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## **Abstract**

### **Domus, Villa and Insula: A Neo-Rationalist Taxonomy of Housing Types along the Via Consolare-Pompeii**

by

Joseph Weishaar

In the early letters of Cicero, the guide on agriculture by Varro, and the complete works of Vitruvius, there is a foundation laid for the governance of domestic architecture which can only be glimpsed through the moment frozen in time at Pompeii. This thesis is directed at a critical analysis of the residential architecture situated along the Via Consolare in Pompeii. The question posed at the onset was how do dwellings change and adapt based on the localized context. The context in this case can be as simple as neighbor to neighbor spatial relationships and as complex as urban to suburban or exurban based on proximity to the city wall. By analyzing the plans of dwellings in context it is possible to find patterns of spatial occupation which submit to logical methods of construction and an ideal typological form. Through the lenses of typology, geometry and space syntax, this thesis attempts to broaden the classification of plans for irregular dwellings as well as to show how they belong to the transitional gradient of housing development which occurred during the lifespan of Pompeii. Each portion of the work looks at the known history and development of the type being analyzed and then breaks down portions of the dwellings into a series of simple and interchangeable elements. The typological study looks at the atrium and its network of support spaces to identify which rooms and how many direct spatial connections define each pattern. The geometric survey is aimed at identifying an applicable surveying technique which may have governed dwelling construction. In the least, it denotes a proprietary explanation for the development of castrum styles and simple geometries in the house such as the ratio for width to depth. The final lens of Space syntax was employed to assess patterns of in the quantity of rooms as compared to overall dwelling size. With each layer of analysis a better picture of housing development emerges allowing for a deeper understanding of the ideal Pompeian dwelling when faced with the strictures of site and construction



**Domus, Villa and Insula:**  
A Neo-Rationalist Taxonomy of Housing Types  
Along the Via Consolare-Pompeii

A thesis submitted in partial fulfillment of the requirements of the  
Honors Program of the Department of Architecture  
in the Fay Jones School of Architecture, University of Arkansas.

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Thesis Committee:

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Davide Vitali

Dean Jeff Shannon

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Spring 2013

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## Introduction

Since its rediscovery in 1748 Pompeii has continued to unveil an indispensable trove of ancient art and architecture which has proven time and again to reconstruct the lives of ancient peoples from the Mediterranean region. Surely for the first time, scholars could reconcile written passages from the classical works of Cicero, Cato, Varro, Virgil, and Vitruvius with the physical landscape which they transcribe. It is from these first-hand accounts which we derive the greatest understanding of the genesis of classical society. For architects, they offer glimpses into the built environment with their descriptions of the spaces in which they dwelt. Pompeii has one of the strongest archaeological records and has become the epitome location of studies on the ancient house in the northern Mediterranean. It is for these two reasons that it was chosen as the host for this study.

Architecture has about it a common language which we use to categorize and define our buildings. Unique to Vitruvius, a Roman citizen living in the first century BC, is his guide for architects and other learned men so that they may understand the theory and reason behind the art of architecture. The structure of his treatise organizes the built environment into useful 'types' which each require their own logic and methodology to create. It is from this text that we rationalize the form of the ancient Roman house and understand that multiple types exist with unique organizations. The three most commonly named Italianate dwelling forms are: the Domus (city house), the Villa (mansion/ agribusiness plantation), and the Insula (apartment/ block condition).

Modern works which cite the architectural typologies of Pompeii have tended to focus on addressing a single typological model in terms of its layout and decoration as a direct response to the ideal lifestyle of

the owner rather than asserting the possibility of a multiple type existence. Further, the principle citations from which the conclusive singular typologies are drawn are most always taken from Vitruvius or Varro who notably address the existence of several related forms. While both of these ancient scholars present sound descriptions of dwellings, there is to date no defined polychotomy for spatially analyzing these ancient Italianate housing types which equally applies to upper, middle, and lower class residences or equally addresses them based on their urban context. While this paper will address the role of wealth as playing a part in the ostentatiousness or grandeur of built works, the final conclusions will only comprise of spatial and structural transformations as they relate to their local and temporal context. This work will also serve as a corollary to other well known Pompeian studies, especially the work done by Andrew Wallace-Hadrill on the Pompeian house, and Carol Watts in her Doctoral study of ancient domestic house interiors at Ostia, Herculaneum, and Pompeii .

### **The First Study**

This paper began with a question into the origins of the ancient Italianate house more than a year ago with the observation that not all of the houses on the maps of Rome and Pompeii looked the same, or even like what August Mau, a 19th century archaeologist and first classifier of Pompeian art, said they should. As simple and naive as this observation sounds, it prompted a study into identifying the essential organization patterns in the Roman house. In this initial exploration, houses were compared based on the location of historically known functional spaces, a gradient of public /private spaces, and axial sequence. The comparisons were conducted separately on 10 urban houses and 5 rustic villas found in the Campagnian region of the Italian Peninsula. The primary goal of this study was to speculate on the 'ideal' type for each urban density. The general assumption formed at the onset of this study was that

each type should be allowed to form independent of the others and that the traditional atrium scheme should be fairly well represented in the final outcome. While this first study did produce results similar to the traditional atrium scheme in the urban house, producing an ideal type raised several questions which only became more aggravating in trying to formulate a model for the villa type. What became apparent was that there were no rules governing the final outcome, rather it was an intuitive exercise based on attempts to logically compose spaces based on their historic antecedents. In other words, it was more about how spaces fit together than how many there should be, or of their relative proportions. This method ultimately failed when confronted with the villa type because of the increased variety amongst the spaces and their locations within the dwelling. Figure 1 contains some of the diagrams produced to examine axial sequence, and the public/private gradient. The diagrams displayed here represent the ten urban domini studied for axuality and spatial gradient. The results of the first study are displayed in *figure 2*. The three plans on the left represent what were rationalized as the ideal and essential urban domus; from left to right: the basic atrium scheme, the atrium scheme with the peristyle garden, and the expanded peristyle for the wealthy client as adapted from the House of the Vetti and the House of the Faun.

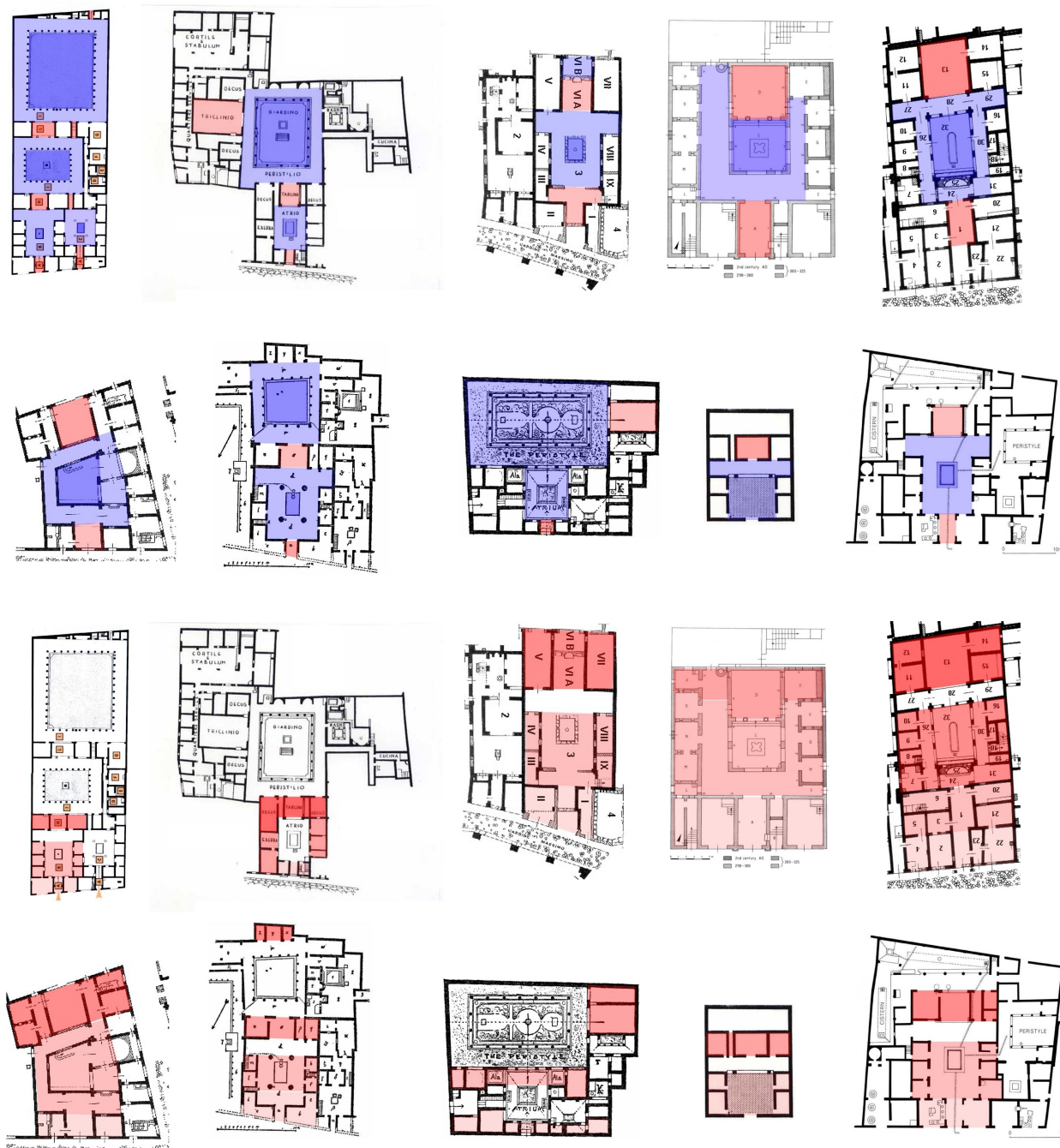
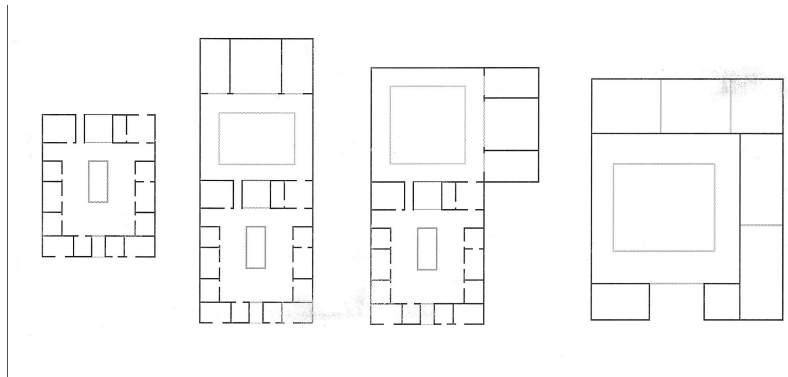


Figure 1: The First Study. Houses from left to right: House of the Faun, House of the Menander, House of Giove Fulminatore, House of the Heres, House of the Porch, House of the Round Temple, House of the Silver Wedding, House of the Vetti, Domus Italica (Patroni), House of Sallust



*Figure 2: Results of the First Study*

The single plan on the right shows the basic scheme for the compact-cubic villa. The lack of clarity in the proposed villa plan, and the fact that there is only one proposed, comes from the inability of the first study's method to be consistently applicable to the multiple villa adaptations. Even though the methodology of the first study was created from a culmination of other theses on dwellings which had cohesive results such as those by Carol Watts and James Packer, the implementation of the processes only worked for dwellings of similar styles. In order to analyze larger samplings, the methods had to be adapted to conform to factors like size and number of rooms. This thesis was undertaken to reassess the ways we can approach the use of typology to classify existing dwellings of disparate conditions.

### **The Usage of a Context Based Approach**

Historians and critics of the discoveries of Pompeii have recently begun to argue in favor of a stronger amount of contextual analysis when looking at ancient dwellings. However, the context which they are examining is driven more by sources of material possessions in culture than urban form. The thinking is that the culmination of possessions could in turn lead to an increased dating sequence in houses. As a corollary to this system, Andrew Wallace-Hadrill has proposed that Pompeii had a relatively high

discrepancy between the wealthy and poor in terms of material ideals<sup>1</sup>. Certainly the house constitutes the most prominent piece of material wealth, but even an analysis of this sort does not convey the reasons why particular spatial organizations were adopted or discarded over time. In the case of this thesis, the idea of a context based approach makes use of urban location to understand typological transformation. The notion is that buildings can be designed in reaction to a series of existing organizations or concepts which the builder may have no control over, such as site.

A highly generalized assertion would be that for conditions where the spatial boundaries are fixed, such as in a walled city, building units should be larger or more regularized where the urban fabric is more ordered and smaller or more irregular where the order merges with the periphery. In conditions where there is no existing organization, such as in the rural landscape, we should expect to see built forms that either create new unique typologies in response to the context or that they draw from regularized prototypes with similar functions. In order to prove these hypotheses we must cross examine the urban typologies with those of the exurbs to see how and why architectural transformations occur in different spatial contexts. The outcome should show the dynamic range between the smallest dwellings to the largest and proposes that the architectural transformations which occurred over the ages were done to adapt and mold dwellings around a series of recognizable 'ideal' forms.

The driving force for this research comes from a study done by Wallace-Hadrill in 1993-94<sup>2</sup> on the correlation between house size and organization (see table 1). His survey of selected regions from

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1 Laurence, R., and A. Wallace-Hadrill, eds. 1997. *"Domestic Space in the Roman World: Pompeii and Beyond"*. (JRA Sup-pl. 22. Portsmouth: Journal of Roman Archaeology.), 4

2 Hadrill, Wallace A. "Houses and Society in Pompeii and Herculaneum." (Princeton University Press, 1994), 65-90

Pompeii and Herculaneum showed that four different types of house existed in the urban block and each had unique features based on their size. Like the outcomes of the first study, the houses in types 3 and 4 showed that the most common dwellings of 350 sq. meters and larger had atria, peristyles, or a combination of the two, with the latter becoming even more prevalent as size increased. See tables 3 and 4 for the data.

#### HOUSES AND URBAN TEXTURE

Averages for area and rooms by quartile						
Quartile	No. of houses	Area sq.m	Avg. area sq.m	Avg. open area sq.m	Avg. rooms per house	Density (rooms:area)
1	58	10–45	25	0	1.4	1:18
2	61	50–170	108	1	4.7	1:23
3	57	175–345	246	16	8.4	1:29
4	58	350–3000	714	104	16.4	1:45

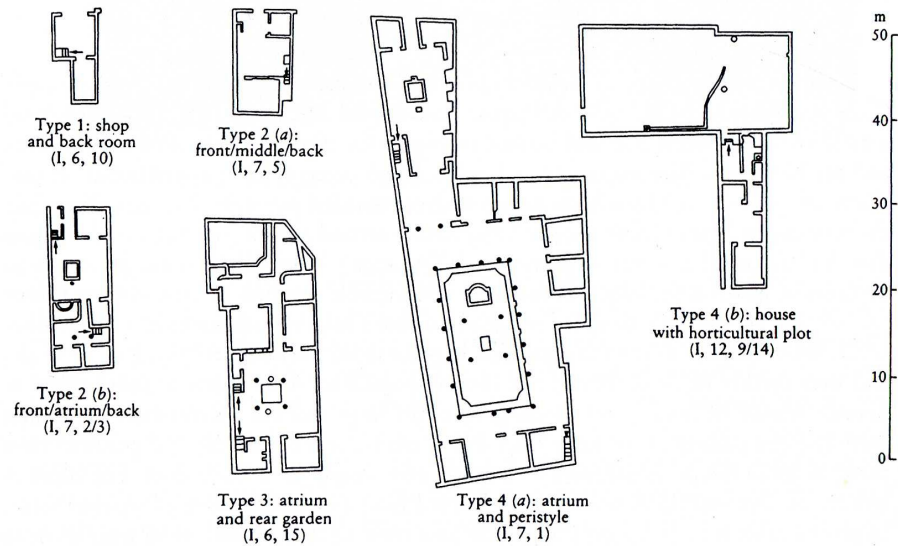
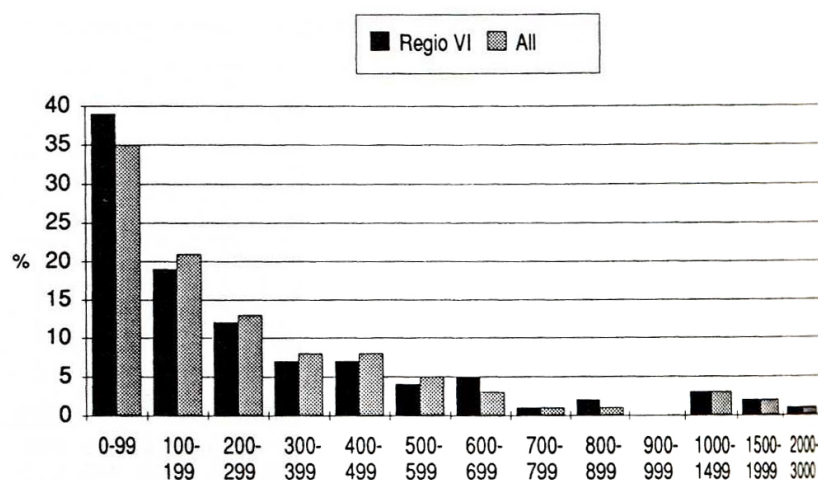


Table 1: Unique types of houses based on a categorization of relative dwelling area



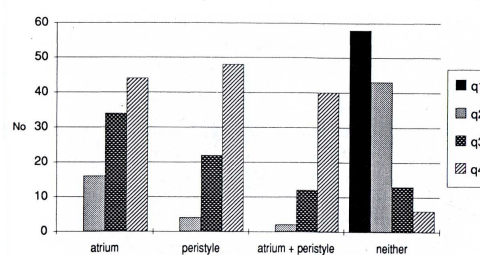
Relative frequency distribution of plans across Regio 6 compared to survey data for Herculaneum and Pompeii. Dwellings are grouped by similarity in square footage

Frequency of atria and peristyles

Feature	No. (%)	Avg. area sq.m	Avg. open area sq.m
Atrium	94 (41%)	480	62
Atrium, no garden	34 (15%)	224	0
Atrium and garden	60 (26%)	626	98
Garden	81 (35%)	552	87
Garden, no atrium	21 (9%)	341	56
Garden, no colonnade	7 (3%)	231	28
Garden, 1 colonnade	22 (9%)	340	63
Garden, 2 colonnades	21 (9%)	433	55
Garden, 3 colonnades	7 (3%)	408	58
Garden, 4 colonnades	20 (9%)	789	110
Garden, 8 colonnades	4 (2%)	1970	424

NOTE: garden here indicates open areas that appear to serve an ornamental function, as opposed to horticultural plots.

HOUSES AND URBAN TEXTURE



Tables 3 & 4: Differentiation of atria and peristyle sub-types as well as frequency across the four quartiles. Wallace-Hadrill, 86-56

Wallace-Hadrill's study however raised several concerns due to the sampling of partial *regiones* which stemmed from his wish to only utilize published data. In particular, the first eight Pompeian *insulae* (blocks) of *regio* 6 were removed as well as *insula* 17. Had these houses been included, the final results may have favored the appearance of larger houses and the urban / suburban villas. The second thing



that Wallace-Hadrill did was to include all recognizable building units and not just those documented as houses. These were incorporated because the possibility existed that properties which functioned as workshops and taverns could also serve as habitation for their owners. The only issue with this is that most of these properties are smaller than 100 sq. meters and so their inclusion skews the data towards small dwelling units. In addition, their inclusion almost quadruples the sample size in the remaining eight blocks. To see how these criteria potentially changed the study data, refer to the tables in appendix A.

The urban typologies must be drawn from a complete sampling of block conditions but limited in a way that not all of Pompeii has to be included. In order to resolve this, this study is only focused on regio 6 with special attention to the Via Consolare. This was done because the Via Consolare is the only street in Pompeii which runs from inside the city to the country which has surviving dwellings in both urban and exurban conditions. Regio 6's one-hundred and nine documented residences show all traits of the various domus types in statistical quantities, and the thirteen houses and four villas of the Via Consolare adequately represent characteristics of each.

## **Methodology**

Three individual methodologies comprise this study of type, supported under the main heading of Neo-Rationalism; they are: typology, geometry, and space-syntax. Each one reveals a different way of approaching the built environment with a scientific and architectural rationale. The other reason for using three methods is that they each fill in information which the other two cannot provide. As will be shown further on in this section, typology can predict functional behavior and composition, but not dwelling size nor room count. Geometry can be deterministic in house size but not function or formal

rationale. Finally, space syntax cannot perform the tasks of typology or geometry, but it can be used to analyze the interconnectedness of all spaces within the type and composition.

The problem with developing multiple types or a taxonomy of types is that it can be hard to know when to quit. A complete taxonomy could include an infinite series of possible combinations. Understandably, the basis of a multi-type study seems to logically go against the concept of rationalizing as few types as possible. It inherently promotes transitional types which could be countless in number. For the sake of remaining diligent to these ideas this study tries in every way to limit the number of types, where the domus and villa will each have one -to- two unique type and one transitional type between categories.

### **Neo-Rationalism**

The emergence of the Rationalist movement in Italy during the 1920s was a product of the Gruppo 7 who sought to re-assess tradition in terms of logical rationale. Their ideas were based on Vitruvius' assertion that architecture is a science which can be comprehended rationally<sup>3</sup>. While the work of Giuseppe Terragni was able to distill elements of the built environment into understandable forms, it could be argued that the end result was of a mostly functionalist nature and did not take into account sub-types for variable site and urban contexts in the same way Vitruvius had. Succeeding this Rationalist movement in the post-war period was the foundation of Neo-Rationalism by the Italian group Tendenza, headed by Aldo Rossi. Their approach integrated into the Rationalist manifesto the idea of typology as the means of understanding buildings in the context of the larger city<sup>4</sup>.

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3 Broadbent, Geoffrey (1990). *Emerging Concepts in Urban Space Design*. Van Nostrand Reinhold (International), London. p. 157 et seq

4 IBID, 166-72

Italian Neo-Rationalism presented an ideology which proposed that ancient structures could be ordered, clarified and assessed as a means to apply them to new or yet unknown conditions. The developers of this theory preferred empirical reasoning over observation in order to find the transcendence of elements without looking to history or culture. Just as the Rationalists re-evaluated historical precedents to find logical congruence on which to build, the intended outcome of this research is a deep investigation of the housing typologies in ancient Pompeii based on a taxonomy of their constituent formal parts and a reading of their relationship to urban boundaries.

In contrast to previous work done on Pompeii primarily by Andrew Wallace-Hadrill, John Clarke and Axel Boethius, the focus presented will examine dwelling conditions occurring at different urban densities and those which have different relational characteristics to social/political boundaries, namely, the city wall. In addition, the research incorporates the principle that dwellings can be examined based on context and form without addressing the station of the owner, an idea which is not usually examined in studies that contain villa typologies. By removing the cultural connotations and rituals associated with the house such as separation of gender or patriarchal relationships it should be easier to cross-examine multiple houses and multiple types at the same time. The intention that this line of questioning will first and foremost lead to a greater system of type comparison in opposition to the often polarizing view with which the domus and villas of Pompeii are often addressed.

## **Typology**

The purpose of looking at a typological survey in the neo-rationalist methodology is an attempt to

quantify or classify structures and forms in a logical way. Neo-rationalism emerged in the late 1960s to emphasize the continuity of form and history against the fragmentation produced by subdividing typologies<sup>5</sup>. This ideology combines the enlightenment philosophy of type established by Quatremere de Quincy in 1825 along with the modernist works of Aldo Rossi, and Rob Krier. The benefit of Quatremere de Quincy's approach was that its vague definition allowed for type to act only as a basis for the conception of works, even those which may not bear resemblance to one another. The most easily comparable ways of working with de Quincy's ideas of spatial production can be realized by analyzing typologies as formal, compositional, and functional organizations. As will be shown, each of these can be a direct bi-product of context. That is to say, that the dwelling types being studied are comparable with each other and with their location in the greater context of the city.

In de Quincy's definition, what we recognize as the 'atrium scheme' found repeated at Pompeii seems to fit better to what he says constitutes a 'model'. That is "a mechanical reproduction of an object...a form to be copied or imitated."<sup>6</sup> His conceptualization of type was based on three concepts: "origin, transformation, and invention....Origin is related to the understanding of type as the general form, structure, or character distinguishing a particular type, group, or class of beings or objects."<sup>7</sup>

The approaches set forth by the Rationalists and the Gruppo 7, later elaborated on by Aldo Rossi and Rob Krier, applied a classificatory procedure to architectural form which established detailed rules for spatial combinations. Rossi and Krier's work illicit similar concepts like the exclusion of function as the primary generator and examination of historical cities. Krier's research, undertaken at the scale of the

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<sup>5</sup> Broadbent, 157

<sup>6</sup> Moneo, Raphael. "On Typology." (Oppositions n.13. Summer 1978, MIT Press), 28

<sup>7</sup> IBID

urban node states that “Genotypes are abstract relational models governing the arrangement of spaces...By examining the syntactical aspects of phenotypes, it is expected to reveal the underlying genotype that is shared by the phenotypes examined”<sup>8</sup>. The goal of his work was to identify patterns in existing conditions rather than to build and create new ones. Rossi's work on the other hand was devoted to the understanding of type as it related to the city for generative purposes. Type was a device which could be considered as retaining the “internal logic of form”<sup>9</sup> and which sought an ideal stability based on historical antecedents. As a combination of both men's philosophies, the neo-rationalist perspective validated the analysis of type through a secondary analysis of its constituent forms. In the context of this thesis, the secondary forms (phenotypes or subtypes) are the individual elements that make up the larger dwelling and the idealized type.

As Rafael Moneo observed, “the architectural object was meant to be repeatable”<sup>10</sup> but with variations that could be introduced with time. He specifically defines type as the grouping of objects by certain inherent structural similarities and thinking. As best explained by de Quincy, “the type was thus intimately related with needs and nature”. However, as J.N.L. Durand would argue, “composition is directly related to needs”<sup>11</sup>; the classical model of

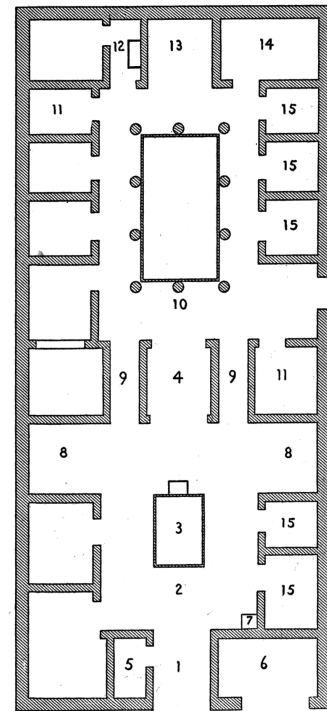


Figure 3: Plan of the town house. Nash, 16

8 Hillier, B. and Leaman, A. “How is Design Possible,” in Journal of Architectural Research, 3: (1974), Hillier, B. and J. Hanson, Social Logic of Space, (1984), 4-11

9 Guney, Yasemin I. “Type and Typology in Architectural Discourse”. (Doctoral Thesis, University of Michigan, 2007), 13. See also Moneo, pg. 36

10 Moneo, 23

11 Moneo, 28-29

the atrio-domus presented by Ernest Nash and a number of other scholars is built along this line of thinking (*figure 3*). Specifically, Durand's idea of convenience states that “symmetry, regularity, and simplicity” are required for a coherent understanding of type. For architectural theorist Carlo Argan, type could be rationalized as a product of comparing and overlapping formal regularities. It was through the transformation of a basic or ideal form that buildings could be understood as products of a common lineage. As his theory suggests I Types are transformed, that is, one type becomes another, when substantial elements in the formal structure are changed.”<sup>12</sup>

The work of Rob Krier can be seen as the urban counterpart to Argan's theory. The development which he proposes to classify typological or morphological change can be thought of as follows: Basic shapes or forms are affected by “modulating, angling, segmentation, addition, merging, overlapping, distortion, or as an amalgamation of elements.”<sup>13</sup> As a second point of usefulness, the factors just described can produce and modify both regular and irregular geometries for any spatial type. The formulations of these geometries may be derived from the simple foundations of the square, circle, and triangle as they appear in plan.

“In this continuous process of transformation, the architect can extrapolate from the type, changing its use; he can distort the type by means of a transformation of scale, he can overlap different types to produce new ones. He can use formal quotations of a known type in a different context, as well as create new types by a radical change in the techniques already employed.” -Rafael Moneo<sup>14</sup>

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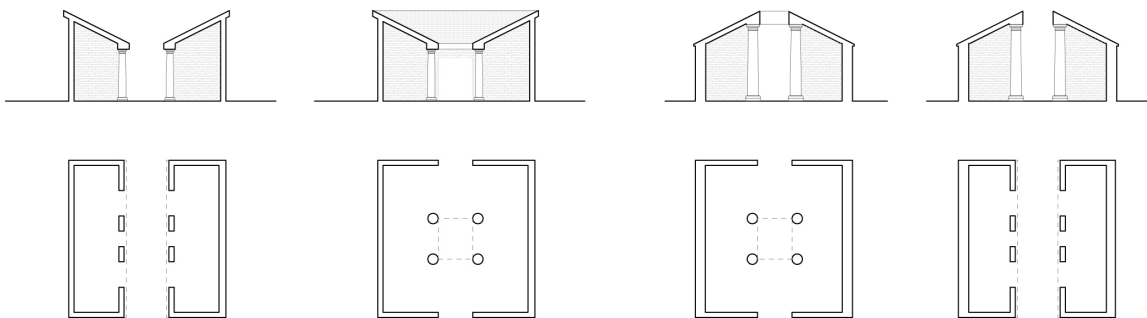
<sup>12</sup> Moneo, 36

<sup>13</sup> Krier, Rob. “*Urban Space*”. (Rizzoli International Publishing, 1979), 29

<sup>14</sup> Moneo, 27

Specific attention has been given to Krier's work here because of the ways he approaches type in terms of urban space and void forms. If we could invert all of his diagrams it is possible that the converse of his ideas could be just as applicable to the positive forms of buildings. Type creation in buildings is equally about the amalgamation of elements brought together for a specific use. Because type requires the joining of unique elements it should be said that a purely 'formal' process is not the only way to achieve significant results. Equally applicable are the structural and climatic factors which govern building construction and which provide the basis for establishing building use and functionality. In these ways, the resultant design comes as a response to a desired functionality which is then carried out through a logical construction method. The reason that Quatremere de Quincy's ambiguous ideas of type are still pertinent is that there has yet to be a new definition which acknowledges forces outside of form and use driven by function.

Our understanding of type is typically considered in the plan view, and thus we are limited to seeing the full functional potential of the building type. It is logically conceivable that two different types could exist with identical plans or sections as the drawings in *figure(4)* depict.



*Figure 4*

Both look the same in plan, but have distinct uses which accompany their sectional characteristics. The

problem is that a singular mode of representation is insufficient to capture a complete understanding of how a building will function. Equally, without a context represented it is impossible to grasp all of the forces at work in shaping the form. The overall type is tied to this because it is a product of lesser elements which belong to the construction method and desired design. These must be arranged harmoniously within the form for all parts to function correctly.

## Geometry

One of the easiest ways of understanding and perceiving type is through the way which we see patterns and geometric variations. The method through which they are explored shows them as compositions but also as products of their overall form. Vitruvius covers definitions regarding both devices as being important to our understanding and reading of buildings.

“Therefore, since nature has designed the human body so that its members are duly proportioned to the frame as a whole, it appears that the ancients had good reason for their rule, that in perfect buildings the different members must be in exact symmetrical relations to the whole general scheme.”(Vitruvius III.1.IV) “In width and length, atria are designed according to three classes. The first is laid out by dividing the length into five parts and giving three parts to the width; the second, by dividing it into three parts and assigning two parts to the width; the third, by using the width to describe a square figure with equal sides, drawing a diagonal line in this square, and giving the atrium the length of this diagonal line” (Vitruvius VI.3.III)<sup>15</sup>

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15 Vitruvius. “*The Ten Books on Architecture*.” trans. Morris H. Morgan (Boston: Harvard University Press, 1914), 73, 177



Carol Watts describes several methods for organization based on constructions made with a circle and square. These she defines as the sacred cut and root 2 progression which can be seen in *figure (5)*. Even though very few true squares or exacting geometries can be found using these methods Tons Brunes, originator of the term “sacred cut”, argues that the level of accuracy which ancient builders could achieve was limited to subdivision by compass and chain measures.<sup>16</sup>

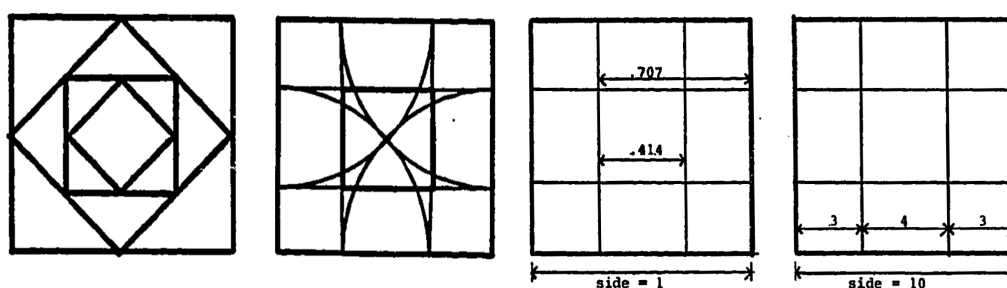


Figure 5: Square constructions of 'sacred cut' and root 2 geometries. Watts, 43

While the method that Tons Brunes has created in the 'sacred cut', ad quadratum, or golden section works to a degree, the geometric studies in appendix (C) construct a simple root 2 proportion simply because the inclusion of the entire circumscribed square makes it very unwieldy in non-rectilinear spaces. The way Carol Watts and Ton Brunes have gone about constructing their geometries is actually the downfall to this method. The reality is that if ancient Pompeian builders were actually taking chain measurements they would have to begin their survey at a single fixed point, and it would have to be the same point every time (such as the front left corner of the property). Without such strictures there is no way to compare the construction geometry. The second problem is the construction of a square in open space. Typically, any 4 circles of equal diameter intersecting the center points of the two nearest circles

<sup>16</sup> Watts, Carol. “A Pattern Language for Houses at Pompeii, Herculaneum and Ostia” (Doctoral Thesis, University of Texas at Austin, 1987), 73, 77

will produce a square. From that square a 45 degree diagonal can be drawn. However, as is the case with most building sites, four equal circles cannot be drawn because the street does not pass the end walls perfectly perpendicular to them or other buildings get in the way of creating a full arc. The result is that a 45 degree diagonal cannot be drawn with any accuracy as it has no reference. However, if a single fixed point is used to survey the entire exterior form of the house, then diagonals can be constructed from angle bisectors resulting in rhomboid geometries very similar to squares. To this point, utilizing this second method of geometric construction has produced results of even higher accuracy than that achieved by Watts, generally with less than 2% deviation. This method appears consistently, even in houses of different sizes. The proportioning which establishes the initial rectangle falls into one of three geometric construction systems based on the square.

