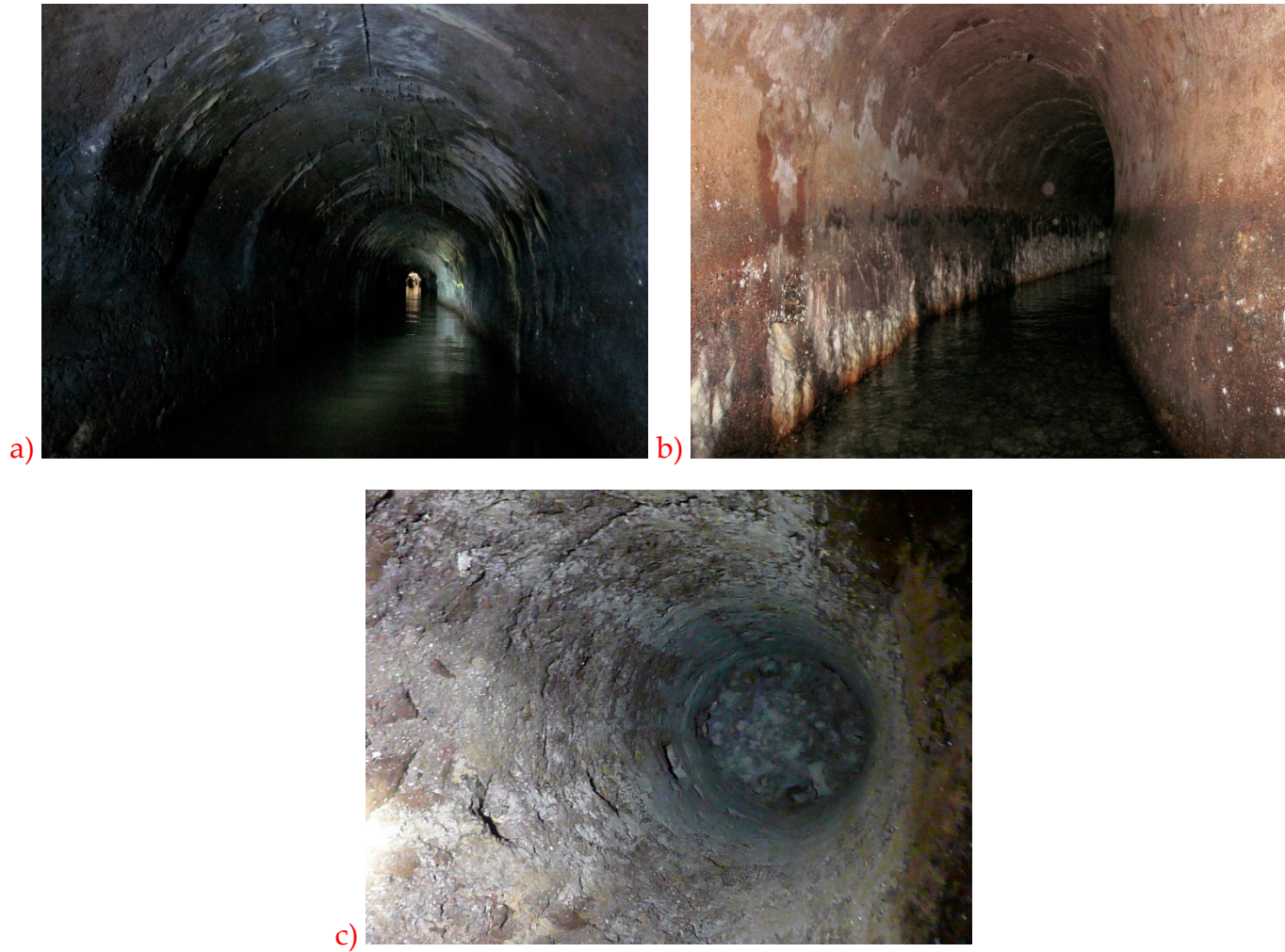


**Table S1.** Report of the sampling and description of the sample.

Images of external and inner surface have been collected using a Dino-Lite Digital Microscope and DinoCapture 2.0 software. Descriptions follows NORMAL, UNI 11176:2006 Cultural heritage - Petrographic description of a mortar, 2006. Mass colour refers to the dried sample.

## Villa Medici



Photos of the inner duct of Aqua Virgo in the area of Villa Medici (a,b) and of the well from which sample VIR4 has been collected (c).



