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Design Analysis of the Peristyle Building from 'Ein ez-Zeituna

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From June to November 1993, a salvage excavation was carried out at 'Ein ez-Zeituna in Naḥal 'Iron, c. 23 kilometers east of Caesarea. A large peristyle building was uncovered on the southern slope of the wadi, similar in style to a *mansio*. The eastern rooms were poorly preserved, but the rooms to the west were nearly complete, with several thresholds and doorjambs intact, and walls standing up to 1.3 m in height. The high standard of its construction, the precision with which the walls were laid out, and its proximity to the town of Legio might indicate that the function of this building may have been related to the imperial post or possibly to tax collection (see Glick, this volume).

Historically, it is probable that the shortest land route linked the proconsul, stationed at Caesarea, with the Roman legions (Legio II and Legio VI in the second century) stationed at Legio, near ancient Tel Megiddo. However, little archaeological evidence has been found to indicate that an imperial 'highway' connecting Legio to Caesarea did indeed exist. The meagre archaeological evidence was first recorded by Schumacher in 1903, who found eight milestones, starting from Legio southward in the direction of Wadi 'Ara (Schumacher 1903); the milestones are cited in Thomsen's catalogue of Roman milestones in the Holy Land (Thomsen 1917:69–70, Nos. 233–240). One milestone dates to 162 CE. Other evidence includes a Roman bridge built near Lajjun, which was probably built by the Roman army stationed nearby (Roll 1995:31*).

The Building

The peristyle building follows a common plan throughout the Mediterranean, with a central open courtyard separated from the surrounding rooms by a narrow passageway. We were able to uncover 12 rooms, but if we assume that the design was symmetrical, then the building had eight more, for a total of 20 rooms (Fig. 1). All floors were made of beaten mud, although there is evidence that the entrance hall (Room I), on the southern side of the building, had a paved flagstone floor. Eight thresholds were found, with round cup-holes for pivoting door sockets, the doors of which invariably opened into the rooms. Found in the entrance room and in Rooms IX and XV were piers attached to the walls and preserved two to three courses high, and fallen voussoirs. These form the strongest evidence of the arched stone roofing system for these rooms, which was probably a barrel vault, while all the other rooms of the building were probably roofed by wooden beams. The ceramic repertoire consisted mainly of household wares, such as cooking pots and storage jars. The numismatic and ceramic finds indicate a late first to second century CE date (see Glick, this volume; Bijovsky, this volume).

The peristyle building is particularly interesting for a number of reasons. First, the construction of its walls was of a very high standard. The inner walls flanking the entrance (Room I), as well as other walls in the north, were particularly well constructed of finely carved ashlars, each measuring 0.6 × 0.3 × 0.3 m. One course of

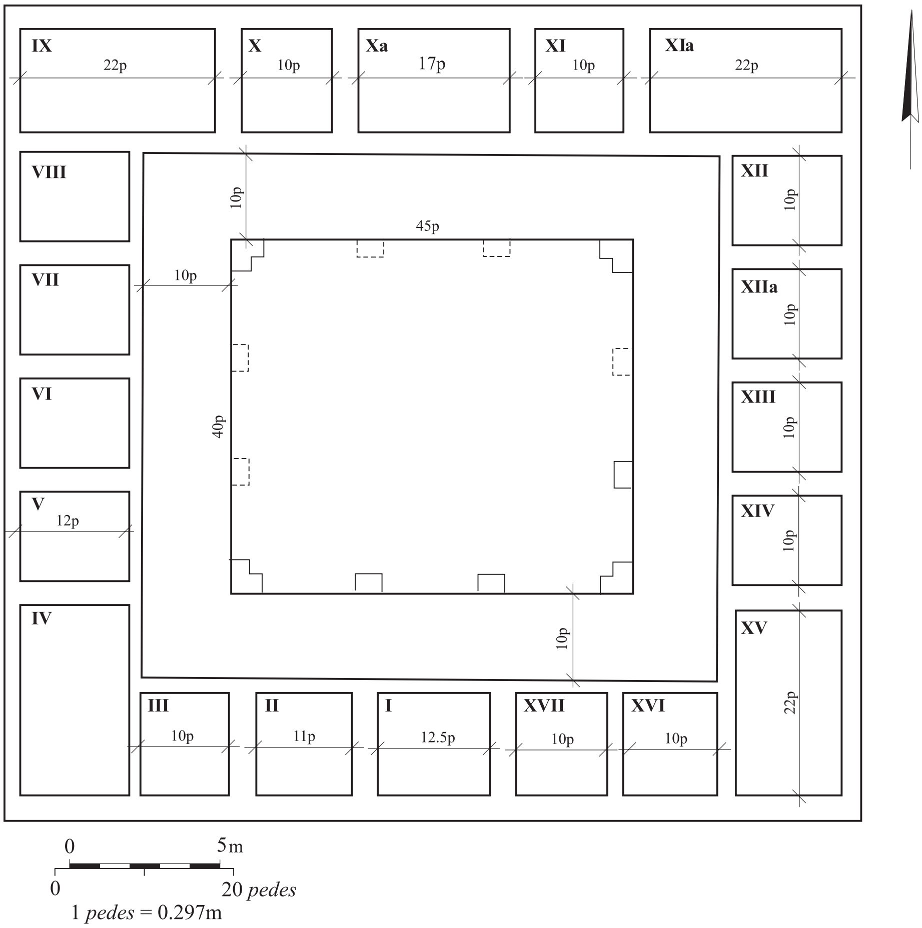

Fig. 1. A proposed plan showing rooms with dimensions in original *Pedes*.
Room numbers follow excavation numbering.

