(*for more information about the Khan's history check the project: "Khan El Faranj" , by Owen Thompson)



Plan and sections of the town and defences of St. Jean D'Acre (Published by John Weale, 59 High Holborn, June 1, 1843)

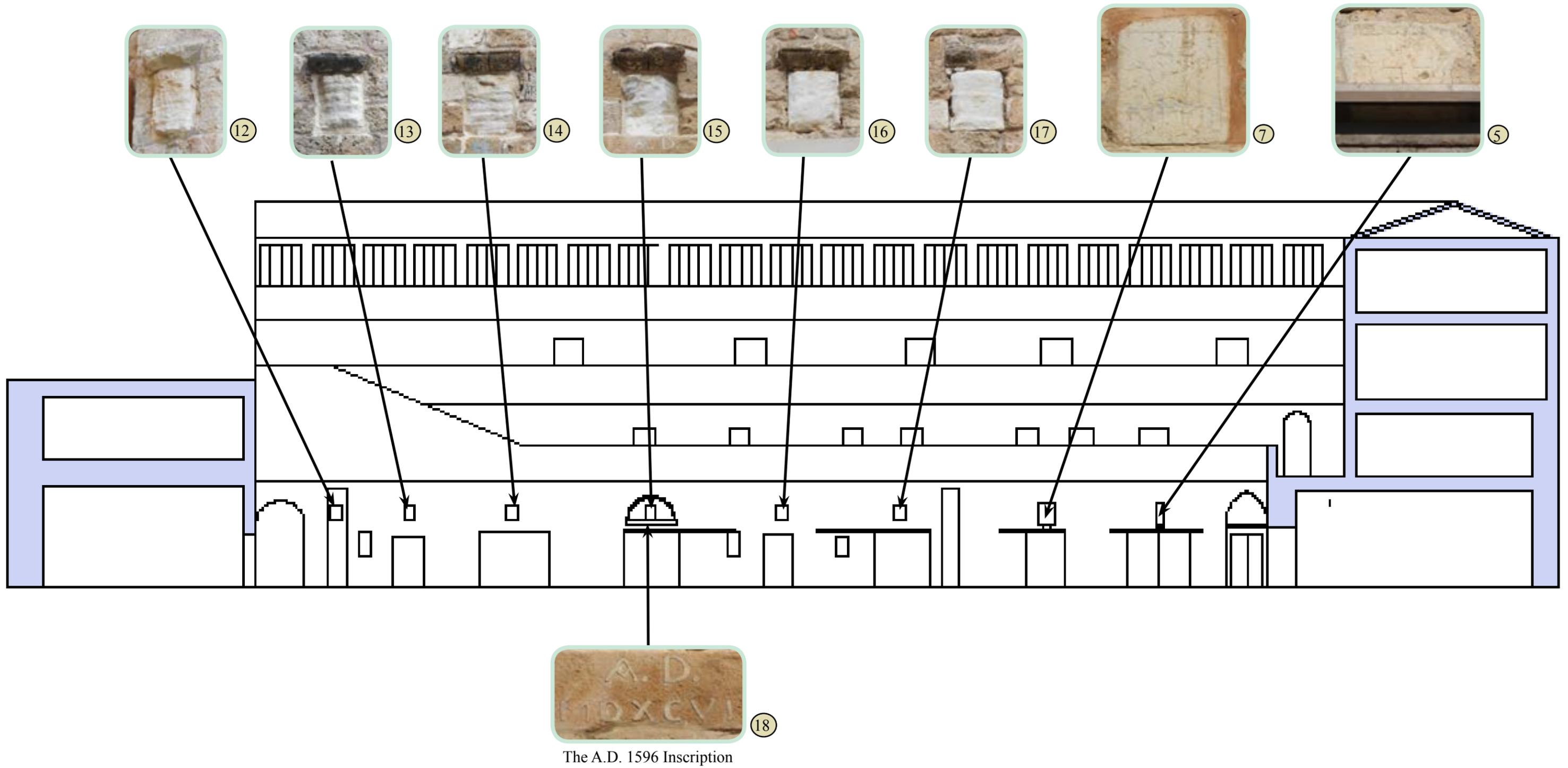


3.2 Facade map of the architectural elements

North facade

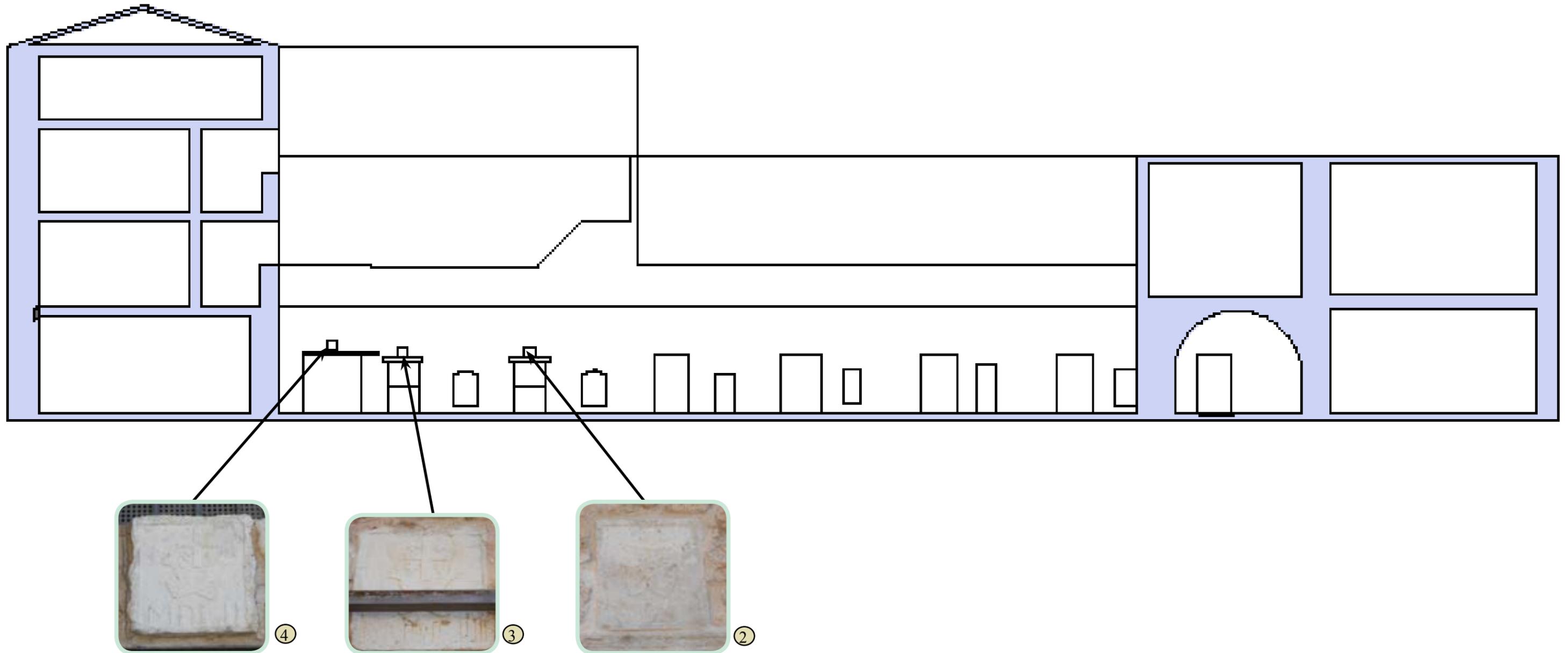
6 identical pilars set on the same height of the north facade