VIR1

Area of sampling



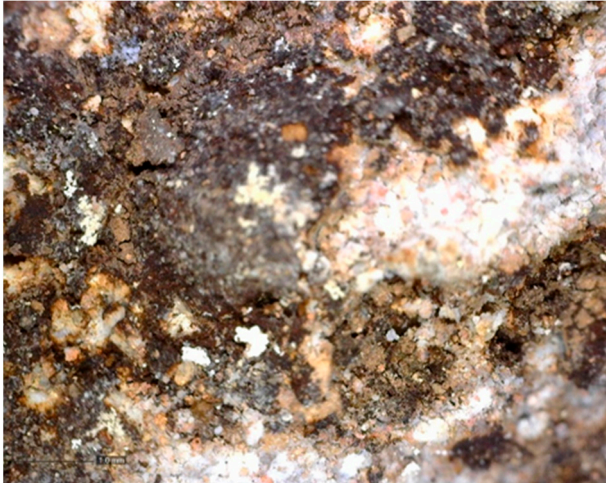
Point of sampling



Sample



External surface



Inner surface



- Dimensional aspect: arenaceous (< 2 mm).
- Mass colour: light grey.
- Clasts colour: reddish, grey.
- White inclusions, with variable shape and bigger dimension respect to other clasts are present.
- Cohesion: friable.
- External black patina, with white spots.



VIR2

Area of sampling



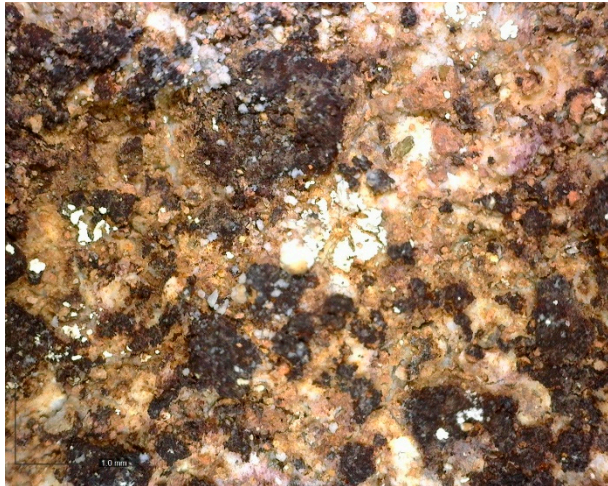
Point of sampling



Sample



External surface



Inner surface



- Dimensional aspect: mainly arenaceous (< 2 mm), but one aggregate fragment, millimetric in dimension, is visible.
- Mass colour: light grey.
- Clasts colour: reddish, grey.
- Cohesion: friable.
- External black patina, with white spots.



# VIR3

Area of sampling



Point of sampling



Sample



External surface



Inner surface



- Dimensional aspect: arenaceous (< 2 mm), with some slightly bigger clasts.
- Mass colour: light grey.
- Clasts colour: reddish, grey. Few exceptions yellow and black.
- Cohesion: friable.
- External black patina, with white crystals on top.



VIR4

Area of sampling



Point of sampling



Sample



External surface



Inner surface



- Dimensional aspect: arenaceous, except for few clasts > 2 mm.
- Mass colour: light grey - reddish.
- Clasts colour: reddish, grey.
- White lumps are present.
- Cohesion: friable, close to incoherent.
- No evident external patina. Rough surface.



VIR5

Area of sampling



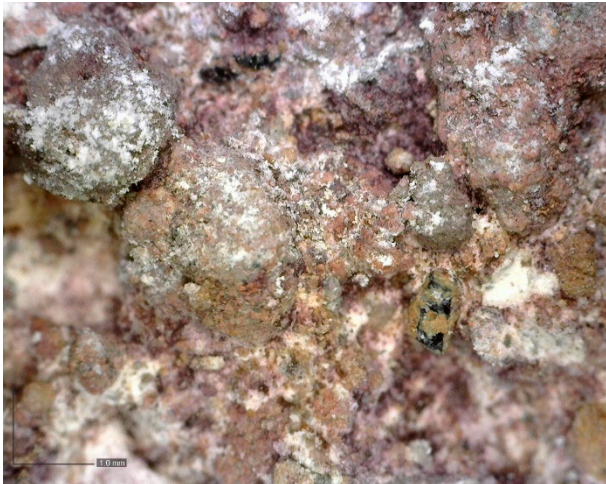
Point of sampling



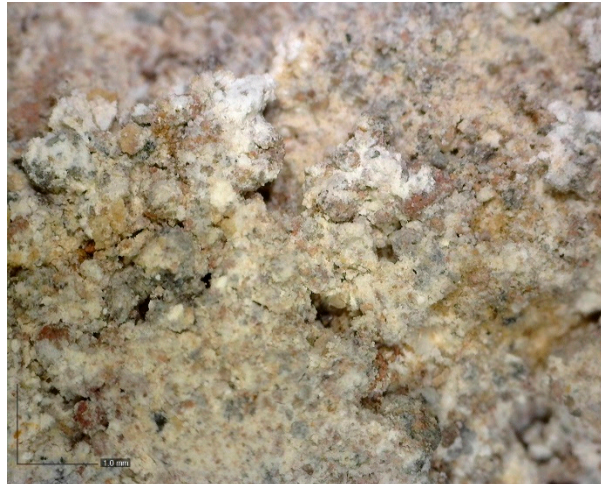
Sample



External surface



Inner surface



- Dimensional aspect: bimodal, one fraction is arenaceous (< 2 mm) and one is conglomeratic (even bigger than 4 mm).
- Mass colour: light grey - reddish.
- Clasts colour: reddish, grey. Few exceptions ochre and black.
- White lumps are present.
- Cohesion: friable.
- No evident external patina. Rough surface.