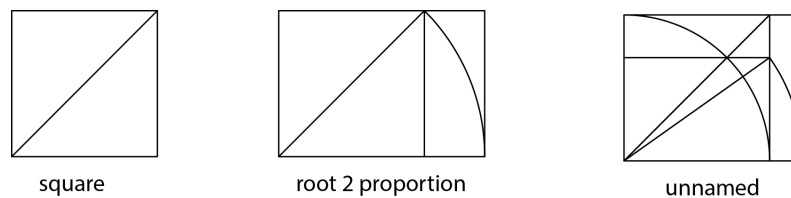


Figure 6: Geometric constructions based on the square

If additional depth is required as with houses with gardens or peristyles, then the geometry is either repeated or a further transformation of the initial governing geometry (*see figure (7)*). In cases where the

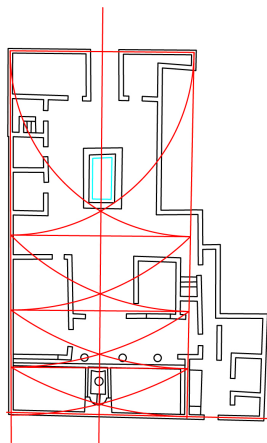


Figure 7

house or space is not rectangular or has a skew to it, the proportions still define the planned wall center-lines. Figure 7 shows the application of this method to the House of the Large Fountain (VI. 8. XXII,I). In this case we would classify the house as belonging to those defined by a root 2 progression.

In the average domus, the width from the edge of the compluvium/ impluvium to the nearest wall is almost exactly  $\frac{1}{2}$  the distance from the same edge to the

exterior walls (*figure 8*). Another way of looking at this is that a figure drawn around the spaces adjacent to the atrium would be congruent to a figure drawn around the perimeter of the atrium or around the impluvium.

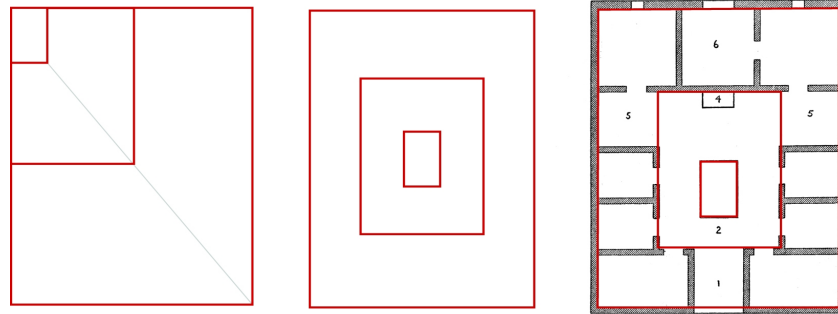


FIG 1. Plan of the original Roman atrium-house  
1. fauces—entrance 2. atrium 3. impluvium—basin for rain water 4. hearth 5. alae—wings 6. bedroom of the owner

Figure 8

The inherent problem with geometric studies is that it is very easy to interpret what you want and ignore ground rules that prevent nonsensical or abstract dimensioning. These only serve to cloud meaningful results. The other problem is that when constructing geometries over top of existing plans it becomes more likely that dimensioning will occur in the middle of a room without a logical system of how a builder might have construct the geometry to get there in the first place. The drawings at the beginning of Appendix (C) work through the process of constructing a house geometrically in an urban infill site. As can be noted, the process is surprisingly complex and there are very few solutions which can perfectly recreate the symmetrical geometry which we commonly attribute to the traditional plans indicated by Vitruvius.

What we find in most studies of the Pompeian house can be thought of in terms of composition. We have at our disposal a set of programmatic spaces defined by Vitruvius and Varro which may be arranged within the type without changing the nature of the type itself. That is, the functions of the spaces which

we find in the house are free to be arranged independently of the house form as long as the atrium remains in the middle. As a compositional device, geometry is highly adept at determining spatial planning. The most common way it is used architecturally is to signify what Francis Ching describes as order. Buildings can be axial (linear), radial, clustered, centralized, and gridded.<sup>17</sup> Pompeian architecture has tended to be classified in terms of axuality due to the Roman social context which put emphasis on lines of sight as the primary way to understand power and hierarchy.

### Space Syntax

The last methodology which will define the study of typology is a form of Hillier and Hanson's space-syntax theory. The primary goal of the space syntax theory is to better understand spatial configurations in buildings and urban areas. What results from a space-syntax analysis are a series of patterns which emerge from spatial pairs or the sequences of spaces required in order to reach a destination.<sup>18</sup> This

method follows the same process logic architects utilize whenever they delineate spaces as primary, secondary, tertiary, etc.. From these layers of space we can imagine a branching tree

diagram which unites them based on how connected they are to their neighbors. An example of this can be

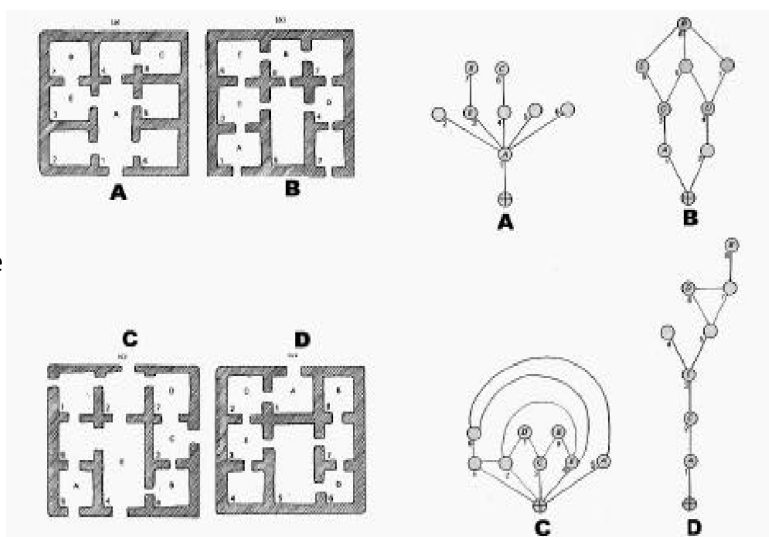


Figure 9: Each "j graph" branching tree structure on the right corresponds with possible path sequences through the plans on the left

<sup>17</sup> Ching, Francis. "Architecture: Form, Space, and Order". John Wiley & Sons, Inc. Hoboken, New Jersey, (2007), 195

<sup>18</sup> Haq, S. "Space Syntax", in *Complex Architectural Settings: An Investigation of Spatial and Cognitive Variables Through Wayfinding Behavior*, (PhD Dissertation, Georgia Tech, 2001), 1

values can be associated based on the layered distance from the entry and an average can be taken. This average is known as the mean depth. A score for an entire house can be calculated as  $2 * (\text{Mean Depth} - 1) / (\text{number of rooms in the network} - 2)$ <sup>19</sup>. The visual representation of this data comes in the form of what is known as a “j graph” or justified graph<sup>20</sup>. A simplified version of these graphs are also displayed in *figure (9)*.

The two most well known studies utilizing the space-syntax method are Frank Brown & Bellal Tahar’s study of Berber housing in Algeria, and Deniz Orhun’s study of traditional Turkish houses<sup>21</sup>. In each study, a selected group of houses from each town were compared to see if they showed patterns or similarities in spatial connectivity between functional spaces of the home and the exterior. What they found were that houses could be categorized as being either 'shallow core' or 'deep core'<sup>22</sup> showing what we would architecturally consider in terms of the number of tertiary spaces or entire regions of the house which are only connected by corridors. A visual breakdown of primary, secondary, and tertiary spaces in all dwellings included in this study can be found in appendix D.

Because most of the domini in this study have similar organizational logics and scales, the method of working with syntax is only partially useful because the collection of houses returns a relatively uniform set of values. Where this is most potent is in the examination of the villas because they are so varied. A

19 IBID, 9. “Since the number of spaces is a consideration for RA, it follows that size can have an effect on the level of RA values in real systems. So, to compare between different sized systems, the modified unit Real Relative Asymmetry (RRA) is used. This is comparison of RA values with those for a theoretical ‘root’ or a diamond shaped pattern. It is given by the equation  $RRA = RA / Dk$ , where Dk is the D-value of the system with the same number of spaces as the real system. Therefore consideration of RRA values gives the opportunity to compare between environments (Hillier, 1984)” For a complete understanding of the method in application see Ray Laurence "Roman Pompeii: Spaces and Society", 115-117 on the House of the Vetti.

20 Brown Tahar p. 4 “The justified graph shows how the arrangement of convex spaces [vertices] and their entrances [linking lines or edges] control access and movement. It is organised in a particular way : all the spaces are aligned above a certain space [normally the site in which the dwelling sits, which is sometimes referred to as the 'carrier' of the system] in levels according to their depth from that space until the furthest convex space is reached.”

21 D. Guney, Yasemin, 14

22 Brown Tahar, 12

sampling of domini will still be analyzed so that a comparison between the two types can be made which proves or disproves the existence of shared prototypical patterns.

## Context – Urban and Suburban Life

### Development and Expansion of the City

Pompeii was established in the end of the seventh century B.C. as a market community which served the farmers, craftsmen, and travelers of the region. The first few streets were unpaved and the central forum lacked a recognizable formal organization. The period of Samnite influence which lasted from the fifth through first centuries B.C. was concurrent with the expansion of the city to its current borders<sup>23</sup>.

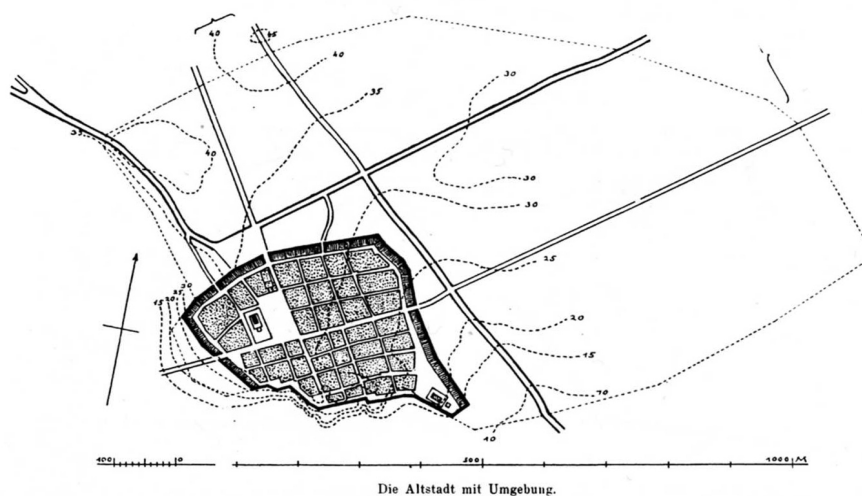


Figure 10: Pompeii: reconstruction of the first town and of the main roads in the surrounding area by A. von Gerkan, Stadplan, Pl. 2. from Herman Geertman in "The Urban Development of the Pre-Roman City" in *The World of Pompeii* - Dobbins and Foss p. 83. The Altstadt is the shaded area.

This enlargement was planned in a more traditional grid format which left the blocks in rectangular or trapezoidal configurations. Early on, these insular plots were only occupied as required, and so the

23 Richardson, L., jr. 1988. Pompeii: "An Architectural History". (Baltimore: Johns Hopkins University Press.), 3-26

houses were left sprawling or scattered amongst their gardens<sup>24</sup>. The land itself was remade to fit an urban center; in particular, the landscape of insula 1 in regio 6 was terraced and re-subdivided around the end of the third century B.C and the old dwellings which did not conform to the new grid organization were removed.<sup>25</sup> The decline of the early Samnite period began in the mid third century as Pompeii's prosperity as a market began to draw the eastern Hellenistic and Greek influences. It wasn't until the end of the Social War in 88 B.C. that the city was fully swept into the Roman influence conquering the Italian peninsula<sup>26</sup>.

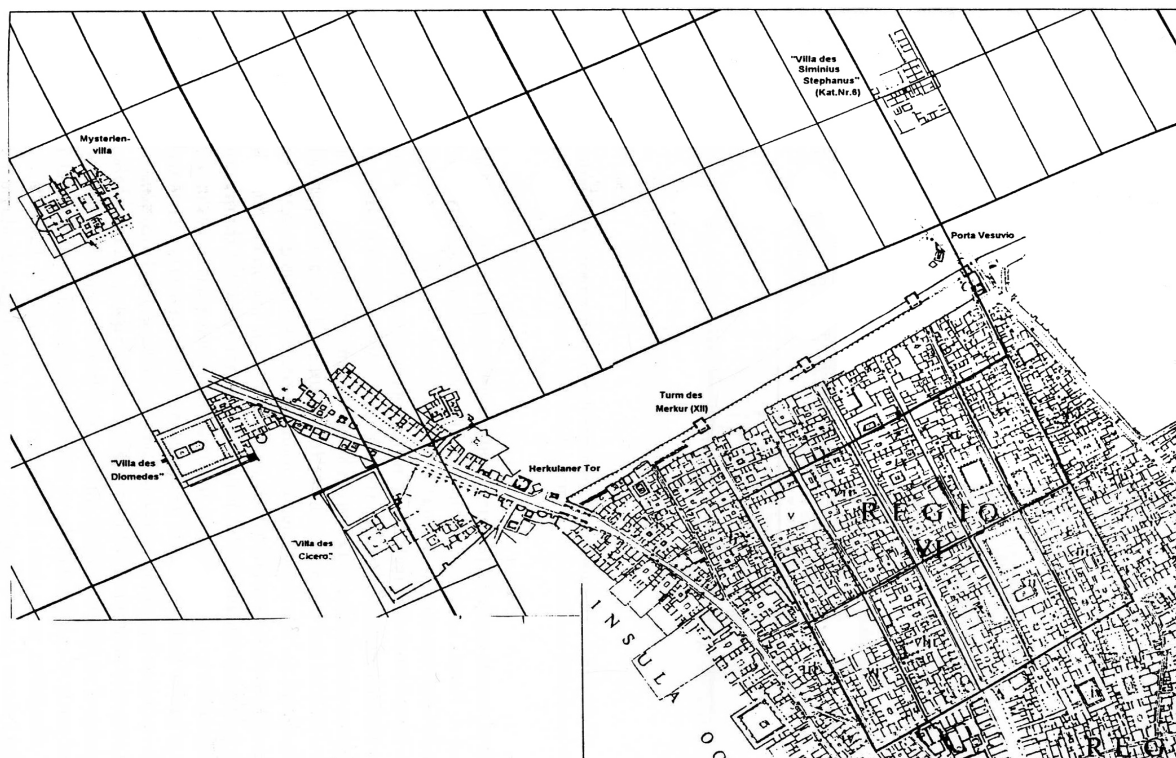


Figure 11 Part of the centuriatio north of the city before 80 BC; Oettel, *Fundkontexte*, figs. 29-30. Also see Erice M. Moormann, "Villas Surrounding Pompeii and Herculaneum" in *The World of Pompeii* - Dobbins and Foss p. 437

24 Carrington, R.C. "The Ancient Italian Town-house." (Journal of Antiquity 7:133-52. 1933), 62

25 Jones, Rick & Robinson, Damian. "Intensification, Heterogeneity and Power in the Development of Insula Vi.I" *World of Pompeii?* In "The World of Pompeii" (Routledge, New York, 2007), 391-392

26 Richardson, 16

In an exurban analysis done by Valentin Kockel figure (11) it should be observed that the urban boundaries do very little to stop the organizing principles of the city from emerging in the hinterland. The *centuriatio* grid system which pre-dates Regio 6 continues beyond the wall and can be seen in alignment with the villas of the Via Dei Sepolcri.<sup>27</sup> As seen in the figure (11) all four villas conform in some way to this grid structure. The positioning of the grid also explains why the Villa of the Mysteries does not sit directly on the Via Superior or the Via Dei Sepolcri. A separate dominant grid defined by the traditional *cardo* and *decumanus* controls a majority of the urban plan, especially in the eastern half of the city. An analysis of either grid to date has been limited to the configuration of the streets and *insulae* and has yet to be continued into the ordering of the house itself.

### The Via Consolare

As stated previously, this study focuses exclusively on Pompeii and its exurbs towards the region just north known as Boscoreale. In particular the westernmost street in Pompeii, the Via Consolare.

Technically, the Via Consolare becomes the Via Dei Sepolcri and the Via Superior as it exits the city through the Porta Ercolano. For the purposes of this study however, it will be acknowledged as a single route just as it was in the Samnite Period (2<sup>nd</sup> century BC) when it was known as the Via Sarina.<sup>28</sup>

Specifically, this study includes the houses/apartments in Regio 6 - Insula 1, the south end of insula 2, and the dwellings of *insulae* 3, 4, and 17 which directly front the Via Consolare. This is an area which has not reached a high level of scrutiny to date. As one of the first sections of the city to be unearthed, the means and methods of archeology were far less advanced than the later excavations. In addition, the ruins were subjected to bombings at the end of World War II which caused additional erosion and

27 Moorman, Eric M. "*Villas Surrounding Pompeii and Herculaneum*" Chapter 28 in "The world of Pompeii" (Routledge, New York, 2007), 445

28 AD 79 - Destruction and Re-discovery <https://sites.google.com/site/ad79eruption/pompeii/regio-vi> (June 1, 2012)



mudslides.<sup>29</sup> Even with new excavations in the 1960s and 70s insula 17 has never been fully examined.

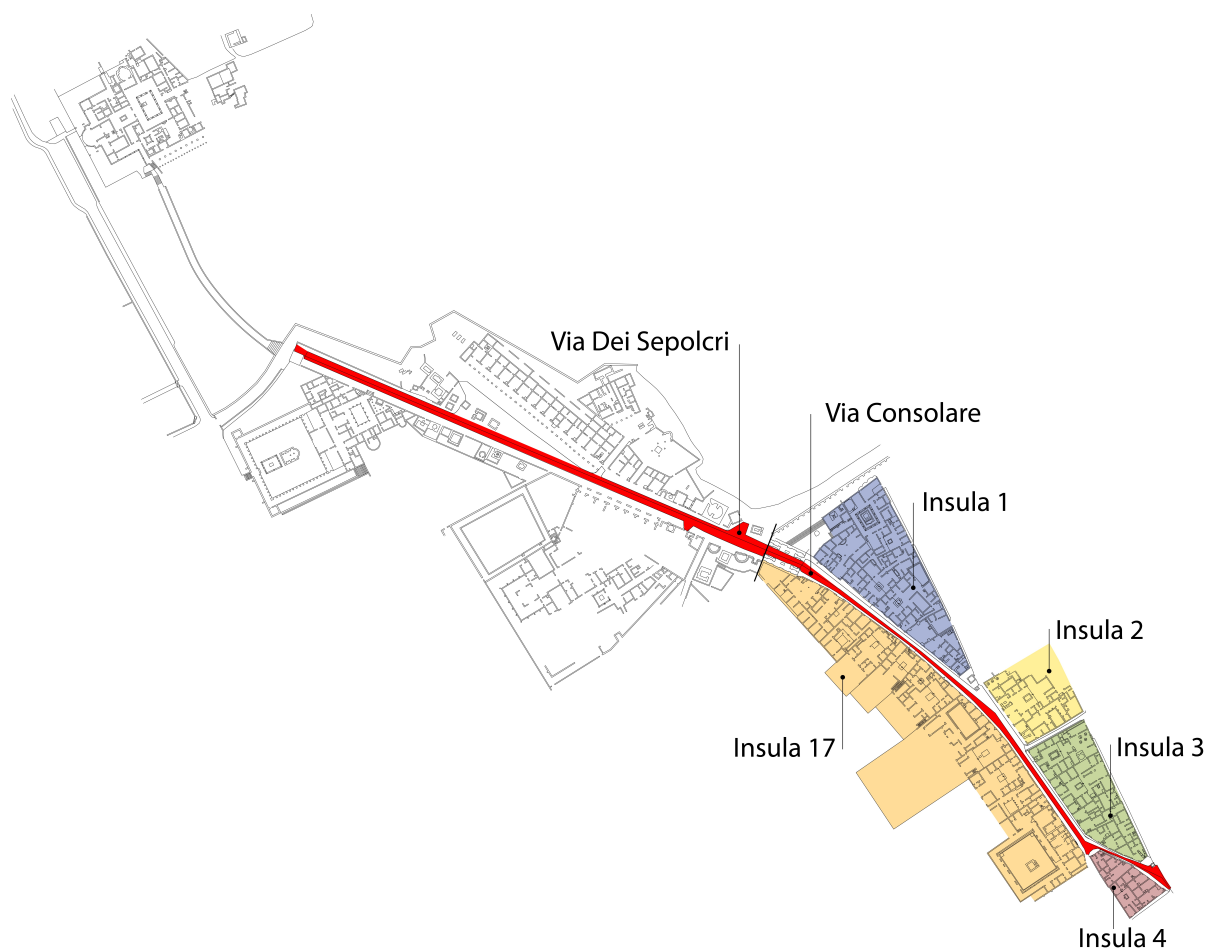


Figure 12

The second unique feature which prompted the focus of this study to the Via Consolare is that while the east side of the street contains more typical house structures (regio 6 insula 1), while the west side (insula 17), also known as the Insula Occidente, contains dwellings similar to those found in regio 7 which have merged with the city wall and taken on villa qualities prompted by the luxury of a coastal view. As Wallace-Hadrill's study did not include these insulae it is worth addressing the point that dwelling size is

<sup>29</sup> Tybout, Rolf A. "Rooms With a View: Residences built on terraces along the edge of Pompeii (Regions VI, VII and VIII)". Chapter 26 in *"The World of Pompeii"* (Routledge, New York, 2007), 408.

nonuniform from one side of the street to the other. If the Via Consolare had been considered then the type 4 domus would have most likely become the dominant form.

It is important to recognize the different functions of buildings along the Via Consolare and the people that were drawn to the neighborhood around Regio VI insulae 1, 2, and 17 in order to understand their role in Pompeii. In tersing out building types that do not fall into the reaches of this study (non-dwellings) it is interesting to note the separation that dwellings have from the wall due to the insertion of caupone and popinae. It is in these areas as well that we should expect to find some of the highest concentrations of Wallace-Hadrill's type 1 and 2 conditions. Certainly one explanation for this is to accommodate the traveler or migrant worker; even as in modern times we locate hospitable services directly on the main transportation networks of a city.

The boundary of the city was defined by the walls and guarded by the Lares, the gods of the house and urban life. More specifically, a series of stones placed outside of the city gates marked the pomerium. In all Roman towns this territorial boundary marked the true boundary of the city<sup>30</sup>. Symbolically, the division of urban and exurban spaces announced the beginning of the necropolis, a secondary city of the dead. In many ways, the urban boundary is difficult to comprehend in the provincial towns. It would seem that this line is more a mark of behavioral practices. The dead were buried in the exurbs not because there wasn't space within the walls, but because it was where society dictated the dead belonged.<sup>31</sup> Pompeii is a unique city because the pomerium boundary is severely blurred outside the

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30 Encyclopedia Britanica 2012. The **pomerium** or **pomoerium** (Latin, from *post* + *moerium* > *murum*, "wall"), was the sacred boundary of the city of Rome. In legal terms, Rome existed only within the *pomerium*; everything beyond it was simply territory (*ager*) belonging to Rome. See also Laurence, 11.

31 Laurence, 10-11

Porta Ercolano. Several of the villas outside the city mingle with the necropolis, and directly within the gate many of the buildings function to serve the needs of the traveler. Both of these conditions imply that this territory is more permeable or has a close relationship with neighboring towns.

In looking at a single street in urban, sub-urban, and rural contexts equally it must be noted that what we see in terms of spatial grandeur in houses seems to increase relative to the distance that one travels away from the city gate. In the exurbs, even though the villa condition is immediately present outside the Porta Ercolano, the country villa becomes more regularized the farther that it moves away from the wall. Within the city, the domini that we observe seem to become more defined and symmetrical the closer to the city center that they are. There are two general observations for why this phenomenon might occur. The first is a matter of free space. As the dwellings inside and outside the city move closer to the walls the more their geometries have to coincide with the irregular boundaries which do not follow the same rigid organization as the insulae. The second idea is that the general wealth of the populace is held by those who control the power within the city center. As such, they could afford the space required to fulfill the culturally desired want for symmetry and regularity in their dwellings.

### **Part 1: Houses**

It is often easy to overlook the radical transformations which occurred in order to change the ancient log frame hut into the complex fusions of use that we recognize in the atrium typology. Arguments outlined by James Packer reveal the contention which exists in this statement. [see part 3: Insulae] The following descriptions of the house however will take the stance that the Italianate atrium derives from the

ancient one room hut. (figure 13)

The hut had an opening in the center of the roof which provided light and allowed smoke from the hearth to escape. This hole also allowed for the collection of rainwater and is thus called the *compluvium* (opening in which

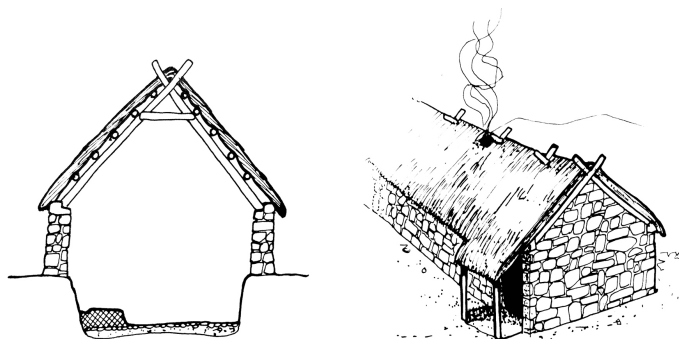


Figure 13: The Appenine hut. Boethius, 12

rainwater collects). In many cases there was a corresponding well dug in the floor below which was called the *impluvium* (place into which water flows).<sup>32</sup> Due to the extensive excavations done at Pompeii it can be shown that the impluvium is common to the atrium type most notably from the third century B.C. onward.<sup>33</sup>

### Etruscan and Early Republican Housing

Historically, the development of the atrium-impluvium relationship is well documented as an emergent feature of Etruscan construction logic. The transformation and variations discussed at length by Vitruvius are visually present in the houses collected by Morris H. Morgan and in Etruscan tombs. As Vitruvius describes them, there are five different styles of cavaedium, the latinized central hall of the house.

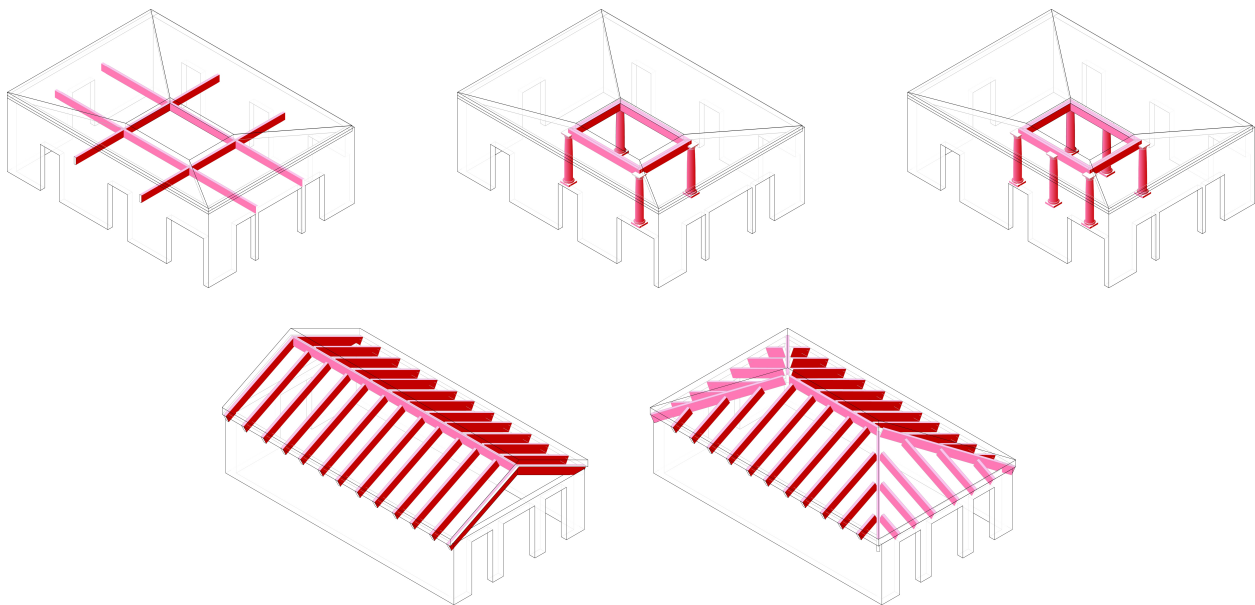
“In the Tuscan, the girders that cross the breadth of the atrium have crossbeams on them and valleys sloping in and running from the angles of the walls to the angles formed by the beams...In the Corinthian, the girders and roof-opening are constructed

<sup>32</sup> Nash, Ernest. “*Roman Towns*.” (J.J. Augustin Publisher, New York, 1944), 13

<sup>33</sup> Boethius, A. and Ward-Perkins, J. B. “*Etruscan and Roman Architecture*.” (Harmondsworth, Middlesex England, 1970), 89

on these same principles, but the girders run in from the side walls, and are supported all round on columns. In the Tetrastyle, the girders are supported at the angles by columns, an arrangement which relieves and strengthens the girders...In the displuviate, there are beams which slope outwards, supporting the roof and throwing the rainwater off...the Testudinate is employed where the span is not great and where large rooms are provided in upper stories.” (Vitruvius VI.3.1)

Within Vitruvius’ explanation of these styles there are two different types present, those which collect water and those which remove it. The first three styles belong to this first impluviate type.

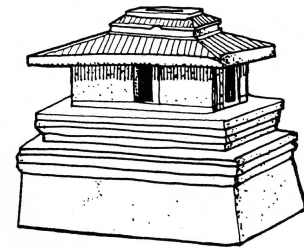


*Figure 14: From left to right: Tuscan, Tetrastyle, and Corinthian, Displuviate and Testudinate*

The displuviate type seems to be more related to the Etruscan mansion or Greek megaron because of its outward slope (Tomba a Tablino - *Figure (16)*). Clusium (Chiusi) presents us with a model depicting what

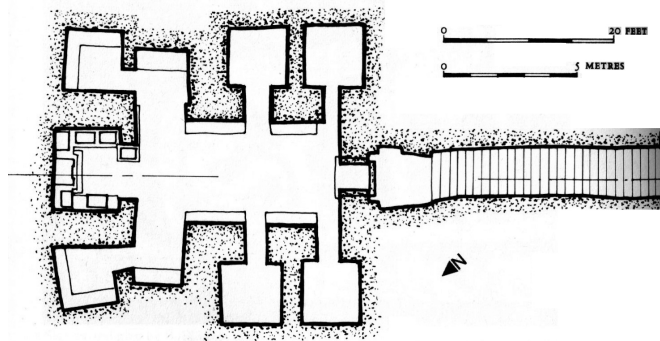
this type of house might have looked like (*figure (15)*). Despite the outward slope these roofs could still have compluvia cut in the pointed hip to allow for smoke to escape and for light to enter; a feature which makes them even more related to the Italianate hut.

The problem with the displuviate style as Vitruvius states is that the pipes meant for diverting the water away from the roof and interior could often not keep up with the runoff.<sup>34</sup> The inversion of the roof to be impluviate and collect water rather than shed it shows what could be considered a huge advancement and adaptation while not requiring any significant change in construction methodology.

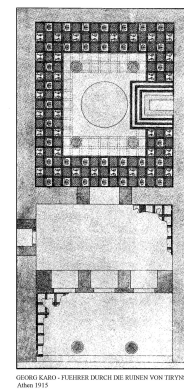


*Figure 15: Model of an atrium displuviatum fourth or third century B.C. Boethius, 90*

In studying only the plans of these early houses, the Greek and Etruscan roots are still easily identifiable. In the tombs of sixth and fifth century nobility there is a high correlation in the spatial planning with what emerges later as a house for the Hellenistic bourgeoisie.



*Figure 16-17: Tomba a Tablino and Typical Greek Megara Plan*



<sup>34</sup> Boethius, 89-91

Equally distinguishable are the small rectangular houses which resemble the Greek Megara in layout.