stones was laid with an inner face of stretchers and an outer face of headers, with small pebbles and mud used to fill spaces between the stones, making the wall extremely strong and durable. In the next higher course, the placement of the headers and stretchers was reversed. The walls made in this manner were invaribly 0.89–0.90 m in breadth.

Second, the precision with which the building was laid out resulted in nearly perfect symmetry between the eastern and western rooms. For example, the width of five rooms in the east and south (Rooms XIII, XIV, XVI, XVII) are all 2.95 m. The space between the stone pier bases of the atrium and their rooms measures 2.95–2.98 m.

The high standard of its construction, the quality of the stone courses with which it was built, and the precision with which it was laid out, all strongly indicate that a trained architect or builder was responsible for this fine structure.

Design Analysis

In any analysis of the architecture of a building, the original unit of measurement must be determined by calculation from dimensions measured at the site (Petrie 1892). As noted above, a dimension of just under 3 m is repeatedly used in the layout of this structure, so that it can be assumed that within this length there must be a whole number of ancient feet. To find the original unit of measurement, we divide 2.97 m by whole

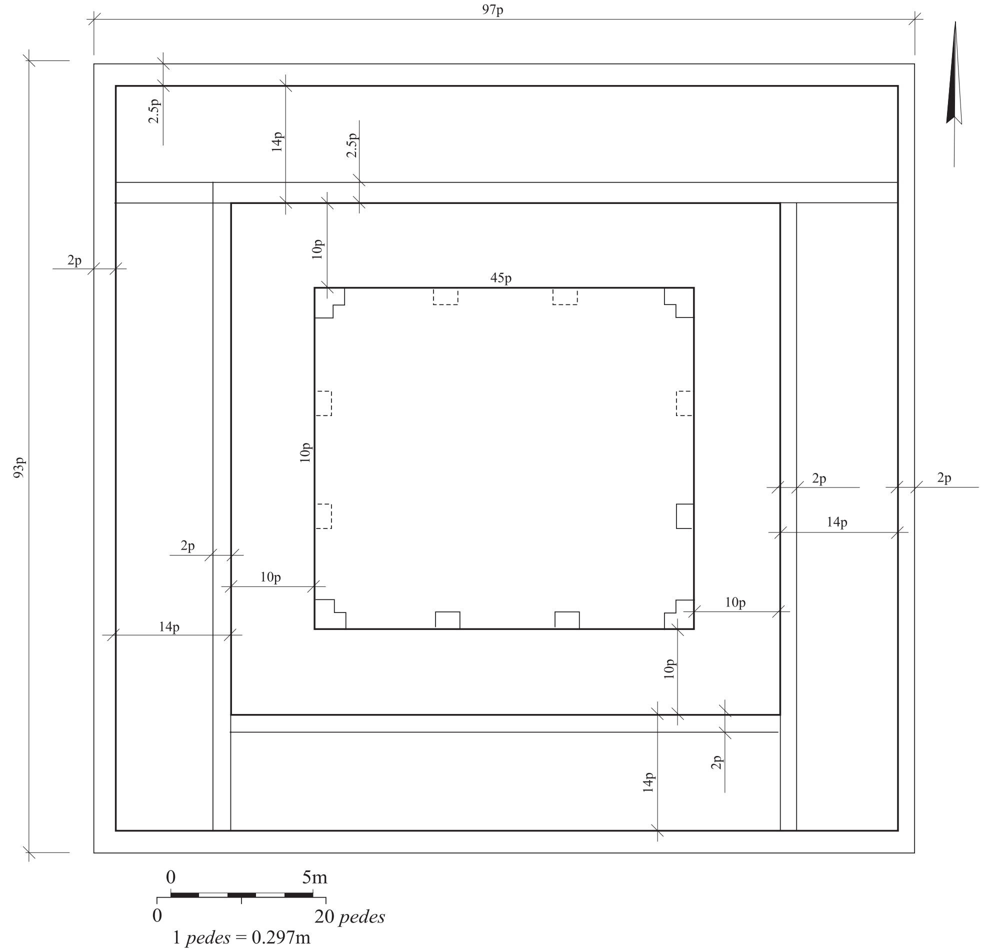

Fig. 2. Diagram of the plan showing three concentric rectangles outlining the walls of the peristyle building.

numbers to get the original unit used in the design of the structure. Dividing the length of 2.97 m by ten gives 0.297 m, a length nearly identical to the standard Roman *pedes*, which is 0.296 m (Wilson-Jones 2000:72).