# VIR6

Area of sampling



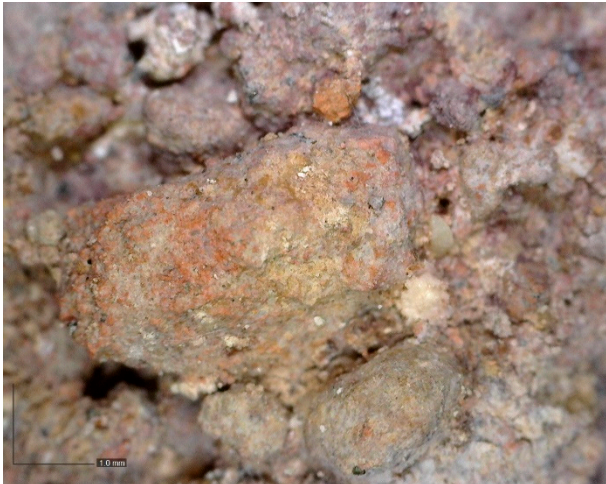
Point of sampling



Sample



External surface



Inner surface



- Dimensional aspect: bimodal, one fraction is arenaceous (< 2 mm) and one is conglomeratic (even bigger than 4 mm).
- Mass colour: light grey - reddish.
- Clasts colour: reddish, grey. Few exceptions ochre and black.
- Cohesion: friable.
- Fissure with carbonatic precipitation is visible.
- No evident external patina. Rough surface.



VIR7

Area of sampling



Point of sampling



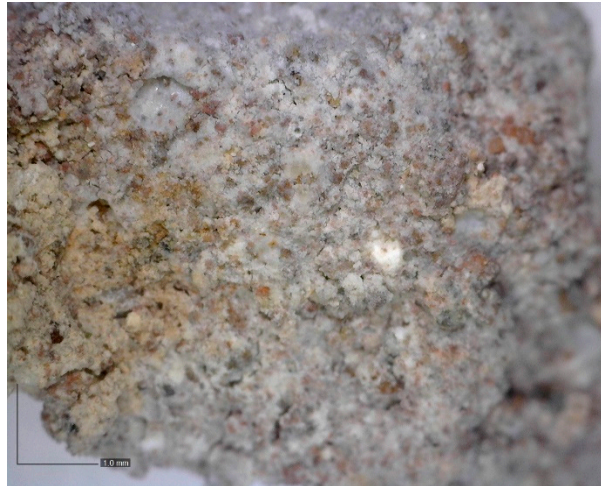
Sample



External surface



Inner surface



- Two layers are distinguishable. The most superficial one is white and so thin that the thickness is hardly considerable, and sometimes the clasts from the layer below emerge.
- External surface deteriorated by a yellowish patina.

The following description is about the inner layer.

- Dimensional aspect: arenaceous (< 2 mm)
- Mass colour: light grey – reddish.
- Clasts colour: reddish, grey.
- Cohesion: almost incoherent.