2 Franciscan logos with the year 1552



3.2 Facade map of the architectural elements

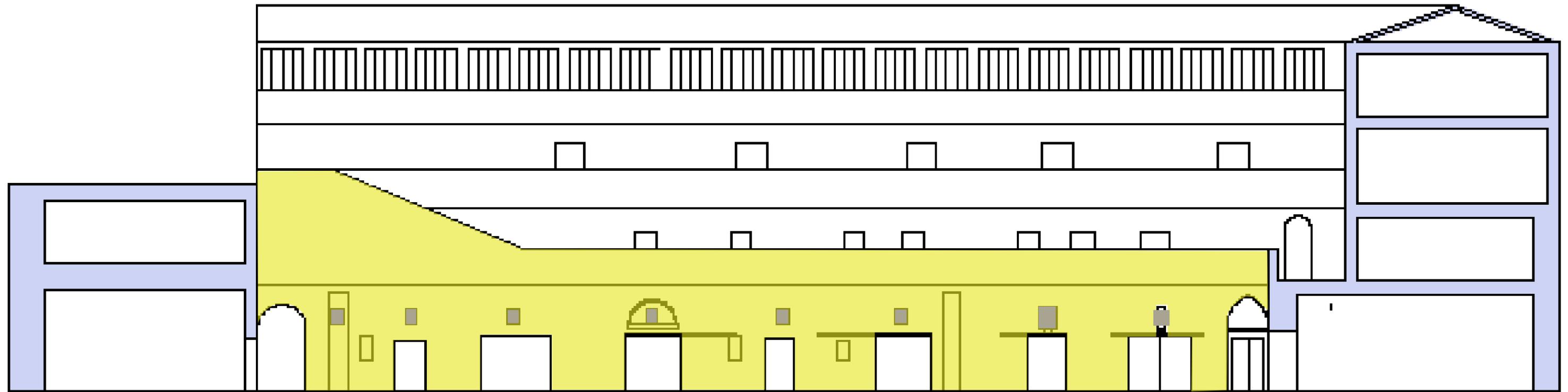
East facade



3 Franciscan logos with the year 1552

3.3 Facade map of the stones

North facade



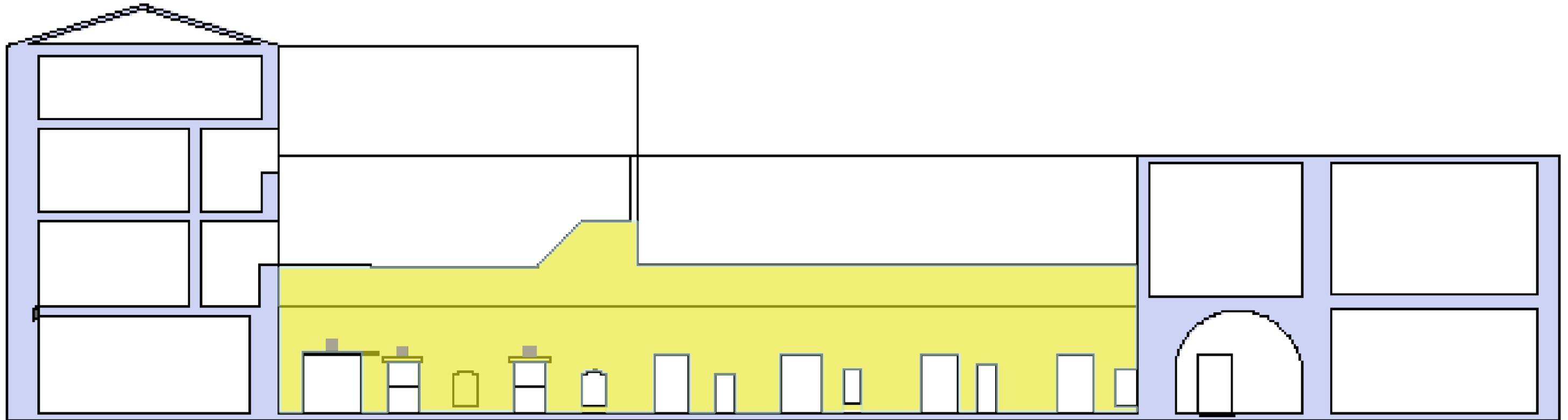
Legend:

- Sandstone ■
- Limestone ■

- Sandstone has been used to build the walls, and the details have been carved in limestone. The walls have been treated with cement, so in some of places the original material is not visible

3.3 Facade map of the stones

East facade



Legend:

-Sandstone ■

-Limestone ■

3.4 Facade map of the mortars

North facade

Cement



12

Cement



13

Hydraulic lime with sandstone particles



14

Hydraulic lime with sandstone particles



15

Cement

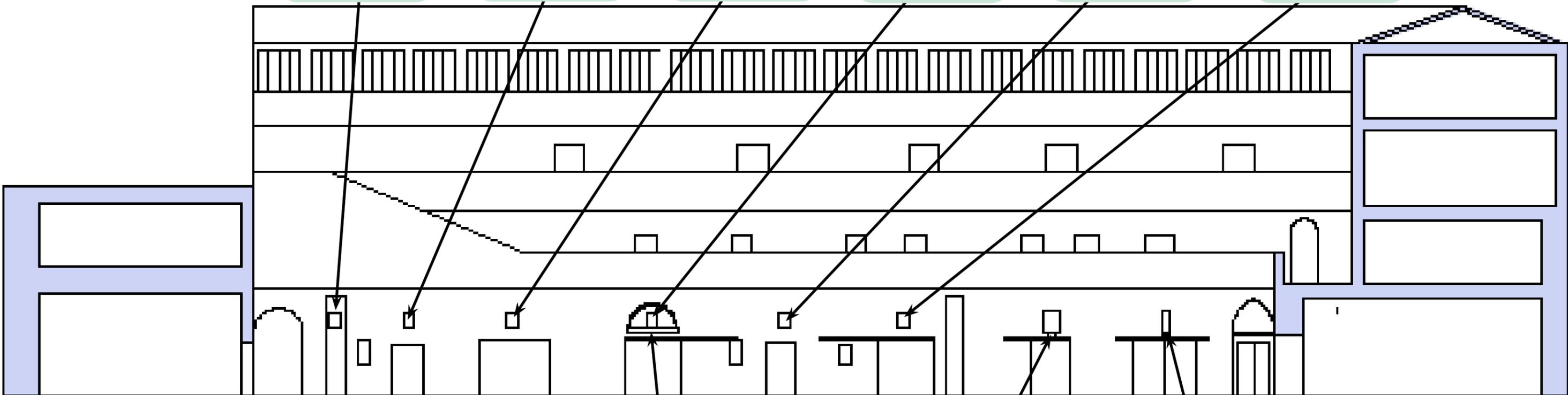


16

Cement



17



18

Cement



7

Cement

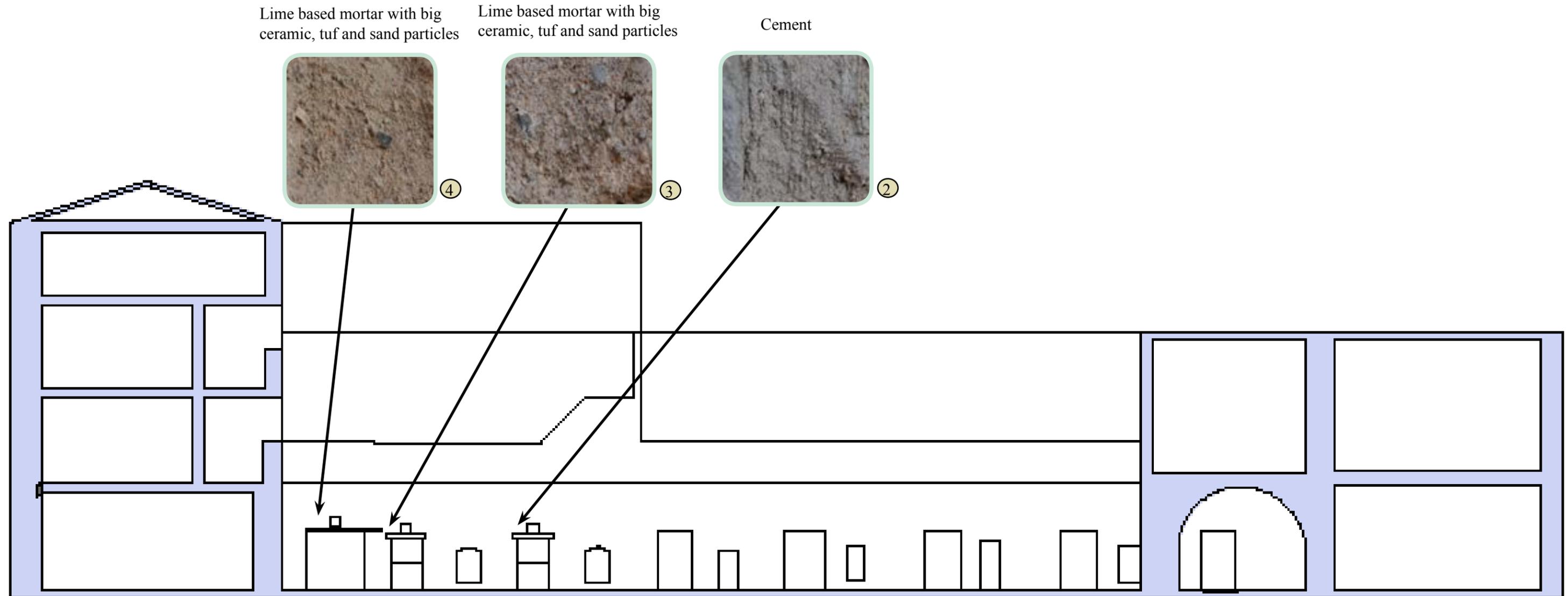


5

Lime based mortar with big ceramic, tuf and sand particles

3.4 Facade map of the mortars

East facade



- Cement is the material we can see here the most. There are different kinds of cement used as treatment, so they cover the original material. There is hydraulic lime based mortar around 2 pilars, and a lime based mortar with ceramic, tuf and sand particles around the 3 out of 5 Franciscan logos

3.5 Description and value of the architectural elements

Physical condition: (1 - the most unstable condition, extremely deteriorated, material is missing; 2 - more stable but highly deteriorated, less material is missing; 3 - there is more material, less deterioration and the element is more stable, 4 - most of the material is present, a little deteriorated, the element is stable 5 is the most stable one, with all of the material present and not deteriorated)

- ① A winged lion carved in limestone with a high artistic value.
Physical condition: 4



- ② A Franciscan logo from 1552, carved in limestone with a high historical value.
Physical condition: 2



- ③ A Franciscan logo from 1552, carved in limestone with a high historical value.
Physical condition: 4



- ④ A Franciscan logo from 1552, carved in limestone with a high historical value.
Physical condition: 4



- ⑤ A Franciscan logo from 1552, carved in limestone with a high historical value.
Physical condition: 3



- ⑥ A relief of a cross in limestone on the east outside of the Khan's walls with a high historical value.
Physical condition: 3



- ⑦ A Franciscan logo from 1552, carved in limestone with a high historical value.
Physical condition: 2



- ⑧ A cross ingraved into a crusaders stone (inside of the garage, on the north side of the Khan) with a historical value, but less technological and artistic values.
Physical condition: 2



9

A V shaped sign (not identifiable) engraved into a crusaders stone (inside of the garage, on the north side of the Khan) with historical value, and less technological and artistic value.
Physical condition: 2



10

2 original, roundly shaped windows in the backyard of the Khan's northern wall with an important artistic value. The windows on the building built in 1927 imitate these ones artistically.
Physical condition: 3 (left picture) and 4 (right picture)



12

What is it: 6 identical limestone pillars on the

13

Khan's wall with a technological value as they are supporting the northern wall. All of them

14

have a more pronounced ledge.