Structured on a system of party walls (*parietes communes*), these houses are typically only 10-13 feet wide and have only two rooms inside; one of which functions as an inner courtyard with a well. If the houses needed to be bigger, rooms could be added to the left or right side. The megara houses are accessed by a door directly affronting the street but still have a portico porch for urban separation.<sup>35</sup>

These organizations along with the Hellenized *consuetudo Italica* (*cavadeium Tuscanicum*) provide the common patterns which continued to define domestic architecture in central Italy through the end of the Republican Age.<sup>36</sup>

### **Late Republican Housing**

The prototypical form of the atrium type is grounded in place by the impluviate / compluviate relationship. All other spaces of the domus are centrally and axially organized around this scheme. As time progressed and the relative wealth of the city increased more rooms were added to the central atrium. Even with this change in formal organization, the central space of the house with the impluvium was still referred to as the *atrium* which translates to, (black room), from the Latin *ater* (black). The name derives from two sources. First, and more commonly recognized, is the labeling of the atrium due to the black soot which would accumulate on the walls and ceilings from the cooking fire.<sup>37</sup> The second source of this toponym is Etruscan and originates with the ancient town of Atria.<sup>38</sup>

In order to enter the house one had to pass through the *vestibulum*, also known as the *fauces* (throat or

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<sup>35</sup> Boethius, 75

<sup>36</sup> IBID p. 186

<sup>37</sup> Nash, 13-14

<sup>38</sup> Watts, 43

jaws)<sup>39</sup>. The primary purpose of this space was to act as formal entry for the home. A second likely function was to move the house farther from the street edge so that shops and other commercial enterprises could occupy the space between curb and house and be directly accessible by passerby. Even though these shops were sometimes operated or leased by the owners of the house they were attached to, they were walled off from communicating with any of the other dwelling spaces. Ray Laurence has studied a number of these conditions and been able to create two separate classifications for them. The first are doorways which are associated with the fauces of a dwelling, in which the front door on the street is tied to that particular house. The second type are doors which are associated with shops. In these cases, the shop, bar, or other mercantile space must be passed through in order to reach the atrium.<sup>40</sup> Surprisingly there are more reported cases at Pompeii of the second type which shows that the scheme of a fauces flanked by two shops is not actually the dominant configuration as asserted in the past. The tripartite facade division however still remains the most common<sup>41</sup>.

Situated on either side of the atrium were small rooms known as *cubicula* or what can be more commonly thought of as bedrooms. In the more traditional houses, the *cubicula* number between two and three per side of the atrium. Rather than have four pairs of *cubicula* the last has been removed or left open to the atrium to serve as hallways, shrine niches, or spaces to be used in conjunction with the hearth. Like the transept to a cathedral, these open spaces are referred to as the *alae* or wings<sup>42</sup>. As the house developed over time, the hearth moved to a more established kitchen space, leaving this area open to solely serve the back rooms and the *tablinum*. The *tablinum* acted as an office for the owner of

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39 Nash, 17

40 Laurence, 100

41 IBID, 101

42 Nash p. 14



the house to conduct business and to store business papers (*tabulae*).<sup>43</sup> In almost all cases found at Pompeii, the *tablinum* is the largest space directly adjacent to the atrium and is typically on axis with the front entry.<sup>44</sup>

All of the elements noted thus far can be found in the typical Roman atrium type scheme in one configuration or another with the plan variations appearing almost limitless. At this point we must divert from the atrium type. The features that I will now introduce are not required in order to recognize or define a dwelling as belonging to the formal or functional requirements of the atrio type.

The introduction of the peristyle represents a drastic change to the organization and understanding of the atrium house. While there were houses in Pompeii prior to this development which had *horea* or *nymphaeum* located in the rear beyond the *tablinum*, these spaces did not have secondary spaces which specifically served their functionality or were diminutive in size.<sup>45</sup> A quick visual scan of all house plans in Pompeii will reveal that less than half of all homes contain a peristyle garden alluding to the idea that this extra space and larger lot size required a higher level of wealth.

The atrium-peristyle house can be seen as the merger between Roman and Greek building techniques. Similar to the Roman atrium, the Greek *Peristylum* was a large central colonnaded courtyard about which the living spaces radiated.<sup>46</sup> In order to make this transition between cultures even more apparent, the corridor which connects the atrium to the peristyles is known as the *andron*, a word which

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<sup>43</sup> Nash, 14

<sup>44</sup> Boethius, 185

<sup>45</sup> Nash, 17

<sup>46</sup> Clarke, J.R. "*The Houses of Roman Italy 100 B. C.-A.D. 200: Ritual, Space and Decoration*". (Berkeley: University of California Press. 1991), 12

means (reserved for men) and which is of Greek origin<sup>47</sup>. In comparison to the Etruscan and Greek roots, the Late Republican house had large windows or completely removed walls behind the tablinum in order to view and access these gardens. As the peristyle became more prominent even the tablina itself transformed to perform more as a passage way or even in some cases was removed all together.<sup>48</sup>

With the addition of the peristyles also came the development of several different room types; the most prominent of these being the *triclinium* or dining room. Additional spaces include an oecus (living room), an entertaining hall, excedra, and various other spaces which could serve as kitchens, bathrooms, bedrooms, or storage<sup>49</sup>. In order to block the peristyle and its rooms off visually from the front of the house, the tablinum often had a series of double doors which could be closed.<sup>50</sup> In the older and more traditional villa urbana it was common for there to be a garden or horti behind the tablina. Just as Vitruvius describes this relationship we can see it manifested in the Villa of the Mysteries. The logical possibility seems that the garden and peristyle were equally interchangeable in transitioning between the Roman and Greek styles; especially as the colonnade became more commonplace in Hellenized towns.<sup>51</sup> As compared to the non-rigid Greek organizational pattern, the Roman peristyles present in *aedic* (building) construction had imposed a much stricter axuality and sense of symmetry. This tradition was so commonplace that even into the Imperial Age palaces carry a disposition for axuality as it relates to doors, niches, and frescoes.<sup>52</sup>

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47 Nash p. 17

48 Boethius, 186

49 IBID

50 Nash, 18

51 Boethius, 187

52 IBID, 187-188

In writing on the organization of the peristyle, Vitruvius asserts that certain spaces should be arranged as to benefit the owner with pleasant conditions of light and air at all times of the day and with the changing of the seasons. "Baths and winter dining rooms should be located on the west side of the peristyle; bedroom suites, libraries, dining rooms used in the spring and autumn should be on the east, and summer triclinia should face north."<sup>53</sup> The larger triclinia can in fact be noted as facing relatively the same direction in the houses of the Vetti, the Faun, and the Menander even though the central axiality of each house is oriented in a different direction. These organizations come well established in the more lavish houses of Pompeii. However, while this evidence supports Vitruvius' statement, it is actually more common to find houses with similar spatial configurations and different triclinia orientations. Therefore it should be reasoned that additional forces are responsible for determining the output in less aristocratic homes. Again and again, a secondary sort of space appears in the center of back of the peristyle on axis with the entry, repeating a similar pattern of fauces-atrium-tablinum found at the front of the house.<sup>54</sup>

The primary objection raised in examinations of spatial organizations of the houses in Pompeii lies with the inability to separate spaces and their functions or labels. The problem with labeling spaces is that we have gained them from three unique sources in Vitruvius, Varro, and Pliny the Younger. As such, It is possible that the labels which each author associated with the various parts of their houses were not the actual names given to these rooms. Even if they were correctly labeled by each author, they may have changed over time and so different names could relate to similar spaces.<sup>55</sup> In many cases, assumptions are made based on analyzing houses of similar configuration with known room types. One of the reasons

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<sup>53</sup> Vitruvius *De Architectura* (6.4.11) and see Clarke, 14

<sup>54</sup> Boethius, 187-188

<sup>55</sup> Allison, Penelope M. "Domestic Spaces and Activities" in *The World of Pompeii* (Routledge, New York, 2007), 276. See pages 276- 277 for additional information.

for utilizing the space-syntax theory is that it allows room networks to be mapped with purely quantifiable data regardless of room function. The network mapping procedures used look at spaces in terms of their proximity to primary entrances. In this way, the progression from room to room can be thought of as moving from a primary to secondary or tertiary level, etc. in which an individual would distance themselves from their urban or suburban environment.

### **Houses in Pompeii**

In a general survey of Pompeian domestic architecture it should be noted that houses fall into three main categories. There are typical atrium houses, atrium houses with peristyles, and irregular house plans which do not conform to the recognizable atrium scheme. These three categories have been offered due to the oversight that the simple atrium and irregular house plans seem to get in most typological studies. This is often a product of their lack of preservation and unidentifiable spatial organizations. They do however still comprise over 50% of all dwellings found at Pompeii and therefore should not be immediately rejected. One of the aims of this paper is to note the elements which are common to almost all dwellings rather than rely on the homes of the wealthy to serve as the model for the type.

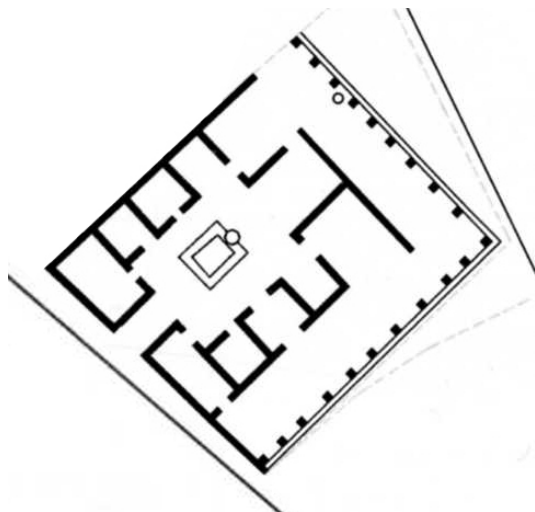
### **Houses on the Via Consolare**

The houses of the Via Consolare show a striking level of contrast to each other as conditioned by their streets and placement near the wall. Each of the houses in this section will be discussed in terms of its unique organizational pattern and the variations that it has undergone compared to its neighbors and the ways it addresses notions of form and function. The first few houses described belong to the insulae on the eastern side of the street which are found in typical block conditions (insulae 1,2, 3, & 4). Those in

the section called ‘the terrace houses’ belong to the western ‘insula Occidente’ also referred to as insula 17.

### House of the Surgeon

The first two dwellings to be built along the Via Consolare were the House of the Surgeon (Casa del Chirurgo) and the House of the Vestals.<sup>56</sup> Recent excavations done below the House of the Surgeon reveal that it has been rebuilt to some extent since 200 B.C. The layout of the original plan hasn't changed much from the traditional organization of an atrium house with fauces, cubicula, and alae in symmetrical fashion. The original dwelling can even be recognized as having a dug out impluvium suggesting that the



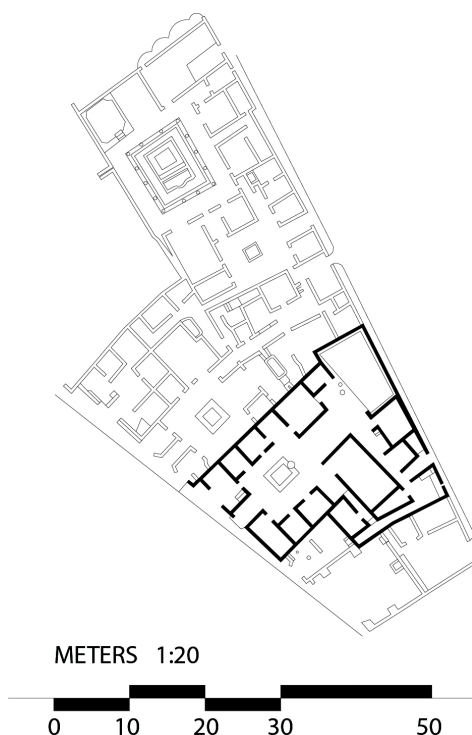
original roof was of a compluviate style.<sup>57</sup> Beyond the tablinum, there is a small rear garden which at some point in time was as wide as the rectangular form of the house. After 150 B.C. or so the house was expanded to the south-east. (figure 18) These new spaces served almost purely functional needs as storage and a kitchen. The expansion also doubled the space adjacent to the tablinum which most likely became the winter triclinium. It is above this addition that a second story potentially existed as evidenced by the two stairs at the front and rear.<sup>58</sup>

*Figure 18: Original Plan of the House of the Surgeon.  
Jones and Robinson, 392*

<sup>56</sup> Jones & Robinson, 391-392

<sup>57</sup> IBID

<sup>58</sup> <https://sites.google.com/site/ad79eruption/pompeii/regio-vi>



### House of the Vestals

Next door to the House of the Surgeon is the House of the Vestals. Built just after its neighbor, it began as a simple dwelling similar to a peristyle house with rooms surrounding a central courtyard. Like other properties in insula 1, the width of the lot was 70 Oscan feet or about 87.4 Roman feet. But, while the House of the Surgeon completely filled its lot, the early plan of the House of the Vestals only occupied a small portion. By the end of the second century BC however the House of the Vestals had doubled in size and spread all the way across the insula to the Vicolo di Narciso. This expansion brought with it a complete atrium, service core, and east entry which was completed around 100 B.C.<sup>59</sup> A third enlargement occurred after the Social War in which the adjacent properties were damaged. This rebuilding phase added a series of public reception spaces grouped around two separate peristyles, and

<sup>59</sup> Jones and Robinson, 393

expanded the footprint of the house to completely cover the northern end of the insula.<sup>60</sup> (figures 19-

22)

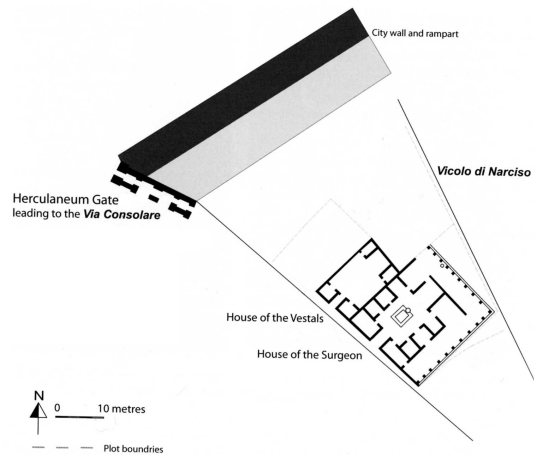


Figure 19: The initial plot layout of the House of the Surgeon and the House of the Vestals. Jones & Robinson, 392

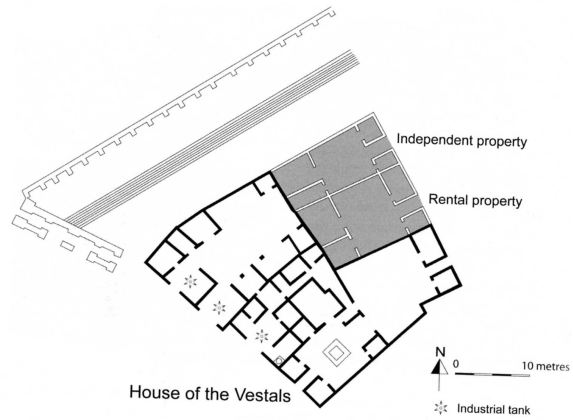


Figure 20: The developing insula during the second century. Jones and Robinson, 394

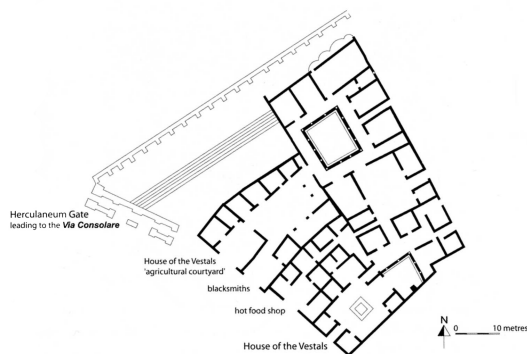


Figure 21: The northern sector of insula VI.I during the first century B.C.. Jones and Robinson, 396

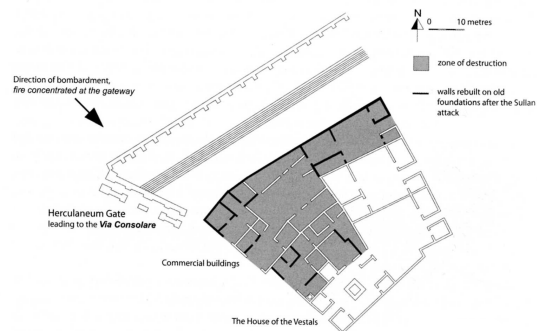
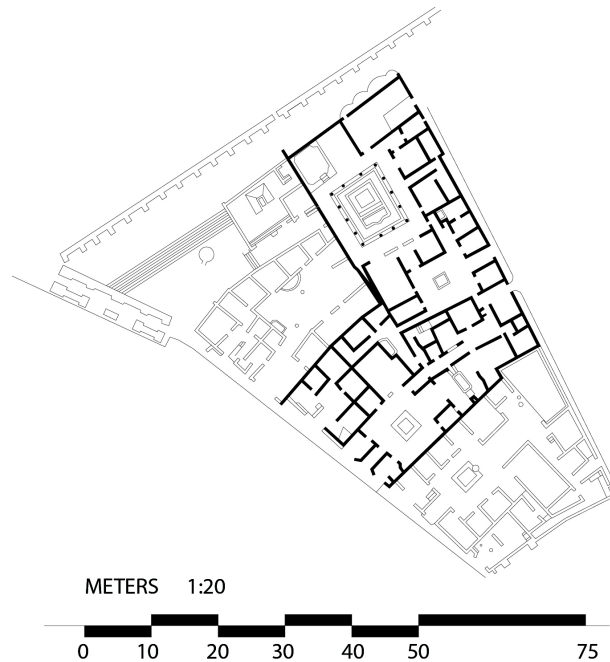


Figure 22: The destruction of the northern end of insula VI.I caused by the Sullan bombardment. Jones and Robinson, 397

While the House of the Vestals can be seen as one of the most opulent houses built within the city by this period, it had a secondary function which was entirely commercial. Even after the primary dwelling

<sup>60</sup> Jones and Robinson, 396

separated from its economic half at the end of the second century, the workshops and tabernae along the Via Consolare retained the strong axial planning of the whole.<sup>61</sup>



### House of Sallust

The house of Sallust was built around the year 300 B.C. in insula 3 of regio VI. Similar in plan to the House of the Surgeon, there is a traditional atrium scheme and a back garden. The original plan was modified on three sides to fill in the horti with very few changes to the actual composition.<sup>62</sup> (figure 23) It is in the houses of the Surgeon and Sallust which we can most clearly see the initial developments of the peristyle. The presence of these gardens also ushered in the

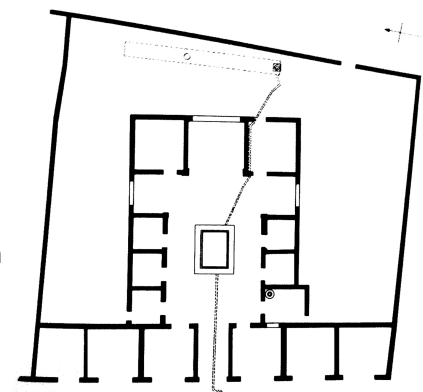


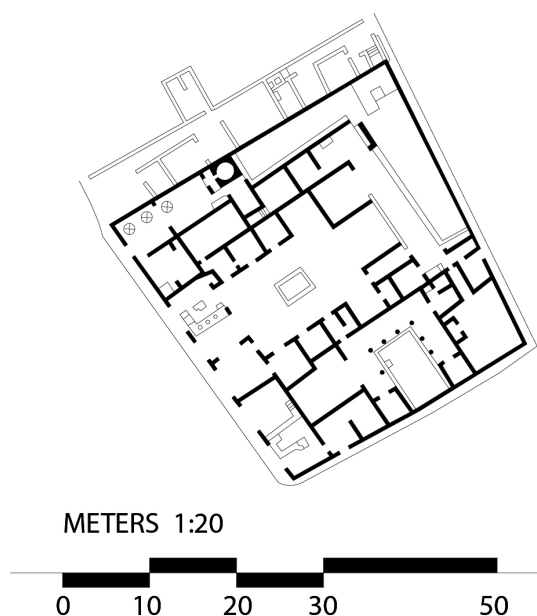
Figure 23: Plan of the Original House of Sallust. Richardson, 109

<sup>61</sup> Jones and Robinson, 396-397

<sup>62</sup> Richardson pg.108



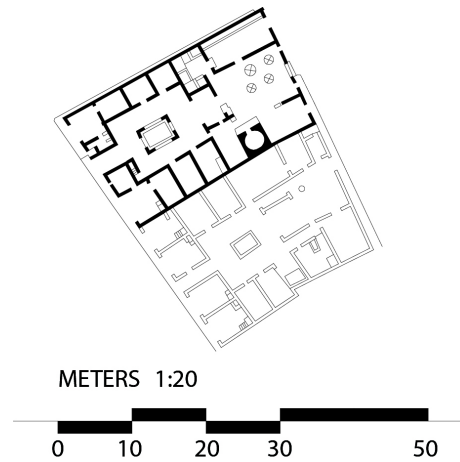
emergence of summer triclinia and spaces of relaxation which could be enjoyed in the warmer months of the year.<sup>63</sup>



### House of the Baker - Casa dei Forno

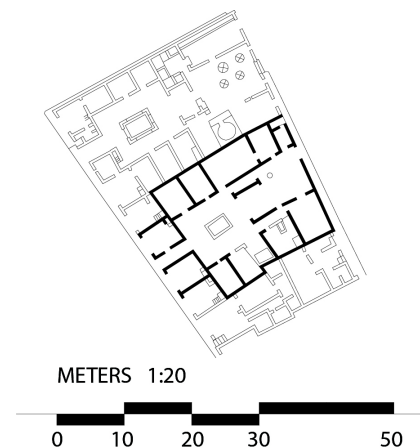
The House of the Baker in insula 3 is unique to the sampling because while it clearly represents the common atrium type there are two distinct functions taking place. The back half of the house where there would typically be a garden serves as a bakery. The question that this raises is whether or not all residences actually take this stance and the space attributed to gardens could really be replaced with any secondary function needed to serve the owner. The second unique feature of the House of the Baker are the brick piers surrounding the impluvium which suggest an upper story, either as an addition to the residence or as apartments. [see part 3 Insulae]

63 Stambaugh, John E. *"The Ancient Roman City"*. (Baltimore: Johns Hopkins University Press, 1988), 163-164



### Casa della Musica

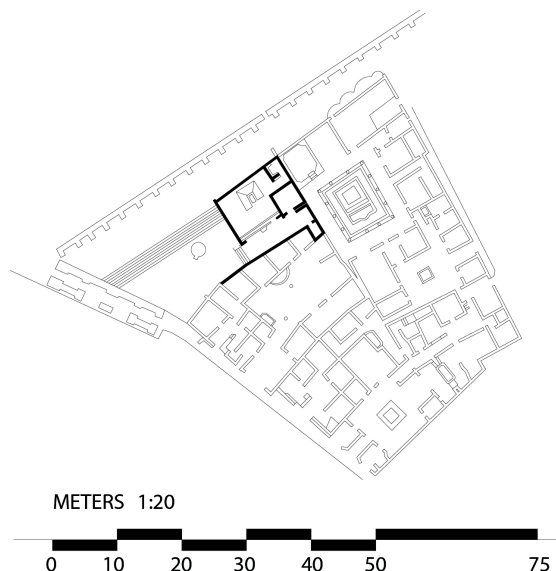
Next door to the House of the Baker, the Casa della Musica has almost the same spatial organization as its neighbor. For as ordered as both houses are, they surprisingly lack *alae* for the most part. As so, it is quite possible that these houses show the transition from the simple atrium to the atrium with cubicula and *alae* found further down the street.



### House of the Triclinium

The house of the Triclinium is a small residence which has infilled part of the gap between the House of the Vestals and the fortifications of the city wall. The naming of the house derives from the garden and

triclinium which are present as compared to an atrium and tablinum. With only five rooms there is little which can be said concerning any organizational strategy. The plan remains a geometrically readable series of squares and root 2 proportions so we at least know there was some intended design logic.



## The Terrace Houses

By the time that the last few houses were being developed along the Insula Occidente the early suburban Villa of the Mysteries was a thriving estate. As such it could be postulated that it might serve as a model for these homes.<sup>64</sup> The houses of insula 17 show the real mixing of urban and suburban cultures and have in some cases been called “reduced urban villas.”<sup>65</sup> Due to their extreme abutment to the city walls it was common practice to remove this barrier in favor of the seaside view. The corroboration of types gave these houses a respectable and urban scaled front which was contrasted to an almost palatial terracing in back.<sup>66</sup>

<sup>64</sup> Tybout, 412

<sup>65</sup> Zanker, Paul. *Pompeii: Public and Private Life*. (Harvard University Press, Cambridge Mass., 1998), 136

<sup>66</sup> Tybout, 411-12

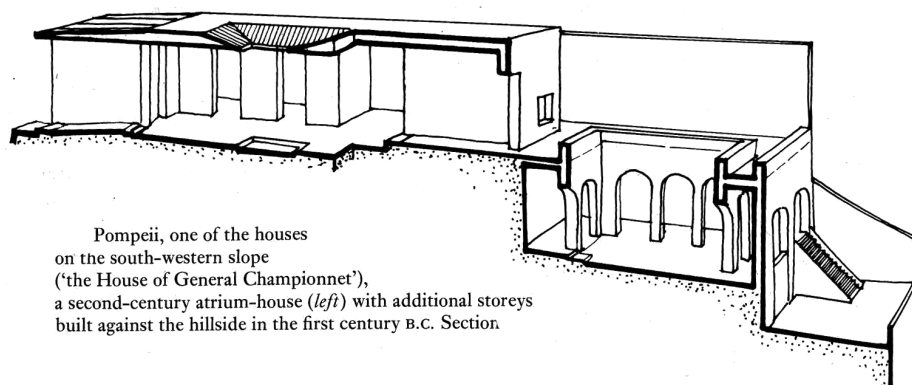


Figure 24. Boethius, 188

### House of Leone

The House of Leone (doorway 25) is a three story atrium type house with no cubicula which would chronologically set it as being an older small existing dwelling. However, there are several features which date it as a likely urban infill condition built after its neighbors. As will be explained more in depth later in the insular methodologies, the plan of the right half of the house is more consistent with what we would find to be the lower story

of an apartment complex.

What gives this plan

ambiguity is the central

set of stairs and the walls

around the garden which

are built to sustain a much

greater load than columns

could. The other unique

tip off is the way the

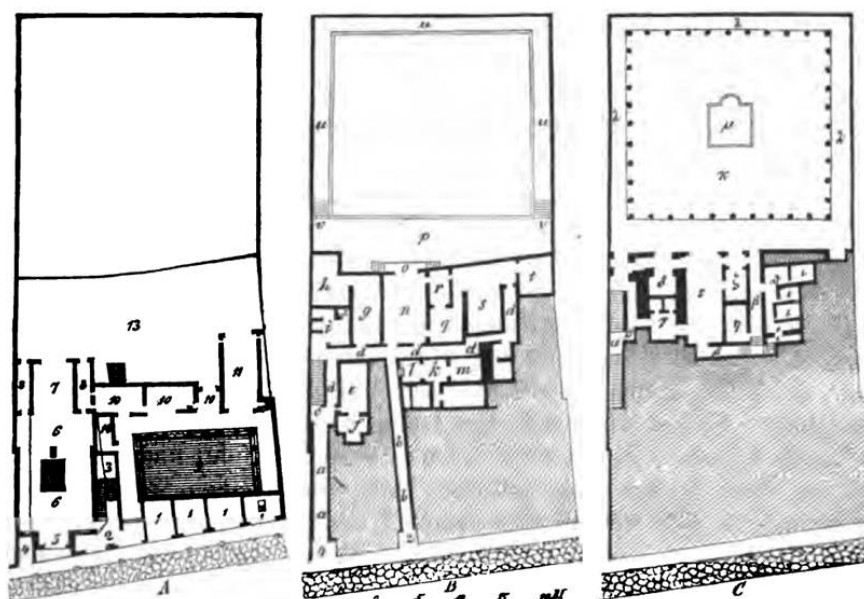
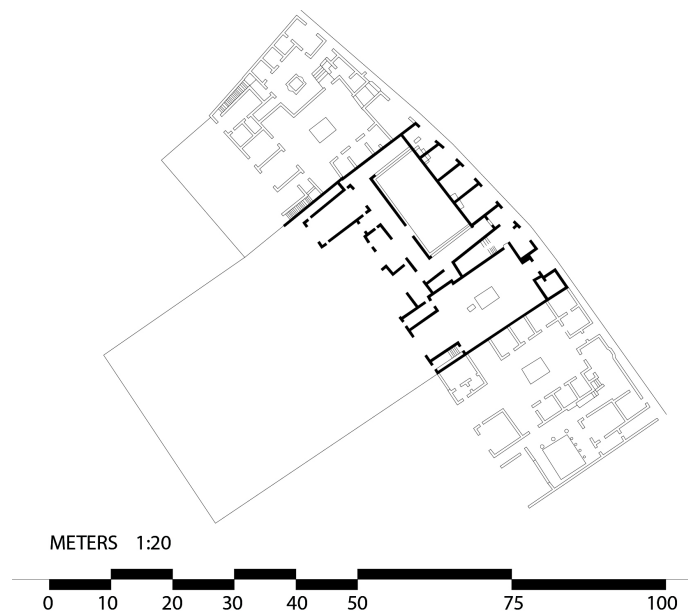


Figure 25: Ground floor and lower level plans of the House of Leone. Pompeiinpictures.net

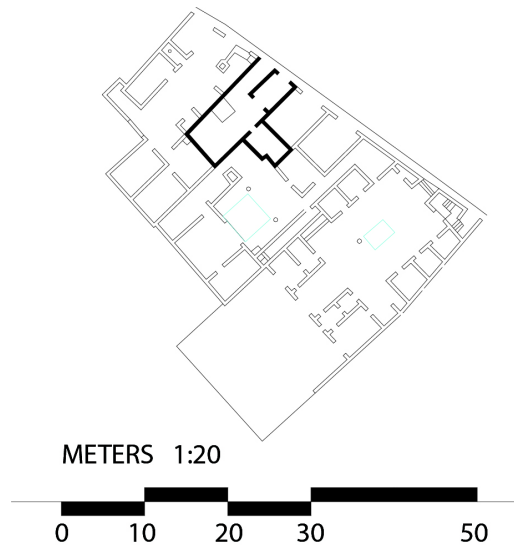
geometry of the atrium mirrors that of the Casa dei Cadaveri di Gesso to the south. If the house of Leone had been built first, and this relationship was maintained, then the builder of the Casa dei Cadaveri would have had a much harder time reconciling the geometry so perfectly. The House of Leone was made for the coastal view. The rooms of the house are laid out in such a way that every one of them has a way of looking out. Because of this, getting from one room to another requires a hall to tie them together. There is also a visual enfilade amongst the spaces in the back of the house which allows for visual communication.



**House of Popidius Rufus**

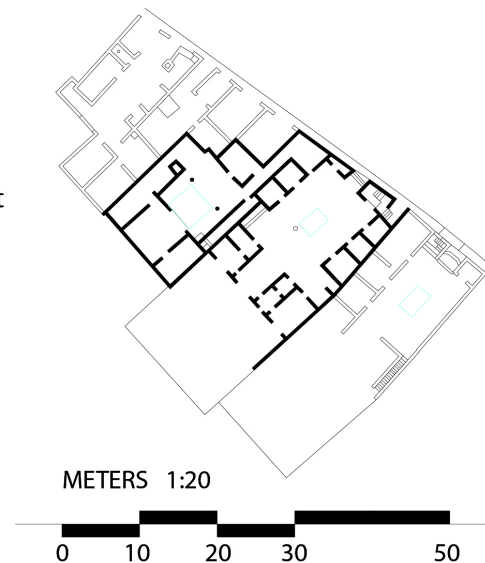
The House of Popidius Rufus is the smallest dwelling included in this study of houses with just three rooms and covering only 86 sq. meters. This residence is deep enough though that it cannot get all of the light it needs from just the doorways so it required a three sided compluviate roof. The form of this house can be the most closely equated with atria having cubicula on one side only but carried out in a manner similar to atriums with no cubicula. What prevents calling this building a shop dwelling is the

dedicated entrance. There is an inherent idea that the owner runs part of the shop business, but is not so tied to it that visitors to the home must pass through it in order to enter.



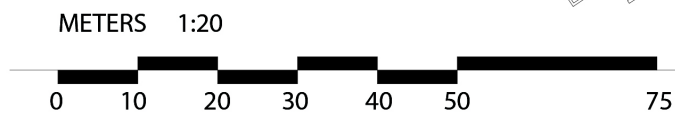
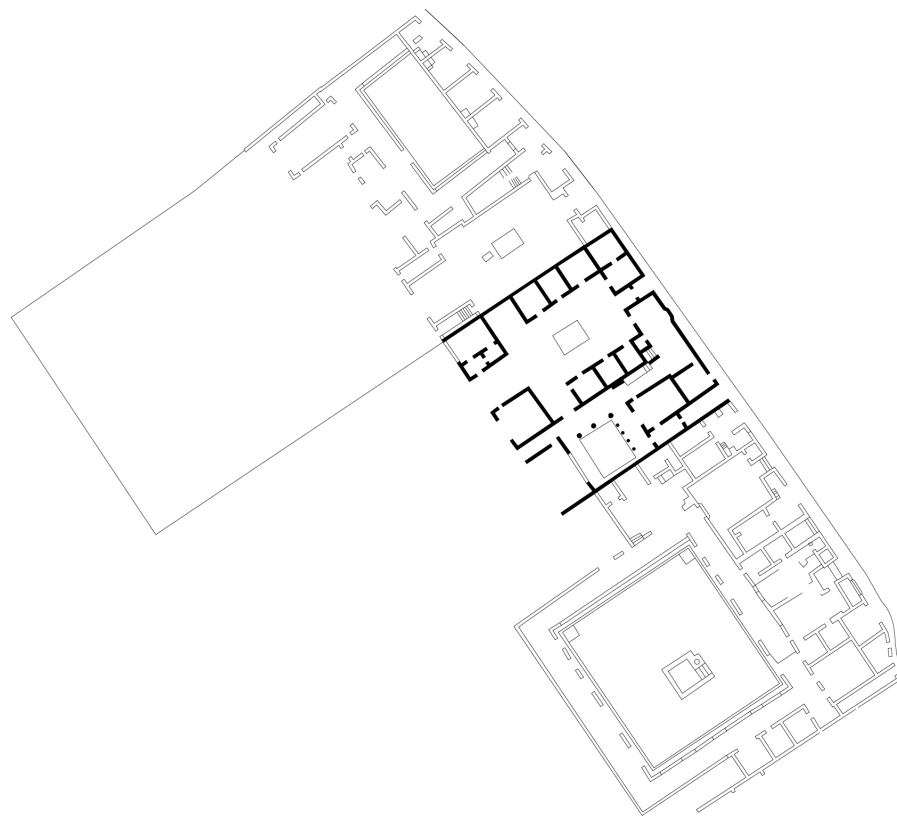
### House of Danzatrice

The House of Danzatrice is a standard atrium scheme which most likely began as a single lot width next to another dwelling located at doorways 5-8. At some point in its history the owners of the House of Danzatrice could have added part of their neighbor's residence on to gain an additional peristyle and the rooms adjacent to it. While this claim is completely undocumented it can be seen in the geometric studies that this second part of the house is completely unrelated to the proportions of the original atrium. It does however have commonalities and an inherent axuality with the shops which lie between it and the street.