VIR8

Area of sampling



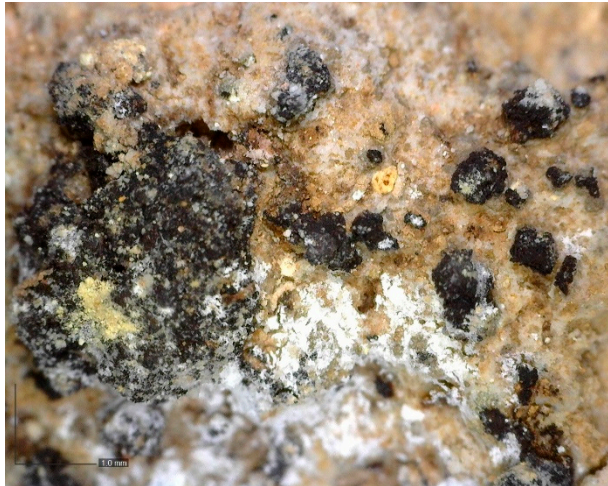
Point of sampling



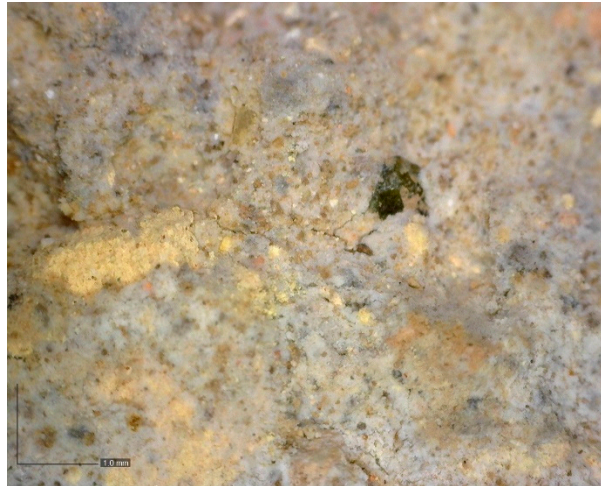
Sample



External surface



Inner surface



- Dimensional aspect: bimodal, one fraction is arenaceous (< 2 mm) and one is fine-grained conglomeratic (2-4 mm).
- Mass colour: ochre.
- Clasts colour: ochre, grey and orange.
- Cohesion: friable.
- External black patina, with white spots.



VIR9

Area of sampling



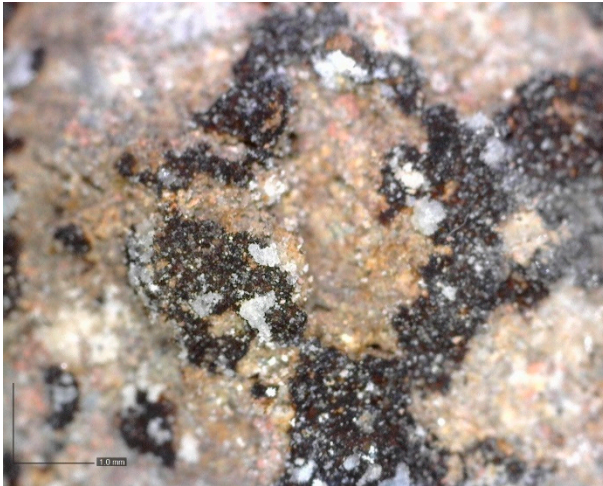
Point of sampling



Sample



External surface



Inner surface



- Dimensional aspect: arenaceous (< 2 mm).
- Mass colour: light grey – reddish.
- Clasts colour: reddish, grey, few ochre.
- White lumps are present.
- Cohesion: from hard to friable.
- External black patina, with white spots.



