

## The partial implantation, at 1:2 scale, of Rabaçal's Roman Villa

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### Abstract

Our aim is the implantation in the terrain of the octagonal peristyle of the Roman villa existing in Rabaçal, at scale 1:2. We will follow, as close as possible, the known Roman procedures, as described by Vitruvius and other ancient sources, and depicted in Roman sculptural reliefs.

### Step by step

This is a hands-on activity, related to the paper "The Roman Villa in Rabaçal and Álvaro Siza" [1].



**Figure 1:** *Overall view of the peristyle*

To implant the mentioned peristyle, three major technical procedures must be accomplished:

- i. the settlement of the North-South axis;
- ii. the drawing of an octagon with the desired measures;
- iii. the drawing of another octagon with factor  $1:\sqrt{2}$  in relation to the first one.

Item i. will be performed according to Vitruvius 1.VI.12 — "Let A be the centre of a perfectly level and plane tablet whereon a gnomon is erected. The ante-meridional shadow of the gnomon being

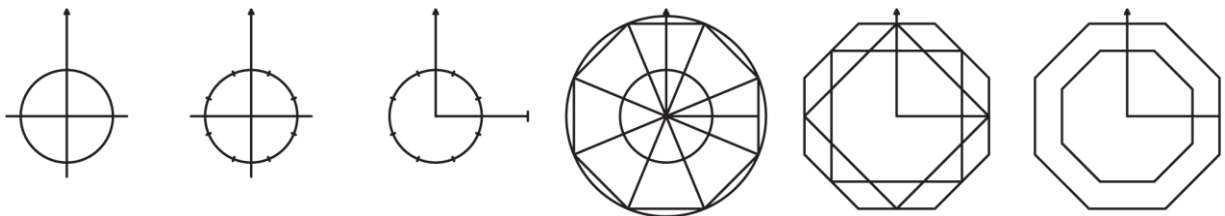
marked at B, from A, as a centre with the distance AB, describe a complete circle. Then replacing the gnomon correctly, watch its increasing shadow, which after the sun has passed his meridian, will gradually lengthen till it become exactly equal to the shadow made in the forenoon, then again touching the circle at the point C. From the points B and C, as centres, describe two arcs cutting each other in D. From the point D, through the centre of the circle, draw the line EF, which will give the north and south points." [2].

This workshop will take place in the afternoon, ideally from 5 pm onwards because the summer in Coimbra is very hot. The morning mark of the shadow (B) will already be registered, according to the time set for the start of the afternoon activity. The gnomon will be a 3-4 ft rod, and all the compass operations will be performed with nylon thread, suitable for the implantation of works, wooden stakes, and either thick chalk, for cement, or a nail, for earth, to make the markings on the ground.

Item ii. will also develop according to Vitruvius 1.VI.13 — "Divide the whole circle into sixteen parts. From the point E, at which the southern end of the meridian line touches the circle, set off at G and H to the right and left a distance equal to one of the said sixteen parts, and in the same manner on the north side, placing one foot of the compasses on the point F, mark on each side the points I and K, and with lines drawn through the centre of the circle join the points GK and HI, so that the space from G to H will be given to the south wind and its region; that from I to K to the north wind. The remaining spaces on the right and left are each to be divided into three equal parts; the extreme points of the dividing lines on the east sides, to be designated by the letters L and M; those on the west by the letters NO; from M to O and from L to N draw lines crossing each other: and thus the whole circumference will be divided into eight equal spaces for the winds." [2].

The Rabaçal villa has an octagonal peristyle with this precise orientation. After thus defining the directions for the octagon vertices, an octagon will be drawn, having 40 Roman feet (1 Roman foot = 296 mm) width between two opposite sides. The measures will be based on a rod marked with the metrological Roman standards according to the ancient procedures [3, page 72].

Item iii. corresponds to the *ad quadratum* geometrical construction on the ground, based on the two squares defined by the sides of the first octagon.



**Figure 2:** The sequence: north direction — division in eight parts — 20 ft to the right —  
— first octagon — *ad quadratum* — the two octagons.

## References

- [1] J. P. Xavier and E. M. Pinho, *The Roman Villa in Rabaçal and Álvaro Siza*, Bridges Coimbra, Proceedings 2011.
- [2] <http://penelope.uchicago.edu/Thayer/E/Roman/Texts/Vitruvius/home.html>
- [3] M. W. Jones, *Principles of Roman Architecture*, Yale University Press and New Haven and London, 2000.