### **Casa dei Cadaveri di gesso**

Doorways 26-30. The Casa dei Cadaveri di Gesso is consistent with the building types which emerged in the mid to late second century B.C.. This house is one of the most spatially regulated and geometrically ideal along the Via Consolare. The organization is clearly axial and the service functions of the house have been completely moved to one side. It is unknown if the peristyle and triclinia were added after the initial construction of the house, however the exacting geometry alludes that they were carefully integrated into the original design for the house.



**House of C. Nivillio**

Doorways 12-14. The House of C. Nivillio is a narrow three sided atrium plan with a lower rear garden.

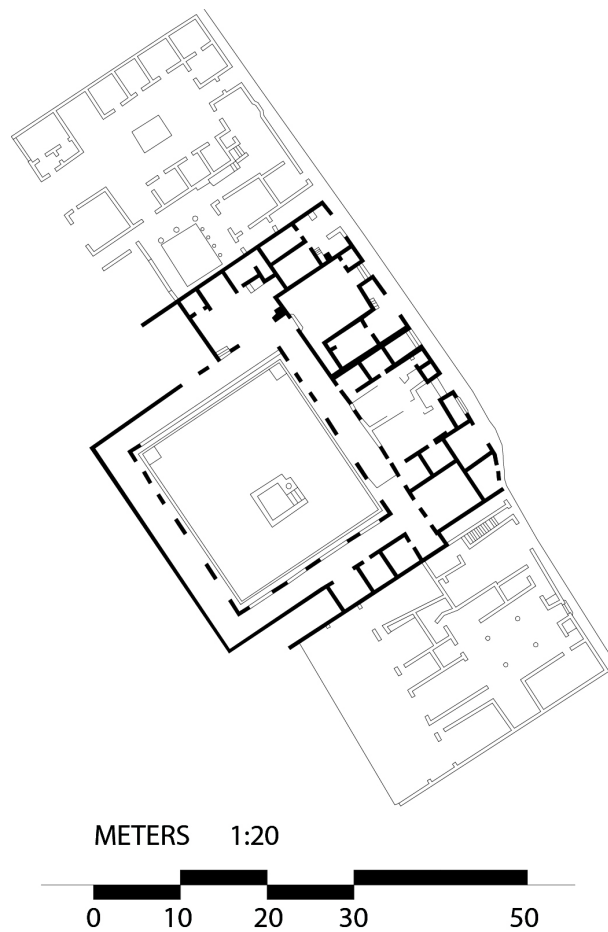
Because the geometry of the house is proportional to the atrium there is no reason to think that this was a larger dwelling at any point or that it could be labeled as infill.



### **Casa della Diana II**

Doorways 32,36. The Casa della Diana II is another case of infill like the House of Leone. Situated between the very planned and regulated Casa dei Cadaveri and the House of the Library, there is almost no clear organization and another pier wall courtyard which may have supported apartments above. Interestingly the house does not take much advantage of the view, a fact which might prove that as an infill and possible apartment having multiple families there was only a desire to go vertically. It is also quite possible that the Casa della Diana II was abandoned at some point before the millennium and then re-occupied and added on to as the city densified.





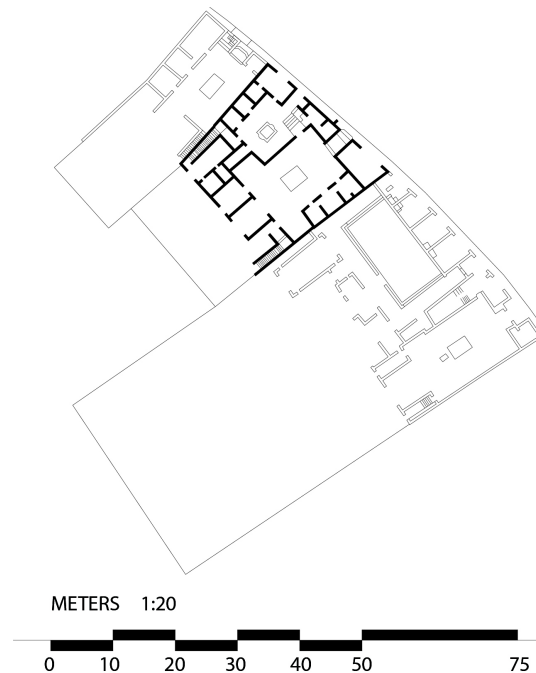
### Unnamed house 16-17

The unnamed house of doorways 16 and 17 is one of the few with multiple levels at the ground floor.

This is most likely a product of the site, however, it is possible that each atrium belonged to a separate family at some point and we should read this building as two individual dwellings joined over the ages.

Particularly interesting are the missing cubicula for the atrium at doorway 17. This case where there is an ala but no cubicula can also be found in the House of the Labyrinth (Reg VI, Ins 11, doorways 9-10). For this exact reason it could be said that this dwelling was always one house and the lower atrium was either an addition incorporated into the demolition of these cubicula or it was planned that way so the

roof slopes from each compluviate atrium could meet evenly on the shared wall. In either case the atrium at doorway 16 is probably not seen as a formal entry because unlike the surrounding terrace houses and the entry at doorway 17 it has not been raised above the level of the street.



### The Ideal Domus

Ideas about multi type house categories are awash in speculation and refutable claims. The problem with defining the house type or types is a question of origins and the lack of an applicable rule which accounts for variation. Scholars who examine dwellings from Ostia, Herculaneum, and Pompeii equally, such as Commendatore Maiuri, are uneasy about the differences in construction methods and building forms between the three towns. There always seems to be a question of which types came first or from where. R.C. Carrington is the biggest supporter of the theory that the Italianate hut became the atrium house. Surprisingly, he has received much admonishment from his fellow scholars, especially Axel Boethius who

contends that the larger unit of the house is made up of smaller prototypes such as shops or tabernae clustered together.<sup>67</sup> This second way of looking at the house favors the Greek and Hellenistic traditions of one to two room houses with porticoes. The real issue behind each argument is time. In Carrington's case the hut grows and develops over the ages getting larger. However, when the Population of Pompeii spikes at the beginning of the Imperial age and the insula becomes the most inhabited type of dwelling, the claim cannot be made that insulae are simply shrunken atrium houses. In Boethius' argument the downsizing to insulae is already a part of the house type, however while the two room shop/dwelling appears continuously in every period, there are almost no surviving examples which support the idea of Pompeian properties as having porticoes.

The formulation of the ideal types which this thesis proposes are a hybridization of both theories. When we look at both approaches several key factors stand out. Each argument supports a hierarchical and axially balanced arrangement of space, as well as favors a large primary living space preceded by a smaller space for entering from the street. Rather than being just divided temporally, the development of the house is also a product of dimensional lot size.

Size matters whether we like it or not. The functionality of the type becomes utterly lost as it shrinks or expands beyond useful dimension. In particular this explains the lack of impluvia in dwellings under 100 sq. meters as well as the non-existence of them in peristyles. Neither of these requires impluvia or compluviate roofs because their size automatically dictates that they receive enough light and air in order to function for the owner. With that said, it follows that by the same account small dwellings are

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<sup>67</sup> Harsh, Phillip. *"Memoirs of the American Academy in Rome Volume XII"*, (American Academy in Rome, 1935), 3

going to be the most common properties which have displuviate or tuscan cavaedium. From a structural stand point the individual definitions of Vitruvius' cavaedium make complete sense. As dwellings grow in size they require longer spans of beams to support their roofs until the point where the maximum length is exceeded and additional support is required from columns.

### **Typology of the Ideal Domus**

Almost all houses in Pompeii fit into two distinct type classifications: impluviate and displuviate. The displuviate condition defined earlier by Vitruvius occurs in conditions where the width of the house is less than 5 meters on average. At this size, there is not enough room to have two roof sheds with a compluvium between them. Surprisingly, even with their small size, displuviate domini appear to have more variation because the parietes (party wall) supporting the roof remove the structural load and allow for an almost free plan condition.

The vast array of houses can be made from adaptations of each of the impluviate and displuviate types, multiplications of those types, or combinations of the two. Looking at the studies done by Packer, Watts, and Clarke it can be seen that several different configurations rule the atrio type. All of the plans in appendix B have the ability to be structured in a way that allows for a compluviate roof and impluviate ground. The central plan reveals the most commonly recognized atrium scheme at Pompeii represented as a root 2 construction. As the plans change we can identify additional organizations which are identifiable with known dwellings from the survey houses and the region. With the earlier houses the functionality of the atrium has not yet appeared because the depth of the plan has not reached a point where light cannot permeate all of the spaces from the openings in the front facade. On the opposite

side, the introduction of a second dominant space transitions some of the functionality of the atrium towards the private sphere. A further transformation of this example results in the second to final plan, which is a pure peristyle condition. In this plan and the next, the pattern begun with the early atrium re-emerges however now spaces are organized around a larger cortile type condition.

Even during the late Republican age the atrium was losing a battle for social and physical centrality to the peristyle. The more secluded garden provided the luxury and relaxation required by the owner and fulfilled the same functionality of a compluviate atrium. In existing houses, or in cases where the owner was trying to be more conservative, the columns around the atrium were multiplied to create a type of miniature peristyle. This transformation represents Vitruvius' *atrium corinthium*, as it appears most dominantly in the house of the same name at Herculaneum.

### **Geometry of the Ideal Domus**

The centroidal atrium focuses on a non-rigid 9 square grid like the 'sacred cut' geometry depicts. The axial atrium focuses more on directionality with an implied symmetrical balance of spaces. The geometric analysis of all 13 plans showed near equal distribution of root 2 proportions and squares as defining the building form. When analyzing the individual spaces of the house the subordinate A4 ratio and doubled-square dominated the proportions of secondary and tertiary spaces. Spaces along the main axis of the house tended to contain the same geometry as the complete dwelling. The only spaces which remained constant were those that flanked the tablinum. In (90%+) of cases these spaces were squares.

### **Space Syntax of the Ideal Domus**

The patterns which define the ideal domus unsurprisingly revolve around the nucleus of the atrium.

Because the visual boundaries of this space extend so far into the house it is often difficult to determine where transitional nodes occur. The result is that the dwellings studied show a pattern of being relatively shallow with a vast majority of the spaces connecting directly to the core. When tertiary spaces do occur they are often linked either as individual appendages to the larger space which precedes them or they show a repetition of the atrium core and have at least 3 further branches. In the plan of the house this pattern typically reveals either a service core containing kitchens, bathrooms, etc. or, as in the case of the House of the Vestals, occurs in places where previous dwellings were before they were incorporated into the final plan.

One of the most mundane conclusions which emerged from the space syntax studies was that as the dwellings get bigger they have more rooms. At face value this seems incredibly obvious and expected. It does however illustrate an interesting point. What it shows is that as residential dwellings get larger, the general room proportions are staying about the same size. It would seem natural that a wealthier owner would instead be more inclined to make spaces which are larger and more grand rather than simply having more of them. From the other portions of this thesis and other studies done by Wallace-Hadrill there are a few possible explanations as to why this phenomenon occurs. One of the simplest is structural rationale. As observed in the styling of the cavaedium each style developed exceeds the beam support distance of its predecessor. At some point however this distance would hit a maximum based on material capabilities. Rooms would be required to take on either a hypostyle configuration in order to get larger or just keep expanding as peristyles. The second possibility, from Wallace-Hadrill's work in chapter 5 of his book *'Houses and Society in Herculaneum and Pompeii'*, illustrates well the point that multiple families could occupy a single residence. Equally, the number of occupants could be made up of servants

and visitors. Larger houses could therefore be made up of smaller rooms in order to divide the distribution of inhabitants.<sup>68</sup> The third possibility is that owners simply had a desire for variety in their dwellings and additional spaces could offer different experiences based on decoration, time of day, or season. All of the syntax survey data can be found in appendix (D).

## Part 2: Villas

### Villa Development

As compared to the surviving literary record for urban town houses, the archives for understanding villa life are infinitely more expansive. This trend exists because along with time for leisure, villa owners found opportunities to engage in scholarly pursuits. For Cicero, engaging in academia was a form of leisure; as it is from him, Horace, and Pliny that we derive the Romanticized concepts of the Greek *otium* (leisure) and *negotium* (business)<sup>69</sup>. The second reason that this trend appears is that there seems to be a steady migration of wealthy citizens away from the urban setting<sup>70</sup>. Along with them, were countless journals and correspondences. With the beginning of the Imperial Age in Rome, cities saw increased congestion igniting a rise in land values. The exurbs and countryside offered relief to those who could afford it.<sup>71</sup> The variations of villa types to date have been named according their context. Those near city walls are deemed *suburbana*, the shore, *marina*, and the country, *rustica*.<sup>72</sup>

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68 Wallace-Hadrill, 94

69 Ackerman, James S. “*The Villa: Form and Ideology of Country Houses*.” (The A. W. Mellon Lectures in the Fine Arts, 1985), 37

70 Ward-Perkins, John B. “*Roman Imperial Architecture*.” (Yale University Press, 1994), 185

71 Boethius, 185

72 Moorman, 435

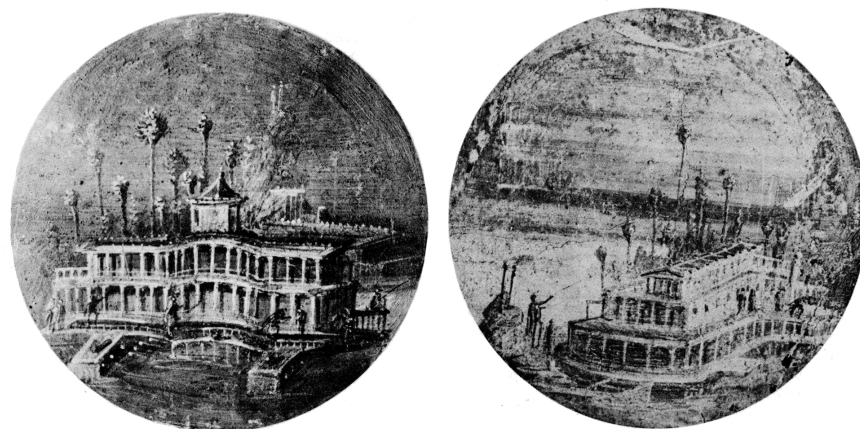


Figure 26: Early Imperial Age paintings from Pompeii showing terraced villas by the sea.  
Boethius, 193

Outside the city the town house transformed to fit the needs of country life. Even the land ownership of the peasant farmers was gradually evolving into a stratified society.<sup>73</sup> By the early phases of the Augustan Empire two distinct types of wealthy country dwellings were appearing in the Campagnian landscape. The first was a semi-compact platform-villa, like the Villa of the Mysteries at Pompeii, which was built on a set of terraces raising it above the landscape<sup>74</sup>. The second type was more integrated with the landscape and spread outwards to take advantage of scenic views and is more commonly found in seaside locations where it is referred to as the *villa marina*<sup>75</sup> According to K.M. Swoboda's classification, these two styles which he refers to as the portico and peristyle villas, respectively, are anything but distinct. His naming of the types derives them as variations of the wall and roof conditions rather than how they merge with the landscape. This primary change in toponyms comes from the observable fact that even some of the coastal portico villas are depicted as being built on a platform (*basis viallae*).

Compared to the peristyle villas, the portico type seems to have had a different origin. Similar to *insulae*,

<sup>73</sup> Boethius, 193

<sup>74</sup> Ackerman, 18

<sup>75</sup> McKay, Alexander Gordon. "Houses, Villas, and Palaces in the Roman World." (Baltimore: JohnsHopkins UP, 1998), 115



they were organized as rows of rooms, each with wide openings. Rather than always facing a courtyard, they were oriented toward a view of the coast, a trade road, or a particular feature in the landscape.<sup>76</sup> Very few villas in this style can be found which do not also have classifiable axiality. Based on Roman descriptions these types of dwellings had more of a simple and utilitarian functionality.<sup>77</sup> The Villa of the Figured Capitals on the Via Dei Sepolcri is the only dwelling in this study which falls into such a stylistic category. Even in the simple type definitions of the portico and peristyle villas, variations appear to exist. The best known variant is the *villa rustica* or rural villa. Our primary definition of the *villa rustica* comes from Varro in his treatises on farming.

“It is an advantage to the owner to have a well-built farmstead. Pg. 9...Build your farm residence according to your means. In case of a good farm, if you build well and on a good site, if you dwell comfortably in the country, you will visit it oftener and with greater pleasure”. Pg. 11 “..If you are going to contract for the building of a new farmstead from the ground up, the builder should do the following: [He should build] all the walls, as he is directed, of lime mortar and small stones; [he should prepare] the supporting pieces of squared stone; all the building timbers that are needed, the thresholds, the doorposts, the lintels, the beams, the supports; [and build] the winter stable for the work oxen, the summer feeding racks in the Faliscan style, the horse stable, the rooms for the slaves...” -Cato the Censor<sup>78</sup>

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<sup>76</sup> Boethius, 193-194

<sup>77</sup> IBID 190

<sup>78</sup> Cato The Censor, “*On Farming*.” (Records of Civilization, Department of History, Columbia University Press, 1933), 9,10, 29,32

From his account we can gather that this type of villa is really a more elaborate farmstead which has been increased in scale to include laborer lodgings, stables, and storehouses. These villas are similar in many ways to the *fattorie* and *casali* which were centers of substantial agricultural estates. They were operated primarily by a foreman but often included lodging for the visits of the landowner himself.<sup>79</sup> The development of this type of villa is based on a sort of agribusiness functionality rather than relaxation. It does however bring up the question as to whether or not all villa owners adopted certain rooms to serve the continued functional needs of such a large dwelling. The difference which needs to be noted in each case is the amount that each villa diverts from the agricultural model. Even though Horace's Sabine farm remained primarily agricultural, other owners sought to surround themselves with all the abundances of the city they could bring.<sup>80</sup>

When an owner was wealthy enough, they would maintain dwellings in both the city and the exurbs<sup>81</sup>. In this case the villa was seen as a weekend retreat for the owner, or as in the case of the farming *villa rusticae*, a place that laborers could commute to daily from the city. With Pompeii's limited primary sources on villa ownership it is unknown as to whether these practices of commuting occurred or not.

### **Villas on the Via Consolare**

As to why the surviving villas of Pompeii are located solely outside the Porta Ercolano, there is little evidence. As a direct route to the coast, Herculaneum, and several other surrounding cities, the importance of this road as a major trade network is hard to understate. While there are ruins of other

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<sup>79</sup> Boethius, 194-195

<sup>80</sup> IBID, 190

<sup>81</sup> Nash, 22

villas scattered about the countryside none conform to any ordered street network which might connect them to the city.

### Villa of the Mysteries

Of all country residences excavated, none display the same remarkable level of preservation found in the Villa of the Dionysiac Mysteries. The villa is situated well outside the city wall on the Via Superior. It is approached and entered from the rear however due to unfinished excavation at its true entry<sup>82</sup>. The Villa of the Mysteries best accentuates the flair of elegance found in the urban town houses. While it has distinct elements of agricultural production, it has been classified in the past as what the ancients called a 'villa pseudo-urbana' or 'suburbana'.<sup>83</sup>

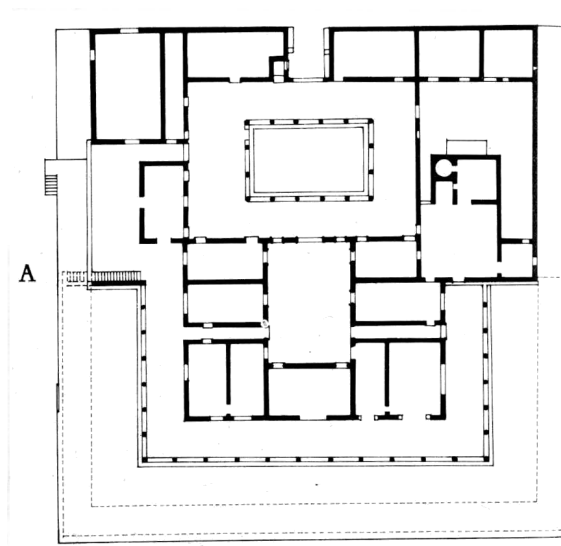


Figure 27: Original Plan of the Villa of the Mysteries

The original design for the Villa of the Mysteries was a for a more rectangular house with a courtyard and possibly a side yard as well. Insert other plan The whole structure was built on a sloping terrace which gave it a recognizable *podia* and raised it to have a view out to the coast. As Cicero accounts of the

<sup>82</sup> Nash p. 23

<sup>83</sup> Boethius, 190

basis viallae (Ad Quintum fratrem, ii,i.5) "Such podia, family tombs, and cisterns became typical of all country seats".<sup>84</sup> This terracing itself was constructed as a series of barrel-vaulted cryptoporticoes covered by incertum, reticulate, or polygonal masonry.<sup>85</sup> Around the end of the second century B.C., the villa underwent a major refurbishment in which the peristyle was added to the north-east side. This arrangement seems to have been quite common as it also appears in the first stage of transformation in the Villa di Diomede.<sup>86</sup> Expansion occurred again in the middle of the first century A.D. with the south west side receiving its large semicircular veranda, colonnade, and diaetae at the corners. A large quadrangular cryptoportico basement supports these garden terraces, especially on the western side.<sup>87</sup> The final design is in direct accordance with what Vitruvius records (VI, 5. III) "in town, atria are usually next to the front door, while in country seats peristyles come first, and then atria surrounded by paved colonnades".

In many ways, the villa displays all of the elements of a typical town house. A near match to the sequence of atrium-tablinum-peristyle is present with the only difference being that the peristyle can be also added to the exterior or the sequencing can be reversed to peristyle-atrium-tablinum as in the case of the Villa of the Mysteries. These three elements align along a central axis and are accessible by a series of doors in each room. The large double doors between peristyle and atrium are an unusual feature and in terms of the sequential ordering of the house disrupt the path between entry and taberna. The interior peristyles perform as secondary atria, gathering the functional rooms about them. In particular, the southern side peristyle organizes the kitchen, oven, and bathrooms in an ordered block.

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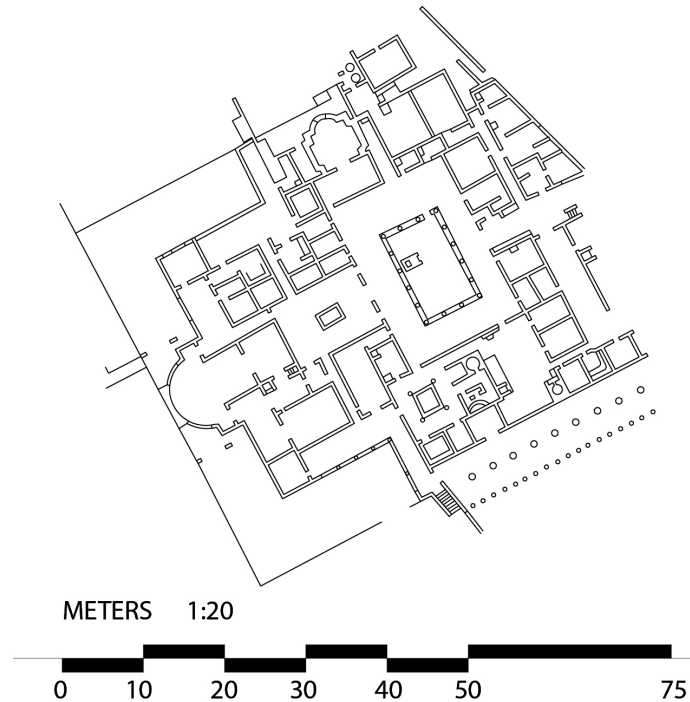
<sup>84</sup> Boethius, 190

<sup>85</sup> IBID

<sup>86</sup> IBID, 192

<sup>87</sup> Clarke, J.R. *"The Houses of Roman Italy 100 B. C.-A.D. 200: Ritual, Space and Decoration"*. (Berkeley: University of California Press. 1991), 11

This arrangement allows the actual atrium to occupy the center of the villa and to serve the living quarters which surround. Like the House of Sallust, the portico to the garden is at the rear of the house behind the tablinum but here it has a view of the sea.

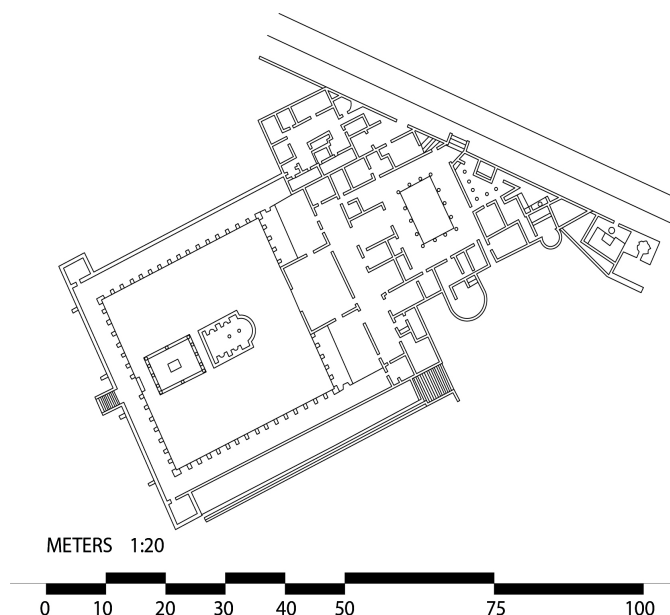


**Villa of Diomedes**

Of the surviving villas outside of the city, none bear as much resemblance to the atrio town house as can be found at the Villa of Diomedes. The primary difference between the two comes in part from the unique topography present on the site. The front portion which is organized around a front peristyle atrium sits almost 4 meters above the second half of the house. In this case, the separation between the tablinum and peristyle garden has a notable demarcation which announces which sphere it belongs to. The front of the villa actually sits about a meter above the height of the street and has an angled alcove entryway. Like most tablina, the one in the Villa of Diomedes had a set of doors at the rear which could close it off from the remainder of the house. Behind this space was a colonnade which again carries a

similar language to what is found in other houses such as the House of Sallust. At some point in its history, this colonnade was converted into a hall to connect additional rooms and provide access to a terrace which overlooked the garden. Access to the lower floor and peristyle garden can be gained by either the stairs next to the front entry or by the unexcavated stair in the south-east corner of the front atrio-peristyle. Just to the east of this stair is cubiculum similar to the one at Pliny's villa in Laurentum in which it is partially separated from the rest of the house and has a semi-circular wall that looks out over more gardens.

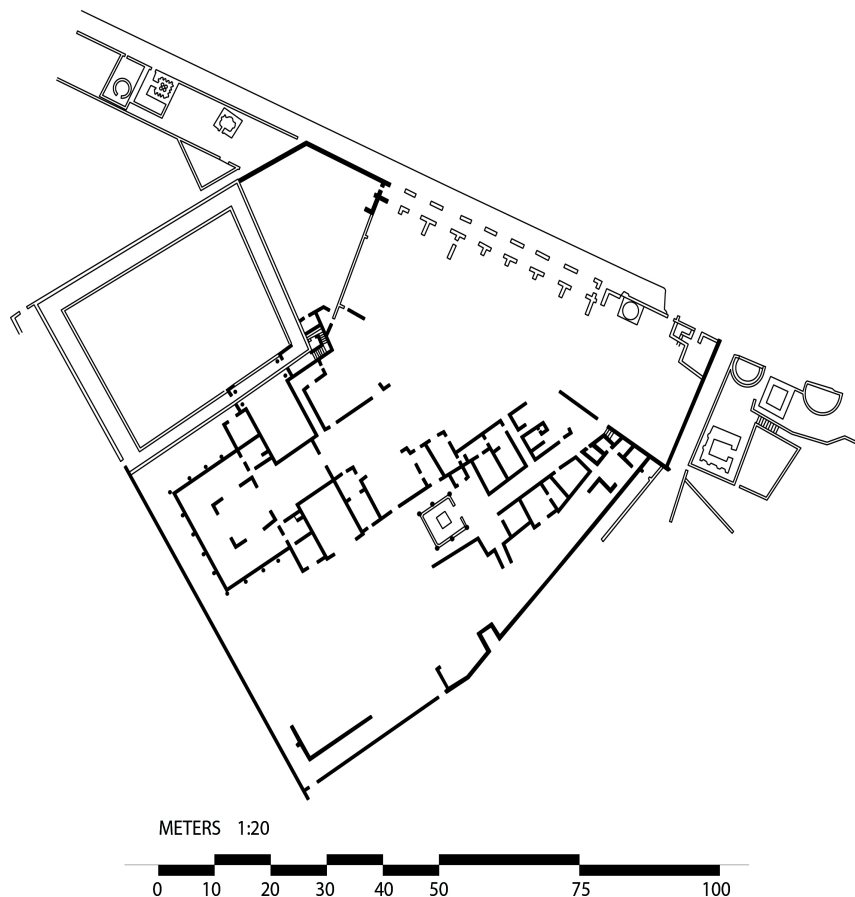
What is incredibly unique to this site is that the intense change in topography allows for complete second story occupation. The rear peristyle portico was most likely a double promenade which had a flat roof surface that could be walked on and accessed from the main entry level. In the very center of the peristyle and on axis with the rest of the villa was a summer triclinium, which was covered.<sup>88</sup>



<sup>88</sup> <https://sites.google.com/site/ad79eruption/pompeii/region-vi>

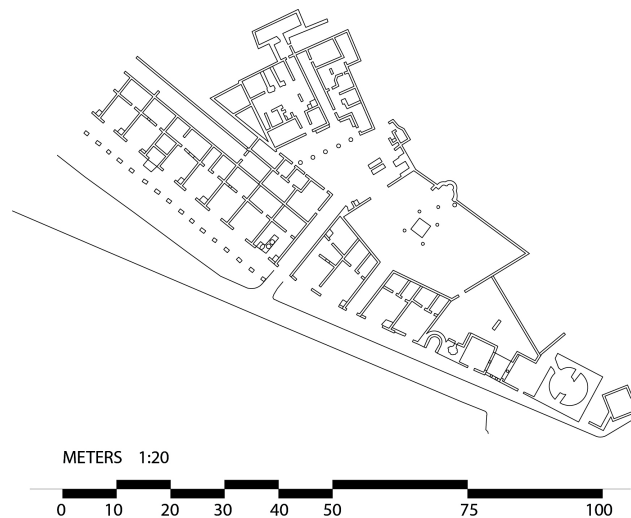
### Villa of Cicero

The Villa of Cicero was one of the very first buildings to be uncovered in the early excavations and has suffered in clarity from age and being partially re-interred. What is hard to discern is where the entrance lies along the colonnaded street front. However this loggia does not belong to the villa and the actual entry lies to the south of it on axis with the first part of the house. In many ways, the second portion of the house in the center of the property is like a domus turned inside out. The roof above the peristyle sheds in a displuviate way and the triclinia open to the gardens as they should except that now the gardens are outside of the peristyle so they disconnect themselves from the interior of the house.



### Villa of the Figured Capitals

The Villa of the Figured Capitals, also known as the Villa of the Mosaic Columns lies half way along the Via Sepolcri behind a series of commercial properties on the eastern side. Compared to the other villas and the houses of the Via Consolare, the constituent parts of the house are distinctly separated. The portion recognizable as the type center (see diagram in appendix B) is divided from the service portion by the long corridor that runs its entire length. Another unique feature of this villa is that it has a portico front rather than being open on any of the other sides.



### Typology of The Ideal Villa

Like the ideal domus, there are two distinct types which explain villa organizations. The first is what Ackerman describes as the compact-cubic and which K.M. Swoboda calls the portico villa. This type accounts for most of the villa rusticae found in the region. These are typically rectangular in form and only have functional openings in their perimeters. On the whole they are inwardly focused and have a peristyle garden which is walled off on the side nearest to the exterior.



The second type of villa is the open extended or peristyle villa. This type is associated with the villa suburbana, and the villa marina. The purpose of this villa is to take in the landscape. It shows a reversal of the peristyles as compared to the portico villa so that now on at least one side of the perimeter there is a complete walled condition and the remaining sides are loggia. This form of villa which Ackerman describes is classified as the open extended villa. In these forms, peristyles form the connections between distinct portions of the villa as it extends across the landscape. None of the villas in this study conform to this type. The most common examples of its presence in the region can be found just south of Pompeii at Oplontis. The fact that these open-extended villas are not commonly found near cities hints that the compact form is more well suited for functioning in a semi-urban zone. Just as likely is the idea that on a scale of material wealth that the largest or most lavish urban dwellings would precede a level of grandeur that could only be obtained by breaking the rigid confines of the regulated block condition.

### **Geometry of the Ideal Villa**

Geometrically, the villae along the Via Consolare follow similar patterns as observed in the houses. However, as compared to the constructive geometries found within the city walls, the square becomes much more prominent in ordering the proportions. Root 2 geometries are still occasionally inserted however the square form is easiest to divide into additional squares, even if they are of unequal size or distribution. The most notable change is that axuality takes on a much more prolific role in villas, which is most likely a bi-product of the owner's personal sense of importance or desire to convey grandeur.

### Space-Syntax of the Ideal Villa

Similar to the findings for the domus , the space-syntax study for villas shows patters which collect in nodes around atrium and peristyle spaces. The variable condition is that villas, with their open porticoes and entrances to the exterior, are much more permeable. To a degree though, this permeability must be overlooked because the sequence of the house is still predicated on arrival and view from specific points. Even in the case of working farm villas the spatial ordering is based on functionality and so openings to the exterior cannot be all treated the same in terms of the network.