VIR10

Area of sampling



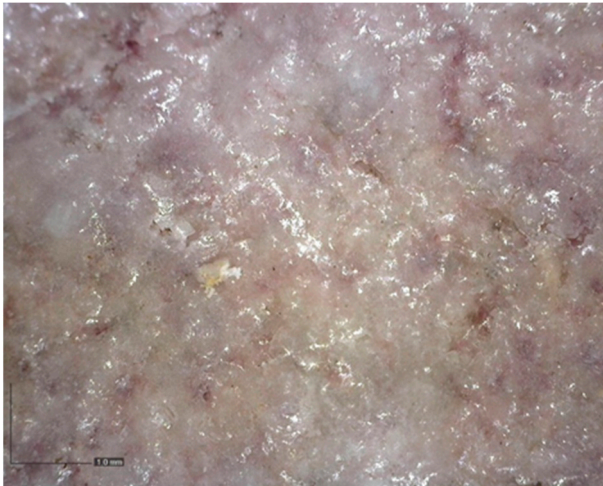
Point of sampling



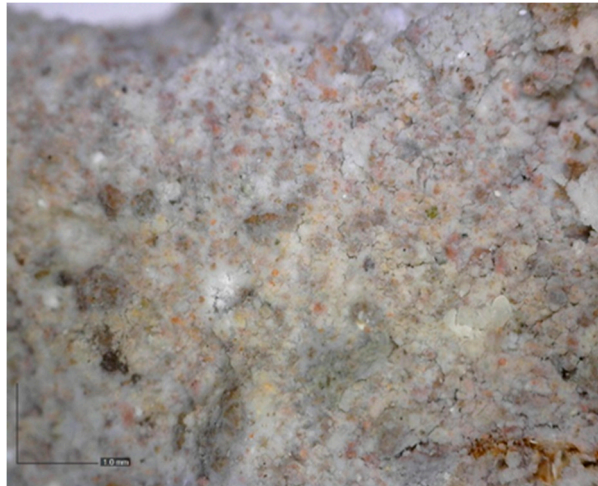
Sample



External surface



Inner surface



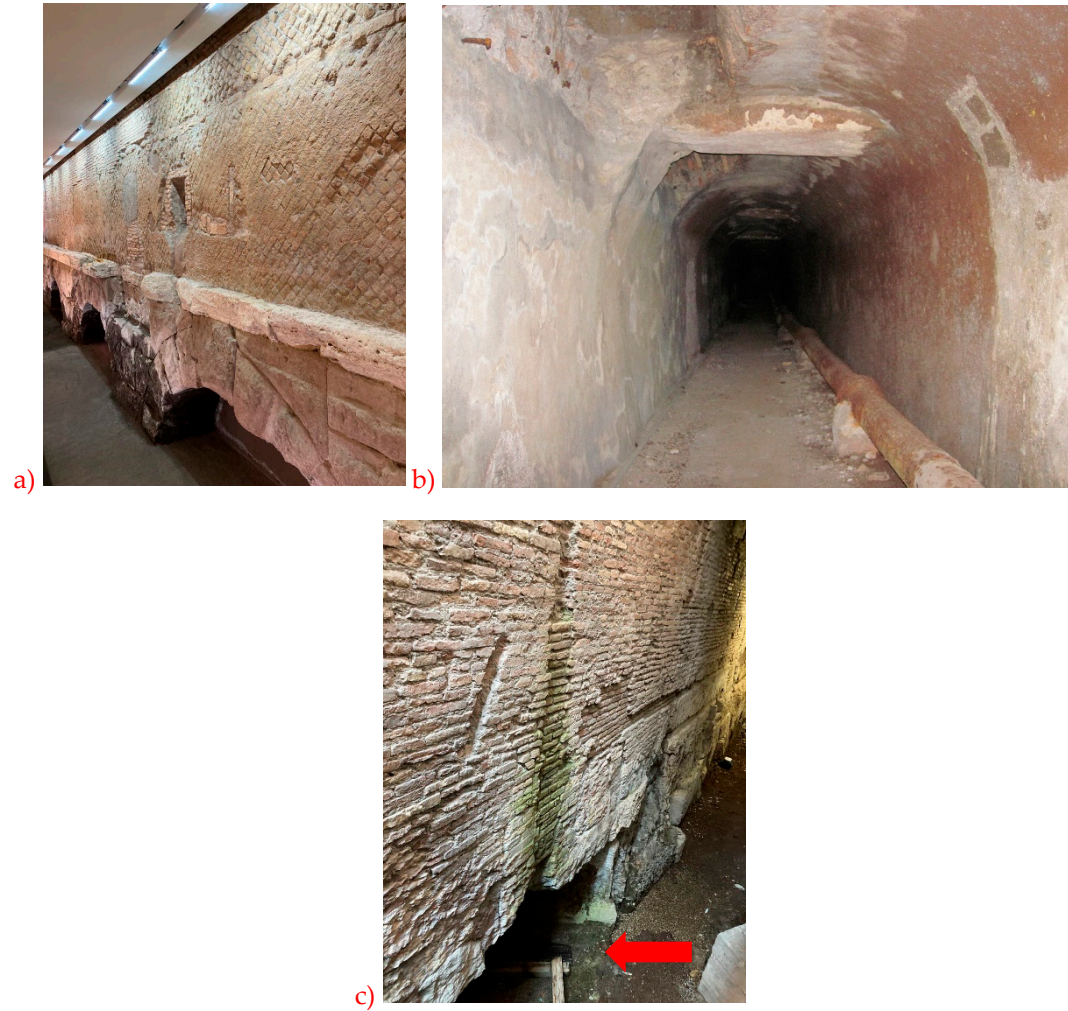
- It is possible to recognize a superficial thin layer, white and translucent, separated from the lower mortar by an ochre layer.

The following description is about the inner layer.

- Dimensional aspect: arenaceous.
- Mass colour: light grey – reddish.
- Clasts colour: reddish, grey, few ochre.
- White lumps are present.
- Cohesion: friable.



## Rinascente



*Aqua Virgo* (a,b) and Aqueduct y (c) in La Rinascente area. a) Photo of the external part of *Aqua Virgo*, visible inside La Rinascente shopping mall. b) Inner duct of *Aqua Virgo*, now in disuse. c) Point in which Aqueduct Y intersect *Aqua Virgo*.