15

Physical condition: some are in better and some in worse physical condition. Mainly the tops are

16

the parts that are in a somewhat worse physical condition.

17



18

An inscription in sandstone: A.D. 1596, placed under an arch and one of the 6 pillars. It has a high technological value due to the way the letters stand in the sandstone. It has an artistic value, and an important historical value.
Physical condition: 3



3.6 Deterioration Patterns

Bird droppings

Discoloration (not original, blue color - probably dropped on the element while coloring the wall next to it)

Incrustation

Dirt, Incoherent deposit

Microbiological attack (visible because of the discoloration of the limestone)

1



Splashes of mortar/ remains of the conservation material

Erosion (loss of original surface, leading to smoothed shapes)

Microbiological attack (discoloration of the limestone)

Problems with cement intervention

Desegregation

2



Splashes of mortar/ remains of the conservation material

Problems with cement intervention

Microbiological attack (discoloration of the limestone)

Desegregation

Erosion (rounding of the edges)

3



Problems with cement intervention
 (detachment of cement - water penetrates and enters the stone)
 Microbiological attack (discoloration of the limestone)
 Desegregation



Splashes of mortar/ remains of the conservation material
 Erosion (loss of original surface, leading to smoothed shapes)



Erosion (loss of original surface, leading to smoothed shapes and rounding of the edges)
 Problems with cement intervention
 (the cement is pressuring the limestone)



Alveolization



Fe pin (stuck next to the pilar)
 Disruption
 Erosion
 Original mortar deterioration
 Salt crystallization problems (due to water penetration and cement which does not allow the area to "breathe")



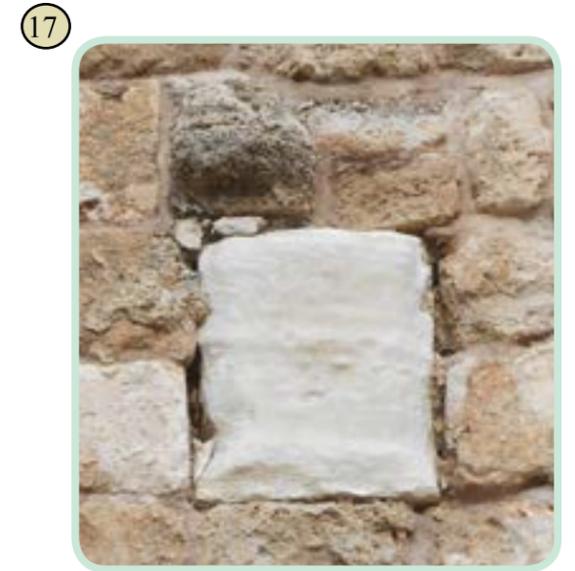
Disruption
 Erosion
 Original mortar deterioration
 Pulverization
 Crust (on the pilar)
 Salt crystallization problems



Disruption
Erosion
Original mortar deterioration
Pulverization
Salt crystallization problems



Fault, Missing Part (of the “roof”)
Erosion (of the “roof”)
Microbiological attack (cracks in the ledge)
Lack of mortar (around the pillar)
Pulverization (of the pilars surface)
Disruption
Salt crystallization problems



Disruption
Erosion
Original mortar deterioration
Pulverization
Salt crystallization problems



Problems with cement intervention
Granular disintegration (often in sandstone)
Corosion process (on the letters)



Disruption
Erosion
Original mortar deterioration
Pulverization
Salt crystallization problems



4. The inscription

The artistic element is an inscription saying:
Anno Domini 1596 .