### Part 3: Insulae

The term insula is quite fascinating because it refers to two separate conditions. In reference to the city, an insula is what we would consider a block. The direct Latin translation means “island”. There is a second definition which appears when looking at the block condition itself. In this case “island” refers to a small and independent piece. It is this second meaning which aligns most closely with our conception of an apartment. As a result of the increase in population, the Roman town house began to shrink in dimensions towards the end of the last century B.C. <sup>89</sup> In Amedeo Maiuri’s 1942 study on insula classification he recognized that the insula block could only be subdivided in so many ways to produce lots which would be large enough to build atrium type houses<sup>90</sup>. At Pompeii the divisions vary even more because the irregular street network produces blocks that are square, rectilinear, rhomboid, and triangular.<sup>91</sup> Around A.D. 62 at the time of the great earthquake of Pompeii there began a transition away

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<sup>89</sup> Nash, 21

<sup>90</sup> Laurence, 104

<sup>91</sup> IBID

from the atrium house.<sup>92</sup> In excavations at Pompeii, Herculaneum, and Ostia there is evidence that the town house was losing much of its prominence to the apartment dwellings of the Imperial Age. Increased population growth was driving a need for more compact housing, and as property values skyrocketed the sprawl of the old town house was no longer economically viable. As the number of insulae (apartments) increased and as the push for light and air drove the houses skywards, the atrium became reduced to a mere light-well, before finally disappearing in its entirety.<sup>93</sup>

### **Hypothetical organization of insulae**

To date, the majority of source material for the multi-residence insula has come from the archaeological records of Ostia due to the survival of a few buildings above 5 meters tall. With Pompeii we are left to speculate as to where these dwellings could occur and the conditions which would make their construction possible. As such, this section will not contain any actual plans or conclusions about an ideal type. Its inclusion in this thesis is a means to recognize the existence of a third driving force of construction and residential design. The methods used to discern spaces at Ostia have been re-purposed to at least gain some insight into the nature of these residences and show probable locations for their existence along the Via Consolare. The source for these methods primarily comes from previous studies done by Patterson, Watts, Calza and Boethius which can be found in the insular methodology section.

### **Insular methodology**

Insulae are probably the hardest to classify as a type. As each unit is relatively small, the number of configurations is quite large. However, as functional units of space, they still have to belong to some

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<sup>92</sup> Ward-Perkins, 185

<sup>93</sup> Ward-Perkins, 186

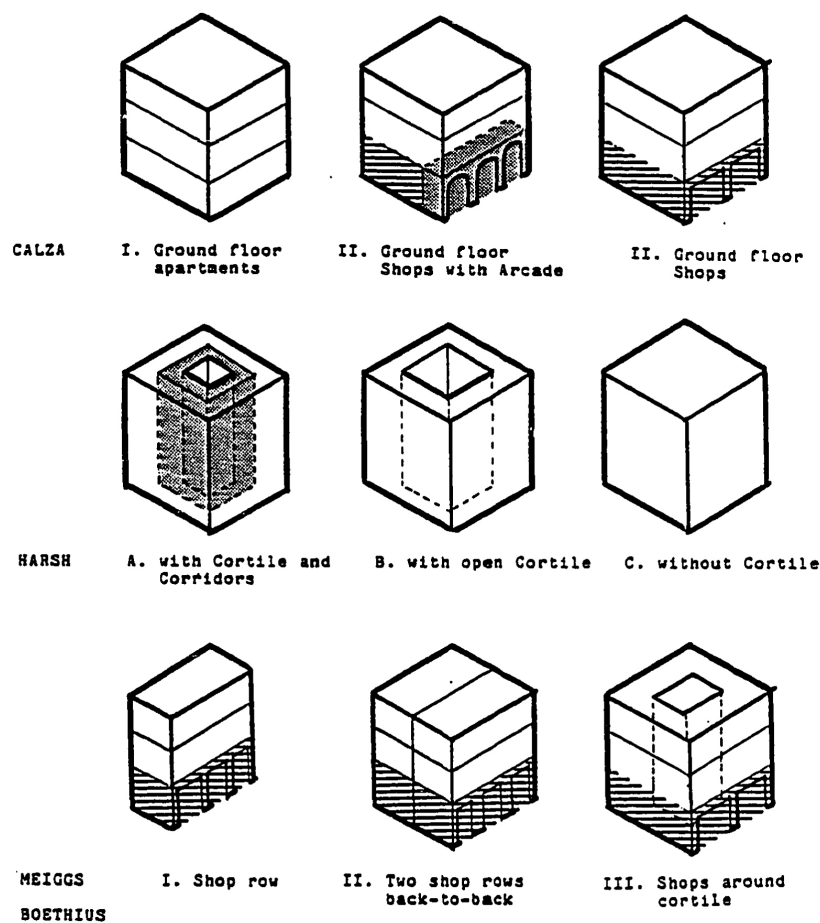


Figure 28: Comparison of Insula Types by James Packer and Guido Calza. Watts, 23

comprehensible order for there to be circulation between them. From what we can see in insulae behind and above shops, they appear to be in consistent two room pairings and are a above houses or other buildings require at least three parallel walls or two parallel walls and a column line below in order to stand. According to Packer, the column line was usually made of brick piers rather than the traditional marble because of the extreme weight increase. Like this example (figure

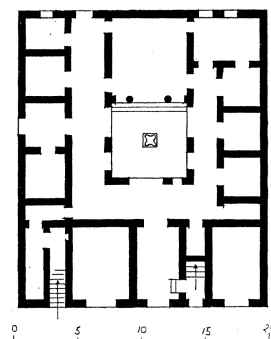


Figure 29: House of the Tempio Rotondo, Ostia. Harsh, 24

(29) of *medianum* from *Ostia*. In this scenario though two of the walls should be closer than the third, otherwise the efficiency of a hallway above is negated. A double-loaded corridor type of housing requires a minimum of four parallel walls and typically has a fixed set of stairs because of the higher traffic.

Apartments grouped around a cortile represent a second type of insular dwelling. The formation of these types of apartments would have been introduced only after the creation of the peristyle. The only proof which exists for this hypothesis is in the structural rationale. In order for the middle of the ground floor to have access to light in a two story building there has to be a central void in the center. Rooms gathered around this ground space would require openings in the walls for light and air, and so the vertical structure would have to be thinner and more durable like a column. The floor above can choose to mirror this logic or exist as a solid wall sitting on trabeated beams. This loading case would seem less common though because of the intense weight. The other walls (parallel to the column lines from the first floor) are simply carried up.

### **Insulae of the Via Consolare**

In such a dense urban environment as Pompeii, the atrio-domus received all of its light and air from the openings in the atrium and peristyles. As upper levels and insulae were added above this configuration, they tended to face inwards to gain these necessities. Because of this introspective view the city streets had very few openings and a drab appearance<sup>94</sup>. R.C. Carrington has made the proposal that the multiple

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<sup>94</sup> Nash, 9 and McKay, 91-96. "Boethius has discovered four categories of insulae at Ostia: (1) A basic structure of ground-level row tabernae with living quarters above; (2) a combination of two-row shops, with apartments, back to back; (3) a combination of both basic designs around a court; and (4) Calza's palazzi di tutti, an elaboration of the cortile-style insula combining the usual facade with tabernae toward the streets..."<sup>91</sup>

dwelling apartment was a byproduct of the domus for this reason<sup>95</sup>. The addition of upper stories around the opening above the atrium ushers in the existence of what could be considered a cortile. This theory has been refuted multiple times by those who prefer the Hellenistic traditions which favor a second level oriented toward the street façade. However, there are only a few buildings at Pompeii which have been found to date which have loggias visibly opening to the street even in their lower stories<sup>96</sup>. A third arrangement comes from Boethius who argues for the first scenario that apartments are the products of shops which have integrated an upper level for their owners to live.<sup>97</sup>

In the south of insula 1 and insula 3 the workshops also underwent another significant redevelopment. An upper story was created that spread right across all of the properties in this block. The stair base, which opened directly from the Via Consolare at VI,i.16, provided access to a rental apartment in this new upper story. Pg. 402 The best known structure which has some habitable elements at the ground level is the Taberna Phoebi in insula 1. Recognizably in the houses of insula 3 each residence has an included stair and the solid pier structure around the atrium. These pier structures also occur in the House of Leone and the Casa della Diana II.

## Part 4: Comparison

### Domus and Villa

The shift from domus to villa represents a unique re-purposing of the common building language. What should be noted is the progression and or transformation that the urban domus went through over the

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95 Harsh, 2

96 Nash, 9-10

97 Packer, James E. *"The Insulae of Imperial Ostia."* *Memoirs of the American Academy in Rome*, (1971), 43-44

ages. The sequence of hut, displuviate, tuscan atrium, impluviate atrium, atrium garden, atrium peristyle,

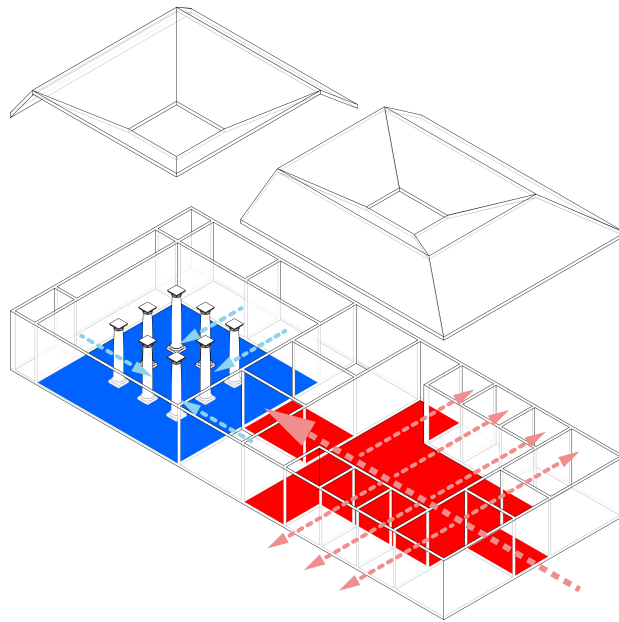


Figure 30: The endocentric atrium (red) and the exocentric peristyle (blue)

and finally just peristyle. The emergence of the villa type can be charted as splintering off about the time that the peristyle was emerging. The key distinction between these two types is that the domus is inherently endo-centric and the villa is spatially exocentric. Another way to think about it is that the atrium is an architectural element which is made to be looked into and the peristyles are meant to be looked through or out of. The relationship of atria proceeding peristyles works well with the idea of

wealth and vista simply because the depth of the atrium extends the view and the physical distance between the urban and private spheres<sup>98</sup>. According to Shelley Hales, the “domus depended on the villa” in Vitruvius' ordering because the wealth moving between city and country was driving the transference of nature into the home<sup>99</sup>.

Another way to explain this relationship is through the idea of the otium and negotium. As defined by Cicero, the otium is the place for relaxation and to enjoy the luxuries of life. In the suburban villa it is the peristyle which becomes the place for interacting with nature and viewing the landscape. The negotium (from which we derive the word negotiate) is the business side of the house. Typically, it is the front

98 Clarke p. 6 . “The doors of the domus were not flush with the street facade but were set into the entryway and opened inward, to create a viewing position for the visitor” - Heinrich Drerup, “Bildraum und Realraum in der römischen Architektur,” *Römische Mitteilungen* 66 (1959): 158-159

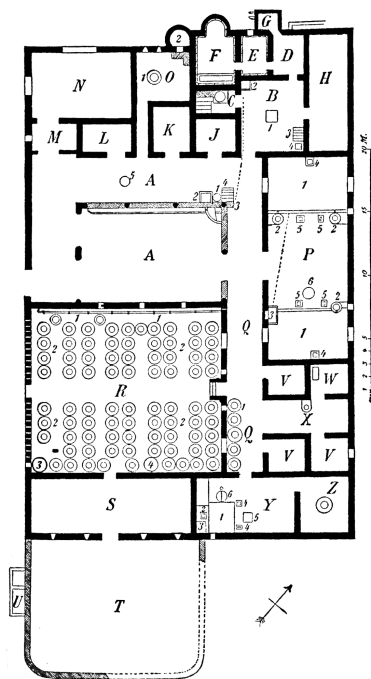
99 Hales, Shelley. “*The Roman House and Social Identity*.” (Cambridge University Press, New York, 2003), 35

atrium of the house in which business actions occur. While we find the colonnaded condition to be architecturally more open and theoretically more inviting, it is actually the more walled front atrium which is meant to be the more public space of the house due to its proximity with the street. In the villa, we find that the otium has been pushed to the perimeter of the house where it merges with the landscape and the formal business component has moved into the center.

The transition which occurs in the development of the villa shows the peristyles taking on different configurations in relation to the atrium. The easiest to recognize of these are the encircling peristyles which occur at the Villa of the Mysteries. In this case there is an additional peristyle loggia which wraps the back sides of the villa. The reason for adding these loggias was so that the spaces below them could look out at the landscape while still being covered by the roof. It is a parallel relationship to what was occurring inside the villa below the inner peristyle. Diagram. These 'wrapping' peristyles are most commonly found in what Ackerman describes as the compact-cubic villa, the best well known of these being Palladio's Villa Rotunda from the sixteenth century.

The other interesting development to chart is the transition of spatial groupings around the atrium to those which are grouped around a peristyle garden. The most unique are the atrium houses that were wide enough to only have cubacula on one side. These houses are quite common within the city and equally made the transition from atrium to peristyle once they moved to the country and had enough room to grow. The best example of these houses is the *Villa of P. Fannius Synistor at Boscoreale*, (figure 31) located about a mile from Pompeii. What makes these houses unique is that the peristyle has moved





GROUND PLAN OF VILLA RUSTICA  
AT BOSCO REALE

From A. Mau, *Pompeii*, translated by F. W. Kelsey,  
New York, Macmillan, 1899.

Figure 31: Villa at Boscoreale. Cato, 31

to the middle of the villa rather than being positioned in the back like in the town-house.<sup>100</sup> This development seems to be limited to only compact-cubic dwellings and is most commonly found in villae rusticae.

Important to note from Ackerman's study of the villa typology is the idea design goal of the villa is to capture the view of the landscape. The goal of the domus is to physically capture nature within. As discussed with the villae it was common practice to raise the structures above the landscape to increase the panoramic views. About half of the well planned houses along the Insula Occidente follow this model by raising the foundations above the level of the street. This is one of the very few places in

Pompeii which we find stairs within the vestibulum which function as part of the entry sequence. There is no site specific reason why this should occur, especially as it can only be found in a few cases. The only logical reason for adding this height was to mimic the podia of the villas and increase the coastal visibility for the owner.

Geometrically speaking the transformation of domus to villa did almost nothing to change the way in which houses were laid out or constructed. If anything, the square became the more pronounced ideal figure for the entire building form. This condition occurs much more frequently in peristyles than in atria

<sup>100</sup>Boethius, 195

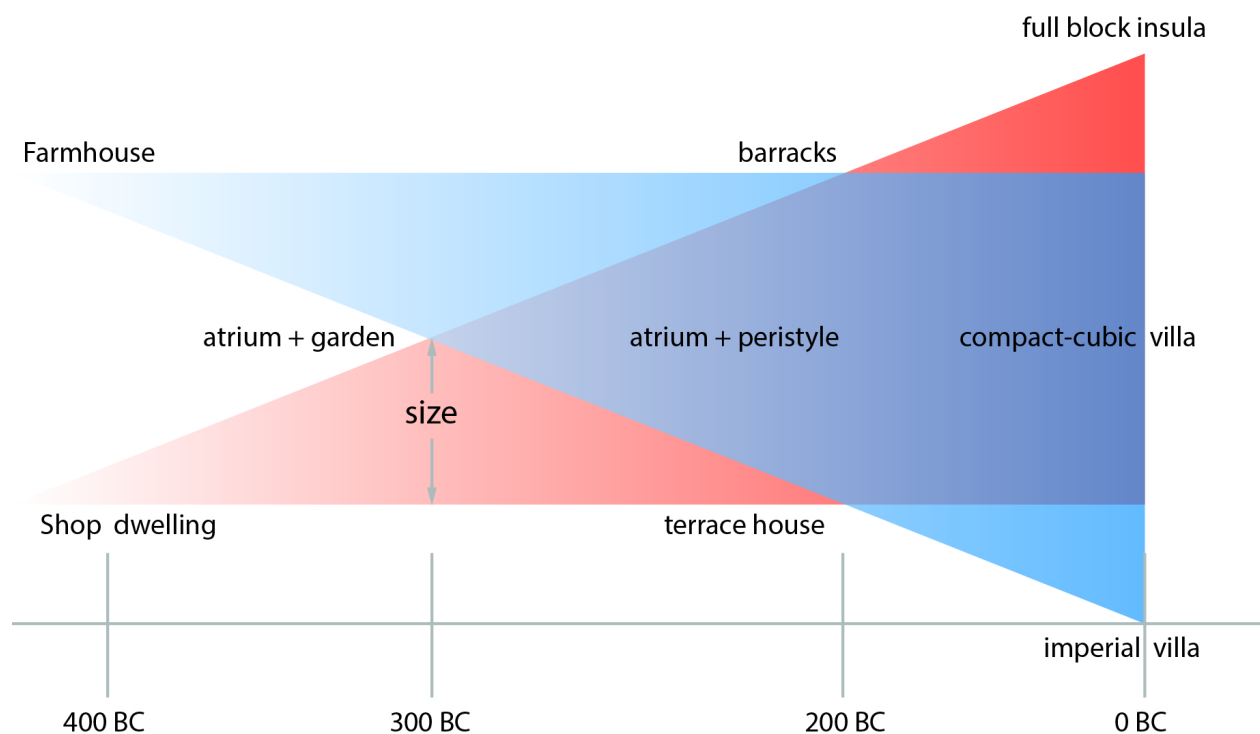
and the exchange of one type to the other in Villas may be the reason for its popularity.

### **Conclusion(s)**

We must look at the dwellings of Pompeii in a temporal way, otherwise they're appearance next to each other makes no sense. The irregular house plans which have been described prior have never been looked at in context of their neighbors to see if there are fragments which may have once belonged to them. We can never rule out the possibility that an irregular house was once a regular unit that was chopped and divided over the ages for new uses and to serve a new population as was done with the House of the Vestals. The other major finding of this study is that classification of houses by typology is not necessarily the proper way to label these dwellings. What have emerged are 5 typologies which represent the transformation of a single prototype over time. Sub-types and styles represent the infinite combinations of minute manipulations which have emerged and even been selected out of the temporal context. In Pompeii there are no rules for an owner who wants to build a first century house next to one existing from the third century B.C. Similarly, a builder in the first century can decide that he wants a third century design to support romanticized ideals.

While the outcome of this thesis certainly strengthens the validity of the atrium prototype as the model for the urban house, no one really needs to say that Vitruvius was right. What is more important is establishing the patterns behind this recognizable form which will hopefully lead to an improved definition of the ancient Roman house. From these results, there should be gathered a better understanding of how dwellings purposefully built outside of cities are part of a similar language rather than constructed oppositions.

Between the urbs and exurbs the transition in dwelling types that occurs over the ages can be conceptualized more as a set of two sliding scales based on size and inclusion of context. On one end of the spectrum are the the small three-room shop dwellings and the rustic farm villas. As time progresses they get larger and builders begin to exchange bits of composition with one another until they merge into a single figure around the end of the second century in the luxury villa. Future development causes them to settle out once again into separate conditions as the urban moves towards the insula and the rural advances towards the imperial landscape villa.



*Figure 32*

This study has shown that dwellings are bound to the contexts of time and place and both weigh heavily on their development. The difference between urban and exurban dwellings in the end product however is little more than the availability of larger space and a view.

One of the more intriguing developments encountered in this thesis highlights the lasting impacts of knowledge available to the Pompeians at their moment in time. Through their volcanic destruction they preserved conditions of high construction sophistication and a propensity toward Euclidean form and Platonic rationale. Even into the modern age these ideals carry on in representing the greatness of classical thought.

### **Methodological Application**

Besides the engagement of Pompeian Housing Typologies, part of this thesis was aimed at a critique of the methods involved. As already stated, the typological assessment had to contend in part with natural transformation and adaptation over time. In many ways it could be asserted that there are only one or two types which cover all of the sample however they could possibly be too reduced to be recognizable or functional in application. The space-syntax method was even less useful than the typological study because the patterns they reveal can often be observed in more simplified and intuitive ways. The redeeming quality is that the patterns which show up in the “j graph” models can be pulled apart and analyzed for repetition or frequency in occurrence.

The best method utilized in the course of this study was actually the part on geometry. More than anything else it identified the concept of organizational and compositional logic, assessment of form, and structural rationale. Of the three methods, geometry also seems to have had the longest reach in architectural history. Application of classical platonic forms and composition have always been at the heart of Rationalism and Neo-Rationalism because their universality allows them to be recognized and

understood as the building blocks of design. The greatest Neo-Rationalist masters like Andrea Palladio, Louis Kahn and Le Corbusier used geometry in the same way as the Pompeians; to assert an authority and timelessness which bore the weight of that which had been built before.

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## Appendix A: Dwelling Area and Room Survey Data

Sample Dwellings in Regio VI



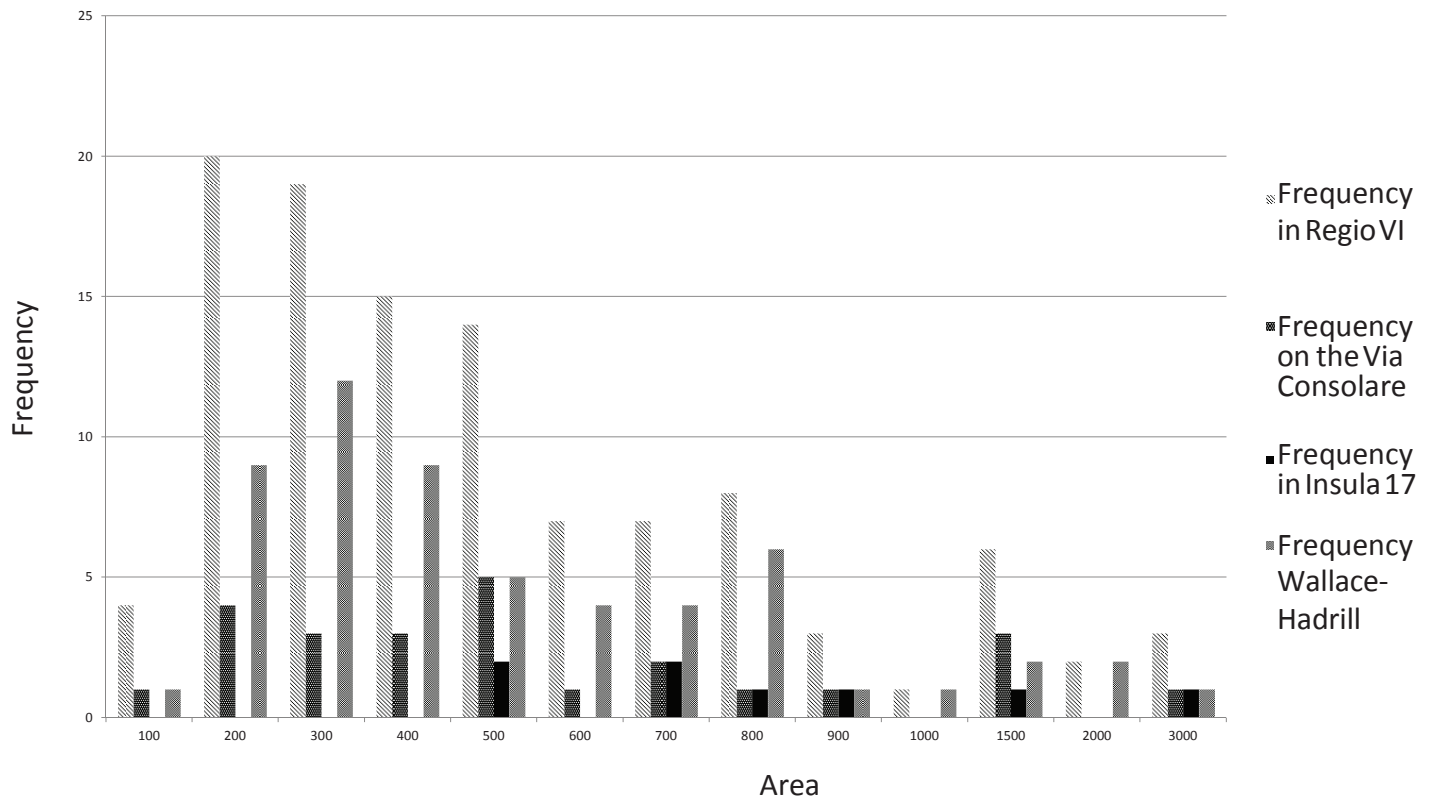
# Regio 6

## Dwelling Survey

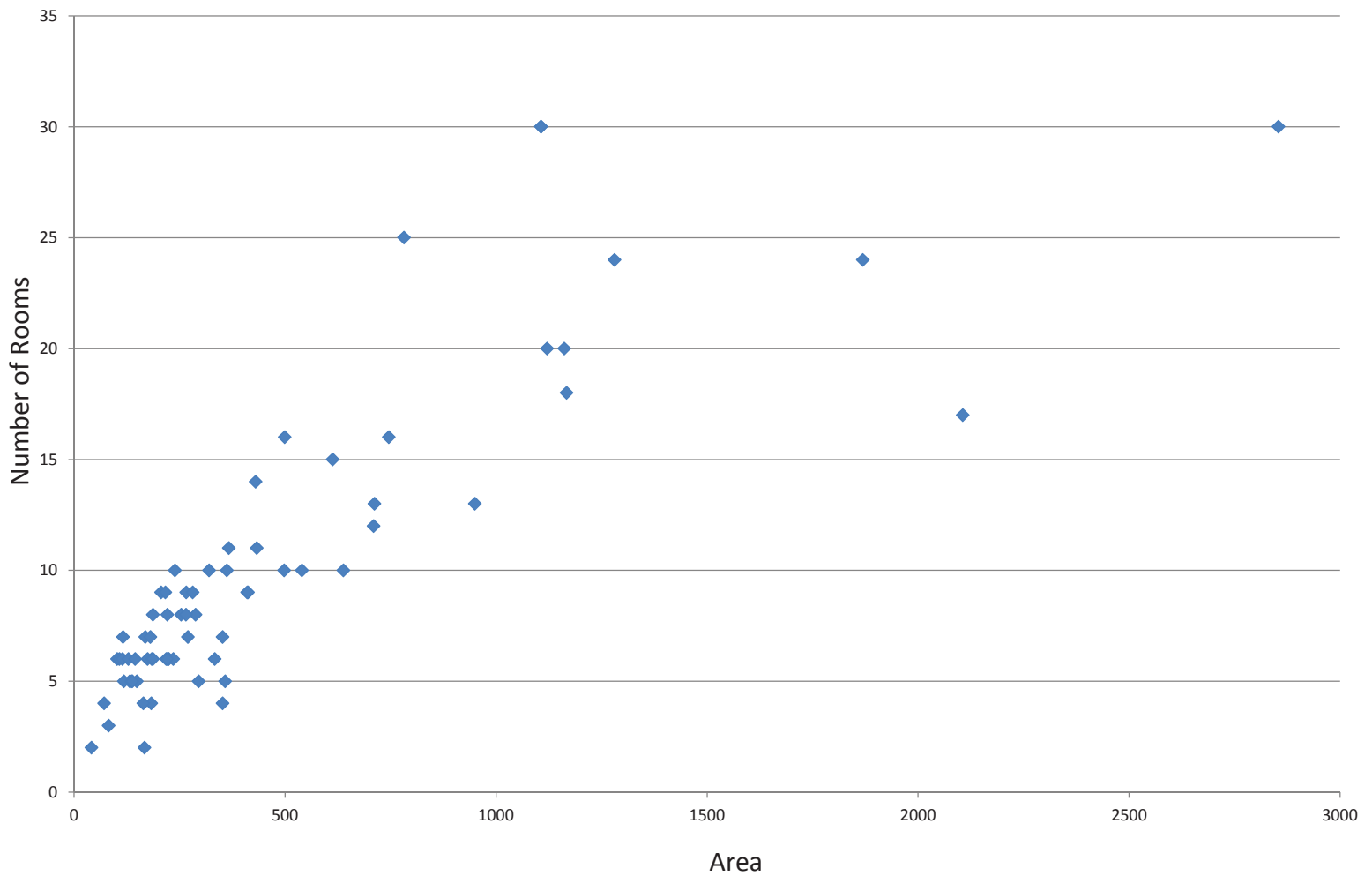
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2	14	169	7
2	8,9,10	174	6
2	29	184	6
2	17	221	8
2	12	223	6
2	11	224	6
2	23,24	235	6
2	22,15	352	7
2	16,21	362	10
2	4-5, 30-31	950	13
6	14	41	2
6	10,10a	102	6
6	6,7	107	6
6	9	116	7
6	1,8,12-13	2106	17
7	1,2	115	6
7	7	167	2
7	24-25	181	7
7	16-17	206	9
7	15	218	6
7	3	239	10
7	6	320	10
7	18	410	9
7	19	412	9
7	23	712	13
7	20-22	1162	20
8	3,5	367	11
8	1,22	540	10
8	23-24	613	15
9	7,8	430	14
9	1,14	782	25
9	3-5,10-12	1106	30
9	6,9	1121	20
9	2,13	1281	24
10	3-4,18	187	6
10	14	266	9
10	2	288	8
10	6,17	498	10
10	8,9,11	638	10
10	7,16	710	12

11	8	132	5
11	18-20	270	7
11	3	352	4
11	11,12	358	5
11	9,10	1869	24
12	2,5,7	2854	30
15	22	118	5
15	9	129	6
15	11,12	164	4
15	13-15	216	9
15	20	221	6
15	7,8	254	8
15	6	265	8
15	2,26	333	6
15	23	433	11
15	4,5,24,25	746	16
15	1,27	1167	18
16	10	82	3
16	32-33	136	5
16	35	138	5
16	28	145	6
16	15-17	187	8
16	29-30	281	9
16	36-37	295	5
16	19,26-27	550	17
16	7,38	759	15
17	5,6	86	3
17	42	467	6
17	12,13,14	479	5
17	41	625	10
17	26-30	656	16
17	16-17	696	14
17	9,10,11	784	13
17	32,36	1236	14
17	25	2092	8

### Distribution of Dwellings in Region VI by Area



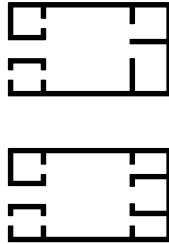
### Comparison of Dwellings in Region VI by Size to Number of Rooms



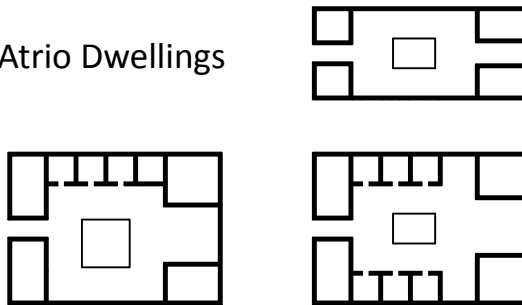
## Appendix B: Typology

### General Typologic Patterns

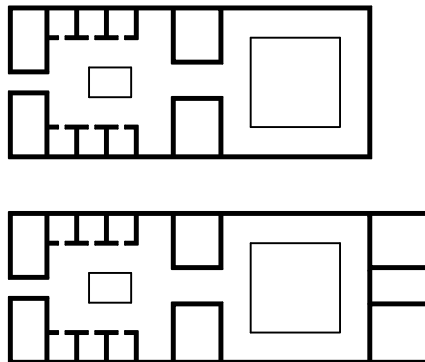
Shop Dwellings



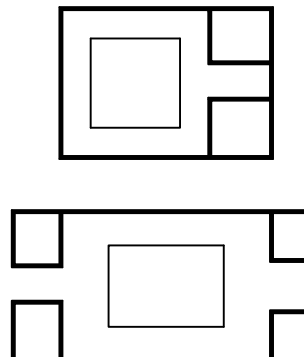
Atrio Dwellings



Atrio Peristyles

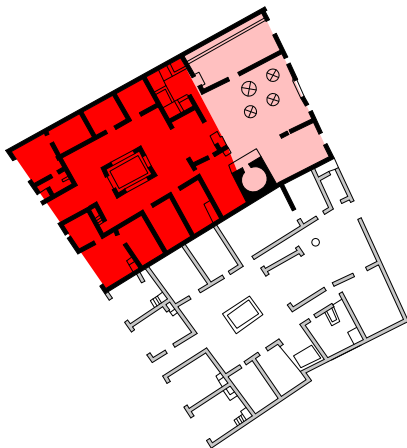
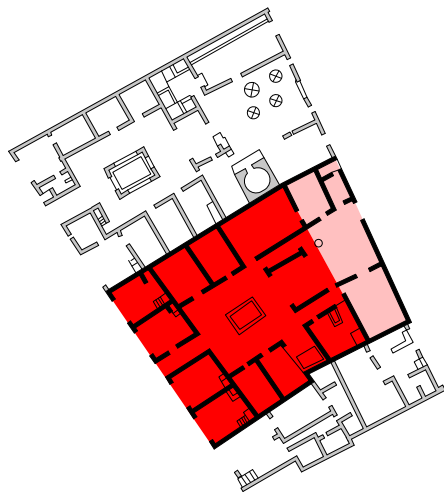
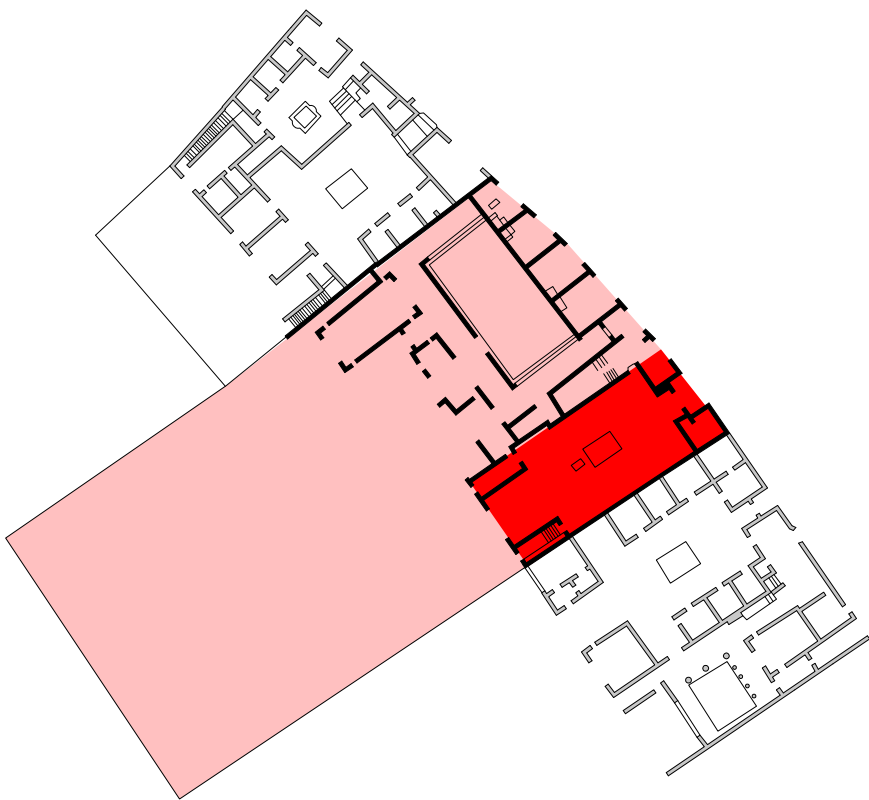
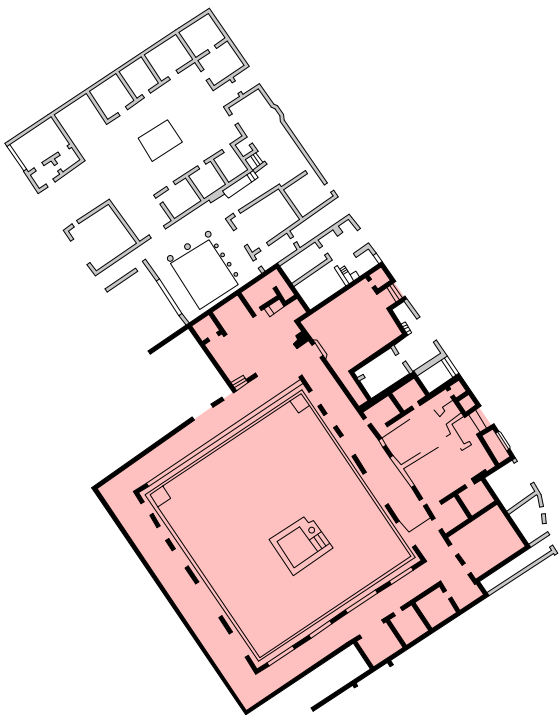