VIR11

Area of sampling



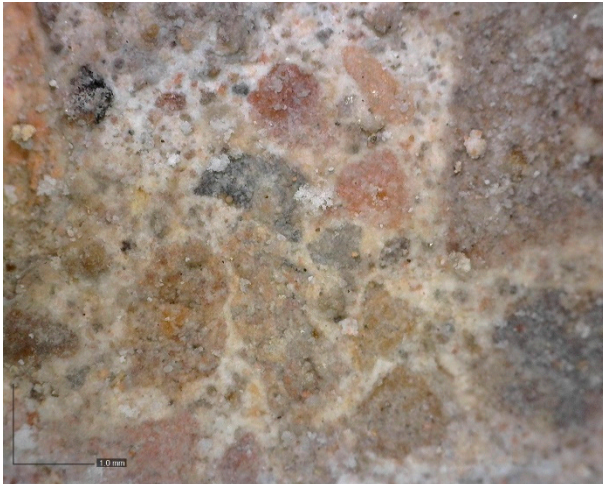
Point of sampling



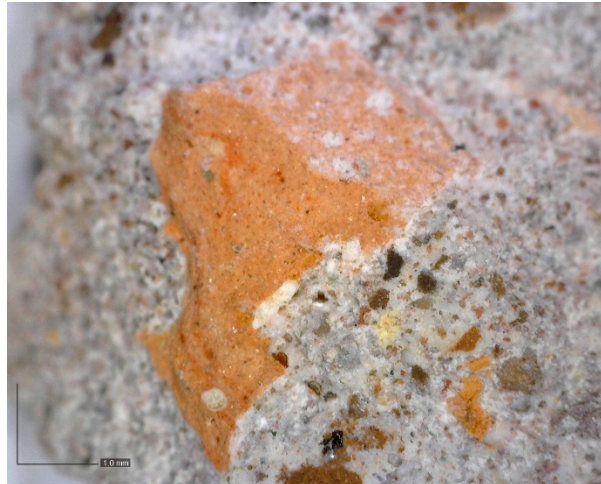
Sample



External surface



Inner surface



- Dimensional aspect: bimodal, one fraction is arenaceous (< 2 mm) and one is fine-grained conglomeratic (2-4 mm).
- Mass colour: light grey.
- Clasts colour: orange, red, ochre, brown, grey, and black. Ceramic fragments are distinguishable.
- White lumps are present.
- Cohesion: hard.



VIR12

Area of sampling



Point of sampling



Sample

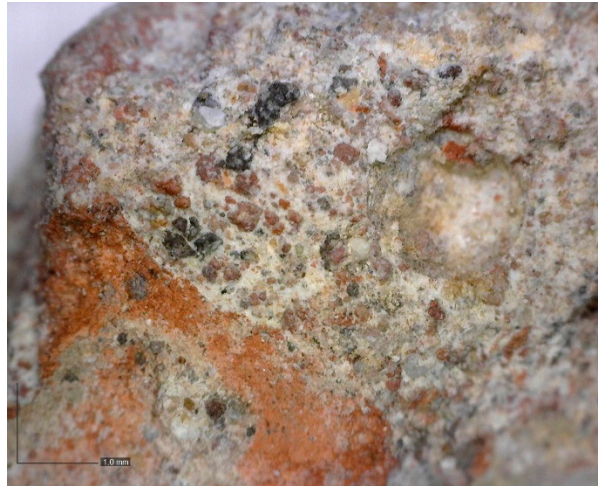


Mortar on the left, brick on the right.

External surface



Inner surface



- Dimensional aspect: bimodal, one fraction is arenaceous ( $< 2$  mm) and one is fine-grained conglomeratic (2-4 mm).
- Mass colour: light grey.
- Clasts colour: red, ochre, grey, and black. Ceramic fragments are distinguishable.
- White lumps are present.
- Cohesion: hard.



VIR13

Area of sampling



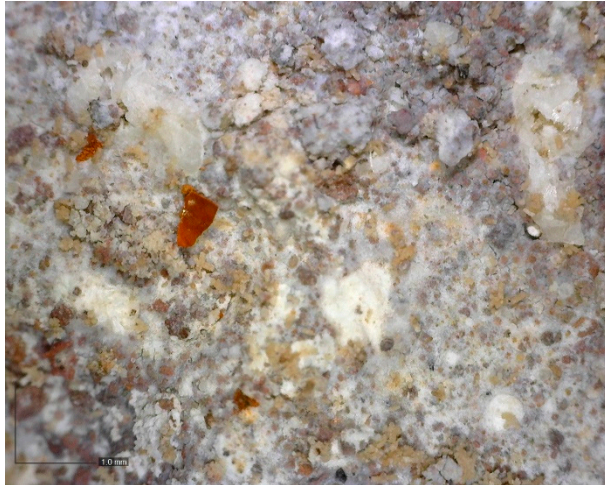
Point of sampling



Sample



External surface



Inner surface



- Dimensional aspect: arenaceous (< 2 mm).
- Mass colour: light grey – reddish.
- Clasts colour: red, ochre, grey, and black.
- White lumps are present.
- Cohesion: hard.