The inscription and its surrounding arch

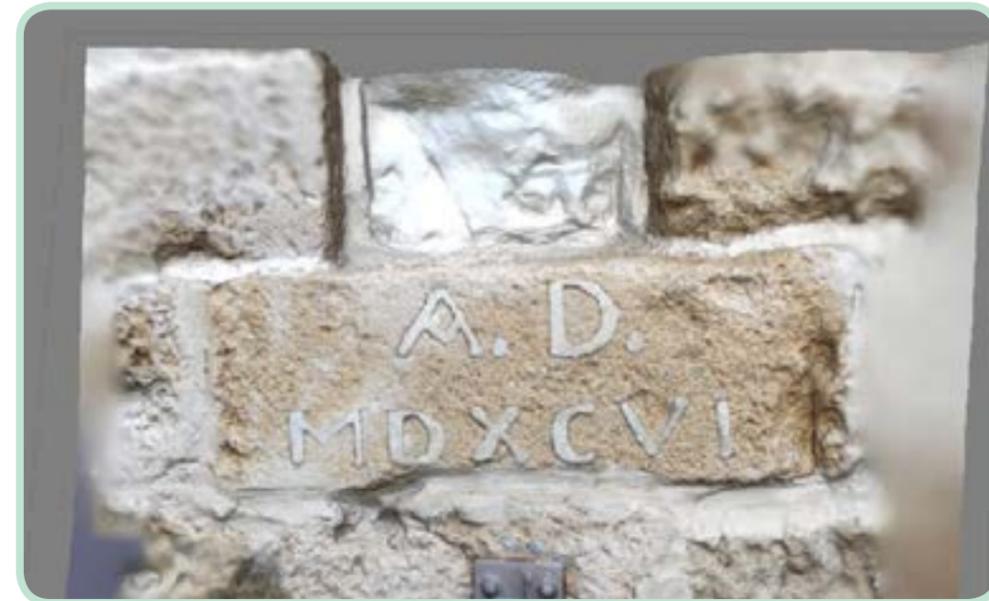


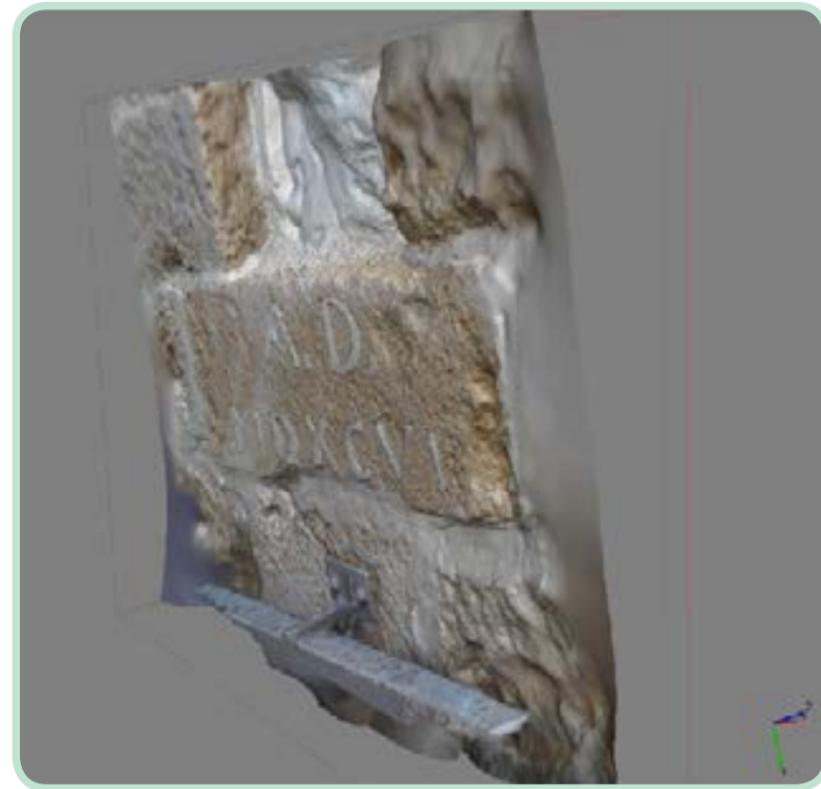
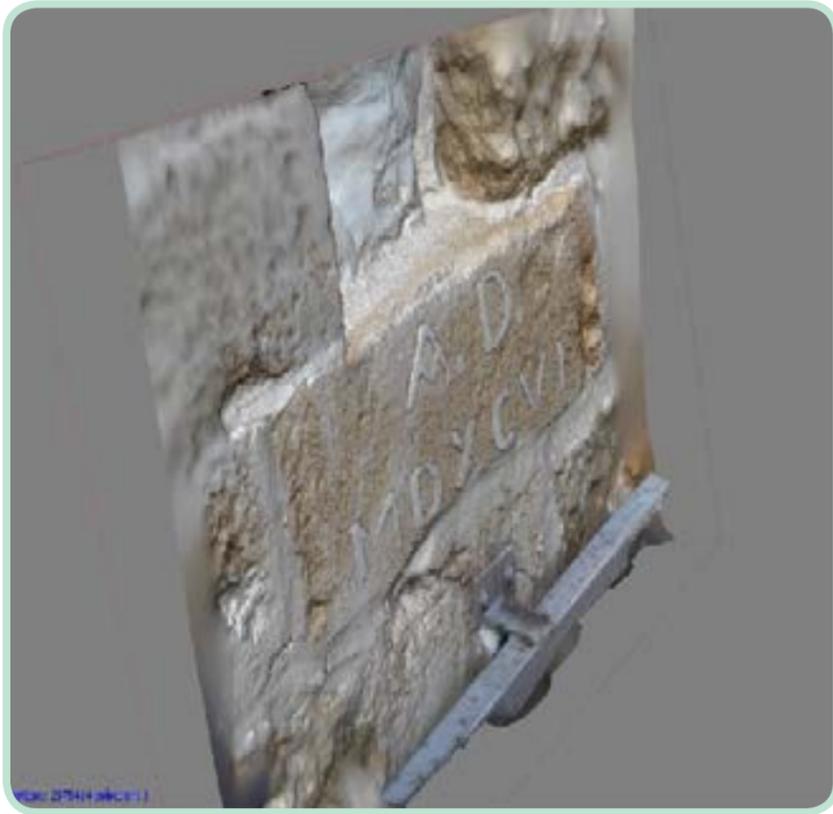
The inscription and the mortar