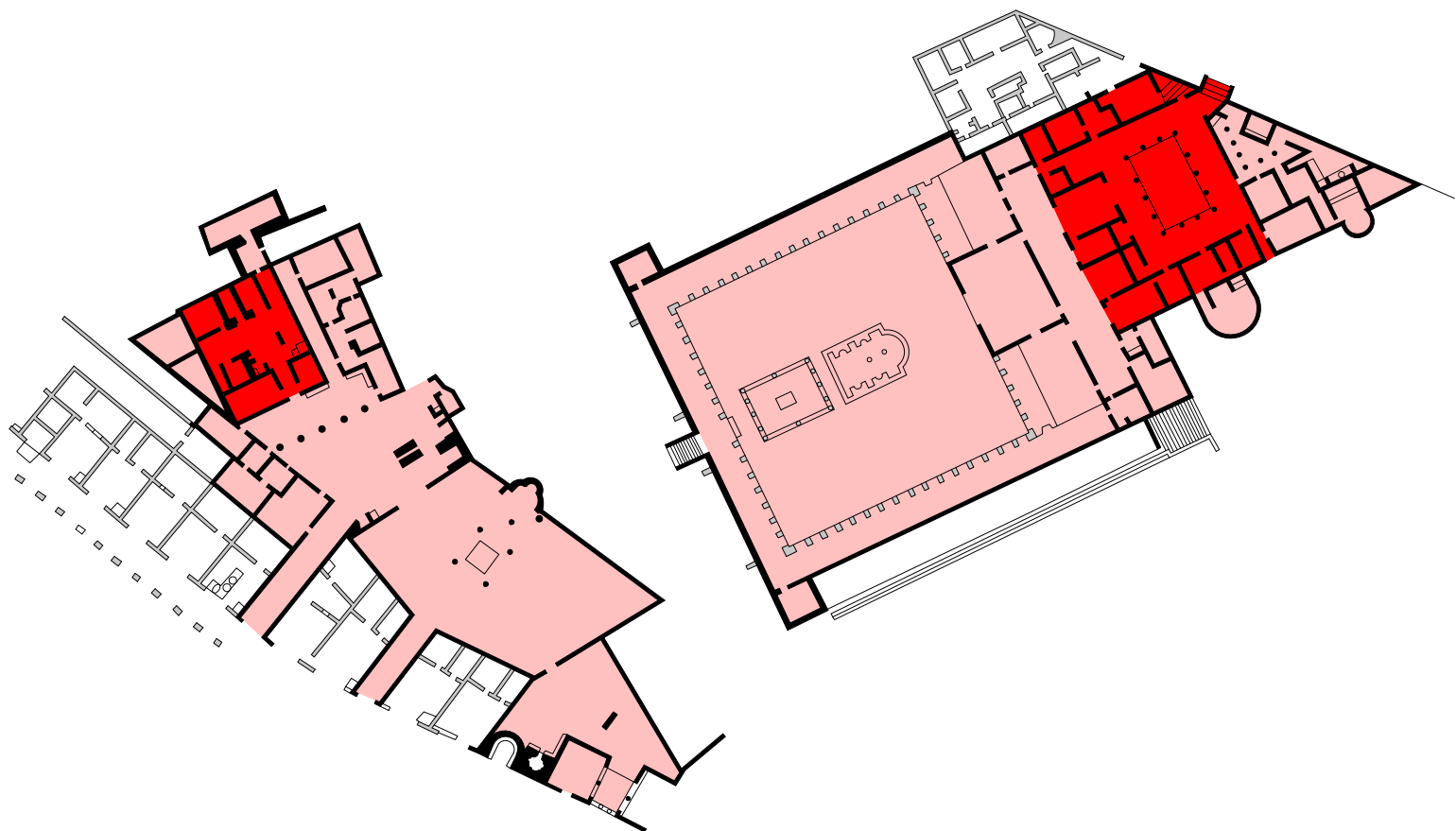
Peristyle Developments



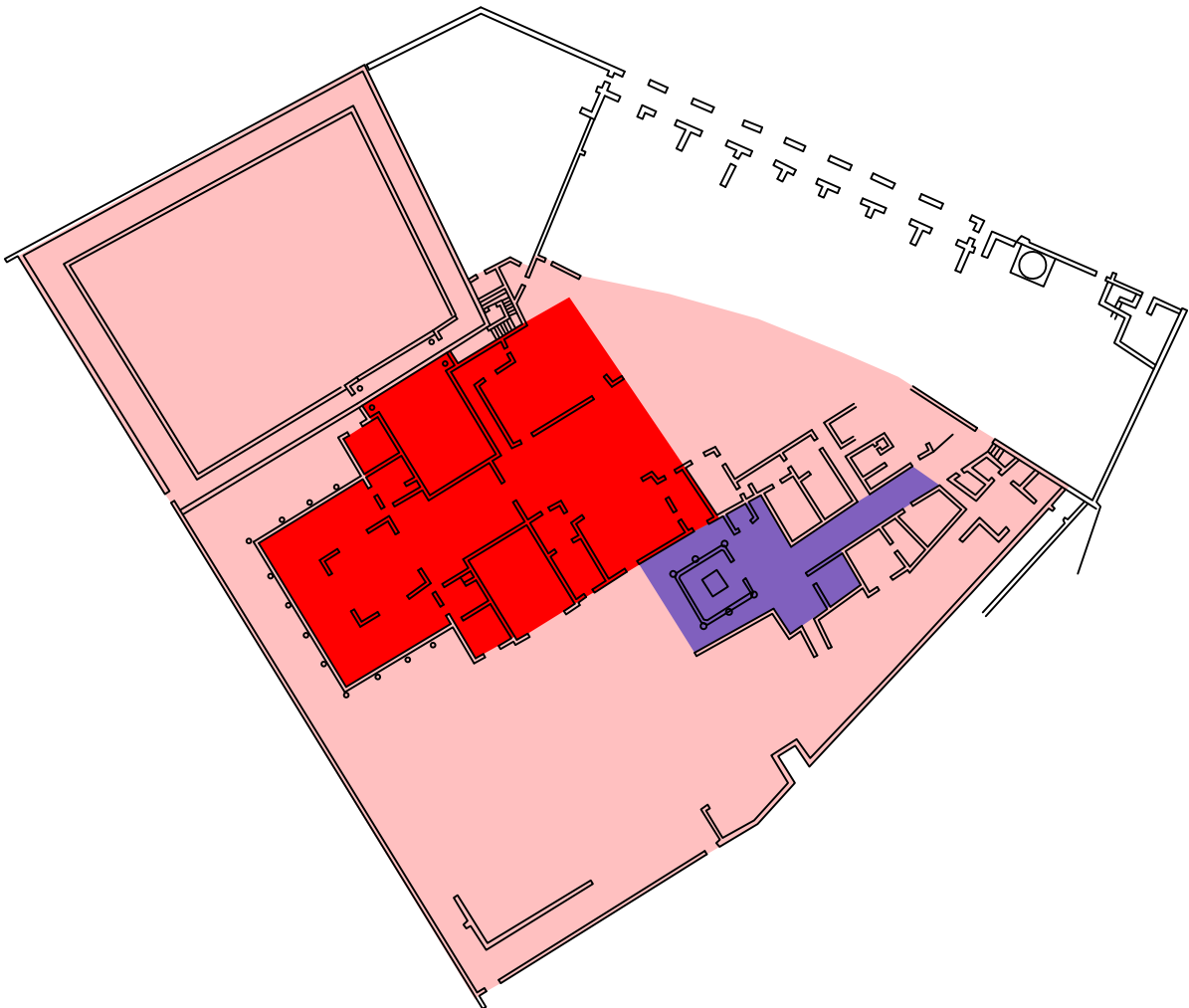
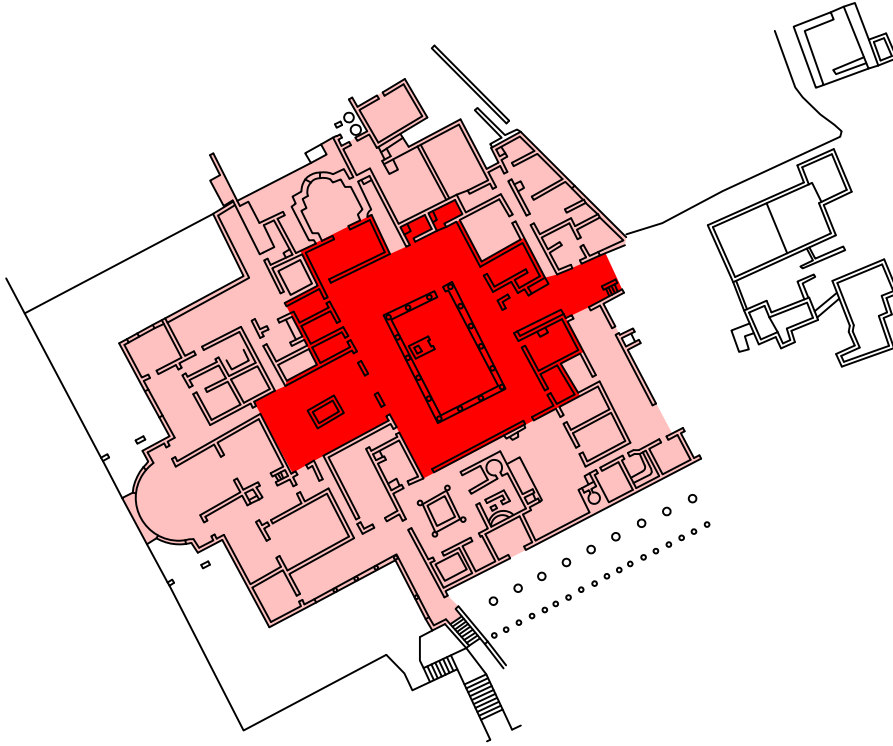
## Typologic Atrium Centers in Context





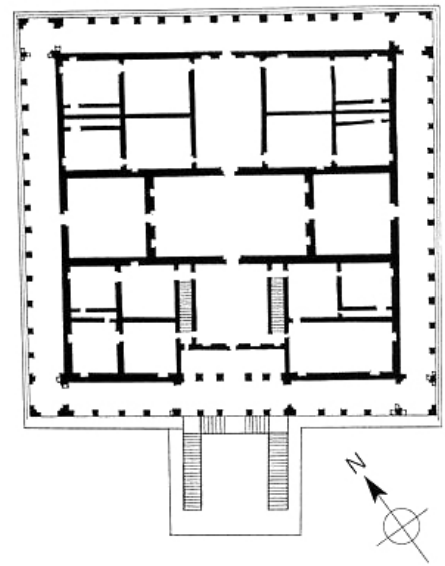
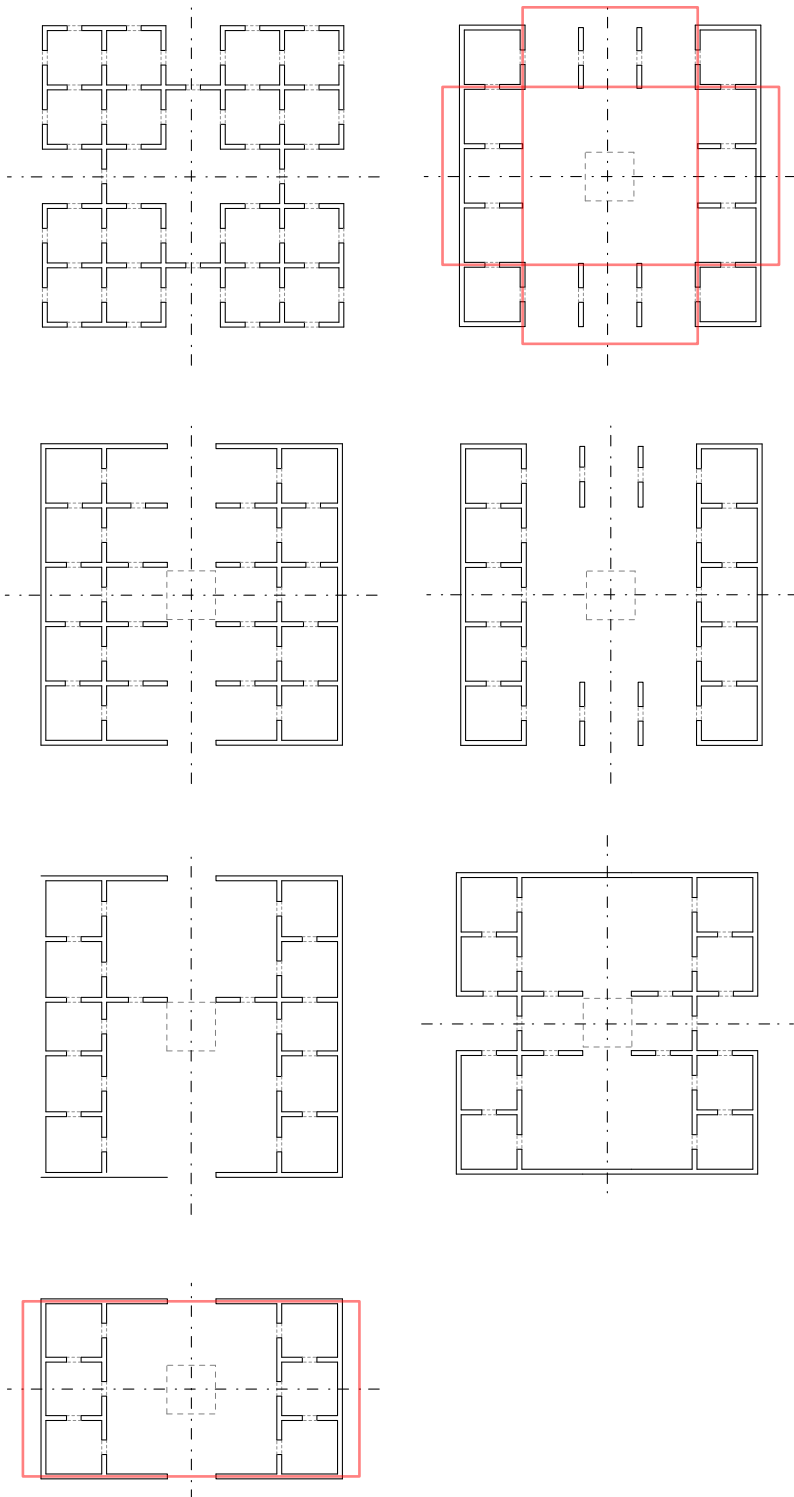




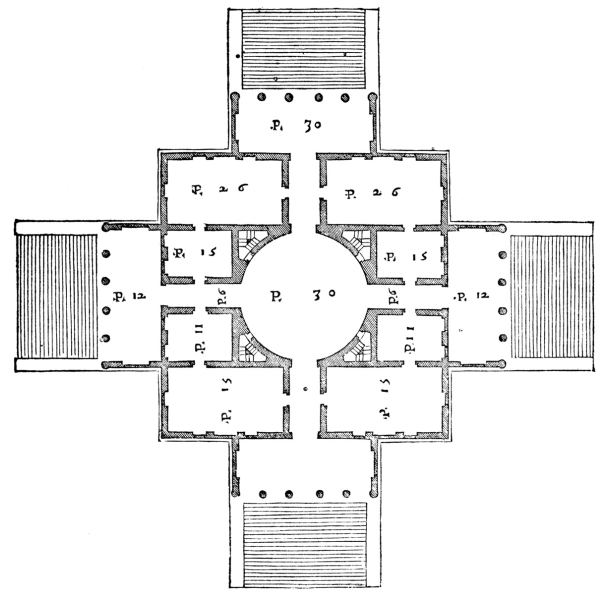


## The Ideal Type Conditions

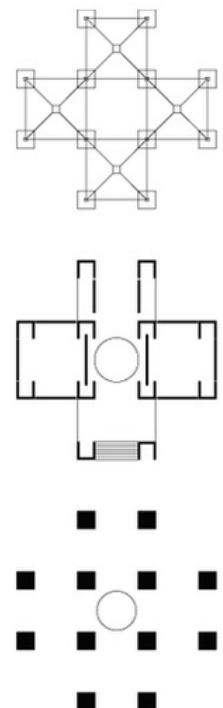
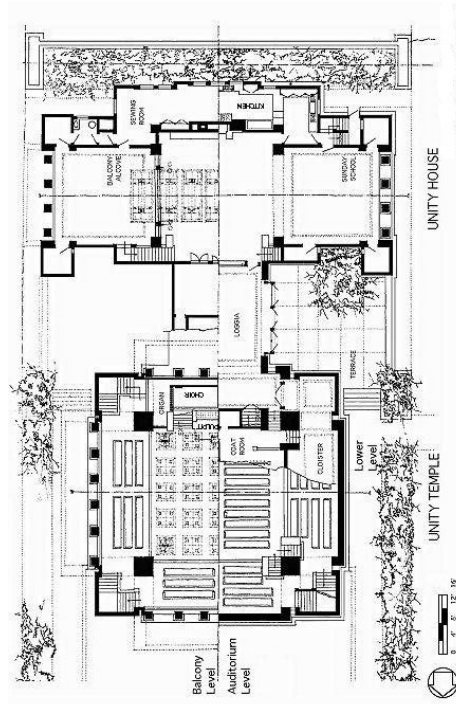
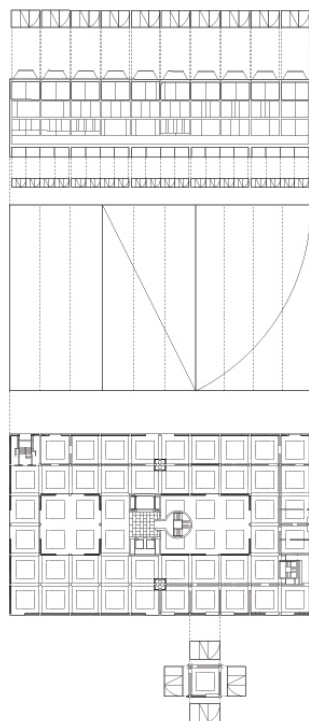
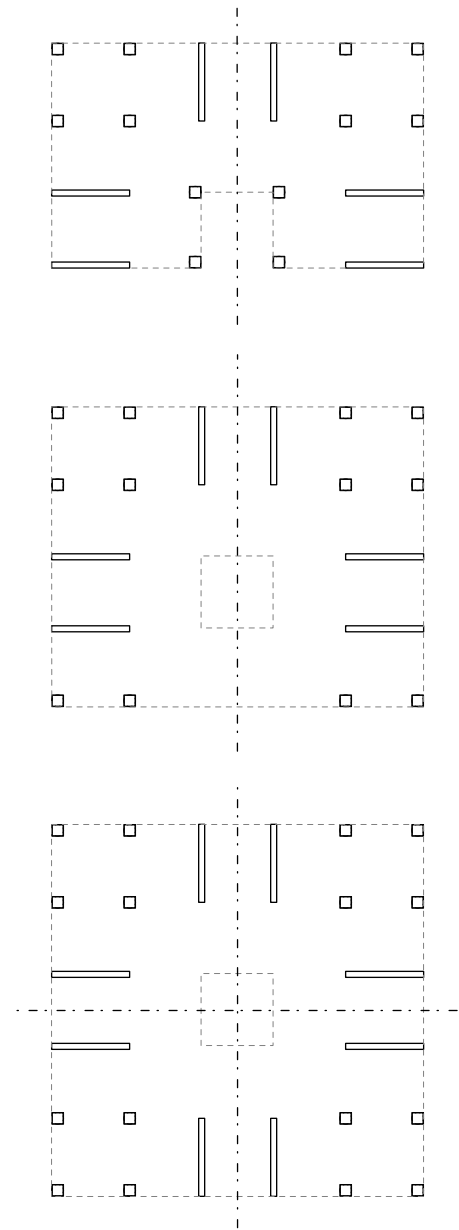
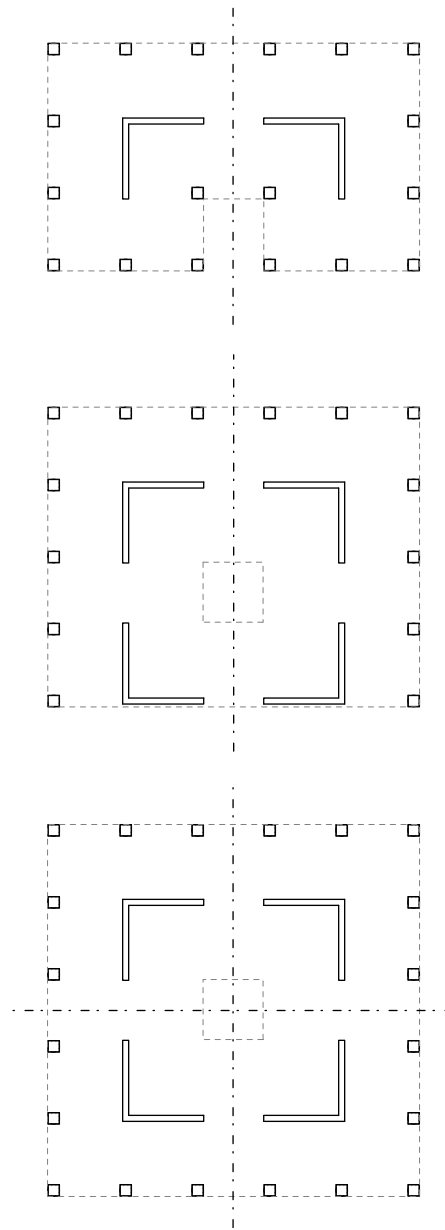
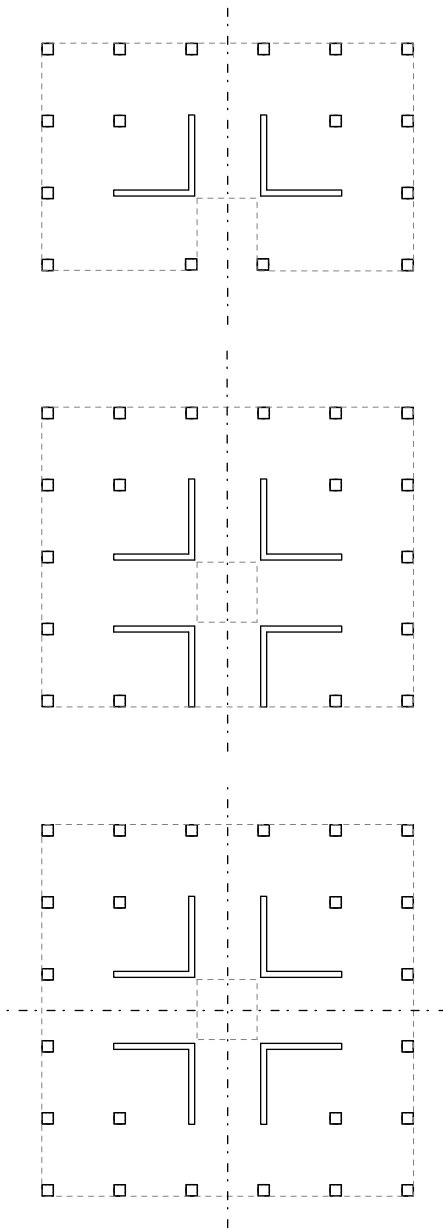
The following are based on hypothetical reconstructions of the dwellings surveyed re-interpreted as squares to identify the underlying type conditions which they share. Additional plans from rationalist architects over the centuries have been included in order to show the transformation and application of these ideal conditions



Villa Medici, Poggio a Caiano  
Giuliano da Sangallo



Villa Rotunda, Capra  
Andrea Palladio



British Art Museum, New Haven  
Louis Kahn

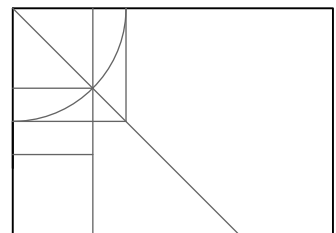
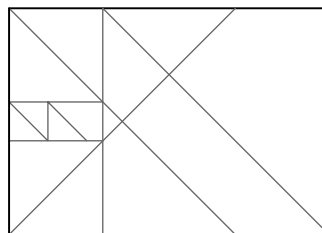
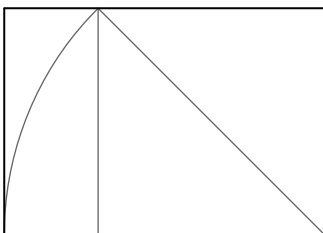
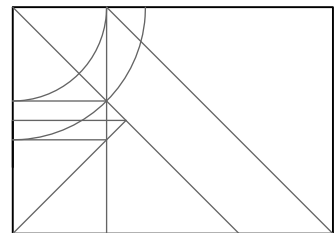
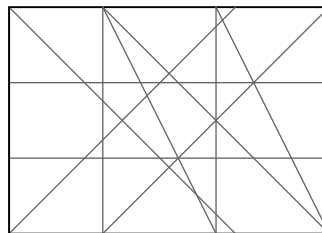
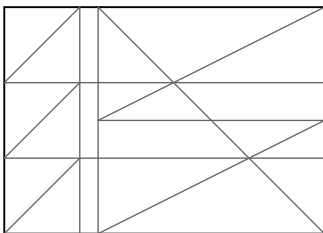
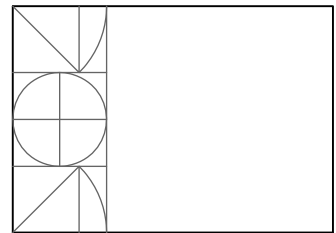
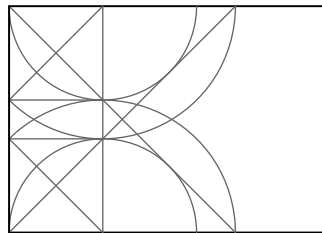
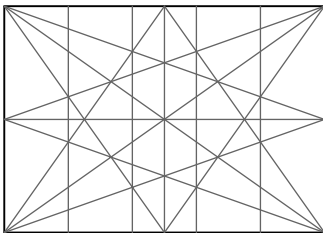
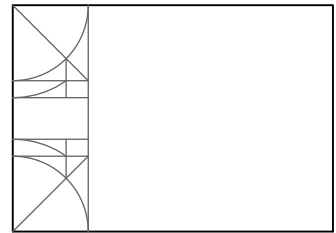
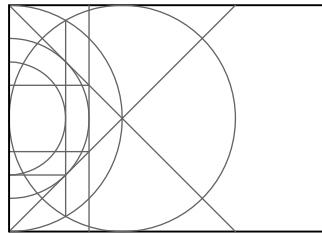
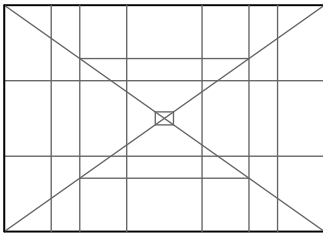
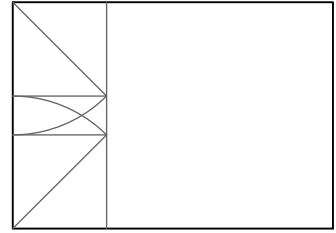
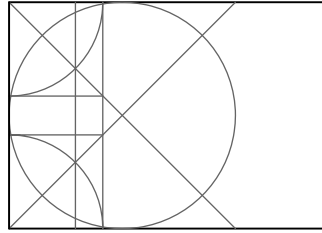
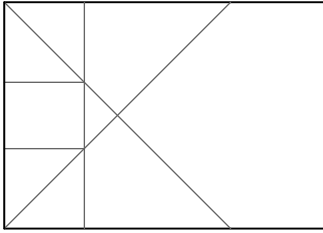
Unity Temple, Oak Park  
Frank Lloyd Wright

Trenton Bath House, Trenton  
Louis Kahn

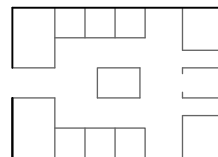
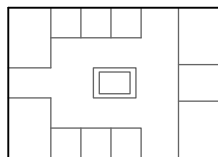
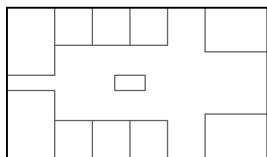
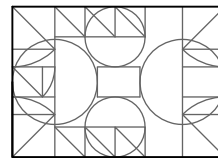
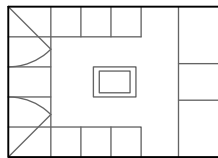
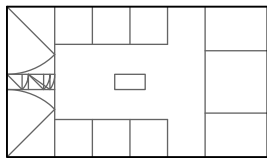
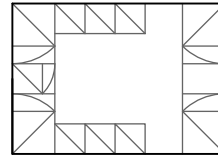
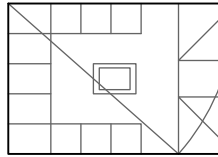
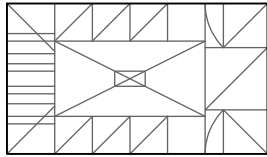
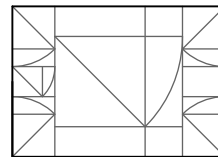
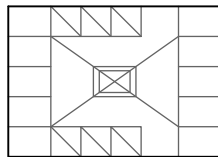
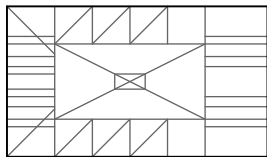
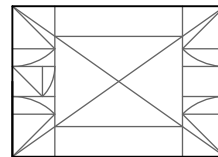
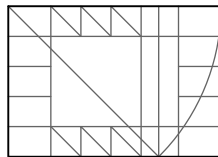
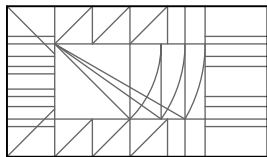
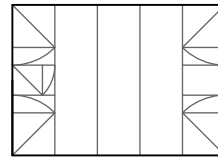
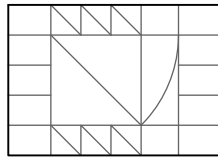
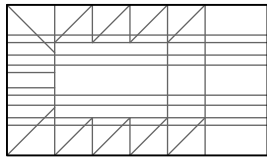
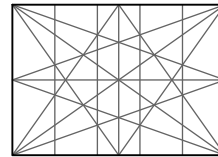
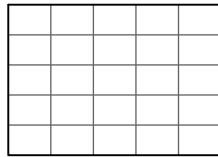
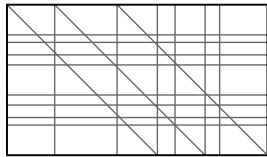
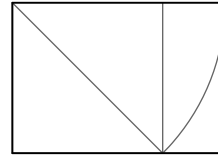
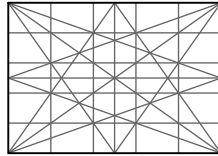
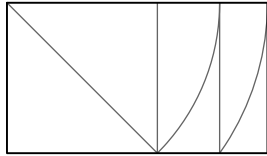
## Appendix C: Geometric Survey

*Please note that this reading of room proportion is only defined by the accuracy of the drawn plan and general survey measurements.*