VIR14

Area of sampling



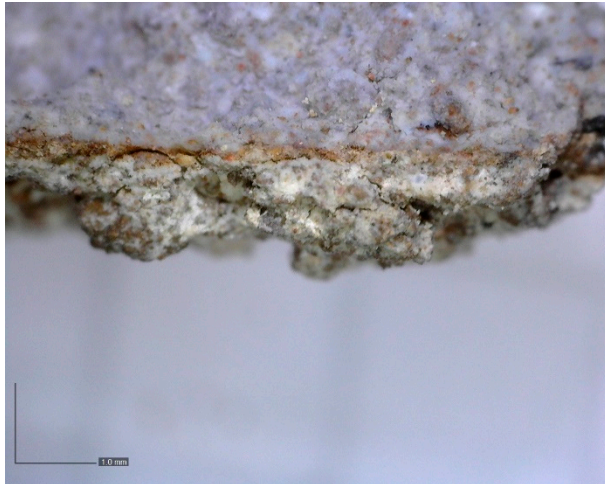
Point of sampling



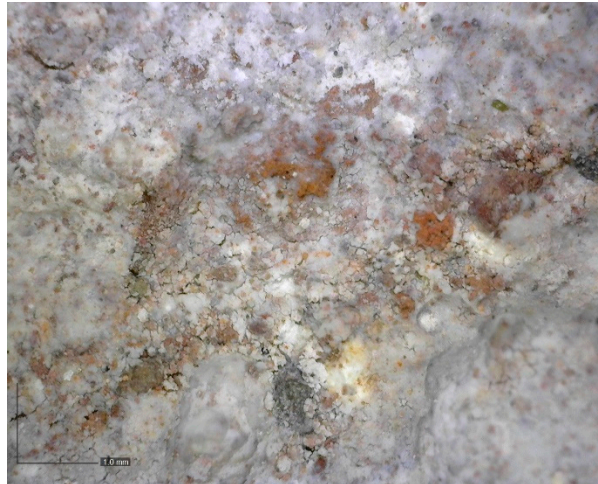
Sample



External surface



Inner surface



- It is possible to recognize a superficial white thin layer, separated from the lower mortar by an ochre layer.

The following description is about the inner layer.

- Dimensional aspect: arenaceous (< 2 mm).
- Mass colour: light grey – reddish.
- Clasts colour: reddish, grey, ochre, and black.
- Cohesion: from hard to friable.



VIR15

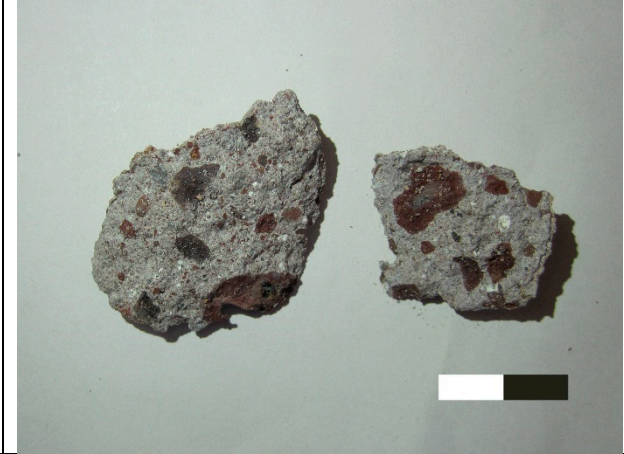
Area of sampling



Point of sampling



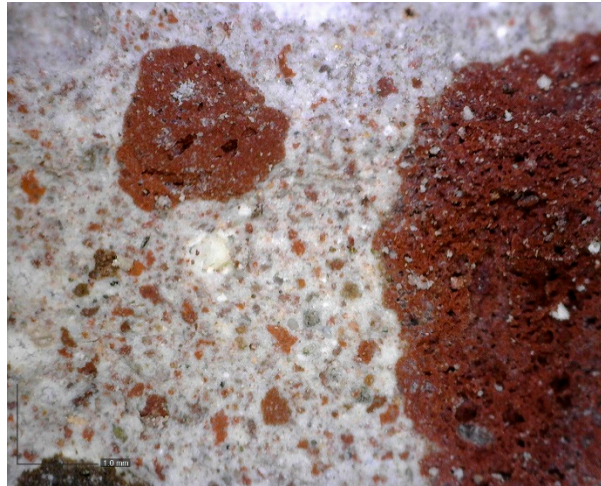
Sample



External surface



Inner surface



- Dimensional aspect: bimodal, one fraction is arenaceous ( $< 2$  mm) and one composed by pyroclastic rock fragments is coarse-grained conglomeratic ( $> 4$  mm).
- Mass colour: light grey – reddish.
- Clasts colour: reddish, grey, ochre, and black.
- White lumps are present.
- Cohesion: hard.
- White patina on the external surface.