This value for the original unit of measurement used in design can be verified by examining the wall widths. The western, southern, and eastern inner walls separating the rooms from the atrium are 0.6 m wide, which is two *pedes* (0.59 m). The partition walls between the rooms in the east and west are 0.9 m wide, which is three *pedes* (0.89 m). Both the outer eastern and western walls of the peristyle house are 0.75 m, which is 2.5 *pedes* (0.74 m).

Calculating measured metric dimensions of the excavated sections of the structure to their equivalent value in Roman *pedes* gives the values presented in Table 1.

Working with these dimensions for the plan of the building and on the assumption that the design was symmetrical, the original design procedure can be reconstructed. The design of the plan was carried out in three stages, each relating to one of three concentric rectangles (Fig. 2). The first rectangle was the smallest, and defined the outer edges of the corner piers of the atrium, with sides 45 by 40 *pedes* long. Dividing the length by the width, we find that these two sides delineate the ratio 9:8; the

Table 1. Dimensions of the Structure expressed in *pedes*

Dimension	*Pedes*	Measured (m)
Outer length	93 (27.50 m)	27.52
Outer width	97 (28.68 m)	28.79
Atrium length	60 (17.74 m)	17.50
Atrium width	65 (19.22 m)	19.10
Courtyard length (incl. piers)	40 (11.82 m)	11.78
Courtyard width (incl. piers)	45 (13.31 m)	13.31
Portico width	10 (2.96 m)	2.95
Width of S, W, E atrium walls	2 (0.59 m)	0.60
Width of walls between rooms	3 (0.89 m)	0.90
Width of N, S outer walls	2.5 (0.74 m)	0.75
Width of E, W outer walls	2 (0.59 m)	0.60–0.65
Width of rooms in S, W, E	12 (3.55 m)	3.50
Width of rooms in N	11.5 (3.40 m)	3.35–3.40
Length of Room I	12.5 (3.74 m)	3.70
Length of Room II	11 (3.25 m)	3.26
Length of Rooms XIII, XIV, XVI, XVII	10 (2.96 m)	3.00
Length of Room IX	22 (6.51 m)	6.50
Length of Room XV	21.5 (6.36 m)	6.30

common module of 5 *pedes* is shared by both the length and the width of the atrium.

Once this first rectangle was laid out on the ground, a second larger rectangle was set out around its perimeter at a distance of exactly 10 *pedes* from it. This equals two modules of 5 *pedes*, called the *decempedes*. The second rectangle defines the inner wall of the portico, so that the entire atrium is 65 *pedes* long and 60 *pedes* wide.

The third and last rectangle used in the design is 14 *pedes* wider on each side of the second rectangle. This rectangle sets the location of the inner side of the outer walls. It is interesting to note that the wall surrounding the atrium is 2 *pedes* wide on all sides but the northern, where it is 2.5 *pedes* wide. Deep foundations were probably necessary to the north because of its proximity to the slope on that side. Since this wall is the longest interior wall, it probably was the first interior wall constructed after the outer walls were completed.

The dimensions of the rooms were then set (see Fig. 1). Starting on the eastern side, we note that the entrance room (I), with its arched ceiling, is 12.5 *pedes* wide. Apparently, this was the widest opening possible using a stone barrel vault. Room II to the west is 11 *pedes* wide, while other rooms in this section (Rooms III, XVII and XVI) are each 10 *pedes* wide. The wall separating Room XVII from XVI was made a half *pedes* smaller than the other walls, which were 3 *pedes* wide. This indicates an on-the-spot adjustment of the thickness of the walls to accommodate the 12.5 *pedes* wide entrance.

There seems to have been complete symmetry between the eastern and western rows of rooms. Both of their southern rooms (IV and XV) were 21.5 *pedes* wide, while all other rooms were 10 *pedes* wide.

On the northern side, we have very little information regarding the layout. Only the northwestern Room IX's dimensions can be fully ascertained; it is 22 *pedes* wide. One other wall was uncovered, which we assume divided Rooms Xa and XI. Again, assuming a symmetrical arrangement, a similarly sized room to Room IX was probably laid out in the northeastern corner. Next to this was a room 10 *pedes* wide, and we assume a similar room 10 *pedes* wide was set next to the northwestern room also. Solid confirmation of these two rooms in the north is the small section of a dividing wall found exactly 10.3 m (or 35 Roman *pedes*) from the eastern wall. This leaves 17 *pedes* for the room (Xa) directly opposite the entrance.

CONCLUSION

The peristyle building at ‘Ein ez-Zeituna was designed according to the Roman *pedes*, and set out according to a very strict plan. The ratio 9:8 defines the inner rectangle, from which the design of the whole building took shape. Multiplying this ratio by the selected 5 *pedes* module gives the dimensions for the atrium. Two modules (the *decempedes*) defined the peristyle around the open atrium. Thirteen rooms out of twenty are also 10 *pedes* wide. These design features indicate the importance of simple round numbers for the setting out of the plan. The workmanship of the building is nothing less than outstanding and an architectural landmark in public building in Roman Palestine.

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