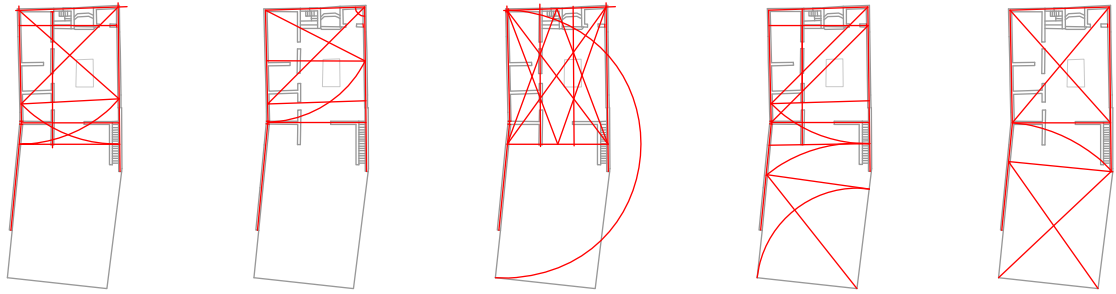
### Geometric Construction of Tablina and Exedra



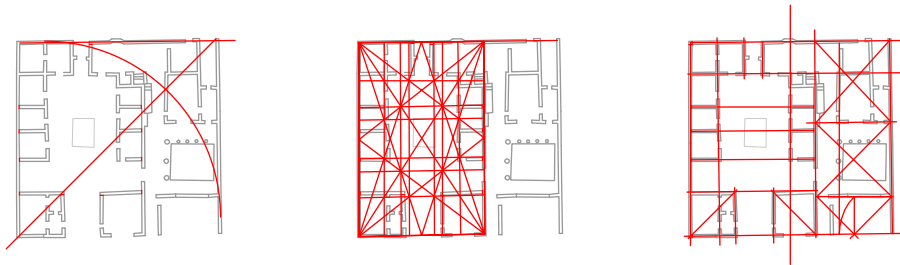
Survey Construction Geometry Required to Proportion Three Basic Atrium House Plans



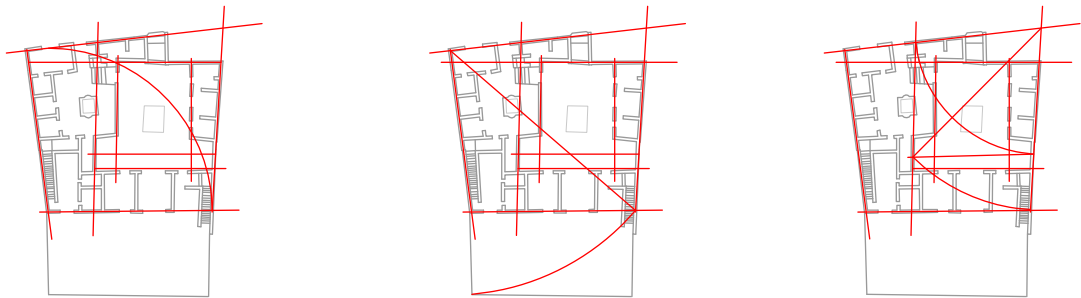
# Survey Construction Geometry Required to Construct Plans based on Width and Depth



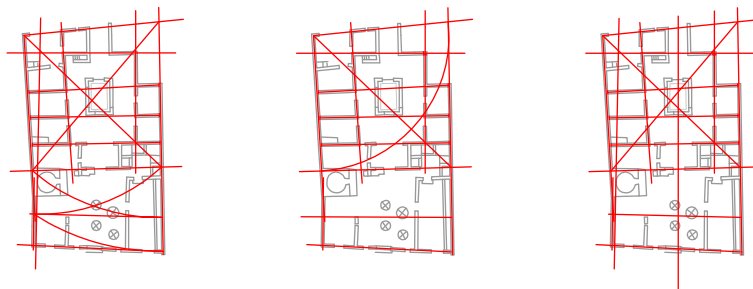
House of C. Nivillio - Root 2 and division by thirds



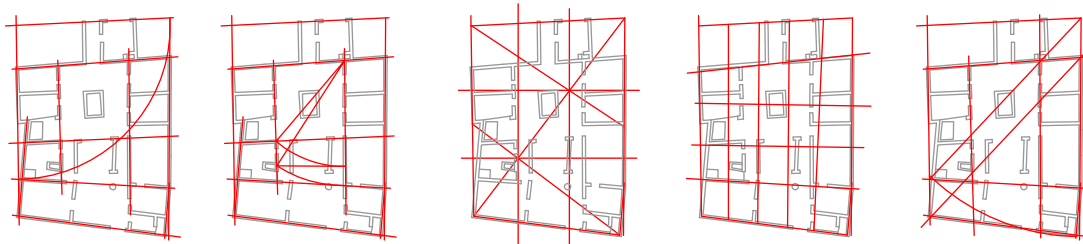
Casa dei Cadaveri di gesso - Squares and division by fifths



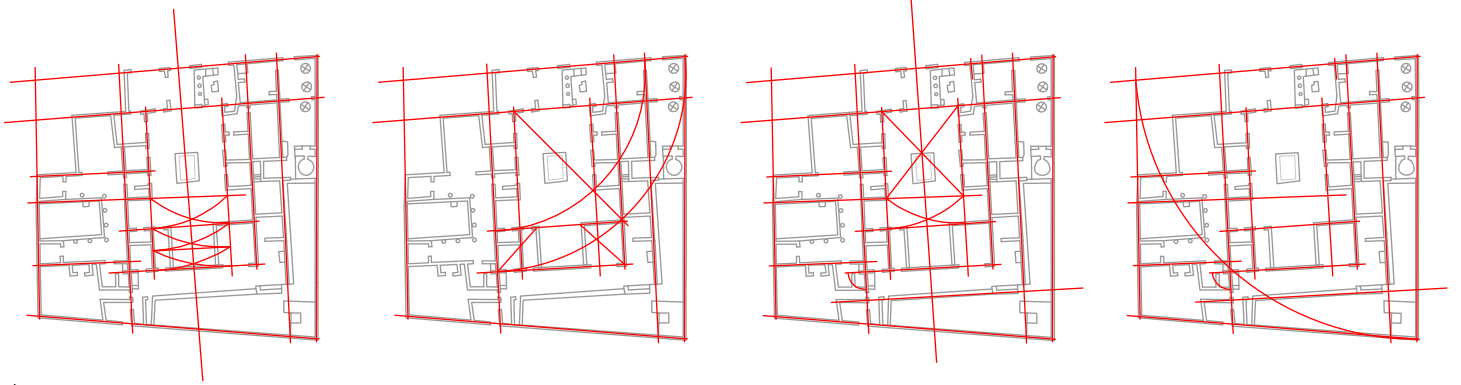
Unnamed House Doorways 16 & 17 - Root 2



House of the Baker - Root 2, division by thirds and fifths



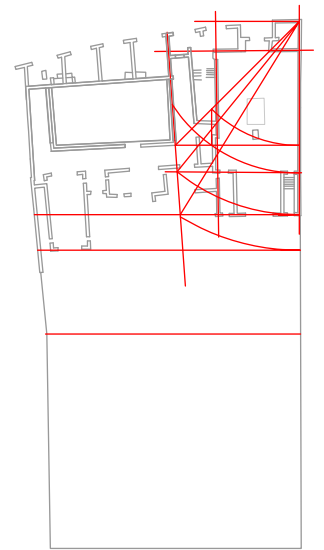
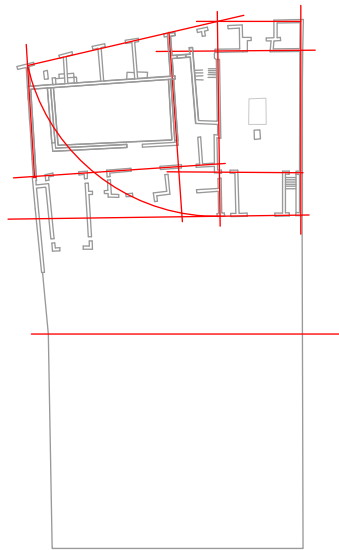
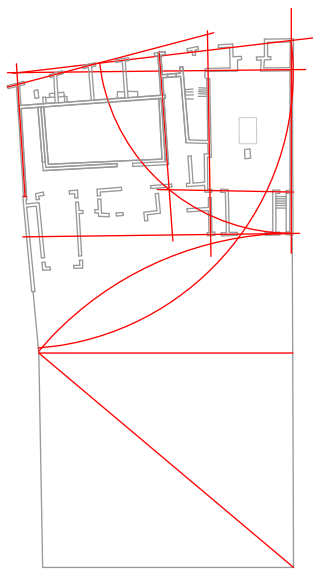
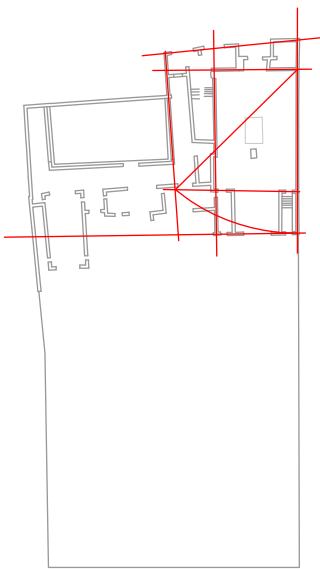
Casa Della Musica



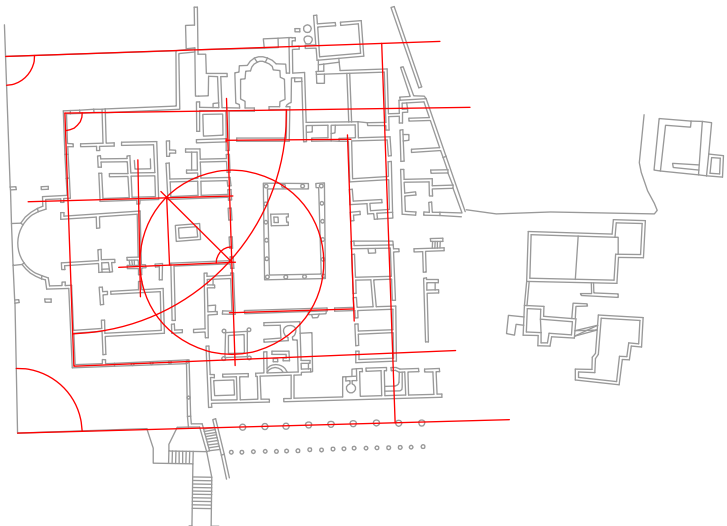
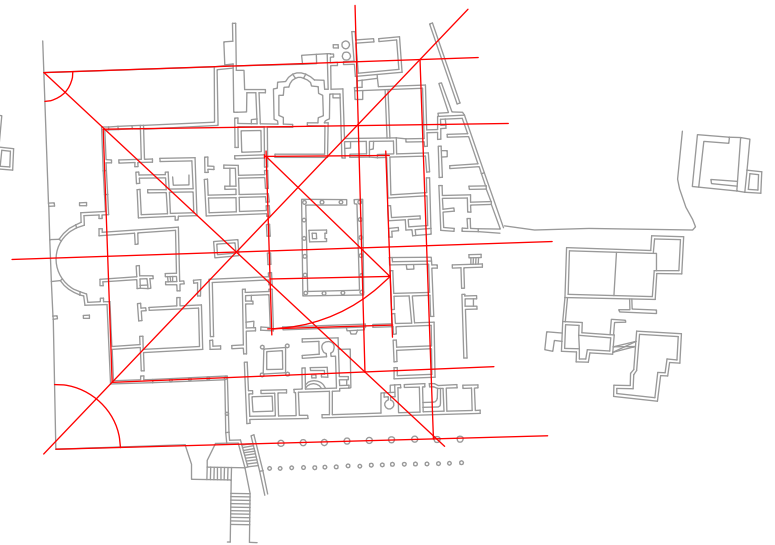
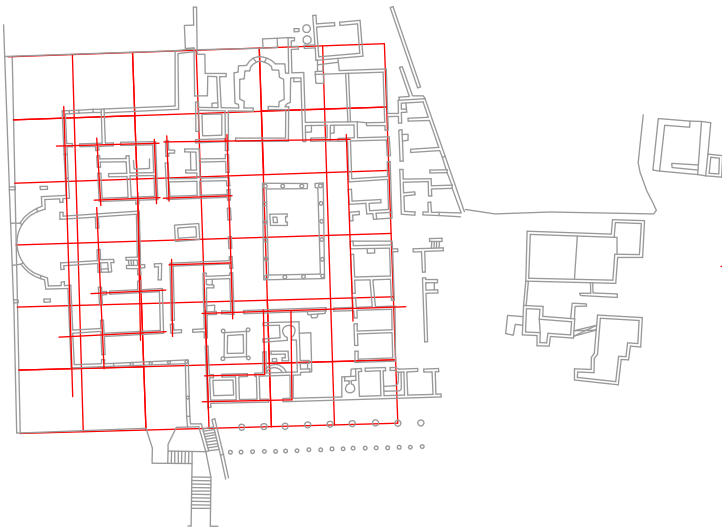
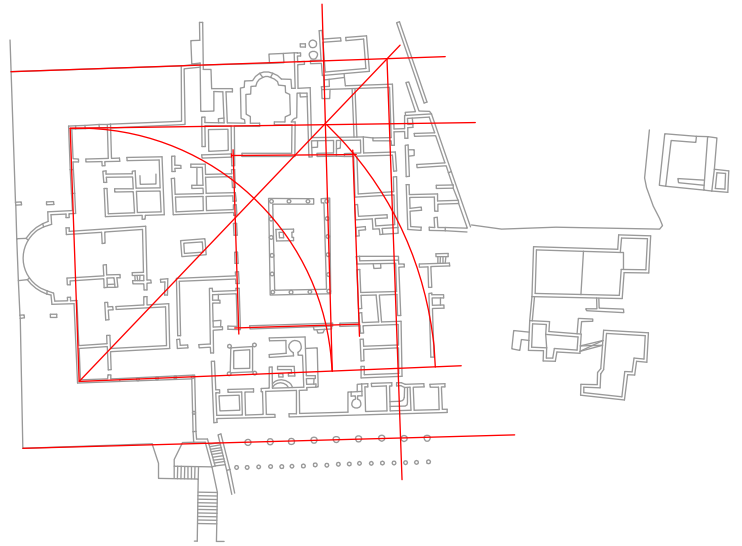
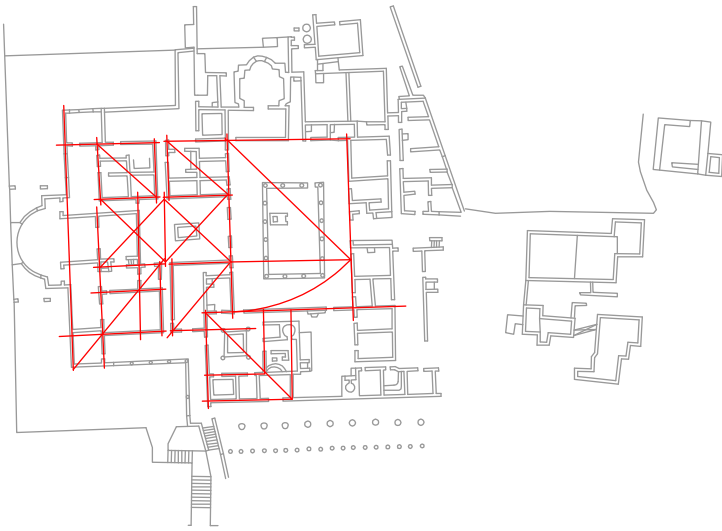
House of Sallust - Square and Root 2



House of the Vestals

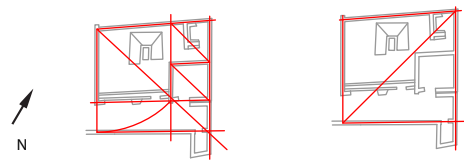


House of Leone - Square and Root 2

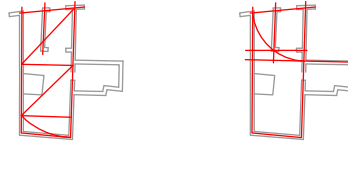


Villa of the Mysteries - Square and Root 2

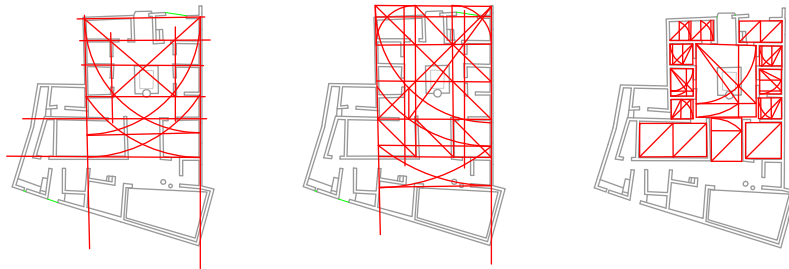




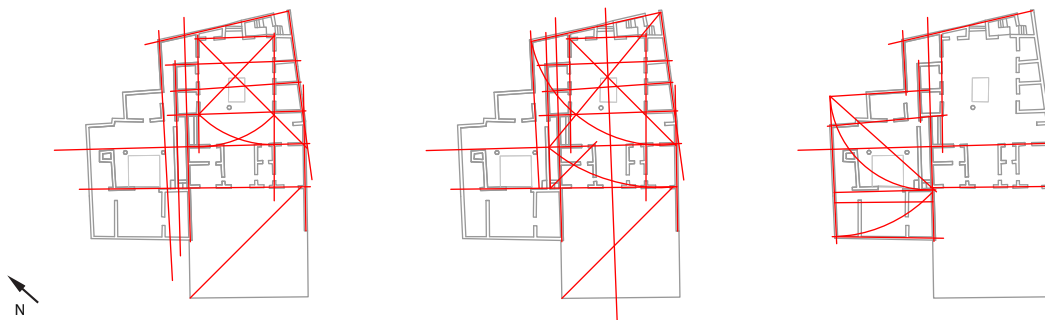
House of the Triclinium - Square and Root 2



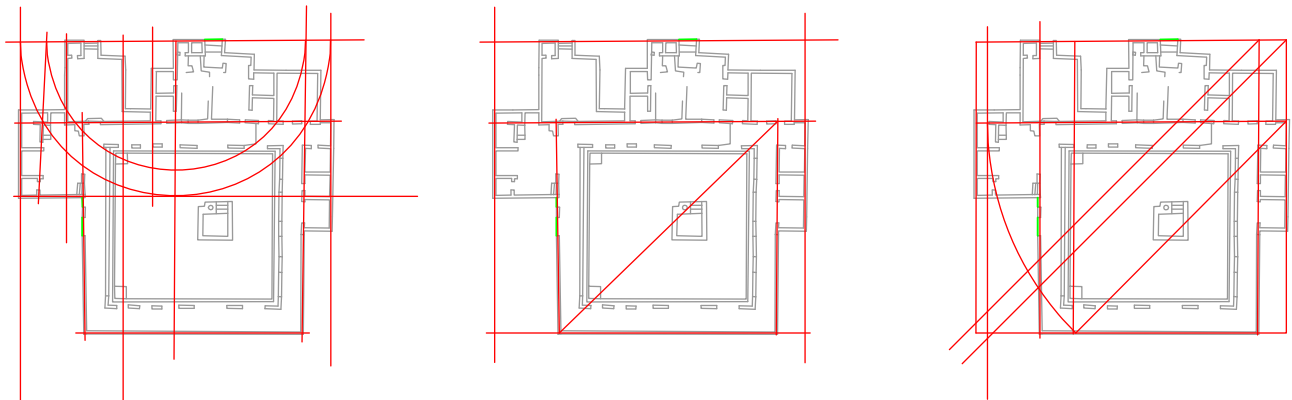
House of Popidius Rufus - Square and Root 2



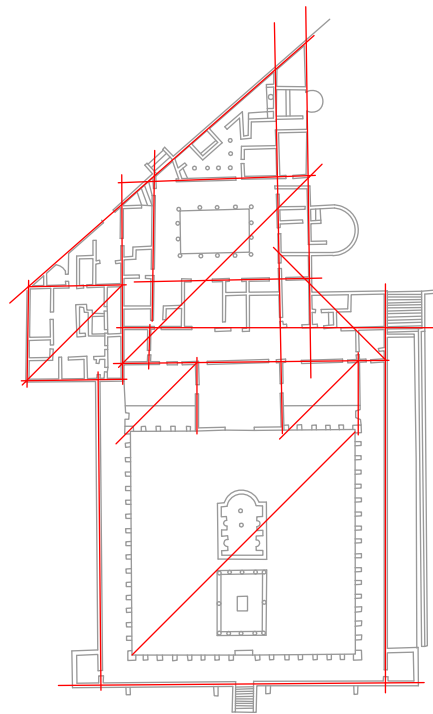
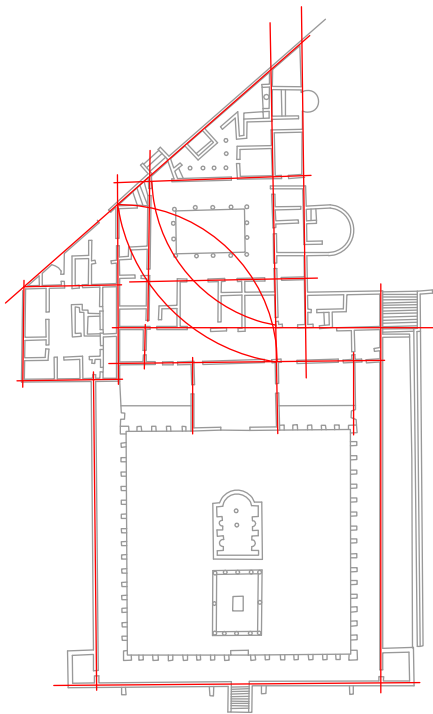
House of the Surgeon - Root 2



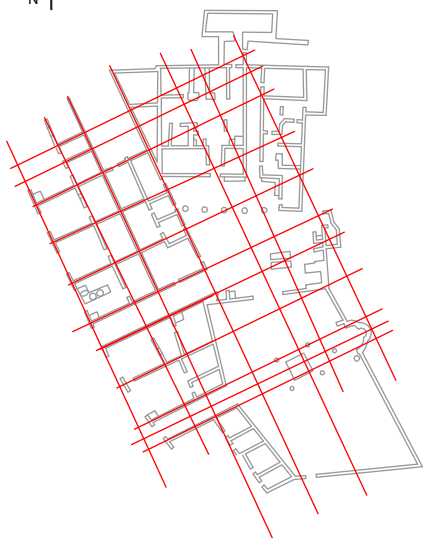
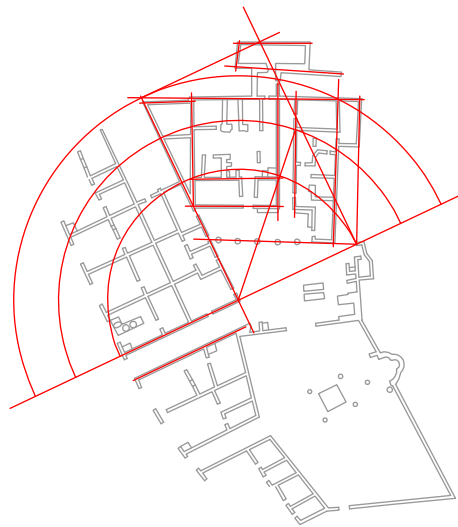
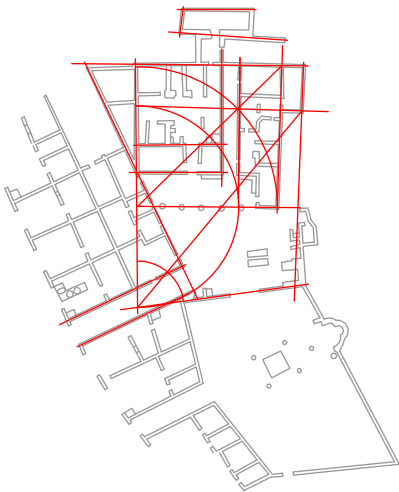
House of Danzatrice - Root 2



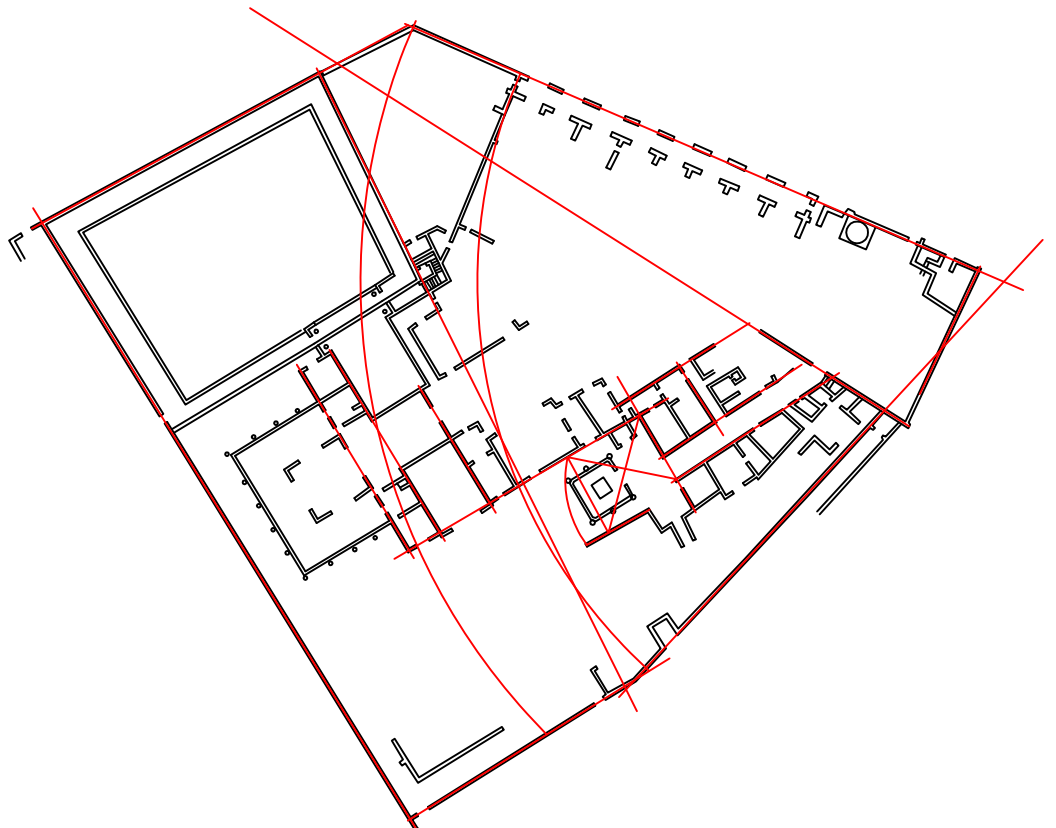
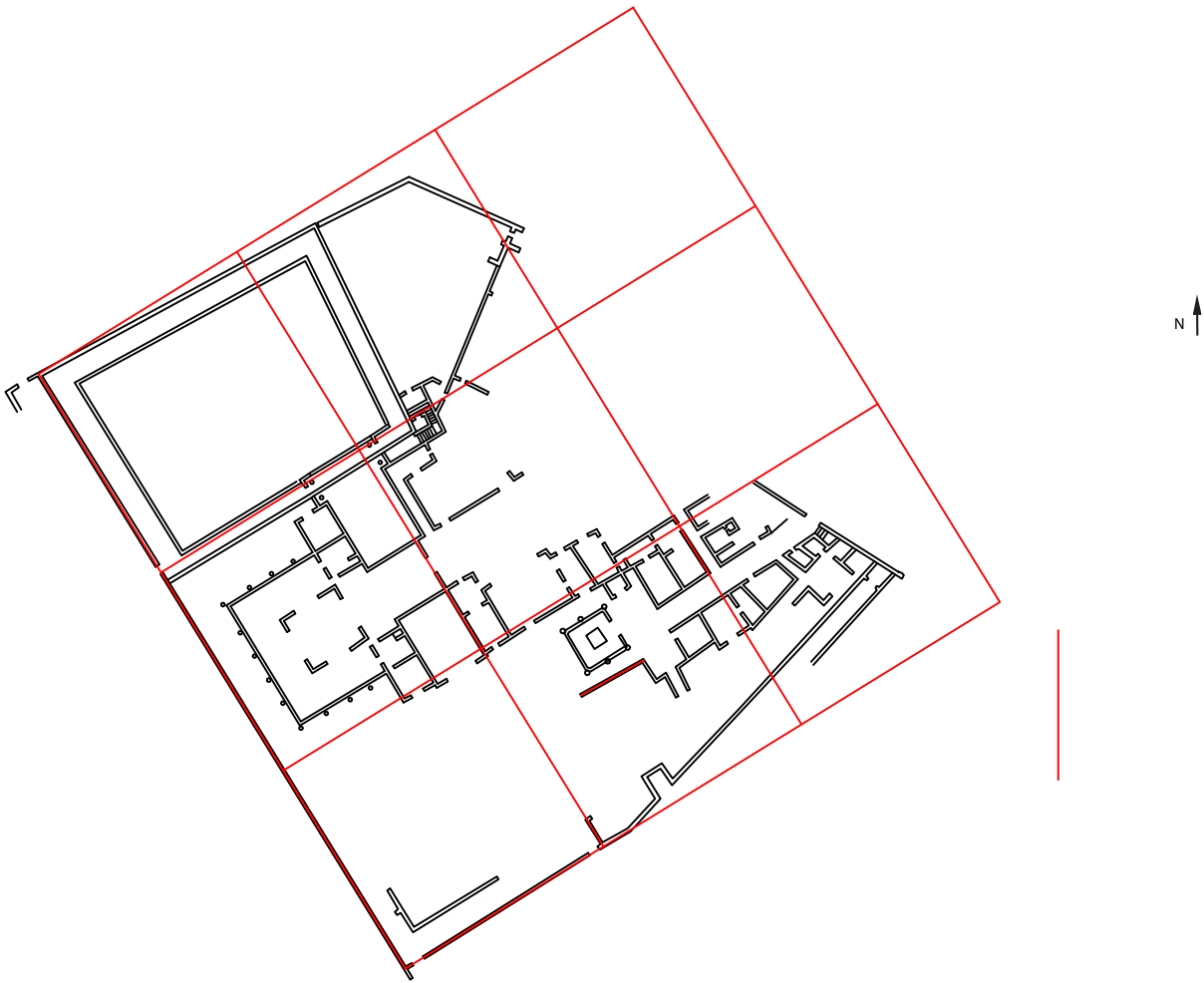
Casa della Diana II - Squares



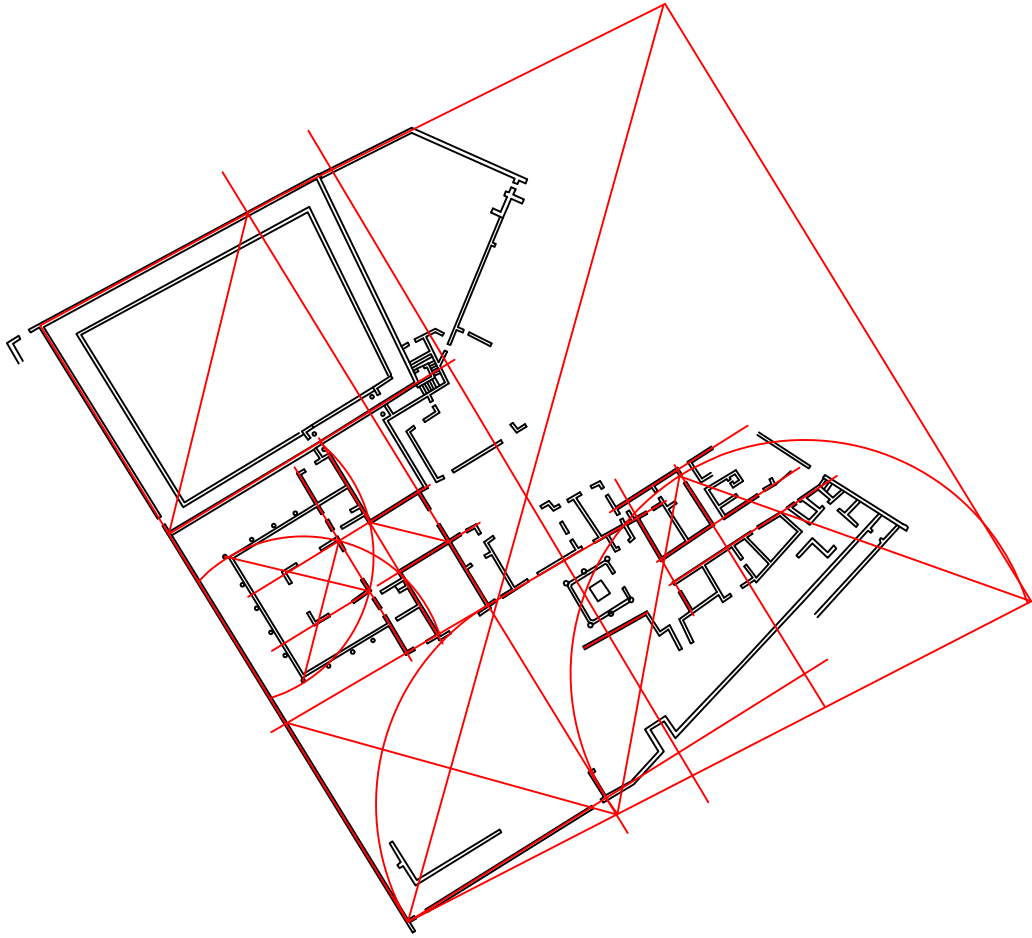
Villa of Diomedes - Square



Villa of the Figured Capitals - Square



Villa of Cicero - Square and Root 2



## Appendix D: Space Syntax

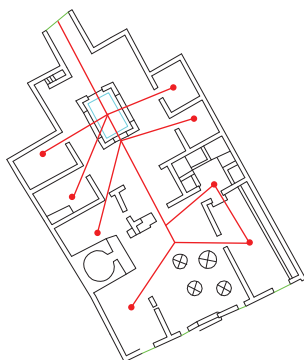
### Space - Syntax Results

Insula	Doorways	Area	Rooms	Mean Depth	Relative Asymmetry
1	1	183	5	2	0.666666667
1	10,13	499	17	2	0.133333333
1	6-8,24-26	1107	37	2.48	0.084571429
2	4-5, 30-31	950	27	2.56	0.1248
3	7,25,26	437	12	2	0.2
3	3	423	9	2.22	0.348571429
17	5,6	86	3	1.33	0.66
17	12,13,14	479	6	1.83	0.415
17	26-30	656	20	2.45	0.161111111
17	16-17	696	19	2.16	0.136470588
17	9,10,11	784	22	2.23	0.123
17	32,36	1236	14	2.29	0.215
17	25	2092	12	2.08	0.216
Villa of Cicero		5483	28	2.86	0.143076923
Villa of the Figured Capitals		1489	28	2.57	0.06038462
Villa of Diomede		2712	30	2.9	0.135714286
Villa of the Mysteries		2871	54	2.98	0.076153846