VIR16

Area of sampling



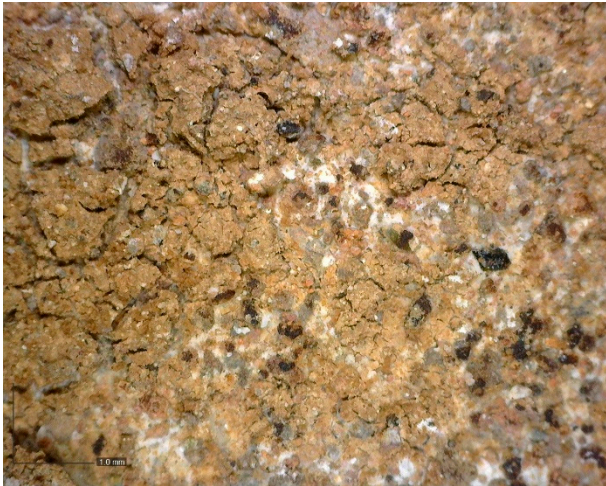
Point of sampling



Sample



External surface



Inner surface



- Dimensional aspect: arenaceous.
- Mass colour: light grey – ochre.
- Clasts colour: grey, reddish, ochre, black, and some clasts are white – yellowish and translucent.
- White lumps are present.
- Cohesion: hard.
- Ochre external patina, cracked. In some points also a black patina is present.



VIR17

Area of sampling



Point of sampling



Sample



External surface



Inner surface



- It is possible to distinguish a thin superficial white layer, with some calcareous precipitations on top.

The following description is about the inner layer.

- Dimensional aspect: bimodal, one fraction is arenaceous ( $< 2$  mm) and one is coarse-grained conglomeratic ( $> 4$  mm).
- Mass colour: light grey.
- Clasts colour: red, grey, ochre, and black.
- White lumps are present.
- Cohesion: hard.



1Y

Area of sampling



Point of sampling



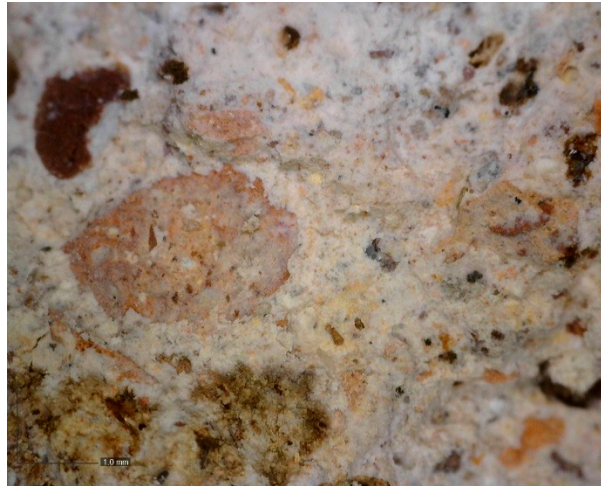
Sample



External surface



Inner surface



- Dimensional aspect: bimodal, one fraction is arenaceous ( $< 2$  mm) and one is coarse-grained conglomeratic ( $> 4$  mm).
- Mass colour: light ochre.
- Clasts colour: ceramic fragments yellow and orange, other clasts are red and grey.
- Cohesion: hard.
- Green biological patina, with some black spots.



2Y

Area of sampling



Point of sampling



Sample



External surface



Inner surface



- Dimensional aspect: bimodal, one fraction is arenaceous ( $< 2$  mm) and one is coarse-grained conglomeratic ( $> 4$  mm).
- Mass colour: light ochre.
- Clasts colour: ceramic fragments are orange, the other clasts are grey and black.
- White lumps are present.
- Cohesion: hard.



3Y

Area of sampling



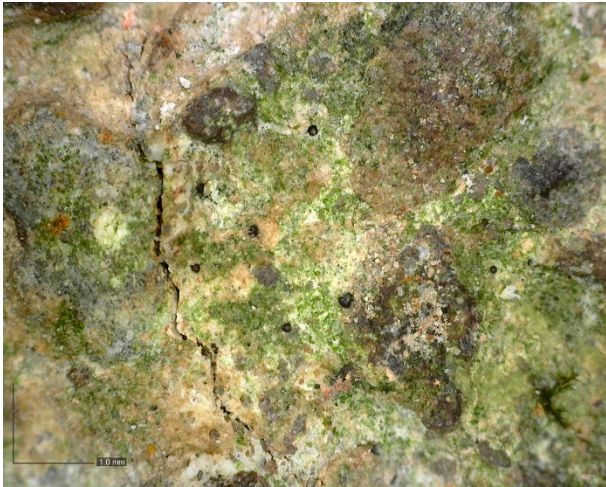
Point of sampling



Sample



External surface



Inner surface



- Dimensional aspect: bimodal, one fraction is arenaceous ( $< 2$  mm) and one is coarse-grained conglomeratic ( $> 4$  mm).
- Mass colour: light grey – orangish.
- Clasts colour: ceramic fragments orange and yellow, other clasts are grey and black.
- Cohesion: hard.
- Green biological patina, with some black spots.