THE CONSERVATION PLAN:

- 1) the observation of the element
- 2) the analysis of the stones and the letters, as well as its surrounding area
- 3) the determination of problems and causes
- 4) the proposition for the treatment

4.1 The 3D Model





4.2 The building technology of the inscription



The inscription



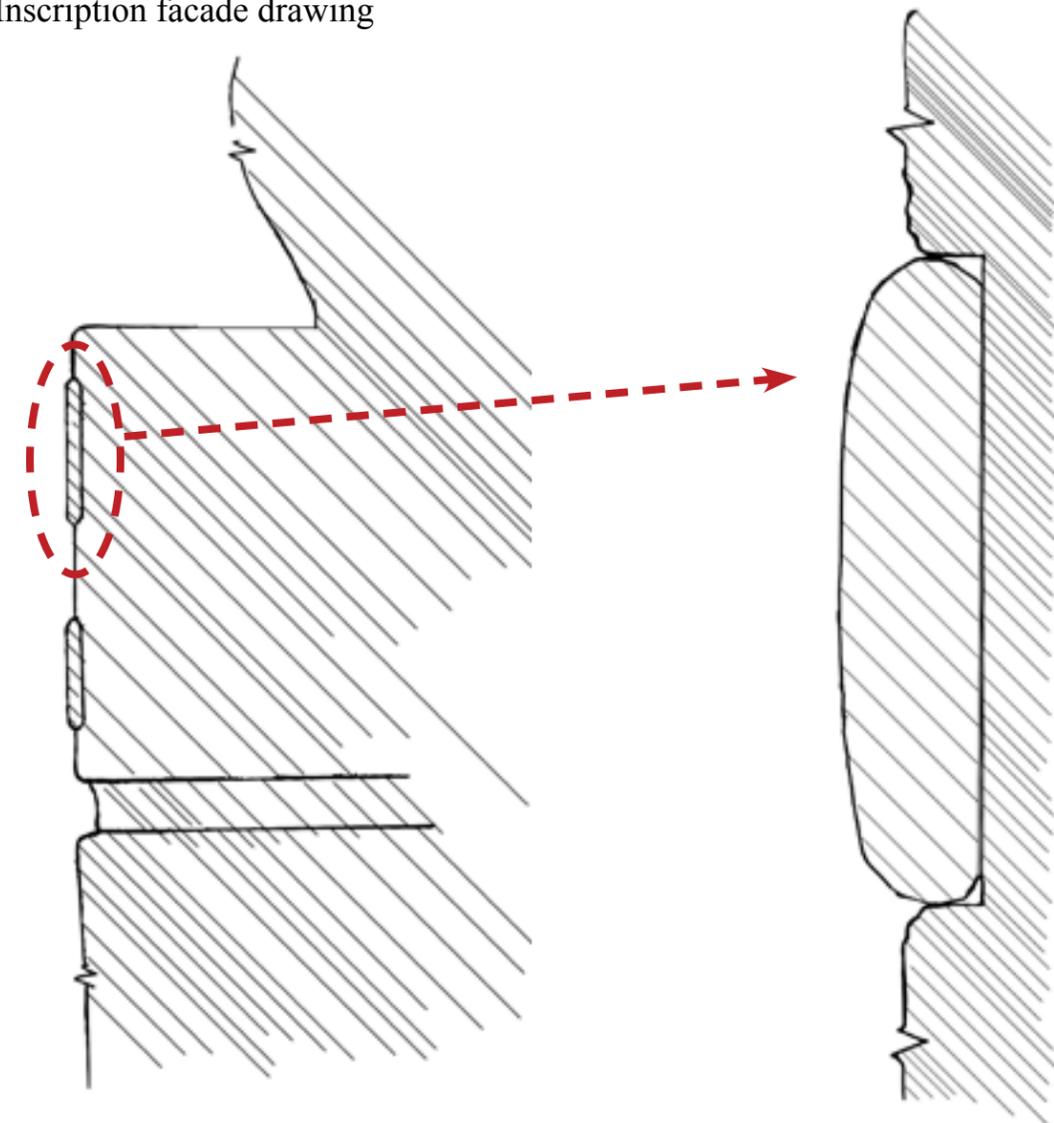
Inscription facade drawing



The letters of the inscription

The building technology:

- 1) the sandstone has been carved in the shape of the letter
- 2) hot led has been poured inside of the carving
- 3) the led has expanded after getting cold and it is firmly attached to the sandstone (very strong led, no disattachment problems)