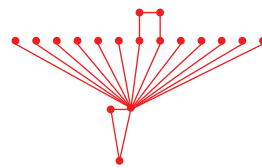
## Syntax "J Graphs"



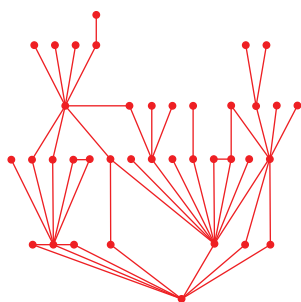
Casa della Musica



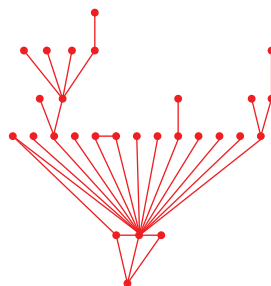
House of the Baker / Oven



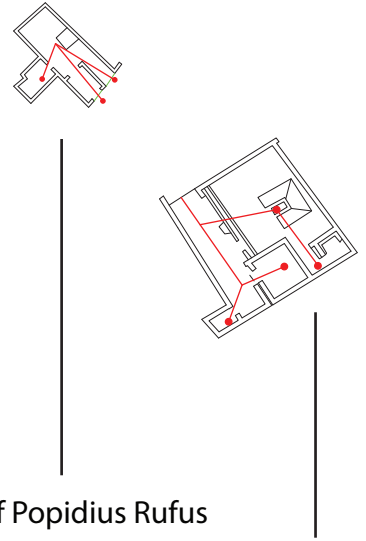
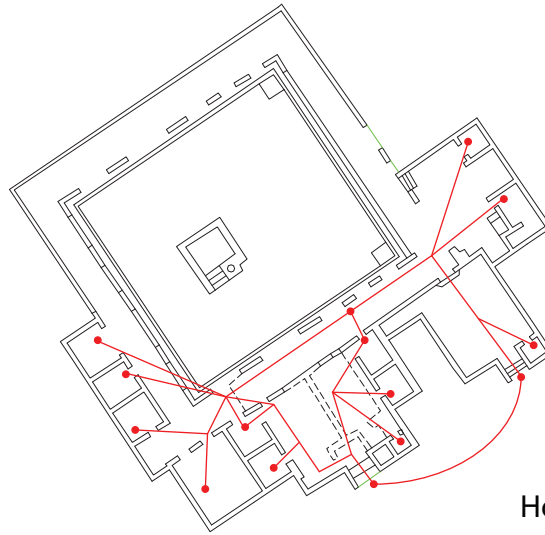
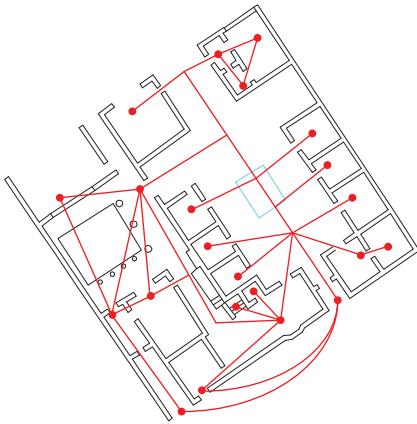
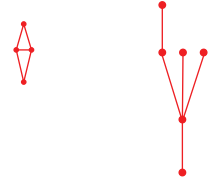
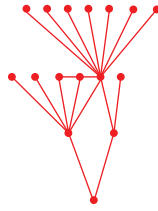
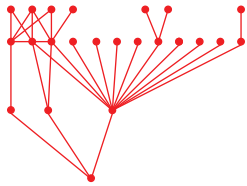
House of the Surgeon



House of the Vestals



House of Sallust

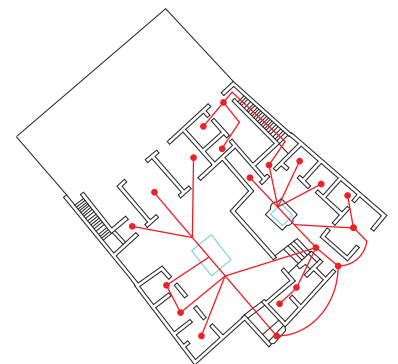
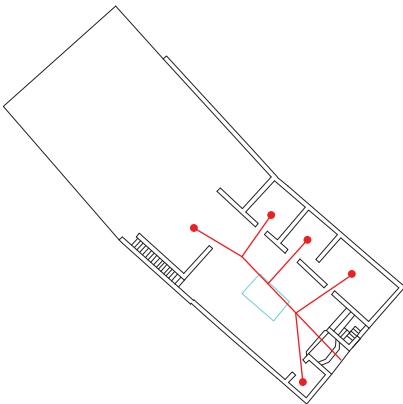
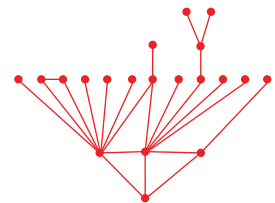
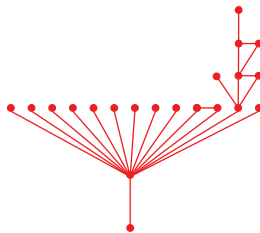
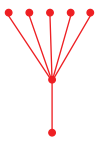


Casa dei Cadaveri di gesso

House of Diana II

House of Popidius Rufus

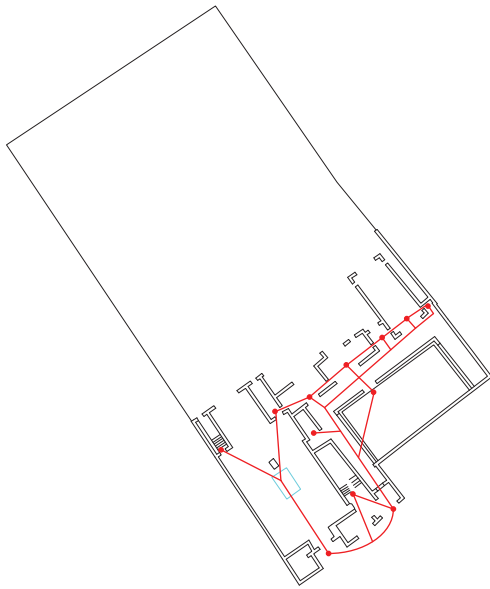
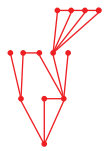
House of the Triclinium



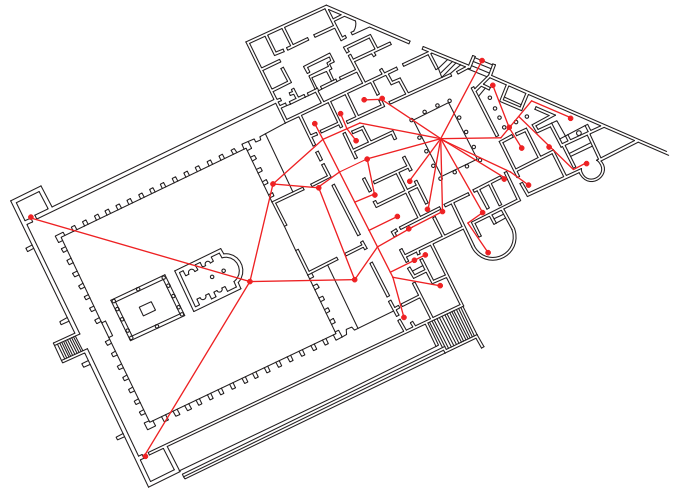
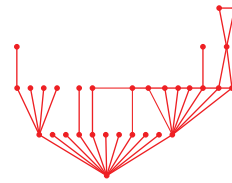
House C. Nivillio

House of Danzatrice

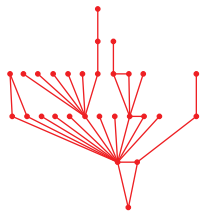
Unnamed House 16 & 17



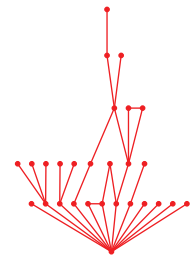
House of Leone



Villa of Diomedes

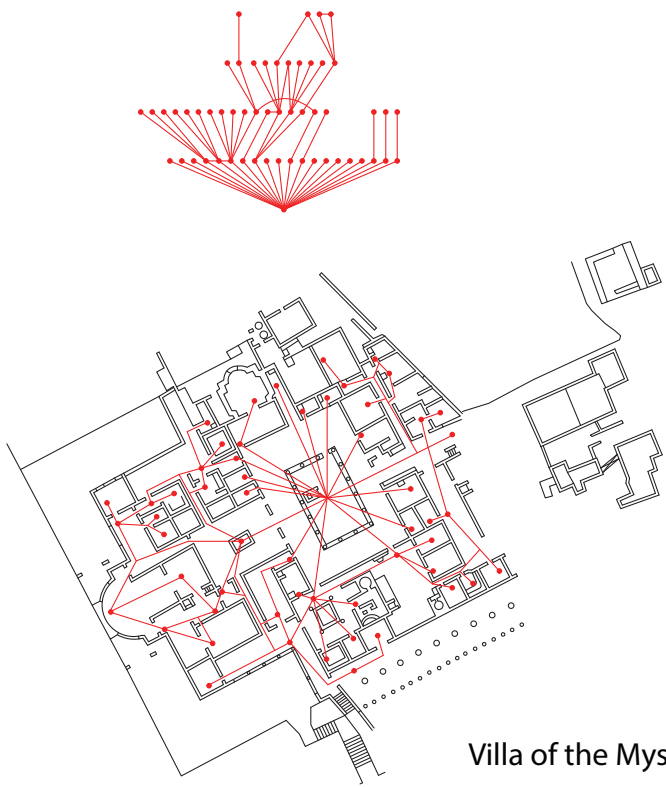


Villa of the Figured Capitals



Villa of Cicero

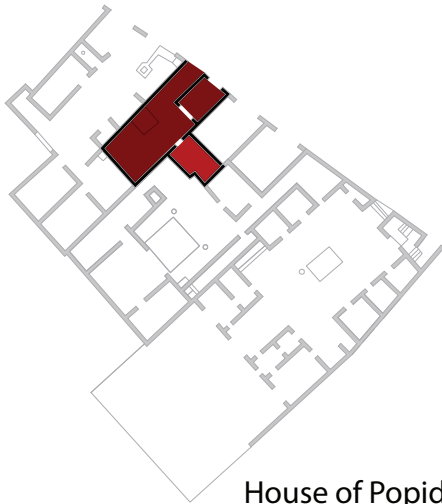




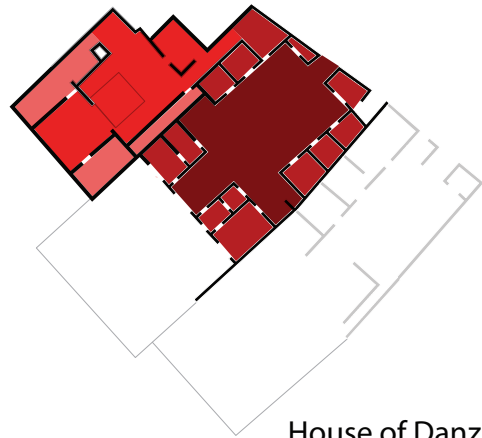
Villa of the Mysteries

## Spatial Hierarchy

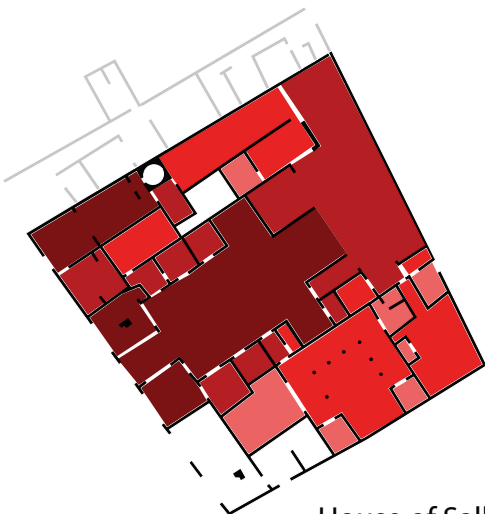
Primary	
Secondary	
Tertiary	
Quaternary	
Quinary	



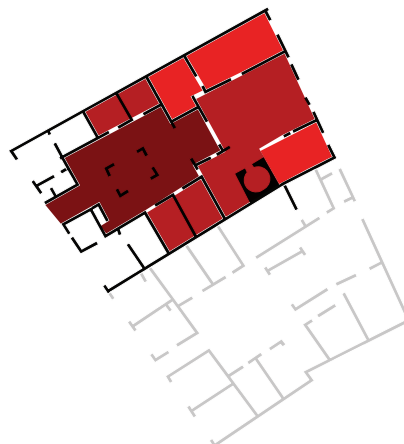
House of Popidius Rufus



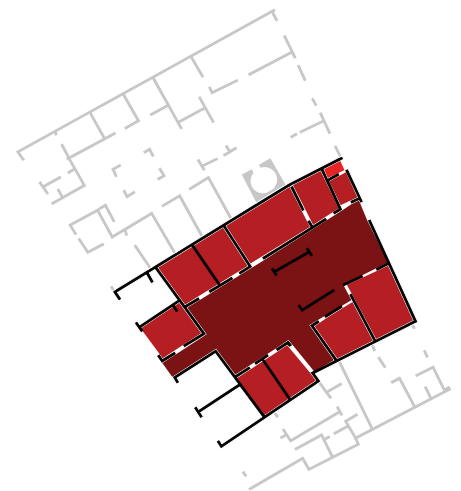
House of Danzatrice



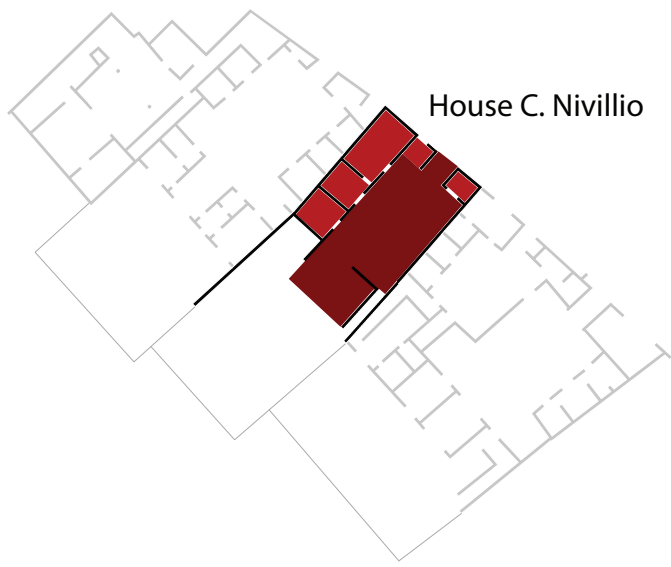
House of Sallust



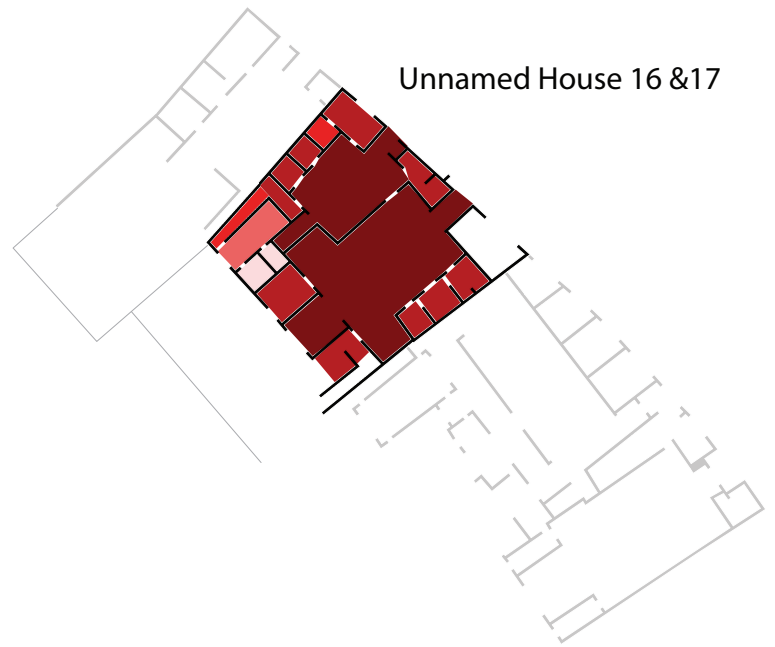
House of the Oven



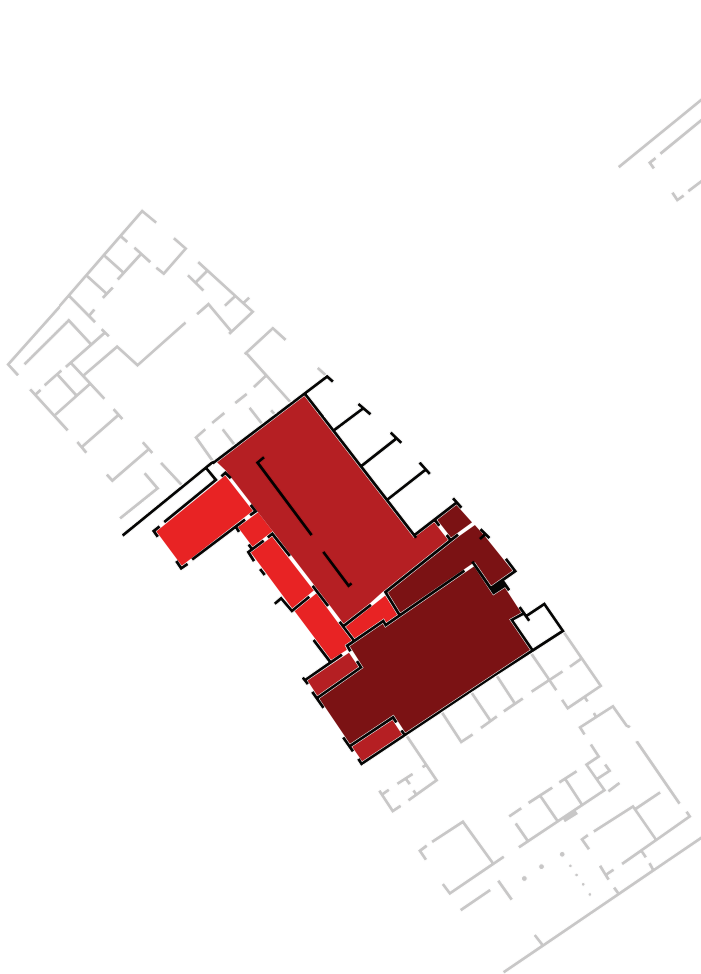
Casa della Musica



House C. Nivillio



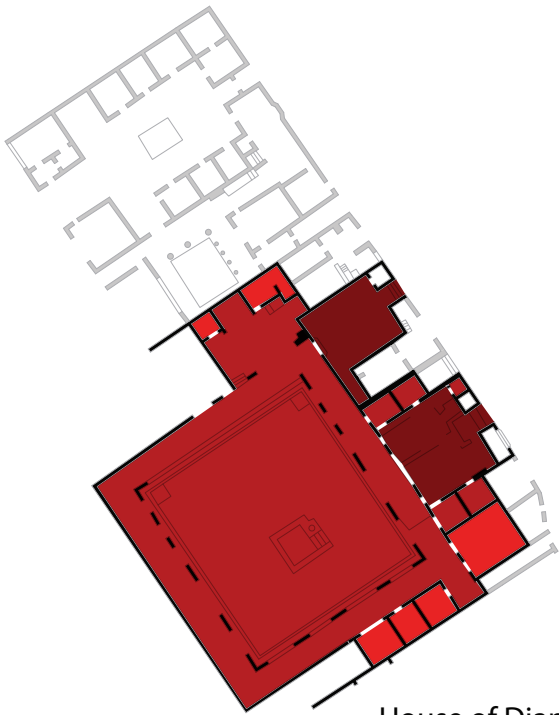
Unnamed House 16 & 17



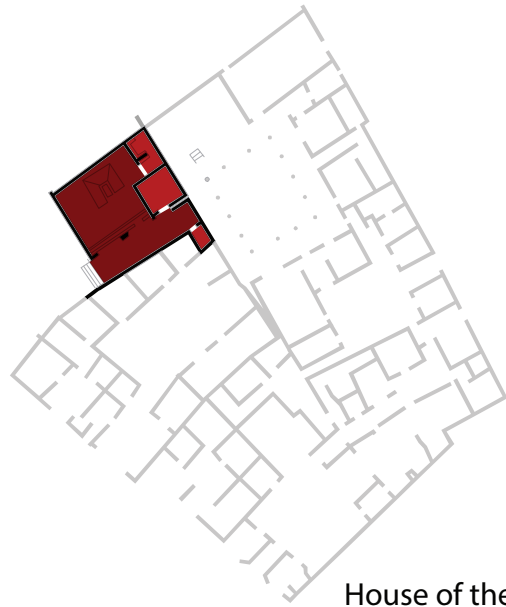
House of Leone



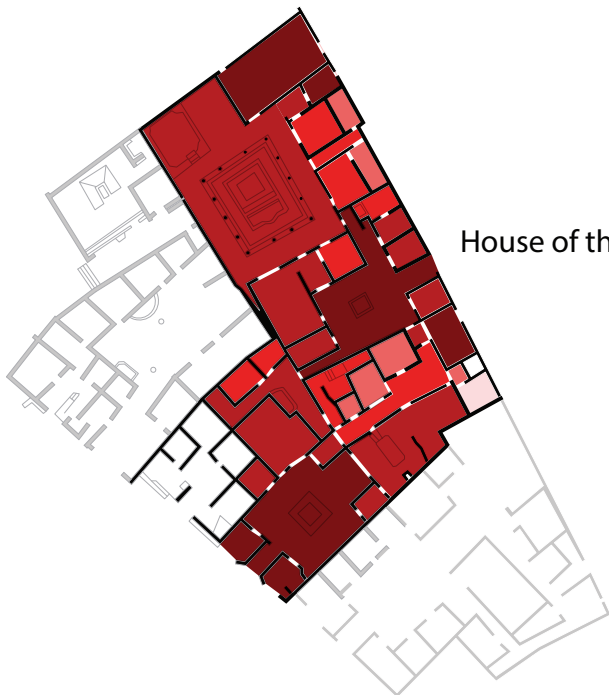
Casa dei Cadaveri di gesso



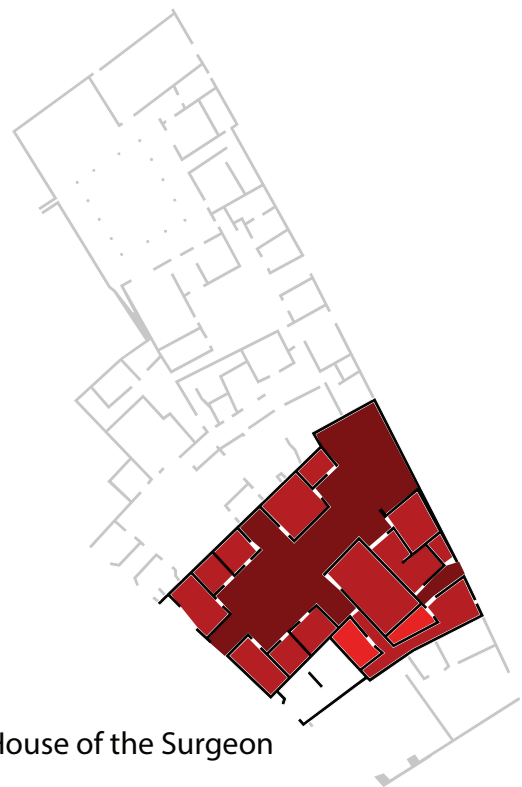
House of Diana II



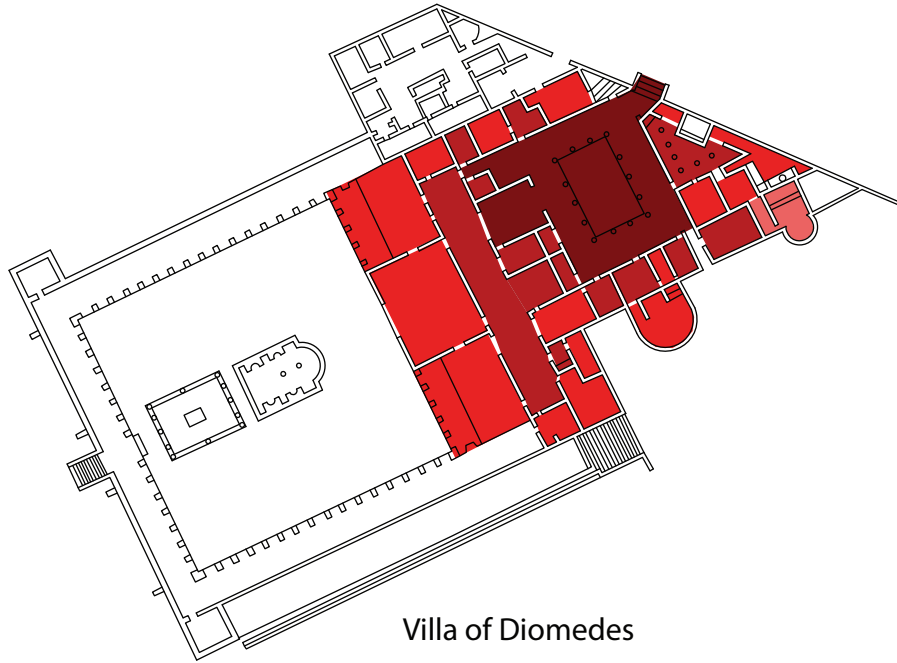
House of the Triclinium



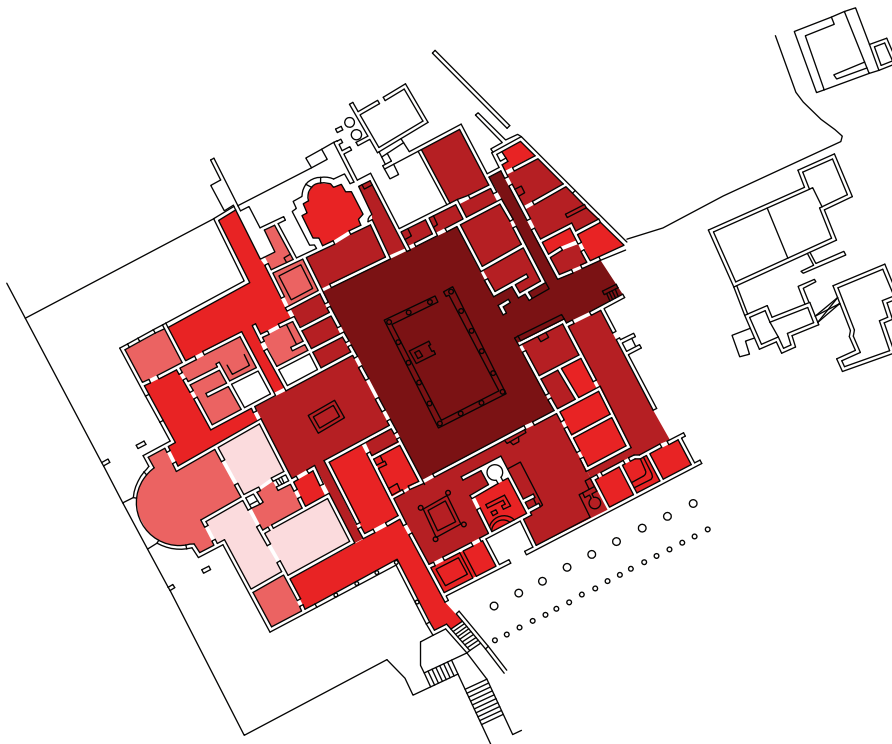
House of the Vestals



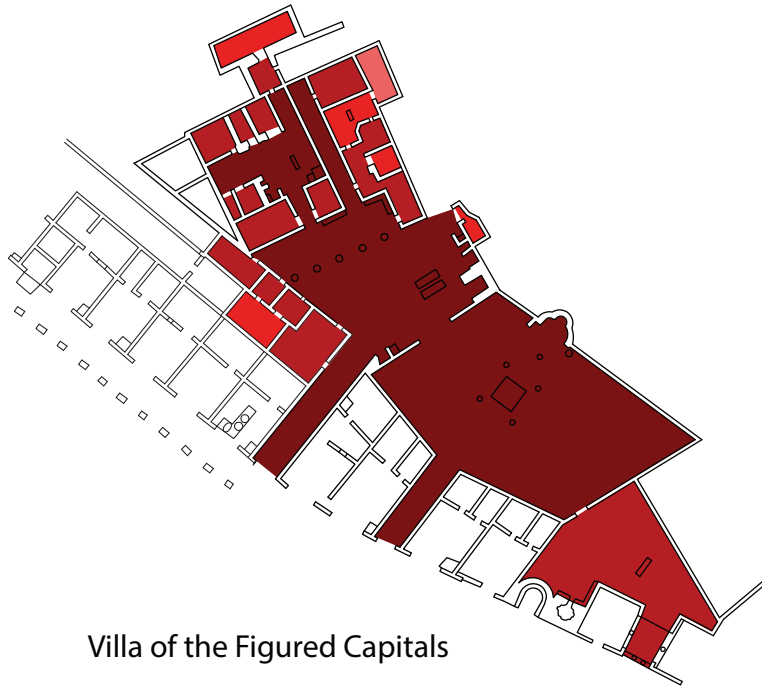
House of the Surgeon



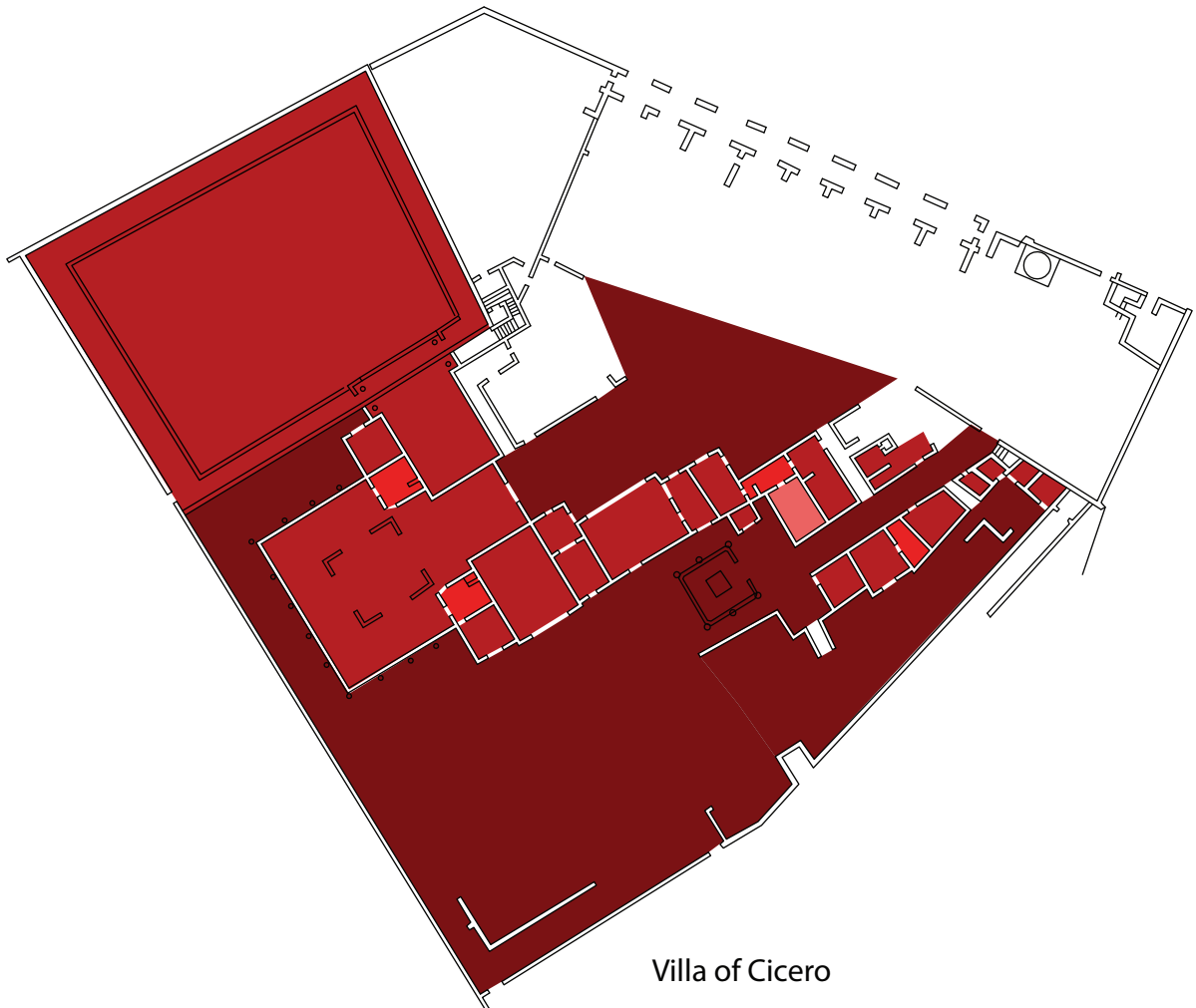
Villa of Diomedes



Villa of the Mysteries



Villa of the Figured Capitals



Villa of Cicero