Inscription section drawing

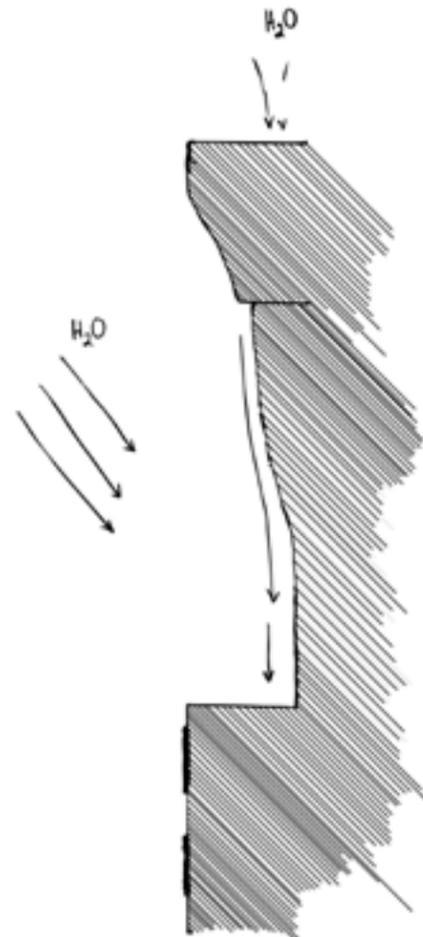
Section detail

4.3 Problems and causes of the physical condition

The pillar and its ledge are causing more problems to the element than the element itself.

1) WATER DRAINAGE

- through a crack on the ledge water comes in and falls down straight to the inscription sandstone
- the whole building has got problems with water drainage with needs to e handled first in order to be able to proceed with the intervention



Section of the ledge, the pillar and the inscription stone drawing - to demonstrate how water enters

2) BIO ATTACK

- the bio attack causes the deterioration of the ledge, which leads to water penetrating through it and falling down to the sandstone



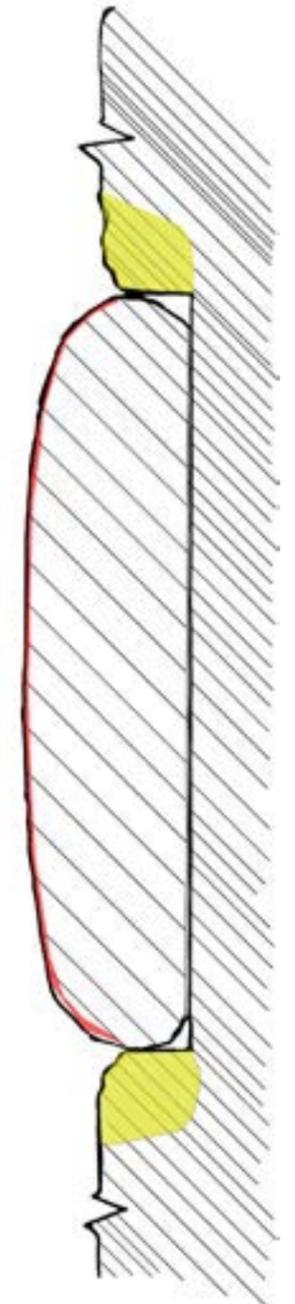
3) SALT CRYSTALLIZATION PROBLEMS

- the whole north facade has salt crystallization problems



4) CORROSION ON THE LETTERS

- the time and the weather condition caused corrosion on the led



- Legend:
- Deterioration of the sandstone ■
 - Corrosion ■

5) PREVIOUS CEMENT INTERVENTION

- not only does cement pressure the stone and does not allow the area to “breathe”, it is also estetically bad
- the estetics of this element and it’s homogeneity is of big importance



The yellow indicates where the cement should be replaced with hydraulic lime mortar with sandstone particles

6) STONE DETERIORATION

- there are places where the sandstone is more deteriorated due to cement pressure and the water that enters; however the sandstone is in a pretty good condition



The red indicates the deteriorated sandstone

4.4 Proposed solutions and treatment

1) CLEANING OF THE ENTIRE AREA

2) REPAIRATION OF THE LEDGE

- a) to clean the ledge from the biological attack : herbicide, fungicide treatment with ALGAE CONTROL BPS 7111 -apply it with a brush, and after clean it with water
- b) joint filling of the hole in the ledge
- c) impregnation with IDROPELEN IMPREGNATION MATERIAL

3) STABILIZATION OF THE PILAR

- a) to apply a mix of paper powder, EDTA (30 g/L) and bicarbonate amonia (30 G/L) and 1 L of water (apply with hands and wait for an hour an clean with water)
- b) to close the holes on the limestone pilar with hidraulic lime mortar
- c) to consolidate the surface of the limestone; apply CALOSIL (Ca(OH)₂ + ethanol nano) with a brush and the material will enter the stone nd crystallize

4) CEMENT REMOVAL AND JOINT FILLING

- a) apply PARALOID B75 (60 g/L) to conservate the stone
- b) put a gauze around the stone and apply PARALOID B72 (150 g/L)
- c) remove the cement
- d) put the hydraulic lime mortar with sandstone particles where the cement was
- e) when the hidraulic lime with sandstone particles dries put acetone on the gauze and remove it

5) MECHANICAL CLEANING OF THE LETTERS

- a) clean the letters mechanically using a skalpel and a brush

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